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Literature List
Tewameter®

S.H. Kim, J.H. Kim, Y.M. Choi, S.M. Seo, E.Y. Jang, S.J. Lee, H.-S. Zhang, Y. Roh, Y.W. Jung, C.O. Park, D.H. Jeong, K.H. Lee, **Development of a biomarker-based platform for comprehensive skin characterization usingminimally invasive skin sampling and quantitative real-time PCR**, Skin Research and Technology: Volume 30, Issue 8, August 2024

Background: Classifying diverse skin types is crucial for promoting skin health. However, efficiently identifying and analyzing relevant biomarkers from a vast array of available genetic data is challenging. Therefore, this study aimed to develop a precise and efficient platform for analyzing specific skin biomarkers using quantitative real-time PCR (qRT-PCR) with the minimal invasive skin sampling method (MISSM). Materials and methods: MISSM was used for RNA extraction from skin samples, followed by qRT-PCR analysis to quantify the expression of 20 biomarkers associated with skin characteristics (four biomarkers each for five skin characteristics). Noninvasive measurements from 299 Korean participants were utilized to correlate biomarker expression with skin parameters. Statistical analyses were conducted between biomarker expression levels and noninvasive skin measurements to select the relatively best-performing biomarker for each skin characteristic. Results: Collagen type 1 alpha 1 (COL1A1) and moesin (MSN) were identified as skin aging biomarkers. Krüppel-like factor 4 (KLF4) and serine peptidase inhibitor Kazal type 5 (SPINK5) were identified as skin dryness biomarkers, whereas melan- A (MLANA) was selected as a biomarker for understanding pigmentation dynamics. Myelin protein zero like 3 (MPZL3) and high mobility group box 2 (HMGB2) were identified as markers of oily skin and skin sensitivity, respectively. Statistically significant correlations were found between the biomarker expression levels and noninvasive skin characteristic measurements. Conclusion: This study successfully developed a platform for the precise evaluation of individual skin characteristics using MISSM and qRT-PCR biomarker analysis. By selecting biomarkers that correlate with noninvasive measurements of skin characteristics, we demonstrated the platform's efficacy in assessing diverse skin conditions.

M. Bagheri, K. Tietz, M. von Kohout, P.C. Fuchs, R. Lefering, J.L. Schiefer, M. Bagheri, K. Tietz, M. von Kohout, P.C. Fuchs, R. Lefering, J.L. Schiefer, **Is It Possible to Monitor the Safest Time to Perform Secondary Surgery on Free Flaps? A Clinical Evaluation of the Tewameter®**, Medicina 2024, 60, 1327

Abstract: Background and Objectives: Postoperative monitoring, following free flap surgery, plays a crucial role in ensuring the survival of the flap. However, in microsurgery, not only the immediate postoperative monitoring period but also the choice of the right time for secondary surgeries is crucial for the free flap survival. There is no clear consensus concerning the right choice of timing for secondary surgery. Our aim was to evaluate transepidermal water loss (TEWL), with the objective evaluation tool Tewameter® in free flap surgery to monitor flap autonomization. Materials and Methods: Transepidermal water loss was assessed in 20 patients with microsurgically transplanted free anterior lateral thigh (ALTP) flaps. The transplantation of the ALTP-flap and the postoperative care were administered in accordance with the standard of care of the department. Measures were taken on the free flap and normal skin at follow-ups of 1, 3, and 6 months after initial free flap transplantation. Results: Transepidermal water loss gradually increased to the values found in normal skin, after 6 months. The differences between the two areas demonstrated the smallest variance after 6 months, specifcally in the ALTP-flap region. The largest disparities were observed between month 1 and month 6, followed by month 3 and month 6, and month 1 and month 3. Conclusions: Free flap autonomization and physiology are complex processes. TEWL might be a valuable parameter to monitor flap autonomization. Our results indicate that TEWL in the free flap is nearly "normal" after six months. For a clear consensus of when to perform individual secondary surgery, further studies are needed.

B.L. Lua, L. Ruan, Y. Lyu, S. Liu, **Understanding the causes of skincare product pilling**, Skin Research and Technology: Volume 30, Issue 8, August 2024

Background: Skincare and makeup “pilling” is an unsightly and undesirable phenomenon whereby skincare such as moisturizers or foundation ball up to form flakes on the skin. To date, the causes of skincare product pilling have not been studied. This study aimed to examine the relationship between skin physiology and pilling potential of sunscreen and foundation (the two products most reported by consumers to cause pilling). This study also examined the effects of product applicationmethods on pilling. Materials and methods: 528 female volunteers fromGuangzhou, China, aged between 20 and 49 years, underwent various clinical skin assessments, followed by three steps of product layering. Pilling was assessed after each product application step. Results: 217 volunteers (41%) experienced pilling. The majority of pilling (n = 655 events) occurred following sunscreen application, while only a few pilling events (n = 35) occurred with foundation. Foundation improved pilling caused by sunscreen in 98.9% of cases. Volunteers experiencing pilling with both sunscreen and foundation had significantly lower facial skin hydration and oiliness, higher pH, and smoother skin texture ($P < 0.05$). Two application methods, rubbing of products in circular and linear motions, yielded the highest numbers of pilling events. Conclusion: This study has provided the first insights into the causes of pilling. Sunscreen is a promoter of pilling, while foundation may resolve sunscreen-induced pilling in many cases. Skin physiology, particularly drier, smoother skin with higher pH, and product application methods are likely contributing factors to this undesirable phenomenon.

M. Szymoniak-Lipska, A. Dańczak-Pazdrowska, A. Lipski, K. Korecka, R. żaba, A. Polańska, **Transepidermal water loss (TEWL) and transonychial water loss (TOWL) measurements in healthy nail apparatus**, Skin Research & Technology, Volume 30, Issue 7, July 2024

Background: Although non-invasive diagnostic methods are widely used to examine the nail apparatus (NA), studies in healthy ones are scarce, and analyzes were often conducted in small groups. In the literature, there are only a few reports on TOWL measurements. The results of TEWL studies in the proximal nailfold have not been published so far. Materials and Methods: Based on a detailed interview and physical examination, 81 volunteers (40 women and 41 men) aged from 22 to 65 years were qualified for the study. In this study, the overall examination of the NA in relation to water loss was performed for the first time, regarding the hand (d, dominant; n, non-dominant) and finger types (number, start of count from thumbs) as well as sex and age. Results: The average TEWL value in the entire group ranged from 7.53 c.u. in the finger nd4 to 11.09 c.u. in nd1. Both in the dominant and non-dominant hand, in the entire analyzed group, and taking into account gender, weak statistically significant relationships were observed between the finger type value and TEWL ($p < 0.05$). The TEWL values were lower moving away from the thumb, the average TOWL value in the entire group ranged from 5.01 c.u. in d1 to 7.34 c.u. in d5. Both in the dominant and non-dominant hand, in the entire analyzed group and considering gender, statistically significant relationships were observed between the type of finger and TOWL values ($p < 0.05$). The TOWL values were higher moving away from the thumb. Subsequently, the values of TOWL and TEWL did not depend on type of hand (dominant or non-dominant), sex and age. Weak and moderate statistically significant correlations were found between TEWL and TOWL values in the entire study group and in females, as well as in selected fingers in males (d2, nd2, d3, nd3, d5, nd5) ($p < 0.05$, $r < 0.27$). Conclusion: Non-invasive diagnostics such TEWL and TOWL measurements are useful to assess differences in structure and function between types of fingers. However, obtained results demand further studies.

A. Stoli□ Jovanovi□, V.M. Tadi□, M. Martinovi□, A. Žugi□, I. Nešić, S. Blagojevi□, N. Jasni□, T. Tosti, **Liposomal Encapsulation of Ascorbyl Palmitate: Influence on Skin Performance**, Pharmaceutics 2024, 16

L-ascorbic acid represents one of the most potent antioxidant, photoprotective, anti-aging, and anti-pigmentation cosmeceutical agents, with a good safety profile. However, the main challenge is the formulation of stable topical formulation products, which would optimize the penetrability of L-ascorbic acid through the skin. The aim of our research was to evaluate the performance of ascorbyl palmitate on the skin, incorporated in creams and emulgels (2%) as carriers, as well as to determine the impact of its incorporation into liposomes on the penetration profile of this ingredient. Tape stripping was used to study the penetration of ascorbyl palmitate into the stratum corneum. In addition, the sensory and textural properties of the formulations were determined. The liposomal formulations exhibited a better penetration profile ($p < 0.05$) of the active substance compared to the non-liposomal counterpart, leading to a 1.3-fold and 1.2 fold-increase in the total amount of penetrated ascorbyl palmitate in the stratum corneum for the emulgel and cream, respectively. Encapsulation of ascorbyl palmitate into liposomes led to an increase in the adhesiveness and density of the prepared cream and emulgel samples. The best spreadability and absorption during application were detected in liposomal samples. The obtained results confirmed that liposomal encapsulation of ascorbyl palmitate improved dermal penetration for both the cream and emulgel formulations.

K. Okoshi, S. Ito, M. Matsuoka, Y. Kinugasa, E. Shimizu, K. Tanaka, J. Okada, T. Nishizaka, A. Nagasawa, T. Seki, M. Iijima, M. Abe, O. Nemoto, **Combination of a Topical Anti-Inflammatory Drug and a Moisturizer, Both with a Lamellar Structure Containing Synthetic Pseudo-Ceramides, for the Treatment of Patients with Mild-to-Moderate Atopic Dermatitis**, Clinical, Cosmetic and Investigational Dermatology 2024:17, p. 1569–1578

Purpose: Atopic dermatitis is characterized by chronic inflammation and dryness accompanied by severe itching. The combined use of moisturizers and topical anti-inflammatory drugs is essential for alleviating atopic dermatitis. We have developed a topical antiinflammatory drug with a steroid and a moisturizer with heparinoid, both in lamellar structure-based formulations containing synthetic pseudo-ceramides. Here, assessed the effcacy of this combination in the treatment of atopic dermatitis. Methods: We included 22 patients with mild to moderate atopic dermatitis and subjected them to a seven-week treatment with the test formulations, followed by a four-week post-treatment period. Results: Clinical fndings and the quality of life of participants remarkably improved after one week of treatment. Furthermore, skin hydration and transepidermal water loss considerably improved at weeks one and three, respectively. The Cer [NP]/[NS] ratio, an indicator of epidermal turnover, substantially increased during the treatment period and remained elevated even thereafter. The improvement in stratum corneum function was distinctive in participants with lower barrier function. Conclusion: These fndings indicated that the combined use of the anti-inflammatory drug and moisturizer, both in lamellar structurebased formulations, is effective in treating atopic dermatitis in patients with fragile barrier function.

J.E. Seol, G.J. Cho, S.H. Jang, S.W. Ahn, S.M. Hong, S.H. Park, H. Kim, **Effect of Amount of Daily Water Intake and Use of Moisturizer on Skin Barrier Function in Healthy Female Participants**, Ann Dermatol. 2024 Jun;36(3): p. 145-150

Background: It is well known that adequate water intake and moisturizer application improves skin barrier function. Objective: This study was conducted to analyze the effects of daily water intake and moisturizer application on skin barrier function and the degree of response to barrier recovery. Methods: Participants with daily water intake more than 1 L were classifed as high daily water intake group (H) and those with less than 1 L as low daily water intake group (L). Each group wassubcategorized into four groups according to intervention method: additional water intake (H1, L1), moisturizer (H2, L2), both (H3, L3), and control (H4, L4). Transepidermal water loss (TEWL) and stratum corneum hydration (SCH) were measured at baseline during the 2nd and 4th week. Results: A total of 43 participants completed the study (H: 22, L: 21). At baseline, there was no signifcant difference in SCH and TEWL in any on the anatomical sites between the high daily water intake and low daily water intake groups. However, SCHs of lef forearm (group H2, p=0.004; group H3, p=0.004), lef hand dorsum (group H2, p=0.010; group H3, p=0.026), and lef shin (group H2, p=0.016; group H3, p=0.001) in group H2 and H3 were signifcantly increased in the 4th week as compared to the baseline values. Conclusion: The results suggest that the degree of water intake may be related to improved skin barrier function. However, application of additional moisturizers had more favorable impact on skin hydration as compared to additional water intake.

M.C. Lidon-Moya, E. Gomez, J. Galvez, A. Soley, G. Mola, R. Delgado, **Nourishing sensitive skin for healthier appearance**, PERSONAL CARE MAGAZINE, June 2024, p. 27-31

Sensitive skin is a condition characterized by heightened responses to stimuli that should not normally cause discomfort. While external factors like temperature and chemicals are known to affect skin sensitivity, the role of nutritional status on skin health and sensitivity is emerging. Therefore, understanding the impact of diet on skin inflammation and ageing is crucial. An unhealthy diet, high in fat and sugar, induces metabolic stress that leads to skin inflammation and accelerates skin ageing. This unhealthy diet triggers the release of stressorins, danger alarm signals that bind to RAGE receptors (receptors for Advanced Glycation End Products) on skin cells and other cells. Consequently, this activates the NF-kB signaling pathway, resulting in increased production of pro-inflammatory cytokines.

A. Ziemlewska, M. Zagórska-Dziok, A. Mokrzyńska, Z. Nizioł-Łukaszewska, D. Szczepanek, I. Sowa, M. Wójciak, **Comparison of Anti-Inflammatory and Antibacterial Properties of *Raphanus sativus* L. Leaf and Root Kombucha-Fermented Extracts,** Int. J. Mol. Sci. 2024, 25, 5622

In the cosmetics industry, the extract from Raphanus sativus L. is fermented using specifc starter cultures. These cosmetic ingredients act as preservatives and skin conditioners. Kombucha is traditionally made by fermenting sweetened tea using symbiotic cultures of bacteria and yeast and is used in cosmetic products. The aim of this study was to evaluate the cosmetic properties of radish leaf and root extract fermented with the SCOBY. Both unfermented water extracts and extracts after 7, 14,

and 21 days of fermentation were evaluated. The analysis of secondary plant metabolites by UPLC-MS showed higher values for ferments than for extracts. A similar relationship was noted when examining the antioxidant properties using DPPH and ABTS radicals and the protective effect against H2O2-induced oxidative stress in fbroblasts and keratinocytes using the fluorogenic dye H2DCFDA. The results also showed no cytotoxicity to skin cells using Alamar Blue and Neutral Red tests. The ability of the samples to inhibit IL-1β and COX-2 activity in LPS-treated fbroblasts was also demonstrated using ELISA assays. The influence of extracts and ferments on bacterial strains involved in inflammatory processes of skin diseases was also assessed. Additionally, application tests were carried out, which showed a positive effect of extracts and ferments on TEWL and skin hydration using a TEWAmeter and corneometer probe. The results obtained depended onthe concentration used and the fermentation time.

X.R. Zhang, Y.X. Jin, P.N. Chien, T.T. Thuy Tien, S.Y. Zhou, N.N. Giang, L.T. Thuy Le, S.Y. Nam, C.Y. He, **Evaluation test and analysis of a microneedle and iontophoresis based medical device "CELLADEEP Patch" in skin improvement on ex vivo human-derived skin tissue models**, Skin Research & Technology May 2024

Background: Microneedles are tiny needles, typically ranging from tens to hundreds of micrometers in length, used in various medical procedures and treatments. The tested medical device named "CELLADEEP Patch" a dissolvable microneedle therapy system (MTS), made of hyaluronic acid and collagen. And the iontophoresis technique is also applied in the system. The study aimed to evaluate the effectiveness of the "CELLADEEP Patch" in skin improvement. Methods: Ex vivo human-derived skin tissue models were used in this study and they were divided into three different groups, namely, the Untreated Group, the Negative Control Group, and the Test Group respectively. The Untreated Group received no treatment measures, the Negative Control Group was exposed to ultraviolet B radiation (UVB) irradiation, and the Test Group was exposed to UVB irradiation and treated with "CELLADEEP Patch". Skin moisture content, transdermal water loss, and skin elasticity were evaluated by three clinical devices. Additionally, histological staining and related mRNA expression levels were also analyzed. Results: The results of skin moisture content, transdermal water loss, and skin elasticity evaluation consistently illustrated that the application of "CELLADEEP Patch" led to remarkable skin improvement. And the analysis of histological staining images also confirmed the effectiveness of the "CELLADEEP Patch", especially for increasing collagen density. Moreover, the upregulation of Collagen type 1 a (COL1A1) and hyaluronan synthase 3 mRNA expression and the decrease of Matrix metalloproteinase 1 (MMP- 1) and Interleukin-1 beta (IL-1β) mRNA expression reflected its wrinkle improvement, moisturizing and anti-inflammation function.

S. Fallone de Andrade, C. Ferreira-Pêgo, T. Fontes Sofia Lopes, L.M. Rodrigues, **Omnivore and vegetarians show similar body composition and skin physiology across body regions—A comparative analysis**, Skin Res Technol. May 2024

Background: Skin physiology seems to be influenced by dietary choices and body composition, although links between these factors remain poorly characterised. In the present manuscript, we elaborate on the potential relationships among food groups,body composition and skin physiology in omnivores and vegetarians. Material and Methods: This cross-sectional observational study involved 181 participants, 129 omnivores and 52 vegetarians. The main functions of the skin measured in our laboratory were transepidermal water loss, deep and superficial epidermal hydration, skin elasticity, and carotenoid content. Skin variables obtained from different body regions were made comparable by a new Proportional Skin Index calculated to respect their relative representativity. Results: No statistical differences were found when comparing both groups' body composition and skin variables from different body regions, with the exception of the skin carotenoid content significantly higher in the vegetarian group ($p < 0.001$). Conclusion: Although dietary patterns significantly differed between groups, with vegetarians consuming fewer animal-derived products and more plant-based foods, multiple linear regression analysis revealed no differences or association between the dietary pattern and the skin physiology. These findings highlight the need for further research to elucidate the specific impact of diet and food groups and body composition on skin physiology.

S. Fallah Pakdaman, A. Samadi, M. Fattahi, A. Naeimifar, F. Amiri Ardehali, Y. Ketabi, S.A. Nasrollahi, A. Firooz, **Fabrication and efficacy assessment of combination of brimonidine and ivermectin for treatment of papulopustular rosacea**, J Cosmet Dermatol. May 2024

Background & Aim: Rosacea is a chronic inflammatory, multifactorial disease for which combination therapy could be an effective treatment.In this study, we evaluate the effect of the combination therapy of brimonidine 0.33% and ivermectin 1% as a single cream for the treatment of papulopustular rosacea. Method: A stable and appropriate formulation was prepared by adding the aqueous phase to the lipid

phase while being stirred. The stability and physicochemical properties of the formulation were evaluated under accelerated conditions. Twelve patients (36–60 years) with mild to moderate papulopustular rosacea and a Demodex count of five or more were treated with the combination of brimonidine 0.33% and ivermectin 1% cream. Clinician's Erythema Assessment (CEA), Patients Self-Assessment (PSA), skin erythema (ΔE) and lightness (ΔL), and skin biophysical parameters including transepidermal water loss (TEWL), skin hydration, pH, and sebum content, as well as erythema and melanin index and ultrasound parameters, were measured before treatment and 4 and 8 weeks after. Adverse drug reactions were also recorded Results: CEA and PSA decreased significantly from 3 to 2 after 8 weeks, respectively (p-value = 0.014 for CEA and 0.010 for PSA). ΔE and ΔL, as well as skin erythema index and TEWL improved after 8 weeks of treatment ($p < 0.05$). Two patients withdrew from the study in the first week because of local adverse effects; one developed flushing following treatment and left the investigation after 4 weeks and another patient withdrew from the study after 4 weeks due to deciding to become pregnant. Conclusion: Eight-week treatment with the combination of brimonidine 0.33% and ivermectin 1% was shown to be effective for improvement of erythema and inflammatory lesions in mild to moderate papulopustular rosacea.

T. Sadowski, C. Müller, N. Nowak, H. Niesalla, H. Gerdes, **Illustrating Skin Hydration by Capacitive Contact Imaging after Frequent Hand Disinfection / Visualisierung der Hautfeuchtigkeit nach häufger Händedesinfektion mittels Capacitive Contact Imaging**, söfw Journal 150, 5/24, p. 8-12

Hand hygiene is essential for preventing healthcare-associated infections. However, hand hygiene compliance is often hindered by a number of factors, one of which is irritant contact dermatitis. Illustrating the benefits of skin friendly hand disinfectants and their effect on skin condition could positively influence hand hygiene compliance. The aim of this study was to analyse the skin hydrating effect of a hand disinfectant with a comprehensive skin care complex using Capacitive Contact Imaging (CCI) as a method to assess and visualise skin hydration in comparison to conventional corneometry. In addition to established parameters, including pH value, transepidermal water loss (TEWL), and dermatological assessments, the study investigated the dermatological effects of a two-week application of a hand disinfectant foam. Frequent daily application of the product led to an improvement in skin hydration without causing intolerability. The results from CCI and corneometry were consistently comparable and showed significantly elevated skin hydration after the two-week application period. CCI illustrated the increased skin hydration and its potential to be used as an additional method to evaluate and demonstrate the effect of hand hygiene products on skin health.

Händehygiene ist im Gesundheitswesen entscheidend für die Infektionsprävention. Allerdings wird die indikationsgerechte Einhaltung der Händehygiene (Compliance) oft durch eine Reihe von Faktoren behindert, einschließlich Unverträglichkeiten wie irritativer Kontaktdermatitis. Eine Visualisierung der Vorteile hautfreundlicher Hände-Desinfektionsmittel für den Hautzustand könnte die Händehygiene-Compliance positiv beeinflussen. Ziel dieser Studie war es, die Haut befeuchtende Wirkung eines Hände-Desinfektionsmittels mit umfassendem Hautpflegekomplex zu untersuchen. Dabei wurde ein kapazitives Bildgebungsverfahren (Capacitive Contact Imaging [CCI]) als Methode zur Messung und Visualisierung der Hautfeuchtigkeit im Vergleich zur herkömmlichen Corneometrie eingesetzt. Zusätzlich zu etablierten Parametern wie pH-Wert, transepidermaler Wasserverlust (TEWL) und dermatologische Bewertungen wurden die Auswirkungen einer zweiwöchigen Anwendung eines Hände-Desinfektionsschaums auf den Hautzustand untersucht. Die regelmäßige tägliche Anwendung des Produktes führte zu einer Verbesserung der Hautfeuchtigkeit, ohne dass Unverträglichkeiten auftraten. Die mittels CCI und Corneometrie erzielten Ergebnisse waren durchweg vergleichbar und zeigten eine signifkant erhöhte Hautfeuchtigkeit nach dem zweiwöchigen Anwendungszeitraum. CCI visualisierte die erhöhte Hautfeuchtigkeit und zeigt damit das Potenzial für den Einsatz als zusätzliche Methode zur Bewertung und zum Nachweis der Auswirkungen von Hände-Hygieneprodukten auf die Hautgesundheit.

B. Aral, **Testing Tactics: Approaches to Measure Scalp Comfort and Care**, Cosmetics & Toiletries, May 2024

The global hair and scalp care market is expected to generate a revenue of about $94 billion in 2024, with an anticipated CAGR of 2.8% in the next four years. Anti-dandruff, hair loss, dry and itchy scalp, dry and dull hair, and white/gray hair product categories dominate, while products targeting scalp comfort and care have emerged as their own sub-category thanks to a few combined factors.

P. Gonry, **Cleaning of the skin: easier said than done,** PERSONAL CARE MAGAZINE, Volume 25, Issue 5, May 2024, p. 45-48

Hygiene is an important and efficient way to keep the skin healthy and beautiful. Dirt and

pathogens that can disturb the proper functioning of the skin are removed on a regular basis. Hygiene is not only crucial to keep the skin healthy, but also the whole body. Cleaning the skin with shower gels, handwashes and soap bars is a worldwide well-established routine. All these skin cleaning products are based on surfactants.

R. di Lorenzo, D. Falanga, L. Ricci, A. Colantuono, G. Greco, M. Angelillo, F. Nugnes, T. di Serio, D. Costa, A. Tito, S. Laneri, **NAD-Driven Sirtuin Activation by *Cordyceps sinensis* Extract: Exploring the Adaptogenic Potential to Promote Skin Longevity**, Int. J. Mol. Sci. 2024, 25

Abstract: In recent years, there has been increasing interest in utilizing Traditional Chinese Medicine principles and natural bioactive compounds to combat age-related ailments and enhance longevity. A *Cordyceps sinensis* mycelium hydroethanolic extract (CsEx), which was standardized in cordycepin andadenosine using UHPLC-DAD, was investigated for its adaptogenic properties using in vitro assays and a double-blind, placebo-controlled clinical trial involving 40 subjects. The CsEx demonstrated activity at a concentration of 0.0006%, signifcantly increasing sirtuin expression (SirT1: +33%, SirT3: +10%, SirT6: +72%, vs. CTR, $p < 0.05$) and NAD+ synthesis in HaCat cells (+20% vs. CTR, $p < 0.001$). Moreover, the CsEx boosted ATP production by 68% in skin cells, correlating with higher skin energy values (+52.0% at D28, $p < 0.01$) in the clinical trial. Additionally, CsEx notably reduced cytosolic reactive oxygen species (ROS) by 30% in HaCaT cells ($p < 0.05$) and enhanced collagen production both in vitro (+69% vs. CTR, $p < 0.01$) and in vivo (+10% vs. D0, $p < 0.01$), confrmed by ultrasound examination. Furthermore, CsEx's stimulation of fbroblasts, coupled with its antioxidant and energizing properties, led to a signifcant reduction in wrinkles by 28.0% (D28, $p < 0.001$). This study underscores *Cordyceps sinensis* hydroethanolic extract's potential in regulating skin cell energy metabolism and positively influencing the mechanisms associated with skin longevity control.

F. Villapiano, R. di Lorenzo, R. Sparaco, E. Magli, F. Frecentese, S. Laneri, A. D'Orsi, V. Nele, M. Biondi, L. Mayol, V. Campani, V. Santagada, G. de Rosa, **Technological and Physical–Chemical Evaluation of Cotton Gauzes Impregnated with Semisolid Preparations for Wound Healing**, Biomedicines 2024, 12, 777

Chronic wounds are marked by an extended healing period during which damaged tissues fail to undergo orderly and timely repair. Examples of chronic wounds encompass venous ulcers, pressure ulcers, and diabetic foot ulcers. The process of wound healing is complex and dynamic, relying on the interplay and response among various cells and mediators. In this study, four marketedwound dressing (namely Betadine® 10%, Connettivina® Bio Plus Fitostimoline® Plus, and Non-Ad® gauzes) have been characterized for their physicochemical properties and ex vivo behaviors. More in detail, the pH and rheological features of semisolid formulations impregnating the gauzes were analyzed along with their ability to adhere to the gauzes. The most promising ones were selected and compared in ex vivo experiments on fresh pig skin. The pH measurements showed an acidic environment for all the tested solutions, albeit with variations in mean values, ranging from 2.66 to 4.50. The outcomes of rheological studies demonstrated that all the semisolid preparations impregnating the gauzes exhibited a pseudoplastic behavior, with signifcant differences in the pseudoplasticity index across the preparations, which is likely to influence their ability to adhere to the gauze. A rheological study in oscillatory mode revealed rheological behavior typical of a viscous solution only for the cream impregnating non-paraffn gauzes. The other products exhibited rheological behavior typical of a weak gel, which is expected to be advantageous as regards the capability of the semisolid preparation to create and maintain the space within the wound and to provide protection to the injured tissue. Results of ex vivo experiments demonstrated that Fitostimoline® Plus was more effective than Connettivina® Bio Plus in promoting both skin hydration and energy.

L. Kakuda, P.M.B.G. Maia Campos, W.P. Oliveira, **Development and Effcacy Evaluation of Innovative Cosmetic Formulations with *Caryocar brasiliense* Fruit Pulp Oil Encapsulated in Freeze-Dried Liposomes**, Pharmaceutics 2024, 16, 595

Encapsulation and drying technologies allow the engineering of innovative raw materials from plant biodiversity, with potential applications in pharmaceutical and cosmetic felds. Lipid-based nanoencapsulation stands out for its effciency, ease of production, and versatility in encapsulating substances, whether hydrophilic or lipophilic. This work aimed at encapsulating pequi oil in liposomes and freeze-dried liposomes to enhance its stability and functional benefts, such as skin hydration and anti-aging effects, for use in innovative cosmetic formulations. Pequi oil—extracted from the *Caryocar brasiliense* fruit pulp, a plant species from Brazilian plant biodiversity—is rich in secondary metabolites and fatty acids. Liposomes and dried liposomes offer controlled production processes and seamless integration into cosmetic formulations. The physicochemical analysis of the developed liposomes confrmed that the formulations are homogeneous and electrokinetically stable, as evidenced by

consistent particle size distribution and zeta potential values, respectively. The geltype formulations loaded with the dried liposomes exhibit enhanced skin hydration, improved barrier function, and refned microrelief, indicating improvements in skin conditions. These results highlight the potential of dried liposomes containing pequi oil for the development of innovative cosmeceutical products. This research contributes to the valorization of Brazilian biodiversity by presenting an innovative approach to leveraging the dermatological benefts of pequi oil in cosmetic applications.

L.K.W. Phoebe, K.W.A. Lee, L.K.W. Chan, L.C. Hung, R. Wu, S. Wong, J. Wan, K.-H. Yi, **Use of platelet rich plasma for skin rejuvenation**, Skin Research & Technology, April 2024

Objective: Platelet-rich plasma (PRP) is recognized as a safe and effective therapy for regenerative skin healing and rejuvenation, utilizing autologous blood enriched with various growth factors. This review aims to assess the efficacy of PRP treatments forskin rejuvenation. Methods: Keywords such as “platelet-rich plasma,” “rejuvenation,” “skin aging,” and“wrinkles” were queried on Ovid, PubMed, and MEDLINE to identify pertinent studies on PRP treatment for skin rejuvenation.Results: Analysis revealed that PRP treatment led to significant enhancements in multiple facial parameters after one to three sessions. Improvements were noted in skin pore size, texture, wrinkle reduction, pigmented spots, collagen density, hyaluronic acid levels, and protection against ultraviolet damage. Combining PRP with hyaluronicacid demonstrated a synergistic effect, particularly enhancing skin elasticity in patients with lower body mass index and firmness in individuals aged 50s and 60s. Incorporating both physical and biometric data for assessment proved superior to relying solely on physical observations for evaluating subtle skin quality and structural changes. Conclusion: This study underscores the efficacy of PRP monotherapy for skin rejuvenation and emphasizes the necessity of standardizing PRP preparation protocols in future investigations. Heightened awareness and advancements in technology have contributed to the emergence of higher-quality, less biased studies supporting PRP as a reliable and safe therapeutic option for skin rejuvenation.

M. Giakoumaki, G.I. Lambrou, D. Vlachodimitropoulos, A. Tagka, A. Vitsos, M. Kyriazi, A. Dimakopoulou, V. Anagnostou, M. Karasmani, H. Deli, A. Grigoropoulos, E. Karalis, M. Christou Rallis, H.S. Black, **Type I Diabetes Mellitus Suppresses Experimental Skin Carcinogenesis**, Cancers 2024, 16, 1507

This study explores the previously uncharted territory of the effects of ultraviolet (UV) radiation on diabetic skin, compared to its well-documented impact on normal skin, particularly focusing on carcinogenesis and aging. Employing hairless SKH-hr2, Type 1 and 2 diabetic, and nondiabetic male mice, the research subjected these to UV radiation thrice weekly for eight months. The investigation included comprehensive assessments of photoaging and photocarcinogenesis in diabetic versus normal skin, measuring factors such as hydration, trans-epidermal water loss, elasticity, skin thickness, melanin, sebum content, stratum corneum exfoliation and body weight, alongside photo documentation. Additionally, oxidative stress and the presence of hydrophilic antioxidants (uric acid and glutathione) in the stratum corneum were evaluated. Histopathological examination post-sacrifce provided insights into the morphological changes. Findings reveal that under UV exposure, Type 1 diabetic skin showed heightened dehydration, thinning, and signs of accelerated aging. Remarkably, Type 1 diabetic mice did not develop squamous cell carcinoma or pigmented nevi, contrary to normal and Type 2 diabetic skin. This unexpected resistance to UVinduced skin cancers in Type 1 diabetic skin prompts a crucial need for further research to uncover the underlying mechanisms providing this resistance.

J. Pazdrowski, A. Polańska, J. Kaźmierska, M.J. Kowalczyk, M. Szewczyk, P. Niewinski, W. Golusiński, A. Dańczak-Pazdrowska, **The Assessment of the Long-Term Impact of Radiotherapy on Biophysical Skin Properties in Patients after Head and Neck Cancer**, Medicina 2024, 60, 739

Background and Objectives: Chronic radiotherapy-induced skin injury (cRISI) is an irreversible and progressive condition that can signifcantly impact a patient’s quality of life. Despite the limited literature available on the assessment of the epidermal barrier in cRISI, there is a consensus that appropriate skincare, including the use of emollients, is the primary therapeutic approach for this group of patients. The aim of this study was to evaluate the biophysical properties of the skin during the late period (at least 90 days) following radiation therapy (RT) for head and neck cancer. Materials and Methods: This was a single-center prospective non-randomized study. It involved theanalysis of 16 adult patients with head and neck cancer who underwent RT at the Greater Poland Cancer Center, along with 15 healthy volunteers. The study and control groups were matched for gender and age ($p = 0.51$). Clinical assessment, based on the LENT-SOMA scale, was conducted for all patients. Evaluation of the skin’s biophysical properties included: an analysis of transepidermal water loss (TEWL), stratum corneum hydration (SCH), and skin visualization using high-frequency ultrasonography (HF-USG). Results: A signifcantly higher TEWL was observed in the irradiated area compared to the control area

in the study group (p = 0.004). However, there was no statistically signifcant difference in SCH (p = 0.073). Additionally, no signifcant difference was observed in the values of TEWL and SCH in the irradiated area between the group of patients with and without clinically obvious RISI (p = 0.192 and p = 0.415, respectively). The skin thickness of the irradiated area, assessed by HF-USG, did not differ signifcantly from the skin thickness of the control area (p = 0.638). Furthermore, no difference in skin thickness was observed in patients with clinical features of cRISI in the irradiated and control areas (p = 0.345). The mean time after RT was 6.1 years. Conclusions: This study marks the frst demonstration of epidermal barrier damage in patients in the long term following RT for head and neck cancer. The impairment of the epidermal barrier was observed independently of evident cRISI features. This observation underscores the necessity to recommend appropriate skin care, including the use of emollients, for all patients following RT. We also suggest that HF-USG examination is generally inconclusive in determining the degree of skin damage in the late period after RT.

B. Walzel, A. Herrmann, B. Senti, T. Shah, S. Bänziger, **A collagen alternative from acacia trees**, PERSONAL CARE MAGAZINE, April 2024

PhytoCollagen is a unique plant-derived collagen alternative sourced from the acacia tree, which combines the cosmetic benefts of collagen with a green, sustainable source and matches consumer preferences. *In vivo* studies confrm that it entirely mimics the cosmetic benefts of animal collagen. This makes it an ideal replacement – a truly plant-derived, sustainable, green, vegan alternative to animal collagen.

C.A. Ysulat, H. Suzuki, S. Ushijima, S. Yoshimoto, **Lysolecithin ingredient to restore sensitive skin**, PERSONAL CARE MAGAZINE, Volume 25, Issue 4, April 2024, p. 60-63

The number of people suffering from sensitive skin caused by atopic dermatitis, allergies, air pollutants, temperature changes and stress is increasing, and sensitive skin cosmetics that claim low irritation and skin barrier repair have become essential products for such people. According to The prevalence of sensitive skin', 60-70% of women and 50-60% of men report having some degree of sensitive skin on surveys conducted in 20 different countries in five continents.

A.C. Kelmer, G. Wiora, C. Uhl, D. Khazaka, ***In vitro* testing – not just for product claims**, PERSONAL CARE MAGAZINE, Volume 25, Issue 4, April 2024, p. 72-75

The importance of *in vitro* tests for analyzing the skin and its functions has increased continuously in recent years. Cultured skin models and skin-like tissue mimicking the characteristics and functions of human skin are readily available and provide a controlled basis for numerous analyses, allowing researchers to manipulate variables more precisely. Notwithstanding the complex interactions between a living body and the environment, they also offer the advantage that tests will score rather reproducible results. This enables the study of specific factors such as environmental influences or genetics on the skin. In particular for cosmetic and dermatological research, *in vitro* tests offer many advantages.

F. Havas, S. Krispin, M. Cohen, J. Attia-Vigneau, **A *Hylocereus undatus* Extract Enhances Skin Microbiota Balance and Delivers In-Vivo Improvements in Skin Health and Beauty**, Cosmetics 2024, 11, 39

Skin microbiota, and its diversity and balance, play a key role in skin health and beauty, influencing skin moisture, barrier function, and radiance. A healthy skin microbiota limits the growth of detrimental species, protecting the skin from pathologies. Prebiotics can support benefcial populations in outcompeting detrimental ones. Dragon fruit (*Hylocereus undatus*) contains prebiotic polysaccharides effective on gut bacteria. Its extract was tested in vitro, in a coculture model including representative benefcial and detrimental species, and in double-blind, placebo-controlled clinical trials. Effects on the skin microbiota were measured via 16S rDNA sequencing, and skin health and beauty benefts were evaluated through image analysis, TEWL measurement, and chromametry.Doppler flowmetry measured skin resilience. The extract supported *S. epidermidis* and *S. hominis* (benefcial species), while limiting *S. aureus* and *C. acnes* (representing pathogens) in vitro. Clinical results demonstrated its benefcial effects on skin microbiota diversity, especially in older volunteers (Faith's index up to +20% vs. placebo). Improvements were shown in skin sensitivity and resilience (by ca. 30% vs. placebo), skin redness (reflecting inflammation status), pigmentation and radiance (+11% ITA), barrier function (-13% TEWL), and wrinkling. This demonstrates this extract's positive effects on the beauty, health, and microbiota balance of the skin.

R. Amin, F. Rancan, K. Hillmann, U. Blume-Peytavi, A. Vogt, J. Kottner, **Effects of a leave-on product on the strength of thedermoepidermal junction: An exploratory, intraindividual, randomized**

controlled trial in older adults with dry skin, Health Sci. Rep. 2024;7:e1985

Background and Aims: Skin aging is associated with dry skin and a decrease of the strength of the dermoepidermal adhesion, which increases the risk for lacerations
(skin tears). Application of leave-on products improves dry skin and seems to reduce skin tear incidence. The aim of this study was to measure the effects of a humectant containing leave-on product on the strength of the dermoepidermal junction in older adult participants with dry skin.Methods: A randomized controlled trial using a split body design was conducted. One forearm was randomly selected and treated with a lipophilic leave-on product containing 5% urea for 8 weeks. The other forearm was the control. The parameters stratum corneum hydration (SCH), transepidermal water loss, pH, roughness, epidermal thickness and skin stiffness were measured at the baseline, Weeks 4 and 8. At Week 8, suction blisters were created and time to blistering was measured. Blister roofs and interstitial fluid were analyzed for Interleukin-1α, 6 and 8. Results: Twelve participants were included. After 8 weeks treatment, SCH was higher (median difference 11.6 AU), and the overall dry skin score (median difference −1) and median roughness (Rz difference −12.2 µm) were lower compared to the control arms. The median group difference for Interleukin-1α was −452 fg/µg total protein (TP) in the blister roofs and −2.2 fg/µg TP in the blister fluids. The median time to blister formation was 7.7 min higher compared to the control arms. Conclusion: The regular application of humectant containing leave-on products improves dry skin and seems to lower inflammation and contribute to thestrengthening of the dermoepidermal adhesion. This partly explains how the use of topical leave-on products helps to prevent skin tears.

S.G. Lee, S. Ham, J. Lee, Y. Jang, J. Suk, Y.I. Lee, J.H. Lee, **Evaluation of the anti-aging effects of Zinc-α2-glycoprotein peptide in clinical and in vitro study**, Skin Research & Technology, Volume 30, Issue 3, March 2024

Background: Skin aging, characterized by the deterioration of skin density and elasticity, is a common concern among individuals seeking to maintain a youthful appearance. Zinc-α2-glycoprotein (ZAG) is secreted by various body fluids, and is associated with lipolysis and identified as an atopic dermatitis biomarker. This study evaluated the potential of ZAG peptides, which exert multiple benefits such as anti-aging. Materials and Methods: We conducted a 4-week clinical trial on patients with noticeable periorbital wrinkles (n = 22) using a ZAG peptide-containing product. The effectsof the products on skin density, elasticity, and the depth of periorbital wrinkles were evaluated using Cutometer Dual MPA580, Ultrascan, and Antera 3D CS, respectively. The effect of ZAG peptides on UVB-treated keratinocyte cells was evaluated in vitro to understand the mechanisms underlying its effects against impaired skin barrier function, collagen degradation, and senescence. In addition, the effects of ZAG peptides on cell viability and expression of aging and skin barrier-related genes were assessed using cell counting kit assay and quantitative reverse transcription-polymerase chain reaction, respectively. Results: The patients demonstrated improved skin density, elasticity, and reduced periorbital wrinkles. Further, more than 85% patients scored the product as satisfactory regarding anti-aging effects. Furthermore, ZAG peptides reduced SA-β-gal staining, downregulated the senescence-related genes, and upregulated the skin barrier function-related genes in UVB-irradiated keratinocyte cells. Conclusions: Our clinical and in vitro findings showed that ZAG peptides exert antiaging effects and improve skin barrier functions, suggesting their promising potential as therapeutic agents to combat skin aging and improve skin health.

U.A. Faisal, A. Jamil, H. Jaafar, W. Syaidatul Aqma, M. Arumugam, **Effects of Malaysian thermal spring water as adjunct therapy for mild to moderate acne vulgaris – a prospective, randomised, controlled, split face study**, Med J Malaysia Vol 79 No 2 March 2024

Introduction: Acne is a common skin disease with a high psychosocial burden, affecting mostly adolescents and youth worldwide. Management of acne is often challenged by cutaneous side effects that leads to therapeutic intolerance, poor compliance and impaired efficacy. Materials and Methods: This was a single-centre, evaluatorblinded, split-face, randomised study investigating the effects of thermal spring water (TSW) in improving efficacy and tolerability of standard acne therapy. Total of 31 participants with mild-to-moderate acne were recruited and subjected to TSW spray to one side of the face 4 times daily for 6 weeks in addition to standard therapy. The other side received standard therapy only. Results: Six (19.4%) males and 25 (80.6%) female with mean age 25.1±6.13 participated, 15 (48.4%) had mild acne while 16 (51.6%) had moderate acne. Seven (22.6%) were on oralantibiotics, 25 (80.6%) used adapalene, 6 (19.4%) tretinoin and 21 (67.7%) benzoyl peroxide. Skin hydration improved and better on spring water treated side with mean difference12.41±30.31, $p = 0.04$ at the forehead, 39.52±65.14, $p < 0.01$ at the cheek and 42.172±71.71, $p < 0.01$ at the jaw at week 6. Participants also report significant reduction in dryness at the treated side at week 6, mean difference 0.93±0.10, $p < 0.001$. TEWL, sebum and pH were comparable on both sides with no significant differences. Tolerability

towards standard therapy improved as early week 2 with reduction of stinging following application of topical therapy (mean difference 0.62±1.43, p = 0.03), increase in skin feelinggood (-1.79±1.70, p < 0.001) and skin suppleness (0.62±1.43, p < 0.001). These improvements were significantly maintained till week 6. Cardiff acne disability index significantly improved at week 6 (p<0.001) despite no significant changes in Comprehensive Acne Severity Scale score before and after treatment. Conclusion: TSW may have a role as an adjunct to standard acne therapy by improving hydration, acne disability index and tolerability towards standard topical treatment.

L. Ma, H. Zhang, Q. Jia, T. Bai, S. Yang, M. Wang, Y. Li, L. Shao, **Facial Physiological Characteristics and Skin Microbiomes Changes are Associated with Body Mass Index (BMI)**, Clinical, Cosmetic and Investigational Dermatology 2024:17, p. 513–528

Background: Overweight and obesity have become public health problems worldwide. An increasing number of research works are focusing on skin physiology and the manifestations of obesity-associated skin diseases, but little is known about the correlations between body mass index (BMI), facial skin physiological parameters, and the facial skin microbiome in healthy women. Objective: To investigate the correlations between BMI, facial skin phyiological parameters and facial bacteria and fungi in 198 women aged 18 to 35 years in Shanghai. Methods: According to the international BMI standard and Chinese reference standard, subjects were divided into three groups, “lean” B1, “normal” B2 and “overweight” B3, and the physiological parameters of facial skin were measured by non-invasive instrumental methods, and the skin microbiota was analyzed by 16S rRNA and ITS high-throughput sequencing. Results: Compared with the skin physiological parameters of the normal group, those of the overweight group exhibited a significant increase in trans-epidermal water loss (TEWL), which indicated that the skin barrier was impaired. The skin haemoglobin content was signifcantly increased, and skin surface pH was signifcant decreased in those with a high BMI. Furthermore, α-diversity, analysed using the Shannon, Chao, Sobs, and Ace indexes, was increased in the overweight group, suggesting that the diversity and species abundance of facial bacterial and fungal microbiota were also increased. Moreover, the overweight group had higher abundances of *Streptococcus*, *Corynebacterium*, *Malassezia*, and *Candida*. Notably, skin surface pH was signifcantly and negatively correlated with the relative abundances of *Malassezia*, *Candida*, and *Cladosporium*. Besides, the abundance of Malassezia was positively associated with the abundances of *Staphylococcus* and *Corynebacterium*. Conclusion: These results indicate that BMI is associated with differences in the biophysical properties and microbiome of the facial skin. A high BMI affects the integrity of skin barrier and changes the skin flora diversity and species composition.

L. Cheng, J. Guo, Y. Lu, ***Lotus corniculatus*** **extract to inhibit lipogenesis**, PERSONAL CARE MAGAZINE, March 2024, p. 78-82

In recent years, excess oil secretion on the skin surface has become a more and more common skin problem with the acceleration of the pace of life. Oily skin is frequently accompanied by large pores, and contributes to the development of acne. The sebaceous glands are an important organ for synthesizing lipids and an important source of sebum for oily skin. Sebum can maintain the integrity of the cutaneous lipid barrier, transport antioxidants to the skin surface, and have antimicrobial, antiinflammatory activity. Although their function is important, excess oil secretion on the skin surface cause great discomfort and should be treated.

N.S. Vicient, **Biomimetic lipid with skin repair effects**, PERSONAL CARE MAGAZINE, March 2024, p. 45-47

Consumers are becoming increasingly interested in beauty secrets and regimens from around the world due to curiosity about how people from other cultures attain and maintain their beauty. The demand for global beauty brands has grown as a result of globalization and increased interest in foreign travel and culture, with the ‘Made In’stamp now carrying more meaning than ever before.

A. Graça, A.M. Martins, P. Pinto, H.M. Ribeiro, J. Marto, **Combining protection with skin health: *In vivo* studies of an innovative gelatin/tannic acid-based hydrogel patch to prevent PPE-related skin lesions**, International Journal of Pharmaceutics 650 (2024)

The prolonged use of Personal Protective Equipment (PPE) can lead to skin problems due to persistent pressure, friction, and tension. This issue has prompted the exploration of solutions to protect the skin while maintaining the effectiveness of the PPE. This study aimed to evaluate the *in vivo* effectiveness of a gelatin/tannic acid-based hydrogel patch positioned beneath a mask to alleviate skin damage resulting from mask-wearing. To understand the pressure exerted by PPE, *in vitro* tests were conducted to measure the tensile strength of three types of facial masks. The FFP2 masks exhibited the highest tensile strength and were selected for subsequent *in vivo* biometric investigations. Biometric

parameters were evaluated using the Flir E50bx® thermographic camera, Corneometer®, MoistureMap®, Sebumeter®, Tewameter®, and VISIA® systems. The results showed that when the hydrogel patch was used under the mask, there were no significant differences in facial skin temperature, sebum levels, or TEWL values ($p > 0.05$). However, a statistically significant increase in skin hydration and a decrease in frontal redness ($p < 0.05$) were observed. Consumer acceptance was assessed through sensory analysis questionnaires. In summary, the observed attenuation of physiological changes in the facial area and the positive consumer feedback suggest that this polymeric film-forming system is a simple yet effective solution to prevent PPE use-related skin issues.

A.L.V. Pequeno, E. Bagatin, **Dermatological ultrasound in assessing skin aging,** Frontiers in Medicine 11:135360, 2024

Ultrasonography (US) has emerged as a pivotal tool in Dermatology since its inaugural use in 1979. Its evolution encompasses technological advancements, higher frequencies, and diverse applications in clinical, surgical, and research aspects. The discussion centers on its crucial role in assessing skin aging through various parameters such as skin thickness, subepidermal low echogenicity band (SLEB) characterization, and echogenicity assessment. This analysis can help guide interventions in a more personalized manner for each patient and assess the effectiveness of cosmetics and procedures. Despite its widespread utility, challenges persist, including discrepancies in research outcomes, operator dependence, inability to detect minute lesions, and measurement variations throughout the day. Combining US with complementary methodologies is advocated for a better understanding of skin aging in vivo. The costeffectiveness and non-invasiveness of the US emphasize its promising future in dermatology, but ongoing research remains imperative to enhance its accuracy and expand its applications.

H. Falholt Elvebakken, I. Blomquist Christensen, C. Vedel, S. Kjærulff, **A proof of concept: Clinical anti-aging efficacy and safety of *Lactiplantibacillus plantarum* LB244R® applied topically in a double-blinded placebo-controlled study**, J Cosmet Dermatol. 2024;23: p. 1233–1242

Background: With the increasing age of the westernized population, there is also increasing economic and aesthetic interest in reducing the signs of skin aging. Additionally, the physical aspect of aging can be displeasing and have detrimental effects psychologically in individuals. Probiotics have shown potential as anti-agingagents, albeit proper studies are needed to confirm their potential. Aims: Proving that *Lactiplantibacillus plantarum* LB244R® could alleviate aging signs relative to its placebo vehicle. Patients/Methods: In total, 46 subjects were randomly assigned either the ointment with live bacteria, *L. plantarum* LB244R® or its vehicle ointment, and had to use the assigned ointment twice daily for 56 days. On Day 0, Day 28, and Day 56 subepidermal low echogenic band (SLEB) thickness, dermal density, skin firmness and elasticity, skin hydration, transepidermal water loss (TEWL), skin pH, collagen fiber visualization using confocal microscopy, Crow's feet, spot score, skin smoothness, and complexion radiance were assessed by dermatologists. Results: All parameters except TEWL improved relative to their baseline (D0) for the active group. *L. plantarum* LB244R® improved SLEB thickness, dermal density, skin elasticity, skin hydration, and Crow's feet wrinkle score relative to the placebo vehicle ointment. Conclusion: The study demonstrates an anti-aging effect of *L. plantarum* LB244R® for topical skin use in the first double-blinded, vehicle-ointment placebo-controlled clinical study.

X. Zhang, H. Tao, Z. Zhang, W. Wang, A. Steel, X. Fang, X. He, **Evaluation of the efficacy of a sunscreen containing ultra-long UVA1 and other UVR broad-spectrum filters on skin barrier protection and melanin content reduction in Chinese adults: A single-center study**, Health Sci. Rep. 2024;7:e1923

Background and Aims: The protection for ultra-long UVA1 is lacked in the market, posing potential damage from ultra-long UVA1 irradiation. The study aims to evaluate the efficacy of a sunscreen containing multiple components, especially Mexoryl® 400 for improving skin barrier function and reducing melanin content. Methods: This single-center study included adults with sensitive and normal skin in China in November 2022. Participants received the test sunscreen for 4 weeks. Melanin and hemoglobin content, sebum secretion skin hydration, and transepidermal water loss were evaluated at T0d, T7d, and T28d. The self-assessment was done at T15min, T7d, and T28d. Results: Sixty participants were included, including 30 self-claimed sensitive skin in the sunscreen group. The sunscreen demonstrated significant improvements in skin parameters. Skin redness reduced by 9.84% at T28d, sebum content in the forehead area decreased by 22.70% at T28d, and skin stratum corneum hydration increased by 38.44% at T28d, $p < 0.001$ respectively. Most notably, skin melanin content significantly reduced by 13.49% after 4 weeks' usage ($p < 0.001$). No adverse reactions were reported in either group. Conclusions: The study sunscreen improved the skin condition by decreasing the melanin content, regulating skin barrier function, and achieving a balance of skin hydration and sebum

secretion.

X. Zhang, H. Tao, Y. Deng, X. He, Z. Zhang, L. Zhong, Y. Wen, **Efficacy and safety of a panthenol-enriched mask for individuals with distinct impaired skin barrier subtypes**, J Cosmet Dermatol. 2024

Background: The protection for different skin types with impaired skin barrier in the market is insufficient. Aim: To evaluate the efficacy and safety of a panthenol-enriched mask (La RochePosay Mask Pro) in addressing various skin barrier impairment subgroups, including dry sensitive, oily sensitive, and oily acne skin. Methods: A total of 177 participants were enrolled in the study and divided into three subgroups based on their skin type. Participants used the mask following the specified protocol, with measurements taken for skin hydration, transepidermal water loss (TEWL), sebum content, and skin redness—factors that are directly influenced by skin barrier function. Assessments were conducted at baseline and after 1 day (tested 15 min post-application), 7 days, and 14 days of application using Sebumeter, Tewameter, Corneometer, Mexameter, and VISIA. Results: Results showed significant improvements in skin parameters across all subgroups. In the dry sensitive skin subgroup, the mask increased skin hydration, sebum content, and reduced redness. For the oily sensitive skin subgroup, the mask regulated sebum production and improved skin hydration. In the oily acne skin subgroup, the mask reduced sebum content, redness, TEWL, and post-inflammatory erythema and hyperpigmentation. Tolerance was excellent for all skin types, with no adverse reactions observed. Conclusions: This study highlights the efficacy and safety of the panthenol-enriched LRP Mask Pro for individuals with distinct skin barrier impairment subgroups. The mask's versatile formulation and proven efficacy make it a valuable skincare product for addressing various skin concerns and achieving healthier, more balanced skin.

L.J. Russell, T. Dodd, D. Kendall, A. Lazenbury, A. Leggett, S. Payton-Haines, L. Jiang, D. Filingeri, P.R. Worsley, **A bioengineering investigation of cervical collar design and fit: Implications on skin health**, Clinical Biomechanics 112 (2024)

Background: Cervical collars restrict cervical spine movement to minimise the risk of spinal cord injury. Collars apply mechanical loading to the skin putting it at risk of skin damage. Indeed, cervical collar-related pressure ulcers are unacceptably prevalent, especially at the occiput, mandibles, and chin. Collar design and ft are often key considerations for prevention. Methods: This comprehensive study evaluated four commercial prehospital and acute care cervical collars. Pressure, microclimate, transepidermal water loss and skin hydration were measured at the interface between the device and the skin. Range of motion restriction was measured to evaluate effective immobilisation. Head, neck, and shoulder morphology was evaluated using three-dimensional scans. Findings: The occiput experienced signifcantly higher interface pressures than the chin and mandibles for most collar designs. Interface pressure at the occiput was signifcantly higher for the Stiffneck extrication collar compared to the other collar designs. The Stiffneck collar also provided the most movement restriction, though not signifcantly more than other designs. Relative humidity at the device skin interface was signifcantly higher for the Stiffneck and Philadelphia collars corresponding to closed cell foam padding, in contrast to the open cell foams lined with permeable fabric used in the other collars. Collar discomfort correlated with both occipital pressure and skin humidity. Interpretation: The occiput is at increased risk of cervical collar-related pressure ulcers during supine immobilisation, especially for Stiffneck extrication collars. Lined open-cell foams could be used to minimise skin humidity and increase comfort.

T. Myers, A. Bouslimani, S. Huang, S.T. Hansen, C. Clavaud, A. Azouaoui, A. Ott, A. Gueniche, C. Bouez, Q. Zheng, L. Aguilar, R. Knight, M. Moreau, S.J. Song, **A multi-study analysis enables identification of potential microbial features associated with skin aging signs**, Frontiers in Aging January 2024

Introduction: During adulthood, the skin microbiota can be relatively stable if environmental conditions are also stable, yet physiological changes of the skin with age may affect the skin microbiome and its function. The microbiome is an important factor to consider in aging since it constitutes most of the genes that are expressed on the human body. However, severity of specific aging signs (one of the parameters used to measure *"*apparent*"* age) and skin surface quality (e.g., texture, hydration, pH, sebum, etc.) may not be indicative of chronological age. For example, older individuals can have young looking skin (young apparent age) and young individuals can be of older apparent age. Methods: Here we aim to identify microbial taxa of interest associated to skin quality/aging signs using a multi-study analysis of 13 microbiome datasets consisting of 16S rRNA amplicon sequence data and paired skin clinical data from the face. Results: We show that there is a negative relationship between microbiome diversity and transepidermal water loss, and a positive association between microbiome diversity and age. Aligned with a tight link between age and wrinkles, we report a global positive association between

microbiome diversity and Crow's feet wrinkles, but with this relationship varying significantly by substudy. Finally, we identify taxa potentially associated with wrinkles, TEWL and corneometer measures. Discussion: These findings represent a key step towards understanding the implication of the skin microbiota in skin aging signs.

T. Tempark, A. Shem, S. Lueangarun, **Efficacy of ceramides and niacinamide-containing moisturizer versus hydrophilic cream in combination with topical anti-acne treatment in mild to moderate acne vulgaris: A split face, double-blinded, randomized controlled trial**, J Cosmet Dermatol. January 2024

Introduction: Topical therapy is the mainstay treatment of acne, and topical retinoids such as tretinoin, tazarotene, and adapalene are recommended as the firstline therapy for mild to moderate acne. However, the cutaneous irritations may occur, and the dermocosmetics are recommended to prevent side effects of antiacne drugs and adhere to treatment. Thus, this study aims to compare the efficacy and tolerability of ceramides and niacinamide-containing moisturizer (CCM) versus hydrophilic cream in combination with topical anti-acne treatment in mild to moderate acne vulgaris. Methods: This was an 8-week, randomized, double-blinded, split face study in 40 patients assigned for topical anti-acne medications (5% benzoyl peroxide and 0.1% adapalene gel), then randomly applied CCM or hydrophilic cream. All patients were followed at week 0, 2, 4, and 8 for acne improvement, adverse reactions, biometric, and biophysical evaluation. Results: CCM could significantly improve the non-inflammatory, inflammatory, and total acne lesions compared with hydrophilic cream after week 8 of treatment. Interestingly, there was an improvement of global worst score, hemoglobin index, melanin index, TEWL, skin hydration, sebum production, and skin surface pH, with no statistically significant differences between the two treatments. No serious side effects from clinical application of CCM and hydrophilic cream in mild to moderate acne vulgaris patients. Conclusion: Ceramide and niacinamide-containing moisturizer in combination with anti-acne medication can significantly improve acne lesions and decrease cutaneous irritations toward a satisfactory treatment outcome of mild to moderate acne vulgaris.

J.M. Carbajo, A. Michan-Doña, M. I. Carretero, M.L. Vela, J.A. de Gracia, F. Maraver, **Biophysical effects of a natural peloid on normal skin**, Int J Biometeorol., 2024 Jan;68(1): p. 143-152

A protocol study was designed to examine cutaneous behavior after continuous application of a peloid in the dry mineral residue of Lanjarón-Capuchina natural mineral water. This study aims toanalyze the biomechanical behavior of normal skin using various non-invasive bioengineering techniques after the application of this peloid. We determine the effects of its application for 3months on 38 healthy volunteers (41.4 ± 5.9 years, range 32-58) without a previous history of skin diseases by courtmetry, sebumetry, pH-metry, reviscometry, and tewametry. It was shown that the production of cutaneous sebum is significantly reduced by 6%, trans epidermal skin loss (TEWL) by21%, skin fatigue by 30%, elasticity increased by 19%, firmness by 5%, and a skin redensification by 6% was obtained under these experimental conditions. Disparate and non-significant results wereobtained concerning pH and viscoelasticity. Continuous skin care with the Lanjarón-Capuchina natural peloid modifies skin behavior, normalizing sebaceous secretion, favoring the biomechanical properties of the skin and the skin barrier function without modifying skin homeostasis.

H.K. Sung, T.J. Kim, H.M. Kim, S.J. Youn, Y. Choi, N.Y. Lee, H.J. Oh, H.S. Kwon, S.M. Shin, **Anti-Wrinkle and Skin Moisture Effcacy of 7-MEGA™: A Randomized, Double-Blind, Placebo Comparative Clinical Trial**, Nutrients 2024, 16, 212

7-MEGA™ is a food product made from purifed Alaska pollack fsh oil containing palmitoleic acid (16:1), commonly referred to as omega-7. We sought to quantitatively evaluate whether this substance inhibits skin aging. A total of 101 middle-aged females were randomly allocated to the intervention (N = 50) or placebo group (N = 51). Each participant was advised to takeeither 500 mg of 7-MEGA™ or a placebo twice daily for 12 weeks. The primary outcomes were the degree of improvement in wrinkles and the degree of moisture flling after consumption for 12 weeks compared to baseline. The secondary outcomes were improvement in skin wrinkles; moisture changes at 4 and 8 weeks from baseline; changes in transdermal water loss, skin elasticity, the melanin index, the erythema index, and the Global Photo Damage Score. We found a signifcant improvement in skin wrinkles and elasticity at 12 weeks in the 7-MEGA™-consuming group compared to that in the placebo group; skin moisture, elasticity, and the melanin index were also improved. No supplementrelated adverse reactions were observed and 7-MEGA™ was identifed as safe. 7-MEGA™ was effective for human skin function in terms of wrinkles, moisture, elasticity, and melanin production and may be useful as a skin nutritional supplement.

S. Oh, H. Kim, M. Kim, X. Jin, S. Zheng, T.-H. Yi, **The effects of Jawoongo soap on skin improvement**, Journal of Cosmetic Dermatology, Jan 2024

Background: Jawoongo is used to treat and prevent skin issues such as dry and keratinization disorders,burns, trauma, pigmentation, scarring, and inflammatory skin conditions. In this study, the efficacy and safety of 0.47% Jawoongo extract-containing soap (JAUN-CS) were assessed in terms of skin improvement effects such as cleansing, moisturizing, sebum secretion management, and skin elasticity enhancement. Methods: Twenty healthy adult men and women aged 20-60 years old took part in the study. Before and after using JAUN-CS, the participants were divided into groups, and various skin improvement effects were measured utilizing machines such as the Corneometer, Tewameter TM 300, and Visioscan. A dermatologist analyzed the product's safety in accordance with Frosch & Kligman and the Cosmetic, Toiletry, and Fragrance Association (CTFA) rules. Results: Using JAUN reduced the amount of base and point makeup by 25.7% and 76.7%, respectively. Also, JAUN showed a great facial exfoliation effect by removing the old and lifted skin keratins by 84.7% and 20.3%, respectively. Impurities in facial pores decreased by 58%, too. Furthermore, JAUN increased the moisture content of deep skin and skin surface by 3.5% and 74.0%, and skin elasticity by 2.8%. Skin tone, skin texture, skin radiance, and skin barrier all showed improvements of 3.3%, 20.0%, 15.0%, and 115.2%, respectively. Lastly, cleansing with JAUN successfully enhanced the condition of the youth triangle by 7.6%, while TEWL significantly decreased by 52.7%. Neither the JAUN nor the control group soap showed any adverse reactions, such as erythema or allergies, during the testing period. Conclusions: The results of this study demonstrated that JAUN is safe for human use and has various skinimproving properties, making Jawoongo a promising natural material for the development of functional cosmetics in the future. Keywords: Jawoongo extract-containing soap (JAUN-CS); skin barrier; skin care; skin elasticity; skin improvement.

W.-J. Sim, J. Kim, K.-S. Baek, W. Lim, T.-G. Lim, **Porcine Placenta Peptide Inhibits UVB-Induced Skin Wrinkle Formation and Dehydration: Insights into MAPK Signaling Pathways from In Vitro and In Vivo Studies**, Mol. Sci. 2024, 25, 83

Excessive exposure to ultraviolet (UV) radiation from sunlight accelerates skin aging, leading to various clinical manifestations such as wrinkles, dryness, and loss of elasticity. This study investigated the protective effects of porcine placenta peptide (PPP) against UVB-induced skin photoaging. Female hairless SKH-1 mice were orally administered PPP for 12 weeks, followed by UVB irradiation. PPP significantly reduced wrinkle formation, improved skin moisture levels, and prevented collagen degradation. Mechanistically, PPP inhibited the expression of matrix metalloproteinases (MMPs) and upregulated collagen production. Moreover, PPP elevated hyaluronic acid levels, contributing to enhanced skin hydration. Additionally, PPP demonstrated antioxidant properties by increasing the expression of the antioxidant enzyme GPx-1, thereby reducing UVB-induced inflammation. Further molecular analysis revealed that PPP suppressed the activation of p38 MAP kinase and JNK signaling pathways, crucial mediators of UV-induced skin damage. These findings highlight the potential of porcine placental peptides as a natural and effective intervention against UVB-induced skin photoaging. The study provides valuable insights into the mechanisms underlying the protective effects of PPP, emphasizing its potential applications in skincare and anti-aging formulations.

F. Huang, X. Wang, M. Zhang, L. Wang, Y. Wang, Y. Hu, T. Dong, P. Wie, **Correlating facial skin parameters with age and gender in population of Shaanxi Province**, **China**, J Cosmet Dermatol. 2024;23: p. 1386–1395

Objective: This study was designed to comprehensively evaluate the changes in facial skin biophysical parameters with age, as well the influence of gender differences in populations of Shaanxi Province, China. Methods: Fourteen skin parameters, including stratum corneum hydration (SCH), transdermal water loss (TEWL), erythema, melanin, R0, R2, R5, R7, F4, gloss, skin surface pH, skin erythema index (a*), wrinkle length, and sebum, were measured by noninvasive instruments in 481 volunteers from Shaanxi Province. Spearman correlation analysis was performed to analyze the relationship between skin parameters and age. Additionally, skin parameters were analyzed for different age groups and different genders. Results: The results of the study showed a linear decrease in skin surface pH and sebum content with age, and the skin elasticity parameters R0, R2, R5, and R7 decreased significantly at the age of 54–65 years. Wrinkle length showed a linear andincrease with age. R5 showed a weak negative correlation with age, R2, R7, and sebumcontent showed a moderate negative correlation, while wrinkle length showed a strong positive correlation. Considering the effect of gender on skin parameters, the results showed that SCH and gloss were lower in men than in women, while TEWL, erythema, melanin, wrinkle length, and sebum were higher than in women. However, there was no difference in skin elasticity between them. Conclusion: The facial skin parameters, especially for the wrinkle length, exhibited the strong correlation relationship with ages in Shaanxi Province.

Meanwhile, most skin parameters show significant differences with gender, which can provide a reference for future research and development in the field of cosmetics.

J.H. Lee, J. Kim, Y.N. Lee, S. Choi, Y.I. Lee, J. Suk, J.H. Lee, **The efficacy of intradermal hyaluronic acid filler as a skin quality booster: A prospective, single-center, single-arm pilot study**, J Cosmet Dermatol. 2024;23: p. 409–416

Background: The use of “skin boosters” comprised of hyaluronic acid (HA)-based fillers to improve skin quality has gained popularity recently, especially in individuals interested in skin rejuvenation. Aim: This study aimed to evaluate the efficacy and safety of intradermal micropuncture injections of HA-based gel filler combined with lidocaine (BYRYZN® SKINBOOSTER HA, ACROSS Co., Ltd., Gangwon-do, Korea). Patients/Methods: A prospective, single-arm, open-label pilot study was conducted with study subjects who were aged between 30 and 60 years old and exhibited evidence of skin aging, such as wrinkles and loss of elasticity. They received three injections at 2-week intervals and were followed up for a total of 12 weeks. Results: Twenty subjects with a mean age of 54.1 years were included. The mean Lemperle wrinkle scale demonstrated a 40% decrease from 2.60 ± 0.60 at baseline to 1.55 ± 0.51 at week 8. The improvement rate was maintained at about 33% until week 12. The average maximum height of the wrinkle (Rz, μm), average skin roughness (Ra, μm), skin elasticity (R2, AU), facial curved length (mm), skin pore size (mm2), skin hydration (AU), TEWL (g/hm2), and skin glossiness (gloss value, AU) exhibited statistically significant improvements over time compared with the baseline measurements. No serious adverse effects or persistent adverse effects were reported, except for a transient subcutaneous nodule in one subject. Conclusions: This study demonstrates that multiple microinjections of HA-based gel filler for facial skin aging are safe and effective in improving facial skin quality.

Y. Cao, X. Zhang, X. He, W. Wang, Y. Yi, Y. Ai, **Efficacy of ceramide-containing sunscreen on skin barrier**, J Cosmet Dermatol. 2024;23: p. 525–528

Background: UV rays not only cause oxidative damage to the skin, but also damage ist barrier function. The use of sunscreen is crucial in preventing skin from UV radiation, but it may have an impact on the function of the skin barrier. While much research has focused on the protective effects of sunscreen against UV oxidative damage, little is known about the impact of daily sunscreen use on the skin barrier. Objective: This study mainly investigated the changes in skin barrier function of volunteers (including those with sensitive skin) before and after using a ceramidecontaining sunscreen. Methods: A total of 60 volunteers used SPF30 sunscreen containing ceramide every morning. Using non-invasive methods to detect skin barrier changes in TEWL, hydration, facial redness based on VISIA-CR image, and Erythema index (EI) value after 4 weeks of using ceramide-containing sunscreen. Adverse reactions were also assessed. Results: After 4 weeks of using ceramide-containing sunscreen, significant reductions were observed in skin redness with both an 11.89% decrease in a* value and a 5.68% decrease in skin EI, while there was also a significant decrease in transepidermal water loss (TEWL) with a reduction of 22.96%, and a significant increase in skin hydration with a 21.96% increase in the moisture content of the stratum corneum. No adverseevents occurred during the entire testing process. Conclusion: Daily application of ceramide-containing sunscreen can increase skin hydration while enhancing the function of the skin barrier.

X. Zhang, D. Kerob, Z. Zhang, H. Tao, X. He, Y. Yi, X. Fang, W. Wang, A. Steel, **Efficacy and safety of a cream containing panthenol, prebiotics, and probiotic lysate for improving sensitive skin symptoms**, Skin Research & Technology, January 2024

Background: Sensitive skin is a common condition affecting a significant proportion of the population, and there is a growing demand for effective and safe management. Aim: To evaluate the efficacy and safety of a cream containing panthenol, prebiotics, and probiotic lysate as an optimal care for facial sensitive skin. Methods: A total of 110 participants (64 in group A and 46 in group B) with facial sensitive skin applied the cream twice daily for 28 days. Group A evaluated their sensitive skin, product efficacy, and product use experience at D0 (15min), D1, D14, andD28. In group B, skin barrier function-related indicators were measured at baseline and on D1, D7, D14, and D28. Dermatologists evaluated tolerance for all participants. Results: After 28 days of use, in group A, 100% of participants reported mildness and comfort with product use. Participants demonstrated significant improvements in skin barrier function-related indicators, including increased stratum corneum moisture content, reduced erythema index, elevated sebum content, decreased trans-epidermal water loss, and diminished skin redness parameter a* value (all $p<0.05$). Dermatologist evaluations revealed excellent tolerance among all participants. Conclusion: The panthenol-enriched cream with prebiotics and probiotic lysate exhibited substantial clinical efficacy in ameliorating facial sensitive skin conditions, coupled with a high safety profile.

R. di Lorenzo, M. Maisto, L. Ricci, V. Piccolo, A. Marzocchi, G. Greco, G.C. Tenore, S. Laneri, **Annurca Apple Oleolite as Functional Ingredient for the Formulation of Cosmetics with Skin-Antiaging Activity**, Int. J. Mol. Sci. 2024, 25, 1677

The identification of natural remedies for the management of the skin aging process is an increasingly growing issue. In this context, ursolic acid (UA), a ubiquitous molecule, mainly contained in Annurca apple (AA) fruit, has demonstrated valuable cosmetic potential. To this end, in the current study, the AA oleolite (AAO, extract in sunflower oil containing 784.40 ± 7.579 μg/mL of UA) was evaluated to inhibit porcine elastase enzymatic reactions through a validated spectrophotometric method. AAO has shown a valuable capacity to contrast the elastase enzyme with a calculated IC50 of 212.76 mg/mL, in comparison to UA (IC50 of 135.24 μg/mL) pure molecules and quercetin (IC50 of 72.47 μg/mL) which are used as positive controls. In this context and in view of the valuable antioxidant potential of AAO, its topical formulation with 2.5% (w/w) AAO was tested in a placebocontrolled, double-blind, two-arm clinical study on 40 volunteers. Our results indicated that after 28 days of treatment, a significant reduction of the nasolabial fold (−7.2 vs. baseline T0, $p < 0.001$) and forehead wrinkles (−5.3 vs. baseline T0, $p < 0.001$) were registered in combination with a valuable improvement of the viscoelastic skin parameters, where skin pliability/firmness (R0) and gross elasticity (R2) were significantly ameliorated (−13% vs. baseline T0, $p < 0.001$ for R0 and +12% vs. baseline T0, $p < 0.001$ for R2). Finally, considering the positive correlation between skin elasticity and hydration, the skin moisture was evaluated through the estimation of Trans epidermal water loss (TEWL) and skin conductance.

C. Kern, S. Dudonné, C. Garcia, **Dietary supplementation with a wheat polar lipid complex improves skin conditions in women with dry skin and mild-to-moderate skin aging**, J Cosmet Dermatol. 2024;23:1 p. 320–1330

Background: Aging, menopause, and seasonal changes alter the lipid composition of the outermost skin layer, the stratum corneum, resulting in dry and itchy skin. Aims: This clinical trial aimed at evaluating the effects of a wheat polar lipid complex (WPLC) on skin characteristics in women showing dry and wrinkled skin, investigating its effects in a subgroup of postmenopausal women, and assessing if benefits were maintained after supplementation. Methods: Seventy-two women with dry and wrinkled skin were recruited in thisdouble-blind, randomized, parallel-group study, and allocated to three groups of 24 subjects, each including at least 10 postmenopausal women. For 56 days, subjects consumed the WPLC supplement (oil or powder), or the placebo. Skin hydration, transepidermal water loss (TEWL), elasticity, and profilometry were evaluated at baseline, after 14, 28, and 56 days of supplementation, and 56 days after the end of supplementation. Additionally, a lipidomic analysis was performed to examine changes in superficial skin layers over 56 days. Results: Dietary supplementation with WPLC rapidly improved all parameters. It increased skin hydration, smoothness, and elasticity while decreasing TEWL, roughness, and wrinkle depth after only 14 days of supplementation. These effects werealso observed in the subpopulation of postmenopausal women and led to an improved self-perception of skin. For all the parameters, outcomes were not maintained after the supplementation was stopped. The lipidomic analysis revealed 10 compounds evolving over the 56 days of WPLC supplementation. Conclusion: WPLC supplementation improved skin hydration, smoothness, elasticity, and wrinkledness within 14 days and, as expected, did not last after supplementation was stopped.

E. Ghasemi, M.A. Nilforoushzadeh, M. Khani, M.A. Amirkhani, M. Nouri, P. Charipoor, M. Eftekhari, S. Izadpanah, B. Shokri, **The quantitative investigation of spark plasma on skin parameters with skin elasticity, thickness, density, and biometric characteristics**, Scientifc Reports, (2023) 13:7738

Cold atmospheric plasma has been developed and utilized as a novel technique for skin rejuvenation because of its various efects on cells and living things. This study investigated the accuracy of this claim and any possible side efects of using spark plasma to rejuvenate skin. The present work is the frst quantitative investigation using animal models. 12 Wistar rats were divided into two groups for this investigation. To compare the skin's natural process with the treated skin, the frst group underwent a single session of plasma therapy, while the second group served as the control group. The back of the necks of the samples was shaved for 20 cm. Before beginning treatment, the MPA9 multifunctional skin tester was used to determine the melanin index, erythema index, and transepidermal water loss (TEWL). The skin's thickness and density were assessed using sonography, and its elasticity index was calculated using a Cutometer. The samples were exposed to plasma radiation in the designated area (in a triangular pattern). The abovementioned signs were examined immediately after the following therapy and at the weekly appointment 2–4 weeks later. Optical spectroscopy was also used to demonstrate the presence of active species. In this study, we found that a plasma spark therapy session signifcantly boosts skin elasticity, and the ultrasound results revealed a signifcantly increased skin thickness and density. The plasma increased the amount of skin surface evaporation, erythema, and

melanin immediately following the treatment. However, 4 weeks later, it recovered to its former state and did not difer signifcantly from before the therapy.

Y.M. Ahn, S. Shin, J.-H. Jang, J. Jung, **Bojungikgi-tang improves skin barrier function and immune response in atopic dermatitis mice fed a low aryl hydrocarbon receptor ligand diet**, Chinese Medicine (2023) 18:100

Background The aryl hydrocarbon receptor (AhR) is a transcription factor that plays a crucial role in regulating the immune system and maintaining skin barrier function. AhR signaling is pivotal in the pathogenesis of infammatory diseases such as atopic dermatitis (AD), and the absence of AhR ligands further contributes to the progression or worsening of AD symptoms. Methods AD was induced with 2,4-dinitrochlorobenzene (DNCB), and Bojungikgi-tang (BJIKT) was administered orally daily for 10 weeks. Serum IgE, splenocyte IL-4, and IFN-γ levels, skin barrier genes, and AhR target gene expressions were analyzed using RNA-sequencing analysis. Spleen tissues were extracted for fuorescence-activated cell sorting (FACS) analysis to analyze the efect of BJIKT on immune responses. A correlation analysis was conducted to analyze the correlation between immune markers and skin barrier genes and AhR target genes. Results BJIKT efectively improved AD symptoms in AD mice fed a low AhR ligand diet by reducing neutrophil and eosinophil counts, lowering IgE levels in the blood, and decreasing IL-4 and IFN-γ levels in the splenocytes. Additionally, BJIKT signifcantly reduced epithelial skin thickness and transepidermal water loss (TEWL) values and reversed the decreased expression of skin barrier genes. BJIKT also considerably altered the expression of AhR target genes, including Ahr, Ahrr, cytochrome P450 1A1 (CYP1A1), and CYP1B1. Furthermore, AhR target pathway genes were negatively correlated with immune cell subtypes, including CD4 + and CD8 +T cells and macrophages (CD11b + F4/80 +) at the systemic level. Conclusions BJIKT can regulate AhR activation and may help reduce infammation in AD by regulating the expression of skin barrier genes and immune responses.

H. Cui, C. Feng, T. Zhang, V. Martínez-Ríos, P. Martorell, M. Tortajada, S. Cheng, S. Cheng, Z. Duan, **Effects of a lotion containing probiotic ferment lysate as the main functional ingredient on enhancing skin barrier: a randomized, self-control study**, Scientifc Reports, (2023) 13: 16879

There is an emergent need to develop functional cosmetic ingredients for the topical management of skin barrier function. This study aimed to investigate the efficacy of a lotion containing fermented lysates VHProbi® Mix R for enhancing the skin barrier. In vitro studies demonstrated that fermented cultures of both Lacticaseibacillus rhamnosus VHProbi® E06 (E06) and L. paracasei VHProbi® E12 (E12) had antioxidant capacity, showing promising scavenging capability for 2,2-diphenyl-1-picryl-hydrazyl. The antioxidant capacity of these strains was also demonstrated in the model of Caenorhabditis elegans. In addition, the fermented lysates of both E06 and E12 enhanced the proliferation of HaCaT cells and ameliorated the toxicity induced by Staphylococcus aureus ATCC 25923, hydrogen peroxide, and ultraviolet B radiation in the HaCaT cell models, which simulated the irritants that facial sensitive skin is exposed to. Subsequently, the ingredient VHProbi® Mix R was formulated using four kinds of fermented lysates: E06, E12, Lactiplantibacillus plantarum VHProbi® E15, and Lactobacillus helveticus VHProbi® Y21. A clinical study was conducted to investigate whether a lotion containing VHProbi® Mix R would be beneficial for people to enhance skin barrier. The participants were asked to use the investigational product for 30 days. Several indicators, including transepidermal water loss (TEWL), skin moisturization, and redness were measured at day 0 and day 30 using VISIA®-CR and CK®-MPA systems. Meanwhile, the burden of sensitive skin (BoSS) and self-assessment questionnaires were performed at baseline and endpoint of this study. The study data showed that at day 30, there was a significant decrease in TEWL ($P < 0.01$), redness measured by CK®-MPA ($P < 0.01$), and redness profile measured by VISIA®-CR compared with the baseline measurements. Skin moisturization had significantly increased after treatment with the lotion for 30 days. BoSS and self-assessment questionnaires also substantiated that the participants felt a markedly positive change in their sensitive skin. Hence, we hypothesize that applying the topical functional VHProbi® Mix R could confer effective benefits for people with sensitive skin and this represents a promising intervention for enhancing skin barrier.

K. Horimukai, M. Kinoshita, N. Takahata, **Transepidermal Water Loss and T-helper 2 (Th2)-Associated Inflammatory Markers in Two Pediatric Patients During the First Four Weeks of Treatment With the Oral Janus Kinase Inhibitor Upadacitinib**, Cureus 15(12) 2023

Few studies have evaluated the effects of upadacitinib on skin barrier function and T-helper 2 (Th2)-associated inflammatory biomarkers in severe atopic dermatitis (AD). In this study, we followed two pediatric patients with AD who had previously failed to respond to conventional treatment and measured their serum Th2-associated chemokine thymus and activation-regulated chemokine (TARC) and serine protease inhibitor squamous cell carcinoma antigen (SCCA) 2 levels and transepidermal

water loss (TEWL) during the first four weeks of upadacitinib treatment. Both patients showed marked clinical improvement and decreased TEWL, blood eosinophil counts, and serum TARC and SCCA2 levels after four weeks of upadacitinib treatment. These findings suggest that upadacitinib attenuates Th2-associated inflammatory markers and promotes skin barrier integrity.

S. Jarząbek-Perz, M. Dziedzic, H. Rotsztejn, A. Kołodziejczak, **Evaluation of the effects of 10% and 30% gluconolactone chemical peel on sebum, pH, and TEWL**, J Cosmet Dermatol. 2023 Dec;22(12): p. 3305-3312

Background: Gluconolactone (GLA) exhibits antioxidant and moisturizing effects. It also presents soothing effects, protects elastin fibers from UV-induced degradation, and improves the function of the skin barrier. Aims: Evaluation of skin parameters such as pH, transepidermal water loss (TEWL), sebum levels before, during, and after a series of applications of 10% and 30% GLA chemical peel in a split-face model. Materials and methods: The study involved 16 female subjects. Three split-face procedures were performed using two concentrations of GLA solution applied on two sides of the face. The skin parameters were measured before treatments and 7 days after the last procedure at four measurement sites on either side of the face, that is, on the forehead, around the eye, on the cheek, and on the nose wing. Results: Measurement of sebum demonstrated some statistically significant changes between sebum levels in the cheeks after a series of treatments. The pH measurement showed that the pH value was reduced after each treatment at all measurement points. The level of TEWL after treatments was significantly lower around the eyes, on the left forehead, and on the right cheek. There were no significant differences between the use of different concentrations of the GLA solution.

A. Soto-Moreno, T. Montero-Vilchez, P. Diaz-Calvillo, A. Molina-Leyva, S. Arias-Santiago, **The impact of photodynamic therapy on skin homeostasis in patients with actinic keratosis: A prospective observational study**, Skin, Research & Technology, Volume 29, Issue 12, December 2023

Background: Photodynamic therapy (PDT) is an effective treatment for actinic keratosis (AKs), but there is little information on how PDT affects skin barrier function. The objectives of this study are: To compare skin barrier function between skin with AKs and healthy skin and to evaluate the impact of PDT on skin homeostasis in patients with AKs. Methods: A prospective observational study was conducted in patients with AKs to evaluate epidermal barrier function and skin homeostasis before and 1 ek after receiving PDT. Results: A total of 21 subjects were included in the study, male/female ratio was 17:4, mean age was 75.86 years. The number of AKS observed before starting treatment was reduced with respect to those diagnosed 1 month after starting PDT (14.83 vs. 1.91, $p < 0.0001$). Application of PDT for treating AKs modifies epidermal barrier function. Immediately after the first session temperature, transepidermal water loss (TEWL), stratum corneum hydration (SCH) and total antioxidant capacity (TAC) increased while pH decreased on lesional skin. After 1-month follow-up, the only remained change was the increased in SCH. Higher increases in temperature were observed when using occlusive PDT compared to mixed modality. 5-ALA and M-ALA seem to have a similar impact on skin barrier. Conclusions: PDT can improve skin barrier function in patients with AKs. Skin homeostasis parameters can be used to assess efficacy and optimize dosing.

M. Roohaninasab, F. Khodadad, A. Sadeghzadeh-Bazargan, N. Atef, S. Zare, A. Jafarzadeh, S.T. Rahimi, M. Nouri, M. Ali Nilforoushzadeh, E. Behrangi, A. Goodarzi, **Efficacy of fractional CO2 laser in combination with stromal vascular fraction (SVF) compared with fractional CO2 laser alone in the treatment of burn scars: a randomized controlled clinical trial,** Stem Cell Research & Therapy (2023) 14

Background: The appearance of skin scars is known as one of the main side effects of skin burns. Stromal vascular fraction (SVF), as a rich source of cell populations with tissue regeneration properties, plays an important role in the healing of skin lesions. Fractional CO2 lasers have occupied a special place in treating skin lesions, particularly skin scars, since their introduction. Our study aimed to compare the combination of SVF and fractional CO2 laser with fractional CO2 laser alone in the treatment of burn scars. Method: This double-blind clinical trial study was conducted on ten patients with burn scars that were treated three times with a fractional CO2 laser at site of burn lesions, and one of the two areas studied was randomly injected with SVF. Two months after completion of the procedure, patients' scars were assessed using the Vancouver scar scale (VSS), biometric criteria, and physician and patient satisfaction ratings. Results: The results confirmed a significant improvement in VSS, cutometry, R7 criteria, complete density sonography, and skin density sonography in the fractional CO2 laser-treated group. The VSS criteria, epidermal thickness sonography, complete density sonography, and skin density sonography in the group treated with the combination of fractional CO2 laser and SVF also showed significant improvement. The VSS criteria and melanin index of Mexameter in the group treated with SVF in combination with fractional CO2 laser were significantly better than the group treated with

fractional CO2 laser alone. Also, physician and patient satisfaction in the group treated with SVF injection in combination with fractional CO2 laser was significantly higher than the other group. Conclusion: The results confirm the efficacy of SVF injection in combination with fractional CO2 laser in the treatment of burn scars and can be considered as a treatment option for better management of these lesions.

Q. Wang, Y. Zhong, N. Li, L. Du, R. Ye, Y. Xie, F. Hu, **Combination of dimethylmethoxy chromanol and turmeric root extract synergically attenuates ultraviolet-induced oxidative damage by increasing endogenous antioxidants in HaCaT cells**, Skin Research & Technology, 2023;29:e13539

Background: Repeated exposure to UV generates excessive reactive oxygen species (ROS) and damages the enzymatic antioxidant defense system including quinone oxidoreductase 1 (NQO1) and superoxide dismutase (SOD) in skin. Topical application of antioxidants may prevent the undesired damage of cellular proteins, lipids and DNA in skin. Dimethylmethoxy chromanol (DMC) is a bioinspired molecule, designed to be a structural analog to the ¤–tocopherol that is naturally present in vegetables and plants. Turmeric root extract (TRE) is from a plant in South Asia extensively used as a food spice & vegetable, and its main components are turmerones. As both DMC and TRE are strong antioxidants with complementary antioxidation mechanisms, the aim of this study was to investigate the enhanced protective effects of their combination on oxidative damage in HaCaT cells following UVB exposure. Materials and methods: The effects of single and combined administrations of DMC and TRE on the SOD activity of HaCaT cells were evaluated by the SOD assay and qPCR. The NQO1 expression in the UVB-treated HaCaT cells was analyzed by the Western Blot. Furthermore, a clinical test involving 24 subjects was conducted to evaluate the in vivo antioxidation efficacies of the serum formulated with the combination of DMC and TRE at the optimal weight ratio. Results: SOD assay showed that pretreatingDMC or TRE alone could not preserve the impaired HaCaT SOD activity after UVB treatment. DMC and TRE at 1:1 weight ratio was the optimal combination to enhance the HaCaT SOD activity by approximately more than 1-fold compared with either of the single treated groups. No enhancement effect was observed at other mixing ratios. The 1:1 weight ratio was further proved to be optimal as this combination boosted the NQO1 expression by more than 50%, whereas no boosting effect was observed at other mixing ratios. The clinical test of the serum containing this optimal antioxidant combination demonstrated promising in vivo antioxidation efficacies after 4-week use, including 7.16% improvement in skin lightening,18.29% reduction in skin redness, 35.68% decrease in TEWL, 19.05% increase in skin glo ss and 32.04% enhancement in skin firmness. Conclusion: Collectively, our results indicated that the combination of DMC and TRE at 1:1weight ratio attenuated the UV-induced oxidative damage by synergistically boosting endogenous antioxidant enzyme activity in HaCaT cells. Therefore, this optimal antioxidant combination is a promising treatment to boost skin antioxidation defense system.

P. Minoretti, A. Santiago Sáez, M. Liaño Riera, M. Gómez Serrano, Á. García Martín, **Topically Applied Magnetized Saline Water Improves Skin Biophysical Parameters Through Autophagy Activation: A Pilot Study**, Cureus 15(11), 2023

Background: Water exposed to a magnetic field exhibits several changes in its properties, such as increased electrical conductivity, reduced density, and low surface tension. Additionally, it has reduced dissolved oxygen levelsand becomes more alkaline. Previous experimental studies have demonstrated that exposure to salinealkaline water leads to a dose-dependent increase in the expression of autophagy-related genes. Here, we hypothesize that the topical application of magnetized alkaline water to the skin can activate autophagy and improve cutaneous biophysical parameters, making it a promising strategy for enhancing skin aesthetics. Methods: Two distinct substudies were undertaken. Firstly, a 12-week, uncontrolled, open-label investigation was conducted with 20 females who desired to enhance the appearance of their facial and neck skin. Secondly, a molecular study was carried out on a subset of 10 females to investigate the serum's impact on two autophagy markers (Beclin-1 and mammalian/mechanistic target of rapamycin {mTOR}) in skin biopsies taken from the posterior neck area below the hair attachment line. Results: After a period of 12 weeks, the application of the serum resulted in significant improvements in skin hydration within the stratum corneum (56 ± 14 arbitrary units {a.u.}) compared to the baseline measurement (47 ± 12 a.u.; $p < 0.001$). Moreover, the transepidermal water loss (TEWL) decreased from 14 ± 2 g/m2/hour to 11 ± 3 g/m2/hour ($p < 0.001$). The results also revealed a notable reduction in sebum content from 38 ± 7 µg/cm2 to 30 ± 4 µg/cm2 after the 12-week period of serum application (<0.001). Additionally, the melanin index ($p < 0.01$) and erythema index ($p < 0.001$) were both significantly lower at 12 weeks compared to baseline. The molecular study showed a 38% increase in Beclin-1 levels after 12 weeks of serum application on the posterior neck area, as measured from skin biopsies. In contrast, mTOR levels decreased by 24% from baseline to 12 weeks. Conclusion: The application of magnetized saline water topically, within a serum formulation, shows potential in improving skin biophysical parameters for females seeking to enhance

the appearance of their facial and neck skin. These beneficial effects are achieved through the activation of cutaneous autophagy, as evidenced by an increase in Beclin-1 expression and a decrease in mTOR content in the skin.

L.F. Coêlho, M.B. Casaro, W.R. Ribeiroa, E. Mendes, G. Murata, P. Xander, A. Linodos-Santos-Franco, F.A. Oliveira, C.M. Ferreira, **A short-term high-sugar diet is an aggravating factor in experimental allergic contact dermatitis**, Heliyon 9 (2023) e21225

Allergic contact dermatitis (ACD) is an inflammatory skin reaction whose incidence has increased and has been associated with a dietary pattern rich in saturated fats and refned sugars. Considering the increased incidence of ACD and the lack of research about the influence of a short-term high-sugar diet on dermatitis, our aim is to improve understanding of the influence of a high-sugar diet on ACD. We introduced a diet rich in sugar ffteen days before inducing contact dermatitis with oxazolone, in mice, and maintained it until the end of the experiment, which lasted three weeks in total. The dermatitis model increased cholesterol and triglycerides in the liver, and the combination of diet and dermatitis increased weight and worsened liver cholesterol measurements. Furthermore, the high-sugar diet increased the production of IL-6, IFN-γ and TNF- α in the skin, which may be involved in the increase in epithelial skin thickness observed in experimental ACD.

M. Bagheri, M. Werres, P.C. Fuchs, H. Seyhan, R. Lefering, G. Grieb, J.L. Schiefer, **Which Moisturizer to Use in Scar Therapy after Burn Injuries? A Subjective and Objective Skin and Scar Evaluation after Topical Treatment with Dexpanthenol, Aloe Vera, and Plant Oil**, Medicina 2023, 59

Abstract: Background and Objectives: Good scar management in burn care is essential. Nevertheless, there are no consistent recommendations regarding moisturizers for scar management. Our aim was to investigate and compare the effects of commonly used products on normal skin and burn scars. Materials and Methods: A total of 30 skin-healthy (control group) and 12 patients with burn scars were included in this study. For an intraindividual comparison, each participant received creams consisting of dexpanthenol (P), aloe vera (A), and a natural plant oil (O) with instructions to apply them daily to a previously defined area for at least 28 days. Objective scar evaluation was performed with Visioscan®; Tewameter®; Cutometer®, and the Oxygen To See® device. Subjective evaluation was performed with an “application” questionnaire, the Patient and Observer Scar Assessment Scale (POSAS), and with the “best of three” questionnaire. Results: After (A) a high trend of amelioration of +30%, TEWL was detected on the scar area. Blood flow increased slightly on healthy skin areas after (A) application to +104%. The application of (A) on healthy skin demonstrated a positive effect on the parameters of scaliness (+22%, $p < 0.001$), softness (+14%, $p = 0.046$), roughness R1 (+16%, $p < 0.001$) and R2 (+17%, $p = 0.000$), volume (+22%, $p < 0.001$), and surface area (+7%, $p < 0.001$) within the control group. After (P), a significant improvement of the baseline firmness parameter of +14.7% was detected ($p = 0.007$). (P) also showed a beneficial effect on the parameters of R1 (+7%, $p = 0.003$), R2 (+6%, $p = 0.001$), and volume (+17%, $p = 0.001$). (O) lead to a statistically significant improvement of volume (+15%, $p = 0.009$). Overall, most study participants stated (A) to be the “best of three”. Conclusions: (A) performed statistically best, and is a well-tolerated moisturizing product. However, further quantitative studies are needed to provide statistically significant clarification for uniform recommendations for scar therapy.

M. Barbera, **Natural restoration of the skin barrier after a minor alteration**, HPC, Vol. 18(5), Sep/Oct 2023

Skin barrier and transepidermal water loss: One of the most important roles of the stratum corneum is to limit water loss by evaporation and to act as skin barrier against the penetration of agents from the external environment. With age, the epidermis becomes thinner and dryer and it weakens the skin barrier. In addition, chronic dermatitis, atopic skin, psoriasis, xerosis or ichthyosis can lead to an increase in evaporation due to skin alteration.

E. Martin, A. Zhang, R. Campiche, **Saccharide isomerate ameliorates cosmetic scalp conditions in a Chinese study population**, *J Cosmet Dermatol.* 2023;22: p. 262–266

Background: Scalp conditions such as flaky or oily scalp affect people across ethnicities and age groups. In addition to flaking, increased sebum secretion, itching, and compromised scalp barrier function were described. Scalp conditions are aesthetically disturbing and may cause psychological distress in affected individuals who are looking for mild and effective treatment at the same time. Saccharide isomerate has a long history as a skin moisturizer, and it was found to improve skin barrier function, also suggesting possible beneficial effects on scalp. Aims: To provide relevant claim substantiation to introduce saccharide isomerate as a new scalp care active against scalp flaking condition. Material and Methods: We conducted a placebo-controlled clinical study in an adult Chinese

population affected by dandruff scalp as assessed by an adherent scalp flaking score. We monitored transepidermal water loss (TEWL), sebum secretion, and scalp flaking during 28 days. Results: Formulations containing Saccharide isomerate significantly improved all parameters both over time as well as compared to the placebo formulation. Conclusion: We propose Saccharide isomerate for cosmetic formulations directed toward improving scalp conditions such as dandruff or oily scalp.

N.G. Ha, S. L. Kim, S.H Lee, W.J. Lee, **A novel hydrogel-based moisturizing cream composed of hyaluronic acid for patients with xerosis: An intraindividual comparative analysis**, Poster Presentation at the 1st Congress of Investigative Dermatology, Tokyo, May 2023 & Skin Research & Technology, Volume 29, Issue 11, November 2023

Background: Hyaluronic acid (HA) is mainly used to treat xerosis. It also exerts woundhealing, moisturizing, and antiaging effects. Although HA is considered an effective and safe ingredient in cosmetics, there is a constant demand for a more money-saving and effective formulation. This study aimed to evaluate the safety and efficacy of a novel hydrogel-based moisturizer containing HA cross-linked with silicone polymers, produced solely through irradiation without the use of cross-linking agents. Materials and Methods: A safety study enrolled 30 participants with healthy skin to perform patch and photopatch tests while recording adverse events. For the efficacy study, 30 participants with xerosis were compared before and after using the novel hydrogel, evaluating the cutaneous barrier function, xerosis severity scale (XSS) score, participant's satisfaction, and Investigator's Global Assessment (IGA). Furthermore, the efficacy of the novel hydrogel-based moisturizer was evaluated by comparing it with a conventional moisturizer, Physiogel, in another 30 participants with xerosis. Results: In the safety study, no serious adverse events were observed. In the efficacy study before and after use, skin hydration and skin surface lipid increased ($p < 0.05$) whereas the XSS scores decreased ($p < 0.05$) with time. In the comparative efficacy study with Physiogel, skin hydration increased whereas the XSS scores decreased ($p < 0.05$) over time in both groups. Furthermore, IGA improved in 100% of participants in both groups. Also, 100% and 93% of participants were satisfied with the novel hydrogel-based moisturizer and Physiogel, respectively.

G. Louvet Pommier, **Hyperbranched Dextrin for Soothing, Microbiome-friendlySkin Care**, Cosmetics & Toiletries November/December 2023

Over-cleansing, over-exfoliating or harsh cleansing can pose a risk to the skin and its microflora, disrupting the balance while also causing discomfort, redness, dehydration, etc. As a result, brands are seeking gentle, soothing solutions for skin.1 Furthermore, the buzz around the importance of a healthy skin microbiota has driven consumers toward microbiome-friendly related claims – on top of their continued growing demand for natural cosmetics.

M. Zagórska-Dziok, A. Ziemlewska, A. Mokrzyńska, Z.a Nizioł-Łukaszewska, M. Wójciak, I. Sowa, **Evaluation of the Biological Activity of Hydrogel with Cornus mas L. Extract and Its Potential Use in Dermatology and Cosmetology**, Molecules 2023, 28, 7384

Due to the growing popularity of herbal extract-loaded hydrogels, this study assessed the biological activity of extracts and hydrogels containing three types (water (WE), water–ethanol (EE) and water–glycerin (GE)) of Cornus mas L. (dogwood) extracts. The content of biologically active compounds in the extracts was assessed using the UPLC-DAD-MS technique. Antioxidant properties were assessed by using DPPH and ABTS radicals and measuring the intracellular level of reactive oxygen species. Alamar Blue and Neutral Red tests were used to measure the cytotoxicity of the tested samples on skin cells—fibroblasts and keratinocytes. Cell migration and the anti-aging activity of the tested extracts and hydrogels were assessed. Transepidermal water loss and skin hydrationafter applying the hydrogels to the skin were also determined. A chromatographic analysis revealed that the extracts contained polyphenols, including gallic, caftaric, protocatechuic, chlorogenic, ellagicand p-coumaroylquinic acids, as well as iridoids, with loganic acid as the predominant component.Additionally, they contained cyanidin 3-O-galactoside, pelargonidin 3-O-glucoside and quinic acid. The obtained results show that the tested extracts and hydrogels had strong antioxidant properties and had a positive effect on the viability of skin cells in vitro. Additionally, it was shown that they stimulated the migration of these cells and had the ability to inhibit the activity of collagenase and elastase. Moreover, the tested hydrogels increased skin hydration and prevented transepidermal water loss. The obtained results indicate that the developed hydrogels may be effective delivery systems for phytochemicals contained in dogwood extracts.

H. Yuceler Kacmaz, H. Kahraman, S. Levent Cinar, F. Ozkan, **Skin properties associated with skin tears in older adults: A case-control study**, Journal of Tissue Viability, Volume 32, Issue 4, November 2023, p. 585-589

Background: The world population is growing rapidly and skin problems such as skin tears (STs) are more common in aging skin dueto changes in the epidermis and dermis. Identification of ageing related skin properties, which are risk factors for STs, isessential for the development of ST prevention protocols. Objective: The aim of this study was to reveal the skin properties related to epidermal function and dermal associated with STs. Material and methods: A prospective case-control study was conducted with a sample of 36 older adults, 18 participants with ST and 18participants without ST, in two elderly care centers. Tewameter TM 210 was used to measure transepidermal waterloss, the Sebumeter SM810 was used to measure sebum, and Cutometer Dual MPA 580 was used to measure skinviscoelasticity (R0-R9). The differences of skin properties between groups were analyzed using the independent t-testand Mann-Whitney U test. Results: The case group had a mean age of 77,17 ± 9,7 and the control group had a mean age of 75,33 ± 6,8. It was determined thatthere were more ecchymosis ($p < 0.000$), hematoma ($p = 0.008$), and ST history ($p = 0.001$) in the case group. Older adultsin the case group were more frail than the control group ($p = 0.044$). Regarding the score of the skin properties, the casegroup showed that the TEWL levels of the older adults in the case group were lower ($p = 0.031$) compared to the controlgroups. There was a significant difference between the groups and R0, R2, R5, and R7. While R0 was higher in the casegroup, R2, R5, and R7 were lower than the control group. Conclusion: Older adults with ST showed differences in skin properties compared to those without ST, especially transepidermalwater loss, and viscoelasticity (R0, R2, R5, R7). The results of this study suggest that some changes in skin propertiesmay be a risk factor for STs.

C.F. Schuler IV, K.M. O'Shea, J.P. Troost, B. Kaul, C.M. Launius, J. Cannon, D.M. Manthei, G.E. Freigeh, G.M. Sanders, S.P. Hogan, N.W. Lukacs, J.R. Baker Jr., **Transepidermal water loss rises before food anaphylaxis and predicts food challenge outcomes**, The Journal of Clinical Investigation, 2023, 133(16)

Background: Food allergy (FA) is a growing health problem requiring physiologic confirmation via the oral food challenge (OFC). Many OFCs result in clinical anaphylaxis, causing discomfort and risk while limiting OFC utility. Transepidermal water loss (TEWL) measurement provides a potential solution to detect food anaphylaxis in real time prior to clinical symptoms. We evaluated whether TEWL changes during an OFC could predict anaphylaxis onset. Methods: Physicians and nurses blinded to the TEWL results conducted and adjudicated the results of all 209 OFCs in this study. A study coordinator measured TEWL throughout the OFC and had no input on the OFC conduct. TEWL was measured 2 ways in 2 separate groups. First, TEWL was measured using static, discrete measurements. Second, TEWL was measured using continuous monitoring. Participants who consented provided blood samples before and after the OFCs for biomarker analyses. Results: TEWL rose significantly (2.93 g/m2 /h) during reactions and did not rise during nonreacting OFCs (–1.00 g/m2 /h). Systemic increases in tryptase and IL-3 were also detected during reactions, providing supporting biochemical evidence of anaphylaxis. The TEWL rise occurred 48 minutes earlier than clinically evident anaphylaxis. Continuous monitoring detected a significant rise in TEWL that presaged positive OFCs, but no rise was seen in the OFCs that resulted in no reaction, providing high predictive specificity (96%) for anaphylaxis against nonreactions 38 minutes prior to anaphylaxis onset. Conclusions: During OFCs, a TEWL rise anticipated a positive clinical challenge. TEWL presents a monitoring modality that may predict food anaphylaxis and facilitate improvements in OFC safety and tolerability.

Y. Lee, Y.J. Cha, S. Jeong, S.-K. Yun, Y. Nho, S. Kang, W. Kim, J. Son, J. Kim, S. Kyung, **A novel sophorolipids extraction method by yeast fermentation process for enhanced skin efficacy**, Skin Research & Technology, October 2023

Aims: Oriental herbs have been used as medicines in the folk remedy for their numerous phytochemicals and bioactivities. In this study, we have selected five Korean traditional medical herbs and applied bio conversion extraction technology, named it as Bioconversion Oji complex, to identify phytochemicals and evaluate skin related efficacies. Material and methods: The process of two-step bio conversion was sequentially conducted. The first step of fermentation was to produce biosurfactants using macadamia seed oil with Candida bombicola, and then five natural plants were added to carry outthe main fermentation. To evaluate skin improvement efficacy of Bioconversion Oji complex, in vitro and in vivo studies were conducted. We studied HaCaT cells cultured to assess viability, skin anti-inflammatory, moisturizing and barrier improvementrelated mRNA expression. For efficacy study, 21 participants were tested evaluating anti-inflammatory, skin moisturizing and skin barrier improving effects of Bioconversion Oji complex compared to Water extraction of Oji (placebo) for the 4 weeks test period. Results: The application of bioconversion technology highly increased the content of amino acids and lipids within Bioconversion Oji complex, and 23 flavonoids were also identified. Bioconversion Oji complex was found to be non-toxic and showed significant effects in all parameters tested, including anti-inflammation, skin moisture, and skin barrier in both in vitro and in clinical studies. Conclusions:

Bioconversion Oji complex has demonstrated skin-friendly properties with significant beneficial effects on anti-inflammatory, skin hydration and barrier function properties. This study provides evidence for the use of Bioconversion Oji complex as an active ingredient in cosmetics and skincare products.

H. Choi, J.H. Ha, H.C. Kang, W.S. Seo, B.-H. Bin, **The Protective Effects of Moisturizer Containing Potentilla anserina Extract in the Topical Treatment of Skin Damage Caused by Masks**, Int. J. Mol. Sci. 2023, 24

Abstract: The use of face masks during the COVID-19 pandemic resulted in significant societal changes, particularly for individuals with sensitive skin. To address this issue, the researchers explored traditional medicine and identified Potentilla anserina extract as a potential solution due to its anti-inflammatory and moisturizing effects. This research investigated how this extract influences skin hydration, barrier function, and itching. The findings revealed that the extract had a hydrating effect by elevating Aquaporin-3 (AQP3) expression. Additionally, the study demonstrated that the extract improved skin barrier function, with Filaggrin (FLG) expression being approximately three times higher ($p < 0.001$) in the Potentilla-anserina-extract-treated group compared to the control group and the genes associated with itching being reduced. In this process, we researched and developed P_CD (hydroxypropyl-_-cyclodextrin)-Liposome containing Potentilla anserina extract, gradually and sustainably releasing the active components of the Potentilla anserina extract. During four weeks of clinical trials involving individuals wearing masks for over 6 h a day, a moisturizer containing Potentilla anserina extract demonstrated a notable reduction in skin redness. Hemoglobin values (A.U.), which serve as indicators of skin redness, showed decreases of 5.06% and 6.74% in the test area inside the mask after 2 and 4 weeks, respectively, compared to the baseline measurements. Additionally, the moisturizer containing Potentilla anserina extract notably decreased Trans Epidermal Water Loss (TEWL), with reductions of 5.23% and 9.13% observed in the test area inside the mask after 2 and 4 weeks, respectively. The moisturizer, especially in the test area treated with the extract-containing moisturizer, significantly enhanced skin hydration compared to the control group. The Corneometer values (A.U) exhibited notable increases of 11.51% and 15.14% in the test area inside the mask after 2 and 4 weeks, respectively. These discoveries emphasize the potential of Potentilla anserina extract and its utility in tackling skin issues caused by mask wearing, including enhancing moisture, fortifying the skin's barrier, and alleviating itching. These results indicate that moisturizers incorporating specific ingredients provide greater benefits compared to conventional moisturizers.

A. Catalano, K. Mitri, P. Perugini, G. Condrò, C. Sands, **In vitro and in vivo efficacy of a cosmetic product formulated with new lipid particles for the treatment of aged skin**, J Cosmet Dermatol. 2023;22: p. 3329–3339

Background: The cumulative oxidative damage causes an acceleration in the skin aging. Objectives: To evaluate the ability of a new patented matrix of lipid particles (SIREN CAPSULE TECHNOLOGY™) to have superior anti-aging properties due to its high sensitivity to reactive oxygen species (ROS), testing its efficacy versus free or encapsulated vitamins. Methods: An in vitro study was conducted to evaluate the protective effects of lipid particles using menadione as an enhancer of oxidative stress. Subsequently, in vivo studies evaluated skin hydration, skin barrier function, and smoothness and wrinkle depth. For this purpose, gels containing free or encapsulated vitamins were used as controls. Results: In vitro, the SIREN CAPSULE TECHNOLOGY™ gel shows inhibitory activity against ROS production through menadione induction. In fact, at both tested concentrations, ROS production is lower than in the control samples (placebo, free vitamins, encapsulated vitamins). In vivo, the net effect of SIREN CAPSULE TECHNOLOGY™ gel versus the others permitted to conclude that lipid particles exert a higher skin moisturizing effect (20.17%) and a stronger effect in reducing transepidermal water loss (-16.29%) after 4 weeks of treatment. As for surface analysis, a gel based on SIREN CAPSULE TECHNOLOGY™ improves the skin texture in a similar way than gel containing encapsulated vitamins (Ra and Rz variations in 4 weeks). Conclusions: SIREN CAPSULE TECHNOLOGY™ represents an advance and a successful strategy to develop cosmetic products for the treatment of skin conditions associated with an accumulation of ROS. SIREN CAPSULE TECHNOLOGY™ represents a result-oriented breakthrough in the effective delivery of active ingredients to the skin.

A. Rosano, A. Ciavola, **Effect of physiological stress on skin cells and efficacy of Medicago Sativa sprout extract to cope with signs demonstrated by an innovative approach**, Podium presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Psychological stress has negative effects on healthy skin affecting its integrity and function. This is due to the activation of the central and peripheral hypothalamic-pituitary-adrenal (*HPA*) axis, including the *11¤-HSD1* enzyme that converts cortisone to cortisol. This study aimed to demonstrate that an active

ingredient based on *Medicago Sativa L. Sprouts* was able to act on cortisol biosynthesis and fibroblast stiffness consequently reducing skin aging and skin damage. The effect of *Medicago Sativa lyophilized extract* (*MSle*) was investigated *in vitro*, evaluating its cell proliferative effects and impact on cortisol biosynthesis associated with the inhibition of the *11□-HSD1* enzyme. In addition, mechanical properties analysis was realized in cell culture treated with *MSle* and cortisol. *MSle* dissolved in glycerin and water was clinically tested on a stressed population to observe its efficacy in improving the expression wrinkles, skin mechanical properties, skin barrier, skin redness and skin radiance. Globally, this innovative study demonstrated that cortisol has a negative impact on fibroblast mechanical properties, causing its increase in stiffness, and consequently premature aging. *MSle* both inhibits cortisol biosynthesis and decreases fibroblast stiffness. Accordingly, the active ingredient based on *Medicago Sativa sprouts* showed to reduce the unwanted effects of stress on the skin of individuals.

F. Yang, T. Chen, M. Guo Z. Zhou, H. Wang Hua, **The New Skin Barrier Insights for Skin Aging of Asian Ethnic Group from Multi-Omics Study**, Podium presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

To study the correlation between clinical skin parameters, skin metabolites, skin microbiomes in different age groups, 83 healthy Asian volunteers were recruited and their skin physiological clinical parameters (e.g., Tewameter and wrinkles) were characterized. The skin metabolites were collected by swab and analyzed by untargeted metabolomics technique, and the skin microbiomes of different age groups were detected using the high-throughput detection technique. The multi-omics study was carried out by pearson correlation analysis. PLS-DA and student t-test demonstrated that several key metabolites (e.g., isocitric acid) showed significant differences within the aged group and young group. The KEGG pathway analysis found that tricarboxylic acid (TCA) cycle ranked the most dominant metabolic pathway. Moreover, the microbiome diversity increased with age, as indicated by the differences in Propionibacterium, and Cutibacterium acnes at species level. The multi-omics data cross-domain correlations also suggested clinical skin parameters, skin metabolites, and skin microbiome are mutually influenced. This work provides more deep insights for studying the skin aging and skin barrier mechanism and developing microecology-relevant cosmetics.

J.W. Park, J.M. Kim, R. Lee, J.-Y- Choi, H. Park, S. Hong, K.-M. Joo, B.-F. Suh, E. Kim, **Impact of Gender and Shaving Habits on Immature Composition of the Male Skin Barrier: An Analysis of Corneocyte Maturity, and Lipid Composition**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

The differences between male and female skin barrier characteristics of different facial zones were evaluated by analysing transepidermal water loss (TEWL), corneocyte maturity and lipid composition. We found that the male skin barrier was composed of a higher proportion of immature corneocytes and the ceramide NP/NS ratio was significantly lower than that of females. In addition, shaving habits may cause recurrent damage and regeneration of the male skin barrier, leading to deterioration in male skin barrier function.

Z. Hani, S. Ridwan, F. Meti, **An Innovative Scalp Care Technology of Shampoo for Hijab Women through TEWL Analysis for Hair Loss Reduction**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

The head scarf (hijab) may lead to hair problems including scalp hydration reduction and hair loss. Transepidermal water loss (TEWL) value of hijab wearing women (hijabi) is higher compared to non-hijabi. In this study, a novel shampoo formulation containing a combination of SLES, amino acid surfactant, ginseng extract, and rosemary oil, was studied for scalp-care of hijabi. A case-control study was conducted on 60 Indonesian hijabis for two weeks. The assessment by dermatologist, the combing test, and Tewameter (Courage Khazaka TM-300) were used to assess scalp condition and TEWL. The performance of the hair cuticle was examine using Aramo and SEM. A significant reduction in TEWL (mean 27.59%, $p < 0.05$) and reduction of the amount of hair loss (mean 29.09%, $p < 0.05$) was showed after 14 days application compared to baseline. The product test was considered non-irritant, hypoallergenic, and safe for use by dermatologists and HRIPT. An enhancing hair cuticle performance revealed by SEM. An improvement in hair density ($p<0.05$), hair thickness, and hair loss parameter revealed based on Aramo visual analysis. Thus, a shampoo formulation in this study successfully improved scalp condition of hijabi by reducing TEWL, hair loss, and better hair shaft quality.

A. Jeanneau, C. Lubrano, ***Padina pavonica* thallus extract, the ultimate cosmetic active to preserve the skin from aggression**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Skin is constantly exposed to environmental aggressions which disturb its homeostasis by accelerating ageing and the development of dermatological diseases. There are many ways to evaluate the effects of exposomal factors on the skin. This study was designed to assess the efficacy of a natural extract developed from *Padina pavonica* alga to protect the skin from deleterious consequence of pollution. Our research was first carried out *in vitro* on keratinocytes and fibroblasts after an exposure to particles matter PM10 pollutant with or without PPTE at 0.4%. Biological markers of the skin barrier and cell's defenses mechanism (antioxidant, DNA repairing and cell's division), as well as impact on the dermis structure (extracellular matrix components) were investigated. Then, the clinical effects of PPTE extract at 3% in a basic cosmetic formula versus placebo on adult skin regarding exposome factors were evaluated by using the tapestripping aggression that elicit an acute stress response. Measure of the TEWL (TransEpidermal Water Loss) and skin erythema has highlighted that PPTE extract has a global protective effect to improve the skin defense against external aggression.

A.P. Fonseca, C. dal Pizzol, A.C Vanzo, P.M.C Maia Campos, **Clinical efficacy and tolerance of a cosmetic formulation containing vegetable oils and salicylic acid for acneic skin hydrolipidic balance**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Currently, there are many products in the market with the purpose of reduce drastically oiliness on skin while treating/preventing acne lesions, presented in the form of cleansing gels, tonics, dryers, among others, which can compromise the skin barrier function, since a balanced sebum plays an important role on skin global protection. In this context, it was developed an innovative biocompatible formulation for oily skin in order to promote hydrolipidic balance to skin, besides reduce acne lesions, preserving the skin hydration and healthy lipid balance while participating in acne treatment. For this, 32 subjects aged 28 ± 8 years, presenting acne grade II (94%) and oily (53%) and mixed (47%) skin were enrolled. There was a significant reduction ($p<0.05$) in the values of skin surface oiliness after 28 days of formulation application (-24,1%) and 100% of the subjects presented a reduction in skin oiliness. Since a healthy cutaneous barrier play an important role on acne, maintaining a healthy balance of oiliness and hydration on skin surface contribute to improve skin barrier function, besides providing a good sensorial experience to the user, contributing to perseverance with the product use in their routine.

J. Kim, H.W. Lee, J.-O. Park, H.-K. Lee, J.H. Shin, **A comparative study of skin biophysical characteristics as cosmetic formulations within environmental changes**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Background: Skin conditions according to environmental changes are influenced by temperature and humidity. It is widely accepted that climate conditions especially affect skin surface properties and long-termly induce internal change of the skin. Several studies have reported about skin physiological parameters and their changes according to different environmental conditions. Moreover, there have been many skin cares and cosmetics to prevent or block skin surface from environmental changes. In the current study, we have investigated the skin properties on individually different formulations due to temperature changes to find useful formulation targeting on seasonal product. Methods: In order to check the skin condition according to the change in the external environment, the skin properties were measured through mechanical evaluation after applying the 5 different types of cosmetics which are silky, greasy, watery, hot, and cool. Experiments were carried out in a climatic chamber with independently controlled Ta and RH. The skin of volunteers was exposed for some minutes in variable atmosphere manner as follows general- (20- 24℃, 40-60%), cool- (14-16℃, 45-55%), and hot- (28 - 32℃, 40-60%) conditions. Results: Although skin hydration, trans-epidermal water loss (TEWL), sebum content, and skin pH measurement did not show any difference according to environmental change conditions, skin temperature revealed atmosphere temperature-dependent results in all formulations and erythema (skin redness) measurements showed differences depending on environmental change conditions. Hot product was most sensitive formulation with respect to sebum content, TEWL, skin pH, skin redness, and skin hydration. Greasy product was the stickiest in all environmental conditions, showing the level of high sebum contents and low skin hydration. Conclusion: Taken together, these results demonstrated that skin biological properties are influenced by formulation type according to external changes. Therefore, we suggest that biophysical properties in accordance to environmental changes can be major seasonal consideration in the development of cosmetics.

M. Isoir-Ingrez, A. Falip, N. Yousfi, L. Arnaud-Sebillotte, B. Biatry, K. Delhommeau, C. Cornillon, P. Wang, M. Huey, J.T. Simonnet, **Ascorbic acid formulation in a neutral aqueous serum and its efficacy**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Vitamin C stabilization is very challenging specially at a high level of ascorbic acid. Internal in vitro data on fibroblasts show a superior pro-collagen I stimulation for ascorbic acid, compared to its derivatives. Herein, up to 15% of ascorbic acid was stabilized in an aqueous serum. We have shown

that by adjusting pH to 6, ascorbic acid chemical loss was less than 10% for 2 months at 45°C and CO2 release was prevented. Color evolution was reduced by polyquaternium-67 addition which complex the ascorbate anion. Classically, the ascorbic acid efficiency is linked with low pH (Pinnell SR et al, 2001). We demonstrate herein that 12% ascorbic acid at pH6 significantly inhibits sebum lipoperoxidation (in vivo and ex vivo), has a strong effect on anti-pigmentation and significantly decreases transepidermal water loss. Benefits were further confirmed by a 2-months clinical study with significant clinical scores at day 56 on radiance, skin tone evenness, skin softness, skin smoothness, fine lines, wrinkles and skin firmness. Moreover, no significant differences were achieved between the pH6 serum and a 15% ascorbic acid serum at pH 2,6. So, we have shown that ascorbic acid can be also efficient when formulated at pH6.

Y. Zhong, X. Zheng, Q. Zhang, J. Liu, X. Wu, **The efficacy of the revitalizing oil cream in sensitive skin repairing**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

The revitalizing oil cream is an innovative cream formula, up to 35% oil phase. The unique and critical dual-phase system is designed to efficiently delivery actives to the skin layers, which could quickly repair the skin barrier and improve the skin fatigue of aging, friendly to the sensitive skin. In this study, the in-vitro studies were assessed oil cream's protective effects against damaged skin. Notably, Oil cream effectively inhibited the inflammatory reactions via the down-regulation of the IL-1¤, TNF-¤, IL-6, and PGE2, caused by SLS-induced EpiKutis®3D epidermis models via ELISA, and protected the SLS-induced epidermis models by upregulating the expressions of filaggrin (FLG), Transgulataminase-1 (TGM1), and loricrin (LOR), which is known to decreased in damaged skin cells. The clinical result demonstrated that using oil cream for 4 weeks could effectively increase the hydration degree of cheek cuticle and reduce trans-epidermal water loss and skin redness. Additionally, the skin firmness and dermal thickness were significnatly improved. These evidences to confirm the oil cream can efficiently rapair the damaged skin, and concurrently improve the signs of skin aging.

L. Kakuda; L.N. Favaro, P.M.B.G. Maia Campos, **Benefits of formulation with Pequi Oil for the skin: a clinical study by instrumental measurements and sensorial perception**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

This study aimed to develop a minimalist serum formulation containing pequi oil and assess its immediate and short-term clinical efficacy and sensorial perception. A serum was developed with 3% pequi oil (F2) or not (F1). Twelve healthy female participants aged 22 to 30 were recruited for the clinical trial. Measurements of stratum corneum water content, transepidermal water loss (TEWL), sebum content, and skin microrelief were conducted on the frontal and malar before and after 2 hours and seven days (t7) of using the formulations. Porphyrin count and sebaceous gland activity were evaluated at t7. Results showed that F2 immediately reduced skin desquamation and TEWL and increased skin hydration. At t7, F2 maintained TEWL, improved skin hydration, reduced porphyrin and sebum content, and decreased sebaceous gland activity. This corroborates with the participant's perception, where they considered F2 easy to spread and reported reduced oiliness. These results suggest that the carotenoids in pequi oil and its oleic and palmitic fatty acids contribute to reduced sebum content and sebaceous gland activity. In conclusion, pequi oil improves skin barrier function and hydration and establishes a hydrolipidic balance.

G.F. Cadioli, P.M.B.G. Maia Campos, **Skin Hydrolipidic Mantle: Formulations Development based on Avocado and Sunflower Seed Oil and Clinical Efficacy Evaluation**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

The hydrolipidic mantle of the skin is essential in maintaining hydration and cutaneous homeostasis. However, continuous exposure to exposome factors can disrupt this mantle and compromise the skin's barrier function. Thus, the development of cosmetic formulations containing biocompatible ingredients is essential for preserving the hydrolipidic mantle and skin physiology. In this study, moisturizing cosmetic formulations were developed, incorporating sunflower seed oil and avocado oil either individually or in combination. A 28-day long-term efficacy evaluation was conducted in terms of skin microrelief, transepidermal water loss, stratum corneum water content, as well as perceived efficacy in terms of hydration and oily sensation. Results demonstrated that the formulation with the synergistic combination of oils effectively protected the skin barrier, improved hydration, and reduced skin desquamation compared to the vehicle formulation and individual oil additions. In conclusion, the formulation containing both oils was more effective in protecting the skin barrier function, increasing skin hydration and improvement of skin microrelief when compared to the formulations containing the oils individually. These findings suggest that the ideal composition of fatty acids contributes to better outcomes when incorporating vegetable oils into cosmetic formulations.

F. Yi, X.-J. Kuang, G.-X. Lin, Y.-H. Liu, L. Geng, S.-Y Zhu, H. Liang, **The Chinese female facial skin database construction and utilization: Deciphering the Ageing status of Chinese sensitive females**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Objective: This study aimed to compare the Bowman questionnaire and the lactic acid tingling test for studying facial aging characteristics of sensitive skin in Chinese women. Additionally, it analyzed differences in facial skin characteristics and aging patterns between sensitive and tolerant populations using a database of 4 million non-invasive facial indicators. Methods: 1000 women aged 20-45 years participated in the study across 7 Chinese cities. The Bowman questionnaire and lactic acid tingling test were administered, and non-invasive instruments quantified all biophysical parameters. Detailed characterization of female facial skincwas achieved through multidimensional non-invasive assessment data. Results: The Bowman questionnaire effectively determined sensitive skin and yielded more statistically significant skin indicators compared to the lactic acid tingling test. The sensitive population exhibited lighter skin tone, higher total acne prevalence, and fewer pores and total pigmentation than the tolerant population. Aging trends classified the sensitive population into latent aging (20-28 years old), abrupt aging (29-33 years old), and accelerated aging (34-45 years old), each displaying distinct skin characteristics. Conclusions: These findings on sensitive skin aging will inform the development of personalized and precise skincare product customization.

S. Bom, P. Pinto, H.M. Ribeiro, J. Marto, **A step forward in Personalizing Beauty: the effect of 3D-printed skincare masks' design on hydration performance**, Podium presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Personalized beauty is on the rise in the cosmetic industry, with 3D printing offering the ability to customize skincare products to individual needs. Therefore, this work aimed to demonstrate the relevance of using printing design settings as personalizing features to customize the hydration performance of hydrogel-based skincare masks. Three-layered gelatin-based hydrogel patches were printed by an extrusion-based 3D printer (Allevi2, Allevi, USA). To evaluate the effect of the patch's design on hydration performance, occlusive and porous patches were applied to the ventral side of the forearm of healthy volunteers (n=10) under no-occlusion (4h) and under occlusion (24h; plastic occlusion stress test, POST). Hydration and transepidermal water loss (TEWL) were assessed using Corneometer® CM 825 and Tewameter® TM 300 devices, respectively.The data obtained show that the occlusive patches increased moisture content by 108.85%, while the porous patches increased it by 45.38%. TEWL results showed a higher variation for the occlusive patch, whereas the porous patch reduced TEWL by -9.96% after 4h. POST analysis further suggests that the porous patch retained a higher amount of water on the skin surface. Overall, the masks' internal geometry impacts the hydration performance, which can be linked to the skin occlusion degree induced by design.

A. Graça, P. Pinto, S. Raposo, H.M. Ribeiro, J. Marto, **Maintaining skin beauty while being protected: *In vivo* studies on innovative NADES-based sheet-mask to prevent skin lesions caused by PPE,** Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Prolonged and continuous use of personal protective equipment (PPE) exert sustained pressure, tension, and friction on the skin causing lesions, as reported during pandemic times. The present study aims to evaluate the efficacy of a gelatin-based sheet-mask to place underneath the PPE mask to attenuate skin damage provoked by the PPE. The proof of the efficacy of the hydrogel sheet-mask, when used underneath a FFP2 mask for 4 hours, was assessed by *in vivo* biometric studies using 10 healthy volunteers. Facial skin temperature, skin surface, transdermal water loss (TEWL), sebum level, and finally red spots were evaluated using biometric equipment. In addition, a well-being questionnaire was given to each participant. The results showed an overall slight decrease of the facial temperature and TEWL, an increase in hydration ($p < 0.05$), the sebum level maintained ($p > 0.05$), and the red spots decreased over 20%. Regarding the questionnaire, 90% of the participants said that they would buy the product since an attenuation of the skin lesions symptoms was felt. The developed hydrogel sheet-mask may be a simple yet efficient strategy to prevent pressureinduced skin lesions, keeping the facial skin healthy without compromising the protection given by the PPE.

Y. Yang, X. Sun, Y. Yu, S. Ding Song, K. Yang C. Liu, **Process optimization of astaxanthin nanoemulsion and evaluation of facial nourishing efficacy**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

In this study, astaxanthin nanoemulsion was prepared by D-phase emulsification method. Compared with the original phase transformation component method, the production time was shortened by half, and the production efficiency was greatly improved. Human test and safety evaluation were carried out. Thirty-one subjects with fine lines, dryness and roughness on the face were selected, and the age range was between 30 and 60 years old. The test product was used continuously for 28

days, and the moisture content of the stratum corneum, trans epidermal water loss, smoothness (SEsm) and roughness (SEr) of the face were tested before use, 14 and 28 days after use, respectively. At the same time, facial images were obtained using the facial imaging tester. The results of product safety evaluation showed that 0 of 31 patients had skin adverse reactions. The results of human efficacy evaluation showed that astaxanthin nanoemulsion had nourishing effect.

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S. Ding, X. Sun, Y. Yu, C. Liu, **Combinatorial application of liquid crystal emulsion and glycosyl glycerol for improvement of skin elasticity, roughness, trans epidermal water loss and hydration**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Liquid crystal skin care products are widely used in cosmetics field because of their good skin affinity, unique optical characteristics, excellent water locking and moisturizing, control ability in active substances slow-releasd and other advantages. glycosyl glycerol is a glycoside compound formed by the connection of glycerol molecules and glucose molecules through glycosidic bonds. It can balance cell osmotic pressure and maintain cell survival under adverse environmental conditions. In this study, we developed a cream with liquid crystal structure using glycosyl glycerol as main active ingredient and evaluated its effects in skin care on 33 males or females between 30-65 years old with rough and dry skins and wrinkles around their eyes. The combinatorial creams showed statistically significant efficacy for the improvement of skin elasticity, roughness, trans epidermal water loss and hydration. Through self-evaluation from the subjects, facial dry lines, fine lines, moisture, elasticity and other aspects had obvious improvements. cThe efficacy results showed that this combinatorial application was a outstanding method for skin care, especially in anti-aging area to improve skin elasticity, roughness, trans epidermal water loss and hydration.

P.M.B.G. Maia Campos, L. Kakuda, C.R.F. Souza, **A Cosmetic formulation with Brazilian berry extract improves skin morphological characteristics and hydration: a clinical study by reflectance confocal microscopy**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

The skin hydrolipid balance is essential to maintaining the physiological conditions of the skin. Natural extracts with antioxidant properties can accelerate cell renewal and keep the skin in good condition. In this context, the Brazilian berry (*Plinia cauliflora*) extract, rich in polyphenols, presents antioxidant effects and can contribute to restoring and maintaining the skin barrier. Thus, the objective of this study was to evaluate the clinical efficacy of a cosmetic formulation containing Brazilian berry extract in improving skin morphological characteristics and hydration. A gel formulation containing or not (vehicle) 2% of the extract was developed, and a clinical study using Reflectance Confocal Microscopy (RCM) was carried out to evaluate the skin morphological characteristics. In addition, skin hydration, microrelief, and TEWL were evaluated. The studied formulation showed a significant increase in the stratum corneum water content, reduction in TEWL and an improvement of skin microrelief after 45-day period of application. RCM imaging analysis showed that the formulation containing the extract improved the skin hydration in the viable epidermis due to an increase of interkeatinocyes reflectance in the granular layer after the treatment period. Finally, the results showed the benefits of Brazilian berry extract for improving and maintaining skin physiology.

J. H. Lee, I.J. Park, C.R. Park, Y.J. Oh, S.W. Han, Y.J. Kim, S.R. Park, M.S. Park, J.B. Lee, **New Indicators of Skin Barrier Evaluation: Rapid in vivo measurement of skin barrier recovery using confocal Raman Spectroscopy**, Podium presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

The most popular method for evaluating skin barrier function is to measure TEWL. But it has a

limitation to provide direct information on biophysical parameters responsible for the barrier function of the stratum corneum. It has been shown that confocal Raman spectroscopy is the most suitable non-invasive method to determine depth profile of the lateral organization of intercellular lipids, however, few studies have demonstrated in vivo skin barrier recovery function. The aim of this work is to verify recovery of damaged skin barrier function by Raman spectroscopy. Lateral organization of intercellular lipids were observed by Raman spectroscopy probe, and analyzed ICL packing indicator which represents the ratio of intensity of orthorhombic phase lipids and hexagonal phase lipids on forearms after using creams. To verify real barrier-recovery efficacy, we evaluated ICL packing indicator by confocal Raman spectroscopy. We also calculated 'SARR (skin arrangement recovery rate)' which indicates how disordered skin lipid arrangement recovers to the its original ordered state, and 'SARR' was significantly increased on test product application site. We believe that monitoring ICL packing parameter using in vivo Raman spectroscopy provides a breakthrough in assessing the skin barrier recovery efficacy of topically applied substances.

J. Zhang, S. Liu, W. Guo, **A new method for evaluating the efficacy of sensitive skin treatment: Combination of tape stripping and capsaicin patch application**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

A new method for evaluating the efficacy of sensitive skin treatments applied to the medial forearm has been established. Considering the response of the human forearm to chemical stimuli such as capsaicin and lactic acid is later and milder than that of the face, tape stripping was performed on the forearm prior to application of the capsaicin patch (FA-TSCAP) to simulate the response of the face to the capsaicin patch (F-CAP). To compare the results of FA-TS-CAP and F-CAP, an emulsion containing a 4-t-butylcyclohexanol complex was applied to soothe the sensitive skin reaction on both the forearm and face. The semisubjective pain score, a* value and transepidermal water loss (TEWL) were measured before the treatment and after the treatment. The results showed a consistent trend of correlation between FA-TS-CAP and F-CAP. A questionnaire was also given to participants regarding willingness to take the test, while significantly more participants were willing to take the FA-TS-CAP than the F-CAP (96% vs. 4%). This innovative efficacy evaluation method is more user friendly, reduces appearance of facial stimulation, eases potential safety concerns and ethical concerns, especially for those with highly and moderatelysensitive skin.

Y. Yu, S. Li, S. Ding, K. Yang, C. Liu, **Study on the effect of facial mask preparation of sulfated fucan combined with sodium hyaluronate on sensitive skin**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Objective: To study the efficacy of the mask prepared by sulfated fucan and sodium hyaluronate on sensitive skin. Methods: In vitro experiments, L929 Mouse Fibroblasts Cells scratch method, HaCaT cell viability assay and inhibition of inflammatory factors release induced by LPS from RAW264.7 cell. In humans, a single-center open, 4-week continuous before and after control experiment was conducted. 32 sensitive skin subjects used the facial mask three times a week. After 4 weeks , the repair efficacy can be verified by means of instrument test and before and after control. Results: After 24h of cell scratch culture, 0.1% and 1% sample groups all had a certain effect on promoting the healing of the scratch area. The 0.01%, 0.1% and 0.5% sample showed no toxicity to HaCaT cell, and 0.5% concentration had the best effect on cell proliferation. 0.001% of the samples had a better effect on inhibiting the release of inflammatory cytokines IL-β and IL-6. After 4 weeks, compared with before use, the increase rate of skin moisture content in the test area was 13.87% *(P*<0.001) , the reduction rate of TEWL value was 16.21% (*P*=0.001), the reduction rate of a* value was 10.20% (*P*<0.001) and the reduction rate of EI value was 8.13% (*P*<0.001). More than 90% of the subjects were satisfied with improvement of skin redness, itchiness, tightness, stinging, hot and dry, agreed that the test samples were mild and non-irritating. Conclusion: The facial mask has a good effect of anti-inflammatory, moisturizing, promoting skin barrier repair and relieving facial redness.

J.V. Gruber, N. Terpak, J. McCormack, S. Massard, A. Schwartz, C. Lyon, **Jojoba Oil Esters – Ease inflammation, sensitivity and water loss,** Cosmetics & Toiletries September 2023

Recent climate change has triggered significant heat-related events including water shortages and even severe droughts throughout the world. This has brought profound attention among other concerns, the need to focus carefully on pragmatic use and careful management of precious water resources.

G.R. Nirmala, C.-C. Liao, Z.-C. Lin, A. Alshetaili, E. Hwang, S.-C. Yang, J.-Y. Fang, **Topically applied pH-responsive nanogels for alkyl radical-based therapy against psoriasiform hyperplasia**, Drug Delivery, 2023, Vol. 30, No. 1

Phototherapy is a conventional antipsoriatic approach based on oxygen-relevant generation of oxidative stress to inhibit keratinocyte hyperproliferation. However, this therapy can be restricted due to local hypoxia in psoriatic lesions. The generation of alkyl radicals is oxygen-independent and suppresses hyperproliferation. Herein, we established alkyl radical-based therapy to treat psoriatic hyperplasia. Because alkyl radicals are short-lived compounds, we loaded 2,2'-azobis[2-(2-imidazolin-2-yl)propane] dihydrochloride (aiPh) as a precursor of alkyl radicals into the chitosan nanogels to improve stability. The present study presented a topically applied nanogel that led to a ph-responsive network sensitive to skin ph. this ph responsiveness of the nanogels allowed fast alkyl radical release in the target site. The physicochemical properties of the prepared nanogels were determined through size, zeta potential, scanning electron microscopy, and absorption spectroscopy. The antipsoriatic activity was examined with keratinocyte- and animal-based studies. The nanogels displayed a smooth and spherical morphology with a hydrodynamic diameter of 215nm. this size was largely increased as the environmental ph increased to 6. The nanogels heated at 44°c produced alkyl radicals to induce keratinocyte death through the necrosis pathway. Bioimaging demonstrated that topically applied nanogels could deliver alkyl radicals into the epidermis. This targeting was accompanied by the accumulation of free radicals in the epidermis according to the 2′,7′-dichlorodihydrofluorescein diacetate assay. The imiquimod-stimulated psoriasiform animal model indicated a remarkable reduction in erythema, scaling, and overexpressed cytokines upon topical treatment of the nanogels. The transepidermal water loss of the psoriasiform skin was inhibited from 51.7 to 27.0 g/m2/h, suggesting barrier function recovery by the nanocarriers. The nanogels lowered hyperplasia by decreasing the epidermal thickness from 212 to 89μm. The incorporation of 8-hydroxypyrene-1,3,6-trisulfonic acid (hPts) as a ph-sensitive fluorescence dye in the nanogels could be used to diagnose the severity of the psoriasiform plaque due to the stronger fluorescence of HPTS in skin with lower ph (psoriasiform skin ph = 4.4) than in healthy skin (ph = 4.9). it was possible to deliver the prepared nanogels into the epidermis to restrain hyperplasia without causing cutaneous irritation.

S.-M. Choi, K.-S. Kook, J. Park, B.-L. Lew, S.-H. Kwon, **Human dermal fibroblast-derived extracellular matrix reduces postinflammatory hyperpigmentation after fractional carbon dioxide laser facial resurfacing in Asians**, J Cosmet Dermatol, 2023 Aug;22(8): p. 2239-2245

Background: Extracellular matrix (ECM) components promote the development of skin wounds by providing biological scaffolds and regenerative microenvironments. Aims: To evaluate the beneficial effects of human dermal fibroblast-derived ECM after fractional carbon dioxide laser resurfacing in Asians. Patients/methods: In this double-blind, randomized, vehicle-controlled, split-face study, 15 participants with features of facial skin aging were treated with a single session of fractional carbon dioxide laser, followed by the application of either ECM (ECM group) or placebo (control group). In vivo skin parameters were measured at baseline and after 4 and 12 weeks of treatment using the Antera 3D®, Cutometer® MPA580, Dermascan®, and Tewameter®.
Results: A total of 14 participants (mean age 45.1 ± 9.7 years) completed the study. The change in melanin level was significantly lower in the ECM group than in the control group at week 12 ($p < 0.05$). Transient increase in erythema level was observed at week 4 in the control group, and the change in the erythema level was greater in the control group than in the ECM group ($p = 0.014$). Though the ECM group showed improvements in the dermal density, texture, transepidermal water loss, marionette lines (volume, maximum depth, and average depth), and nasolabial folds (volume, maximum depth, and length), no significant differences were found between the two groups. Treatment-related adverse events were not reported. Conclusions: We suggest that human dermal fibroblast-derived ECM may be used as adjunctive therapy after fractional carbon dioxide resurfacing to prevent postinflammatory hyperpigmentation in Asians.

A. Płatkowska, S. Korzekwa, B. Łukasik, N. Zerbinati, **Combined Bipolar Radiofrequency and Non-Crosslinked Hyaluronic Acid Mesotherapy Protocol to Improve Skin Appearance and Epidermal Barrier Function: A Pilot Study**, Pharmaceuticals 2023, 16, 1145

Background: Age-associated changes in epidermal hydration, pigmentation, thicknessand cell renewal influence skin appearance and can lead to laxity, dryness and poor skin tone. The aim of this pilot study was to assess the synergistic effects of a new bipolar radiofrequency plus non-crosslinked hyaluronic acid (HA) mesotherapy protocol compared with radiofrequency alone on skin appearance and markers of epidermal function. Methods: This prospective, singlecenter, split-face pilot study recruited women aged 25–65 years with dryness and laxity of the facial skin defined by a trans-epidermal water loss (TEWL) value of ≥26 g/m2/h. Subjects were treatedwith a bipolar radiofrequency device on both sides of the face. This was immediately followed byneedle hyaluronic acid (HA) treatment on one side of the face with 2.5 mL of a non-crosslinked HA. Photographic documentation, analysis of epidermal barrier function parameters, and highfrequency (HF) ultrasound analysis were performed prior to

treatment and at 28 days. Results:Twenty female subjects with a mean age of 46 (range 29 to 54) years and dry and lax facial skin were included. TEWL was reduced and skin hydration improved to a greater extent with the combinedradiofrequency plus mesotherapy protocol compared with radiofrequency alone (-5.8% vs. +3.9%and +23.1% vs. +1.0%, respectively). The combined protocol was also associated with greaterimprovements in melanin (-7.5% vs. -1.5%) and erythema values (-7.2% vs. +3.0%), respectively. Ultrasound measures of epidermal thickness and epidermal density were greater after the combinedprotocol compared with radiofrequency alone (12.0% vs. 5.6% and 57.7% vs. 7.1%, respectively). Both treatments were well-tolerated. Conclusions: The combined bipolar radiofrequency and HA mesotherapy protocol provided greater improvements in skin hydration, firmness and tone compared with radiofrequency alone. The combination treatment was also associated with greater epidermal thickness and density and increased keratinocyte differentiation suggesting a synergistic effect of both treatments on epidermal homeostasis and barrier function. Both treatments were well-tolerated and led to improvements in facial appearance.

D. Kerob, A. Czermanska, E.M. Karamon, A. Moga, G. Lecerf, M. Nioré, G. Le Dantec, C. Le Floc'h, J. Tan, **A Dermocosmetic Signifcantly Reduces the Frequency and Intensity of Facial Skin Intolerability and Sensitivity in Subjects with Skin Intolerant to Skin Care Products and Sensitive Skin**, Clinical, Cosmetic and Investigational Dermatology 2023:16, p. 1787–1794

Introduction: Intolerance to dermocosmetics is frequent in subjects with allergic contact dermatitis (ACD). A dermocosmetic (DC) was developed to restore the natural skin barrier, to reduce skin inflammation and to improve sensitive skin in ACD. Objective: To assess the beneft of a DC in subjects with an allergic background and intolerance to cosmetic care, or with sensitive skin. Materials and Methods: In this open-label study, 107 subjects above 16 years of age applied DC on the face twice a day for 28 days. Assessments at Days 0, 14 and 28, included skin sensitivity, stinging test, local tolerance, transepidermal water loss (TEWL), skin hydration, inflammatory biomarkers (IL-1α, IL-1RA, PGE2) using tape stripping and subject satisfaction. Results: 88% were women and mean age was 42.0±15.0 years. Skin sensitivity at inclusion scored 5.9±0.35; 46% had ACD, 95% skin irritation, 92% sensitive skin and 88% intolerance to cosmetics. A signifcant ($p<0.0001$) 85% decrease of frequency and intensity of the composite score was observed at both endpoints. Stinging scores signifcantly ($p<0.0001$) decreased from 3.9 at baseline to 2.4 at Day 14 and 1.4 at Day 28; 77% and 81% of subjects reported improved skin reactivity at Day 14 and Day 28, respectively. Similar improvements were noted in the frequency and intensity of irritation, erythema, stinging, burning and discomfort. TEWL, skin hydration and inflammatory biomarker levels signifcantly ($p<0.0001$) improved. Overall subject satisfaction (85%) and tolerance (investigators: 99%, subjects: 97%) were high. Conclusion: DC signifcantly reduced the frequency and intensity of facial skin intolerability and sensitivity in subjects with skin intolerant to skin care products.

G. Gentili, P. Perugini, S. Bugliaro, C. D'Antonio, **Efficacy and safety of a new peeling formulated with a pool of PHAs for the treatment of all skin types, even sensitive**, J Cosmet Dermatol. 2023; p. 22: p. 517–528

Background: Actually, the use of chemical peels in cosmetics and dermatology continues to grow due to their versatility, clinical endpoint–directed predictability, and favorable risk profile in comparison to lasers. The chemical peel is a generally safe method for treatment of some skin disorders and to refresh and rejuvenate the skin. The major challenge of chemical peels is the tolerability, that is because of sensitive skin which is one of the most common skin disorders. Aim: The aim of this study was to evaluate the effectiveness of the new Miamo Renewal Peel Serum formulated with a pool of new generation acids (ELPA25™) on sensitive skin with respect to mandelic acid serum only and with respect to placebo comparison. Materials and Methods: The "in vivo" study following the half-face experimental protocol active versus placebo involved 30 healthy Caucasian female volunteers between 25 and 64 years, with sensitive skin, who were divided into two different groups. ELPA25™ serum was applied in one group three times a week for 8 weeks. The other group, with the same protocol, applied an active serum containing mandelic acid, as control, versus placebo. In particular, skin moisturizing, skin viscoelastic properties, skin surface smoothness, wrinkle reduction, and stratum corneum renewal were evaluated. Results: Renewal Peel Serum was very well tolerated from sensitive skin. A significant decrease in skin roughness and wrinkle breadth, and an improvement in firmness and in skin elasticity, was observed after 2 months of treatment with respect both to mandelic acid serum and to placebo comparison. Conclusions: Scientific protocol using self-controlled study methodology and noninvasive skin bioengineering techniques with adequate statistical methods were able to evaluate both the safety and the efficacy of the new Miamo Renewal Peel Serum. This study highlighted that the Miamo Renewal Peel Serum formulated with a patent-pending mixture of new generation acids (ELPA25™) exerts many beneficial effects and it can be successfully employed for sensitive skin.

I.-L. Young, J. Kim, S.R. Park, S. Ham, H.J. Lee, C.R. P ark, H.N. Kim, B.H. Kang, I. Jung, J.M. Suk, J. H. Lee, **Age-related changes in scalp biophysical parameters: A comparative analysis of the 20s and 50s age groups**, Skin Research & Technology, July 2023

Background: Age-related changes in scalp parameters affect hair quality and scalp condition. However, detailed data on biophysical parameters of the scalp across age groups remain scarce. We aimed to investigate the differences in scalp parameters between individuals in their 20s and 50s and analyze their sex-specific variations. Materials and methods: Two hundred participants (160 women and 40 men) were equally divided into 20s and 50s age groups. Biophysical parameters of the scalp, including elasticity, pH, trans-epidermal water loss (TEWL), sebum production, desquamation, firmness, redness, and yellowness, were measured in the vertex, occipital, and temporal regions. Hair density and thickness were measured in the temporal region. The accumulation of advanced glycation end products (AGEs) in the skin was noninvasively measured in a subset of 60 women. Results: Skin firmness and redness increased with age in women, whereas yellowness increased with age in both sexes. Sebum production and pH levels were significantly lower in the 50s age group than in the 20s age group, particularly in women. TEWL was lower in men in their 50s than in those in their 20s, particularly in the occipital region. A significant reduction in hair density was observed in the 50s age group in both sexes. AGE accumulation in the skin increased with age and was correlated with scalp skin yellowness. Conclusion: Age-related changes in scalp parameters have important implications for hair health and scalp condition. These findings emphasize the importance of considering age and sex when developing hair care strategies.

M. Li, J. Mao, I. Diaz, E. Kopylova, A.V. Melnik, A.A. Aksenov, C.D. Tipton, N. Soliman, A.M. Morgan, T. Boyd, **Multi-omic approach to decipher the impact of skincare products with pre/postbiotics on skin microbiome and metabolome**, Frontiers in Medicine, July 2023

Introduction: Although pre/pro/postbiotics have become more prevalent indermatologic and cosmetic felds, the mode of action when topically applied islargely unknown. A multi-omic approach was applied to decipher the impact of the skincare products with pre/postbiotics on skin microbiome and metabolome. Methods: Subjects with dry skin applied a body wash and body lotion with orwithout pre/postbiotics for 6 weeks. Skin hydration was measured at baseline,3 and 6 weeks. Skin swabs were collected for 16S rRNA gene sequencing, metagenomics and metabolomics analysis. Results: Skin hydration significantly increased in both groups. The prebiotic group significantly reduced opportunistic pathogens, e.g., *Pseudomonas stutzeri* and *Sphingomonas anadarae*, and increased the commensals, e.g., *Staphylococcus equorum*, *Streptococcus mitis, Halomonas desiderata*. Bacterial sugar degradation pathways were enriched in the prebiotic group, while fatty acid biosynthesis pathways were reduced in control. The changes on skin metabolome profiles by the products were more prominent. The prebiotic group performed greater modulation on many clinically-relevant metabolites compared to control. Correlation analysis showed *H. desiderata*and *S. mitis* positively correlated with skin hydration, *P. stutzeri* and *S. anadarae* negatively correlated with the metabolites that are positively associated with skin hydration improvement. Conclusion: This holistic study supported a hypothesis that the pre/postbiotics increased skin hydration through the modulation of skin microbiome, metabolicp athways and metabolome.

I. Dolečková, P. Orzol, K. Vašičková, S. Karel, L. Petrovičová, G. Huerta-Angeles, M. Stěpánová, V. Velebný, **Retinol-like zinc hexapeptide complex**, Personal Care Magazine online, July 2023

Acne vulgaris is a common chronic skin disease affecting individuals of all ages. The pathogenesis of acne is characterized by four core events: hyperseborrhoea. Epithelial hyperkeratinization, *Cutibacterium acnes* colonization and inflammation. Due to the multifactorial nature of the disease a combination therapy or use of multifunctional compounds are the preferred approaches. Retinoids are among the most effective compounds targeting multiple acne associated pathways. However, they often cause negative adverse effects including skin dryness and irritation.

J. Blaak, D. Dähnhardt, S. Bielfeldt, C. Theiss, I. Simon, K.-P. Wilhelm, S. Dähnhardt-Pfeiffer, P. Staib, **Improvement of Human Epidermal Barrier Structure and Lipid Profile in Xerotic- and Atopic-Prone Skin via Application of a Plant-Oil and Urea Containing pH 4.5 Emulsion**, Cosmetics 2023,10, 95

Epidermal barrier dysfunction can lead to xerotic skin and promote skin disorders like atopic dermatitis. Atopic skin is characterized by reduced water-retaining compounds, altered lipid composition and elevated skin pH. Against this background, a study was conducted to investigate the impact of a specific skin care product on epidermal barrier function in dry and atopic-prone skin. A marketed pH 4.5 cosmetic formulation containing 10% urea and specific plant oils was evaluated on 25 subjects with dry

and atopic-prone skin. Measurements of skin hydration, pH, and barrier function were performed before and after 3 weeks of product usage. Additionally, visual scoring and stratum corneum lipid analysis using electron microscopy were conducted to investigate lipid composition. An improved skin hydration compared to the untreated area and a tendency to decrease the baseline elevated skin surface pH were observed. The visual scoring showed reduced dryness, roughness, and tension through the application. Furthermore, the stratum corneum lipid matrix was improved in terms of lipid content and organization. The combination of an acidic product's pH, a relevant urea content and effective plant oils is shown to be beneficial in terms of improving the skin barrier function, structure and appearance and is recommended for dry and atopic-prone skin.

M. Lee, M.S. Kim, S.H. Jang, H. Kim, G.S. Kim, H. Lee, H.M. Park, J. Yang, **Cera-Glow, ferment lysates of Lacticaseibacillus rhamnosus IDCC 3201, improves skin barrier function in clinical study**, J Cosmet Dermatol, 2023 Jun;22(6): p. 1879-1886

Background: Ceramides are essential lipids in stratum corneum for skin permeability barrier function in that they retain the skin moisture and protect from the invasion of foreign pathogens. Previously, we demonstrated that ferment lysates of Lacticaseibacillus rhamnosus IDCC 3201 enhanced ceramide production in human epidermal keratinocytes. Furthermore, for comprehensive knowledge of this effect, in vitro experiments and multi-omics analysis were conducted to explore the underlying mechanisms. Aims: This study was designed to identify whether a cosmetic sample (i.e., Cera-Glow) containing the lysates improves the skin barrier function in clinical trials. Patients/methods: Twenty-four female participants (45.46 ± 9.78 years) had been enrolled in the transepidermal water loss (TEWL) measurement for 5 days and 21 female participants (50.33 ± 5.74 years) had undergone a skin hydration evaluation for 4 weeks. TEWL and skin hydration were evaluated using a Tewameter and the Epsilon Permittivity Imaging System, respectively. After applying the Cera-Glow sample, all participants recorded a satisfaction survey questionnaire (e.g., satisfaction, efficacy, and adverse reactions). Results: Application of Cera-Glow significantly improved transepidermal water loss induced by 1% (w/v) sodium lauryl sulfate ($p < 0.05$-0.01) and increased skin hydration ($p < 0.01$). Metabolic analysis suggested that Cera-Glow should contain beneficial gradients for skin barrier function. According to the questionnaire, most of participants were satisfied with the skin hydration improvement and efficacy of Cera-Glow. Conclusions: Cera-Glow, ferment lysates of Lacticaseibacillus rhamnosus IDCC 3201, can significantly improve skin barrier function.

M.G. Ryabkov, M.N. Egorikhina, N.A. Koloshein, K.S. Petrova, M.G. Volovik, N.Y. Orlinskaya, Aleksandra O. Moskovchenko1, I.N. Charykova, D.Y. Aleynik, D.D. Linkova, I.E. Pogodin, I.I. Kobyakova, I.Y. Arefyev, **Effectiveness and Safety of Transplantation of the Stromal Vascular Fraction of Autologous Adipose Tissue for Wound Healing in the Donor Site in Patients with Third-Degree Skin Burns: A Randomized Trial**, Med J Islam Repub Iran. 2023 (21 Jun);37.70

Background: The quality of the wound healing at the donor site significantly determines the overall condition of the burn patient, the extent of wound fluid and protein losses, the severity of any systemic in-flammatory reaction, and the intensity of the pain syndrome. It is known that the stromal vas-cular fraction (SVF) has a beneficial effect on the healing of wound defects. This study is aimed at assessing the safety and effectiveness of the application of the SVF of autologous adipose tis-sue to stimulate wound healing of the donor site in patients with burns. Methods: This placebo-controlled clinical study included 38 patients with third-degree thermal skin burns. The patients underwent liposuction, enzymatic isolation of the SVF, and intradermal injection of the preparation into the wounds in the donor site, followed by tewametry, cutome-try, thermography and biopsy after 12 days. Quantitative indicators were compared using the Mann-Whitney test for unrelated groups and the Wilcoxon test for related groups. Spearman's rank correlation coefficient (RS) was used to assess the correlation Results: Epithelization of the wounds in all patients was seen over an average area of 88 (84;92) %, there being no significant differences between the actual and the control wound sites for this parameter. Transdermal water loss in the test wound sites was 2 times lower than in the control sites ($P = 0.001$). The wound donor sites regained their temperature distribution faster than the control sites ($P = 0.042$). Histological preparations of the skin of the wound sites revealed that their epidermal layer was 19% thicker compared to the controls ($P = 0.043$). It should be noted that five adverse events related to manipulations in the postoperative period were registered. Conclusions: Transplantation of SVF autologous adipose tissue into the wound area in most clinical cases proceeded without complications. The area of epithelialization of wound areas af-ter the introduction of SVF did not change, although a significant decrease in transdermal water loss was observed in the wound areas with an improvement in their thermoregulation and an increase in the thickness of the epidermis.

E.H. Park, D. Jung, J.H. Won, J. Seong, J. Na, **Effects of winter indoor environment on the skin:**

Unveiling skin condition changes in Korea, Skin Research & Technology, 2023;29:e13397

Background: InKorea, winter can cause skin dryness due to low relative humidity (RH); moreover, indoor heating devices promote moisture loss and air pollution. If dryness persists, dead skin cells accumulate, leading to skin problems; therefore, careful skin care is required. This study aimed to compare changes in skin conditions when exposed to an indoor environment for a short period of 6 h in winter, and to suggest proper winter skin care practices. Methods: A randomized, split-face clinical study was conducted in which healthy female participants with normal skin were exposed to an indoor environment with a heater turned on for a short period at least 6 h per day in thewinter season, and cream was applied to one side of the face. Skin temperature, hydration, sebum, transepidermal water loss (TEWL), elasticity, texture, pores, redness, and wrinkles were measured at the treated and nontreated sites. Results: After 6 h of exposure, skin temperature, pores, roughness, redness, and wrinkles significantly increased ($p < 0.05$) on the face, whereas TEWL significantly increased on the forearm ($p < 0.05$). However, sebum secretion appeared to function as a barrier to maintain homeostasis in the facial skin. Elasticity, pores, texture, and wrinkles in the cream-treated ceramide site improved compared to those in the nontreated site ($p < 0.05$). The moisture content was also significantly higher in the forearm ($p < 0.05$). Conclusion: Changes in skin parameters of participants with healthy skin were observed even after short-term exposure to an indoor environment in winter. Creams containing ceramide maintain skin homeostasis and protect the skin barrier; therefore, it is recommended to use such creams to prevent skin damage and maintain healthy skin, particularly during prolonged exposure to indoor environments during winter.

S. Jarząbek-Perz, M. Dziedzic, A. Kołodziejczak, H. Rotsztejn, **Split-face evaluation: Gluconolactone plus oxybrasion versus gluconolactone plus microneedling. The effects on skin parameters**, Skin Research & Technology, Volume 29, Issue 6, June 2023

Background: The application of polyhydroxy acids and alpha-hydroxy acids to the skin is often used in cosmetology. To enhance the effect of gluconolactone chemical peeling, a combined method including water-oxygen oxybrasion or microneedle mesotherapy can be used. Objectives: To evaluate skin parameters such as hydration, sebum, pH and TEWL after application of a 10% gluconolactone chemical peel in combination with oxybrasion and microneedling. Materials and methods: Twenty-one Caucasian women participated in the study. A series of three split face treatments was carried out at 1-week intervals. Oxybrasion was performed on the right side of the face and micro-needle mesotherapy on the left side. A 10% gluconolactone solution was applied to the entire face. Before the first and third treatments and 2 weeks after the last treatment, skin parameters were evaluated. Photographic documentation was also made before and after the treatment series. Results and conclusion: Evaluation of skin parameters using Courage & Khazaka 580 Multi Probe Adapter probes (Courage + Khazaka electronic GmbH, Cologne, Germany) showed an increase in hydration and a decrease in sebum, pH and TEWL for both treatments. There were no statistically significant differences between the treatments. Combining chemical peeling of gluconolactone with oxybrasion and microneedle mesotherapy is a good method to seal the hydrolipid barrier and increase skin hydration.

M. Riggs, K.C. Holley, H. Knaggs, S. Powell, B. Cook, G. Diwakar, **Clinical improvement of appearance of cellulite and skincharacteristics witha non-invasive biphasic pulsed microcurrent device system**, EURO COSMETICS 5-23

Low Level alternating current (AC) or direct current (DC) microcurrent based treatment devices have been in use for over a century to improve muscle contraction, wound healing, and pain. Over the last decade the microcurrent treatment modality is increasingly being used for improvement of skin appearance, which includes skin tone, elasticity and reducing overall hyperpigmentation on face and body. To the best of our knowledge, the studies examining the benefits of non-invasive low level microcurrent treatment on cellulite have not been previously demonstrated. Cellulite is a skin condition in which the adipocyte (fat) globules aggregate and enlarge causing degradation of dermal matrix, vasoconstriction and blocking of lymphatic drainage. These enlarged hypodermal fat cells push against the dermis and epidermis resulting in a rippled or cottage cheese appearance of skin. Cellulite mostly appears in the upper triceps area of the arm, abdomen, and upper thighs. Cellulite affects women more than men. Here we report results from a 12-week clinical study using a combination of non-invasive biphasic pulsed microcurrent device system (MDS) comprising treatment body serum and posttreatment body lotion demonstrating significant improvement in appearance of cellulite on arms and upper thigh when compared to subjects who used the microcurrent device system alone.

R. Di Lorenzo, L. Grumetto, A. Sacchi, S. Laneri, I. Dini, **Dermocosmetic evaluation of a nutricosmetic formulation based on Curcuma**, Phytother Res, 2023 May;37(5): p.1900-1910

Endogenous and exogenous factors can alter the skin layer and appearance, determining skin

aging. The extracts and isolated molecules from food matrixes can be used to formulate "healthy" antiaging cosmetics. Two different cosmetic approaches can be used to achieve the antiaging effect. It is possible to use topical products based on food extract (cosmeceutical approach) or take a food supplement and apply a topical cosmetic product based on food extract on the surface to be treated (nutricosmetic approach). This work evaluated in vivo the antiaging potential of a nutricosmetic formulation (cream + food supplement) and a cosmeceutical cream based on Curcuma. The choice of the commercial Curcuma extract to be used for experimental purposes was based on the curcuminoid content determined by an HPLC test. Curcuminoids are the bioactive compounds responsible for Curcuma's antioxidant and antiinflammatory properties. Their levels in Curcuma extracts vary according to the storage condition, variety, and pedoclimatic cultivation conditions. The Tewameter® TM300 was used to evaluate the Trans Epidermal Water Loss (TEWL), the Corneometer® CM 825 to determine the moisturizing effect, the Cutometer® to estimate the skin firmness and elasticity, the Dermascan to assess the collagen index, and the Visioface® 1000D to evaluate the wrinkles. The nutricosmetic product showed potential as moisturizing, anti-age, and anti-wrinkle action better than the cosmeceutical product alone.

S. Li, X. Zhao, Y. Chen, J. Liu, **Therapeutic effects of mesoderm introduction of compound glycyrrhizin injection on the treatment of rosacea**, Skin Research & Technology, Volume 29, Issue 5, May 2023

Objectives: This study aims to introduce compound glycyrrhizin injection for the treatment of rosacea by mesoderm therapy, and further analyze the therapeutic and aesthetic effects of this treatment method and its impact on the dermatological quality of life index, which provides new ideas and methods for cosmetic dermatology treatment of rosacea. Methods: The recruited rosacea patients were divided into Control group (n = 58) and observation group (n = 58) according to the random number table. The control group was treated with topical metronidazole clindamycin liniment, and the study group was additionally used mesoderm introduction of compound glycyrrhizin injection. The transepidermal water loss (TEWL), water content in corneum, and dermatology life quality index (DLQI) in rosacea patients were evaluated. Results: Our results showed that the scores of erythema, flushing, telangiectasia, and papulopustule were significantly reduced in the observation group. In addition, the observation group significantly decreased TEWL and increased the water content of the stratum corneum. Furthermore, the observation group significantly reduced the DLQI of rosacea patients compared to the control group. Conclusion: The use of mesoderm therapy combined with compound glycyrrhizic acid has a therapeutic effect on facial rosacea and improves patient satisfaction.

Z. Su, S. Aforki, Z. Goldsmith, S. Ryu, S. Cummings, S. Karsen, G. Nguyen, G. Simler, S. Paulsboe, A. Marinopoulos, J. Wetter, P. Zhang, S. Ciura, V. Scott, J. Loud, **Biostir AD ointment induces a stronger atopic dermatitis-like phenotype in Nc/Nga mice than BALB/c mice,** Poster Presentation at the 1st Congress of Investigative Dermatology, Tokyo, May 2023

Atopic dermatitis (AD) is a chronic pruritic inflammatory skin disease. House dust mite (HDM), a common aeroallergen associated with AD, is increasingly employed in mouse models as a pharmacology platform to evaluate novel AD targets. In the current study, we compared the AD-like phenotypes between two mouse strains, Nc/Nga and BALB/c, in response to repeated applications of *Dermatophagoides farinae* extract (Biostir AD ointment). In-life endpoints were measured including skin clinical scores, trans-epidermal water loss (TEWL), scratching bouts, as well as terminal endpoints (total serum IgE and tissue cytokines). Six applications of Biostir AD (twice/week) to back and ears resulted in moderate to severe dermatitis in Nc/Nga as evidenced by significant increases in clinical scores, scratching bouts, and TEWL. In contrast, BALB/c showed a modest increase in clinical score and TEWL with only a trend of increase in ear thickness and scratching bouts, but higher serum total IgE. Increases of inflammatory cytokines IL-4, IL-13, IL-31, TNF-α, IL-1β, IL-17A, and TARC in ear and back skin were significantly greater in Nc/Nga. Overall inflammation, acanthosis, and parakeratosis were more severe in Nc/Nga mice compared to BALB/c. Eosinophil infiltrate and spongiosis scores were comparable between two strains after exposed to HDM. Further phenotyping of Nc/Nga was performed, including flow cytometry and pharmacology. Flow cytometry of skin revealed a mixed immune response with increased IL-4, IL- 13, IL-17A and IFNγ from CD3+CD4+ T cells, CD3+CD8+ T cells, and CD3neg cells. JAK1 inhibitor and IL-4R antibody dose-dependently inhibited multiple AD-like endpoints in Nc/Nga mice. Together these data confirm Nc/Nga are predisposed to HDM-induced dermatitis compared to BALB/c, and the immune profile is complex, including innate and adaptive responses. Further studies are needed to enhance our understanding of HDM-induced immune responses in this model and to evaluate its utility in drug discovery for AD

U.A. Faisal, H. Jaafar, A. Jamil, **Effects of a Malaysian Thermal Spring Water as Adjunct Therapy**

for Mild to Moderate Acne Vulgaris, Poster Presentation at the 1st Congress of Investigative Dermatology, Tokyo, May 2023

Acne is a common skin disease with high psychosocial impact. Management is often challenged by cutaneous side effects that leads to therapeutic intolerance and poor compliance. Thermal spring water (TSW) has been used to treat skin diseases for centuries. The beneficial effect iswidely recognized but its impact the skin biophysical parameters is largely unknown. Patients with acne exhibited markedly higher sebum secretion, greater transepidermal water loss (TEWL) and reduced stratum corneum (SC) hydration. Restoring SC hydration and barrier function could be the missing key in acne management.

N.G. Ha, S.H. Lee, W.J. Lee, **A novel hydrogel-based moisturizing cream composed of hyaluronic acid for patients with xerosis: an intra-individual comparative analysis**, Poster Presentation at the 1st Congress of Investigative Dermatology, Tokyo, May 2023

Xerosis is a condition caused by decreased hydration of the stratum corneum and is characterized by clinical signs such as microscopic cracks, scaling and inflammation in the skin and it significantly impairs patients' quality of life, especially when associated with itching. Hyaluronic acid (HA) is mainly used to treat xerosis and plays an important role in wound regeneration, moisturizing, and anti-aging. Although HA is considered as an effective and safe ingredient of cosmetics, there is a constant demand for a more economical and efficient formulation.

F. Havas, M. Cohen, A. Perolat, J. Attia, ***In-Vivo*** **Enhancement of Skin Microbiota Balance and Improvements in Skin Health and Beauty with a *Hylocerus Undatus* Fruit Extract,** Poster Presentation at the 1st Congress of Investigative Dermatology, Tokyo, May 2023

The microbiota present on the skin, and its balance between benefcial and detrimental species, are increasingly recognized to play a key role in skin health and beauty, influencing skin moisture, barrier function, radiance, and luminescence. In healthy skin, the balance is tipped towards benefcial bacterial strains, limiting the growth of detrimental strains – contributing to radiant and well-hydrated skin. A disrupted microbial balance has been linked with skin inflammation, erythema and dullness, compromised barrier function, and skin dryness. Conversely, increased *S. epidermidis* levels on skin have been shown to signifcantly improve skin barrier function and hydration. Prebiotic compositions can support the growth of benefcial bacteria, allowing them to outcompete detrimental bacteria. Dragon fruit (*Hylocereus undatus*) is a superfruit rich in several key nutrients, including carbohydrates previously shown to have prebiotic effects on the gut microbiota. Here, we show that a *Hylocereus undatus* fruit extract may positively influence skin microbiota balance, as well as improve skin tone, and skin barrier function – key markers of healthy and beautiful skin.

R. Fukuda, K. Pak, R. Tanaka, N. Momchimaru, K. Yoshida, M. Kiuchi, N. Hirata, Y. Ohya, M. Mitsui, **Association of stratum corneum and breast milk factors with the development of atopic dermatitis in infancy: A prospective birth cohort study**, Poster Presentation at the 1st Congress of Investigative Dermatology, Tokyo, May 2023

Atopic dermatitis (AD) is a multi-pathogenic disease. The pathogenesis of AD relates to various etiological factors such as atopic predisposition, stratum corneum (SC) disorders, and immunity. As for SC factors, increased transepidermal water loss (TEWL), decreased natural moisturizing factor (NMF), ceramides and lipids have been reported in both adult and pediatric AD. Transforming growth factor (TGF)-β from breast milk plays a role in in allergy development, including AD and eczema). There have been no previous studies investigating SC and breast milk factors over time in the development of AD in infants.

M. Soeberdt, C. Neubauer, M. Kragl, N. Mähler, K. Moritz, S. Hoch, H. Steindl, R. Ziegler, T. Braun, P. Filipek, E. Bonyadirad, T. Jakschitz, G. Bonn, A. Koeberle, C. Abels, **Amelioration of symptoms of dry and eczema-prone skin by an oil-in-water emulsion containing a combination of a *Zingiber officinale* root extract and CBD with antioxidative and anti-inflammatory activity *in vitro*,** Poster Presentation at the 1st Congress of Investigative Dermatology, Tokyo, May 2023

In total, 24 plant extracts of different polarities were screened for potential anti-inflammatory and -oxidative activities in primary cells and cell lines. Effects were assessed and applied to a principal component analysis. Cannabidiol (CBD) and a *Zingiber officinale* root extract were found to be extraordinarily active and subsequently tested alone and in combination in relevant assays for skin inflammation. Subsequently, the newly developed oil-in-water (O/W) emulsion BNO 3731 containing CBD and a lipophilic *Zingiber officinale* root extract was investigated in a clinical study.

G. Grigolon, K. Nowak, S. Poigny, J. Hubert, A. Kotland, L. Waldschütz, F. Wandrey, **From Coffee Waste to Active Ingredient for Cosmetic Applications**, Int. J. Mol. Sci. 2023, 24, 8516

Coffee silverskin (CS) is the thin epidermis covering and protecting the coffee bean and it represents the main by-product of the coffee roasting process. CS has recently gained attention due to its high content in bioactive molecules and the growing interest in valuable reutilization of waste products. Drawing inspiration from its biological function, here its potential in cosmetic applications was investigated. CS was recovered from one of the largest coffee roasters located in Switzerland and processed through supercritical CO2 extraction, thereby generating coffee silverskin extract. Chemical profiling of this extract revealed the presence of potent molecules, among which cafestol and kahweol fatty acid esters, as well as acylglycerols, β-sitosterol and caffeine. The CS extract was then dissolved in organic shea butter, yielding the cosmetic active ingredient SLVR'Coffee™. In vitro gene expression studies performed on keratinocytes showed an upregulation of genes involved inoxidative stress responses and skin-barrier functionality upon treatment with the coffee silverskin extract. In vivo, our active protected the skin against Sodium Lauryl Sulfate (SLS)-induced irritation and accelerated its recovery. Furthermore, this active extract improved measured as well as perceived skin hydration in female volunteers, making it an innovative, bioinspired ingredient that comforts the skin and benefits the environment.

Y.G. Koh, J. Seok, J.W. Park, K.R. Kim, K.H. Yoo, Y.J. Kim, B.J. Kim, **Efficacy and safety of oral palmitoleic acid supplementation for skin barrier improvement: A 12-week, randomized, double-blinded, placebo-controlled study**, Heliyon 9 (2023)

Background: Palmitoleic acid (omega-7) has been reported to be effective primarily for metabolic disorders. Recently, it has been reported to help improve quality of life (QoL) by improving skin symptoms.Objective: The aim of this randomized, double-blinded, placebo-controlled clinical study is toevaluate the effcacy and safety of oral palmitoleic acid in improving skin barrier, elasticity, andwrinkle formation in adult women. Methods: In this randomized, double-blind, placebo-controlled clinical study, 90 healthy participants were enrolled and received 500 mg/day palmitoleic acid (intervention) or corn oil without palmitoleic acid (control) for 12 weeks. Skin hydration and transepidermal water loss and skin elasticity, surface roughness, eye wrinkle volume, and wrinkle severity were measured at 6-weekintervals to assess the skin barrier function and effcacy in wrinkle improvement, respectively.Results: After 12 weeks, skin hydration and transepidermal water loss signifcantly improved in the intervention group compared to the control group. Skin elasticity, surface roughness, eye wrinkle volume, wrinkle severity, and participant-assessed clinical improvement score did not signifcantly improve compared with the control group.Conclusion: Oral palmitoleic acid effectively improves the skin barrier function improvement, which may enhance QoL in aging adults.

J. Pavlačková, H. Pecháčková, P. Egner, P. Mokrejš, R. Gál, M. Janalíková, **The Effect of Cosmetic Treatment and Gel Laser Therapy on the Improvement of Comedogenic Skin Type**, Gels 2023, 9, 370

Comedogenic skin care receives little attention compared to the care or treatment of more serious acne manifestations. Traditional therapies may have limited success with potential side effects. Cosmetic care supported by the effect of a biostimulating laser may offer a desirable alternative. The aim of the study was to evaluate the biological effectiveness of combined cosmetic treatment with lasotherapy on comedogenic skin type using noninvasive bioengineering methods. Twelve volunteers with comedogenic skin type underwent a 28-week application of Lasocare Basic 645® cosmetic gel containing *Lactoperoxidase* and *Lactoferrin* in combination with laser therapy (Lasocare® method). The effect of treatment on skin condition was monitored using noninvasive diagnostic methods. The parameters were the amount of sebum, the pore count, the ultraviolet-induced red fluorescence assessment of comedonic lesions (percentage of the area and quantification of orange-red spots), hydration, transepidermal water loss, and pH. A statistically significant decrease in sebum production was observed on the skin of the treated volunteers, as well as a decrease in porphyrins, indicating the presence of *Cutibacterium acnes* populating comedones and causing enlarged pores. The balance of epidermal water in the skin was regulated adjusting the acidity of the skin coat in individual zones, which decreased the presence of *Cutibacterium acnes*. Cosmetic treatment in combination with the Lasocare® method successfully improved the condition of comedogenic skin. In addition to transient erythema, there were no other adverse effects. The chosen procedure appears to be a suitable and safe alternative to traditional treatment procedures known from dermatological practice.

R. Hossain, T.M. Ansari, M. Komine, M. Ohtsuki, **IL-33 Modulates Filaggrin and Acid Ceramidase Expression in Tape-Stripped Mice, but Does Not Directly Control TEWL**, Poster Presentation at the 1st Congress of Investigative Dermatology, Tokyo, May 2023

The function of epidermal barrier is crucial for preserving healthy skin moisture and safeguarding body homeostasis. The stratum corneum (SC) bares an essential and large portion of the epidermal

barrier function. Ceramides, the main component of the intercellular lipid, are also the important portion of SC barrier. Sphingomyelin deacylase activity has been shown increased in atopic dermatitis patients, and has been recently revealed to be derived from acid ceramidase beta-subunit (ASAH1b) (Teranishi et al., 2020; Imokawa et al., 2021). IL-33, one of IL-1 family members, resides in the nucleus of epidermal keratinocytes, and has a role as nuclear protein which mediates TSLP-induced epidermal barrier dysfunction (Xiuju Dai, 2022). Overexpression of IL-33 in the epidermis causes AD-like skin eruption in mice. Despite these facts, the effect of loss of IL-33 on epidermal barrier function has not been explored.

I. Harder, D. Stölz, N. Sander, J. Hartmann, E. Rodriguez, C. Mazur, S. Kerzel, M. Kabesch, D. Küster, J. Schmitt, R. Fölster-Holst, S. Gerdes, H. Emmert, S. Weidinger, **Effects of Early Emollient Use in Children at High Risk of Atopic Dermatitis: A German Pilot Study**, Acta Derm Venereol May 2023

Several small studies have indicated that daily emollient use from birth might delay, suppress or prevent atopic dermatitis (AD). Two larger trials did not confrm this; however, a recent smaller study indicated a protective effect if daily emollient use is used in the first 2 months of life. Further research is needed to evaluate the effect of emollient use on development of AD. The current study randomly assigned 50 newborns who were at high risk of developing AD (1:1) to receive general infant skin-care advice (control group), or skin-care advice plus emollient with advice to apply emollient at least once daily until 1 year of age (intervention group). Repeated skin examinations, skin physiology measurements and skin microbiome profling were performed. Of the children in the intervention and control groups, 28% and 24%, respectively, developed AD (adjusted Relative Risk (RR) 1.19, p=0.65, adjusted risk difference 0.05). Skin pH decreased and transepidermal water loss and stratum corneum hydration increased over time in both groups with nosignifcant differences. In the intervention group skinmicrobiome alpha diversity increased earlier, and the abundance of Streptococcus and Staphylococcus species were signifcantly reduced at month 1. Daily early emollient use in children with high risk of AD was safe, but it did not signifcantly reduce the risk of developing AD or impact skin physiology development.

H. Schoenfelder, Y. Liu, D.J. Lunter, **Systematic investigation of factors, such as the impact of emulsifers, which influence the measurement of skin barrier integrity by in-vitro *trans*-epidermal water loss (TEWL)**, International Journal of Pharmaceutics 638 (2023)

Trans-epidermal water loss (TEWL) has been the most widely used method to assess the integrity of the skin barrier and evaluate the irritation potential or the protective properties of topical products for many years. It detects the amount of water that diffuses across the stratum corneum (SC) to the external environment. As one of the most important functions of the skin is to keep water inside the body, an increase in TEWL is used to indicate the skin's impaired barrier function. So far, a variety of commercial instruments are available to measure the TEWL. Their applications mainly focus on the in-vivo TEWL measurements for dermatological examinations or formulation development. Recently, an in-vitro TEWL probe has also been commercially released enabling preliminary tests with excised skin samples. In our study, we frst aimed to optimize the experimental procedures for detecting the in-vitro TEWL of porcine skin. Secondly, different kinds of emulsifers were applied to the skin, including polyethylene glycol-containing emulsifers (PEG-ylated emulsifers), sorbitan esters, cholesterol, and lecithin. Sodium lauryl sulfate (SLS) was used as a positive control, and water as a negative control. Based on the fndings, we established a protocol for accurately measuring the in-vitro TEWL values, emphasizing that the temperature of the skin sample should be constantly maintained at 32 ℃. Subsequently, the influences of emulsifers on the in-vitro TEWL were analyzed. They indicated a signifcant skin barrier impairment of PEG-20 cetyl ether, PEG-20 stearyl ether, and SLS on in-vitro skin. Furthermore, we interestingly found that there consistently was an alteration of the TEWL values, even after the application of water to the skin. Our fndings are of special interest, as the European Medicines Agency (EMA) recommends the use of in-vitro TEWL to determine skin barrier intactness during Franz cell experiments. Thus, this study provides a validated protocol for measuring the in-vitro TEWL and elucidates the impact of emulsifers on the skin barrier. It also improves theunderstanding of tolerable variations of in-vitro TEWL and offers recommendations for its use in research.

T. Yoshimura, C. Manabe, J.-I. Nagumo, T. Nagahawa, T. Sato, S. Murakami, **Taurine accelerates the synthesis of ceramides and hyaluronic acid in cultured epidermis and dermal fibroblasts**, Experimental and Therapeutic Medicine 26: 512, 2023

Abstract. Taurine is a sulfur-containing amino acid derivative that can be found in the majority of mammalian tissues. Taurine is also present in the skin and is involved in maintaining skin homeostasis by exerting osmoregulatory and antioxidant effects. Previous studies have indicated that taurine treatment is effective against age-, ultraviolet- or detergent-induced skin dysfunction. To determine the mechanism responsible for the beneficial actions of taurine in the skin, the present study aimed to

evaluate the effects of taurine on epidermal components (ceramides and filaggrin) and on the dermal extracellular matrix, in three-dimensionally (3D) cultured epidermis and dermal fibroblasts, respectively. These cells were cultured in the presence of 3-50 mM taurine, and cells or culture medium were collected for analysis. The effects of taurine on transepidermal water loss (TEWL) in the skin and the expression of inflammatory cytokines, including IL-1□, IL-1□ and IL-1 receptor antagonist, were investigated in acetone-treated 3D-cultured epidermis using a Tewameter and reverse transcription-quantitative PCR (RT-qPCR), respectively. The mRNA expression levels of MMP-1 and hyaluronic acid (HA) production were measured in skin dermal fibroblasts using RT-qPCR and ELISA, respectively. Taurine was found to suppress acetone-induced elevation in TEWL in 3D-cultured epidermis. Taurine also stimulated the mRNA expression of ceramide synthase 4 and filaggrin, a major structural protein in the stratum corneum, in 3D-cultured epidermis. In skin dermal fibroblasts, taurine inhibited the IL-1□-stimulated mRNA and protein expression of MMP-1. In addition, taurine treatment increased HA synthase-2 mRNA expression and in turn HA production. Results from the present study suggest that the protective effect of taurine on the skin is associated with the enhancement of epidermal barrier component expression and modulation of dermal extracellular matrix metabolism.

C. Uhl, D. Khazaka, A. Pouladi, **Is hair care the new skin care? Use of "classic" biophysical methods for hair & scalp measurement. A review,** EURO COSMETICS, 4-2023

Hair diversity (style, shape, growth pattern or color) is one of the most important features to define us physically. Therefore, it is no surprise that the market of hair care products with a value of 93-5 billion US $ 1 (Statistica, September 2020) is one of the most important sectors in the complete area of cosmetic products. Hair care products for women are the most frequently bought and used cosmetic products of all. Shampoos and conditioners are leading the field. For men, hair care is the most important and favored sector of all cosmetics.

C. Uhl, L. van't Hoff, **Skin pH assessment for sensitive skin claims**, PERSONAL CARE MAGAZINE, April 2023

Specific amounts of water and lipids on the skin surface determine the composition of the hydrolipidic film of the skin. The various functions of sebum and moisture on the skin surface to keep it supple, flexible and healthy have been investigated from the beginning in the cosmetic industry. The slightly acidic pH-value of the hydrolipidic film is a major protective factor for the skin, buffering acids and alkaline products that get in contact, as well as providing an environment favourable to our naturalvmicrobiome, at the same time restricting the growth of pathogenic microbes.

A. Charpentier, **Achieving Instant Gratification – Investing in the Millenial's Dream,** EURO Cosmetics, 4-2023

Hair is an integral part of one's identity, and people around the world place a great deal of importance on its look and style. Consumers are now looking for more inclusive, natural, ethical, and sustainable products that can help them improve their hair grooming rituals while still providing the necessary cleansing and caring benefits.

H.L. Thanh Nguyen, G. Peng, J.V. Trujillo-Paez, H. Yue, R. Ikutama, M. Takahashi, Y. Umehara, K. Okumura, H. Ogawa, S. Ikeda, F. Niyonsaba, **The Antimicrobial Peptide AMP-IBP5 Suppresses Dermatitis-like Lesions in a Mouse Model of Atopic Dermatitis through the Low-Density Lipoprotein Receptor-Related Protein-1 Receptor**, Int. J. Mol. Sci. 2023, 24, 5200

The antimicrobial peptide derived from insulin-like growth factor-binding protein 5 (AMPIBP5) exhibits antimicrobial activities and immunomodulatory functions in keratinocytes and fibroblasts. However, its role in regulating skin barrier function remains unclear. Here, we investigated the effects of AMP-IBP5 on the skin barrier and its role in the pathogenesis of atopic dermatitis (AD). 2,4-Dinitrochlorobenzene was used to induce AD-like skin inflammation. Transepithelial electrical resistance and permeability assays were used to investigate tight junction (TJ) barrier function in normal human epidermal keratinocytes and mice. AMP-IBP5 increased the expression of TJ-related proteins and their distribution along the intercellular borders. AMP-IBP5 also improved TJ barrier function through activation of the atypical protein kinase C and Rac1 pathways. In AD mice, AMP-IBP5 ameliorated dermatitis-like symptoms restored the expression of TJ-related proteins, suppressed the expression of inflammatory and pruritic cytokines, and improved skin barrier function. Interestingly, the ability of AMP-IBP5 to alleviate inflammation and improve skin barrier function in AD mice was abolished in mice treated with an antagonist of the low-density lipoprotein receptor-related protein-1 (LRP1) receptor. Collectively, these findings indicate that AMP-IBP5 may ameliorate AD-like inflammation and enhance skin barrier function through LRP1, suggesting a possible role for AMP-IBP5 in the treatment of AD.

C. Zappelli, A. Tito, M. Angellilo, A. Colantuono, D. Falanga, A. de Lucia, V. Fogliano, **Imperfectly perfect: moisturising and anti-ageing potential of an oil-soluble extract from rejected avocados,** HPC Today, Vol. 18(3) 2023

Avocado (Persea Americana) consumption has experienced a remarkably fast increase in demand, which inevitably leads to significant waste along the production chain. In recent years, the increased awareness of the environmental impact linked to food loss generated a huge rise in demand for sustainable goods. In this study we evaluated the moisturising effect, and the mechanisms behind it, of an oil-soluble extract from aesthetically imperfect, and thus rejected, avocado fruits cultivated in Sicily. Through *in vitro* and *ex-vivo* studies, we demonstrated that this new active ingredient significantly up-regulated proteins with key functions in the maintenance of intracellular water balance. Moreover, we showed that the extract promoted an overall improvement of epidermal barrier function by increasing the synthesis of lipid structures. Finally, clinical studies showed that the extract improved skin hydration and dermal density.

*A. Vitorino de Souza Neto, D. Quintas Balla, T. Marcilio Candido, C. Rosado, A. Rolim Baby, F. Vieira Lima Solino Pessoa***, Effect of an Emollient Emulsion Containing 15.0% of Caprylic/Capric Triglyceride on the Urocanic Acid of the Stratum Corneum,** Life 2023, 13, 876

Natural moisturizing factor (NMF) includes several compounds in the stratum corneum (SC), among them, urocanic acid (UCA). Ultraviolet (UV) exposure turns the *trans*-UCA of the SC into its *cis* isomer. We investigated the impact of a topical emollient emulsion treatment on theUCA isomers of the SC exposed to artificial UV stress. Aliquots of emollient emulsion were applied in healthy subjects for 2 h on delimited areas of the volar forearm, then, the SC was removed by tape stripping. Tapes were irradiated in a solar simulator chamber and a high performance liquid chromatograph was used to quantify UCA isomers from stripped SC extract. The amount of both UCA isomers were almost twice higher in the SC treated with the emollient emulsion. We also observed that the UV irradiation elevated the amount of the *cis*/*trans* UCA ratio on the SC (non-treated and treated), suggesting that the emollient sample was not able to avoid the UCA isomerization. The in vivo tests corroborated with the UCA data obtained ex vivo, since we found an increase in the superficial skin hydration with respective reduction of the TEWL, probably occurring by the occlusion performed by the emollient emulsion containing 15.0% *w*/*w* of caprylic/capric triglyceride.

J.W. Fluhr, G. Wiora, D.G. Nikolaeva, L. Miséry, R. Darlenski, **In vivo transepidermal water loss: Validation of a new multi-sensor open chamber water evaporation system Tewameter TM Hex**, Skin Research & Technology, March 2023

Background: Instrumentation technology for transepidermal water loss measurements has not been substantially modified since its introduction by Nilsson in 1977. Recent progress in sensor development allowed a new sensor arrangement using a matrix of 30 sensors. Raw measurement values are processed with spatial statistical analysis. We aimed to compare the new, multi-sensor probe (Tewameter TM Hex) with the established Tewameter TM 300 probe and to gain reference data for the new parameters of transepidermal energy loss and water vapor concentration on skin. Material and methods: Baseline measurements and repeated measurements on the volar forearm and assessment on eight different anatomical locations were performed on 24 healthy volunteers (both gender) with the TM Hex and the TM 300. Results: A significant correlation ($p < 0.001$; R-coefficient = 0.9) between TM Hex and the TM 300 with a low coefficient of variance (CV) 11% for TM Hex and 19% for TM 300, could be assessed. The CV ranged between 7% (right inner upper arm) and 14% (palms). Average transepidermal heat loss ranged from 12 W/m2 on the lower leg to 38.8 W/m2 on the palm. Conclusion: The correlation between TM Hex and TM 300 along with the robustness of the measurements with the TM Hex shows that the new probe for assessment of epidermal barrier function is comparable to the TM 300. In most conditions, TM Hex provides more accurate measurements than TM 300. New parameters open the field to studying skin's water and energy balance.

P. Perugini, C. Grignani, G. Condrò, H. van der Hoeven, A. Ratti, A. Mondelli, A Colpani, M. Bleve, **Skin Microbiota: Setting up a Protocol to Evaluate a Correlation between the Microbial Flora and Skin Parameters**, Biomedicines 2023, 11, 966

The concept of skin microbiota is not really clear and more accurate approaches are necessary to explain how microbial flora can influence skin biophysical parameters in healthy individuals and in pathology patients with non-infectious skin disease. The aim of this work is to provide a suitable, fast and reproducible protocol to correlate skin parameters with the composition of skin microbiota. For this purpose, the work was split into two main phases. The first phase was focused on the selection of volunteers by the administration of a specific questionnaire. The skin microbiota was then collected from the forehead of selected volunteers as a test area and from the shoulder as control area. On the same

skin area, the biophysical parameters, such as transepidermal water loss (TEWL), sebum level (SL), porphyrin intensity, keratin content and stratum corneum water content were taken. All parameters were taken at t0 and after 15 days without changes in the volunteers' lifestyle. A strong correlation was found between forehead and shoulder area for porphyrin intensity, pH and TEWL parameters, and between *Cutibacterium acnes* and some biophysical parameters both in the forehead and the shoulder area. The procedural setup in this work represents the starting point for evaluating problematic skins and the efficacy of cosmetic products or treatment against skin dysbiosis.

A. Lubczyńska, A. Garncarczyk, D. Wcisło-Dziadecka, **Effectiveness of various methods of manual scar therapy,** Skin Research & Technology, Volume 29, Issue 3, March 2023

Background: The skin is a protective barrier of the body against external factors, and its damage leads to a loss of integrity. Normal wound healing results in a correct, flat, bright, and flexible scar. Initial skin damage and patient specific factors in wound healing contribute that many of these scars may progress into widespread or pathologic hypertrophic and keloid scars. The changes in cosmetic appearance, continuing pain, and loss of movement due to contracture or adhesion and persistent pruritis can significantly affect an individual's quality of life and psychological recovery post injury. Many different treatment methods can reduce the trauma and surgical scars. Manual scar treatment includes various techniques of therapy. The most effectiveness is a combined therapy, which has a multidirectional impact. Clinical observations show an effectiveness of manual scar therapy. Material and methods: The aim of this work was to evaluate effectiveness of the scar manual therapy combined with complementary methods on the postoperative scars. Treatment protocol included two therapies during 30 min per week for 8 weeks. Therapy included manual scar manipulation, massage, cupping, dry needling, and taping. Results: Treatment had a significant positive effect to influence pain, pigmentation, pliability, pruritus, surface area, and scar stiffness. Improvement of skin parameters (scar elasticity, thickness, regularity, color) was also noticed. Conclusion: To investigate the most effective manual therapy strategy, further studies are needed, evaluating comparisons of different individual and combined scar therapymodalities.

A. Stolić Jovanović, M. Martinović, A. Žugić, I. Nešić, T. Tosti , S. Blagojević, V.M. Tadić, **Derivatives of L-Ascorbic Acid in Emulgel: Development and Comprehensive Evaluation of the Topical Delivery System**, Pharmaceutics 2023, 15, 813.

The dual controlled release of emulgels makes them efficient drug delivery systems of increasing interest. The framework of this study was to incorporate selected L-ascorbic acid derivatives into emulgels. From the formulated emulgels, the release profiles of actives were evaluated considering their different polarities and concentrations, and consequently their effectiveness on the skin via a long-term in vivo study that lasted for 30 days was determined. Skin effects were assessed by measuring the electrical capacitance of the stratum corneum (EC), trans-epidermal water loss (TEWL), melanin index (MI) and skin pH. In addition, the sensory and textural properties of emulgel formulations were compared with each other. The changes in the rate of the release of the L-ascorbic acid derivatives were monitored using the Franz diffusion cells. The obtained data were statistically significant, and indicated an increase in the degree of hydration of the skin and skin whitening potential, while no significant changes in TEWL and pH values were detected. The consistency, firmness and stickiness of the emulgels were estimated by volunteers applying the established sensory evaluation protocol. In addition, it was revealed that the difference in hydrophilic/lipophilic properties of L-ascorbic acid derivatives influenced their release profiles without changing their textural characteristics. Therefore, this study highlighted emulgels as L-ascorbic acid suitable carrier systems and one of the promising candidates as novel drug delivery systems.

K. Narra, S.K. Naik, A.S. Ghatge, **A Study of Efficacy and Safety of Ashwagandha (Withania somnifera) Lotion on Facial Skin in Photoaged Healthy Adults**, Cureus 15(3), 2023

Background: Facial skin has an essential cosmetic function in both men and women, and photoaged skin can affect the quality of life in healthy people. Ashwagandha (*Withania somnifera*) which is also called Indian ginsenghas adaptogenic properties and is used in traditional Indian medicine to maintain balance, energize, and rejuvenate. Objective: This randomized, double-blind, and placebo-controlled study assessed the efficacy and safety of topical application of lotion containing 8% standardized Ashwagandha root extract on improvement of skin parameters in the photoaged facial skin of healthy subjects. Methods. Fifty-six healthy men and women aged between 18 and 60 years with Fitzpatrick phototype III-VI skin gradewere randomized to receive the topical application (lotion on facial skin) of either Ashwagandha 8% (AG,n=28), or an identical placebo (PL, n=28) for 60 days. The primary outcome was the change from baseline on day 60 in the scores for global physician assessment scoring for the five dermatological signs (skin wrinkles, pores, hydration/moisture, skin brightness/tone, and

pigmentation) on facial skin. Secondary outcomes were changes from baseline in the transepidermal water loss (TEWL), melanin index, hydration, and skinelasticity (R2 ratio). Another efficacy outcome was quality of life using the health-specific Short Form Health Survey-12 (SF-12). Safety was assessed using local reactions and adverse events. Three (1 AG, 2 PL) patients were lost to follow-up and per-protocol (PP) data included 53 patients (27 AG, 26 PL). For measurement data, repeated measures analysis of variance (ANOVA) was used to assess treatment effect at different time periods in the PP dataset (n=53). Two groups were compared for differences using a t-test for continuous data or a Mann-Whitney 'U' test for ordinal data. Adverse events were compared between two groups using the chi-square test. Results: Greater reduction ($p<0.0001$) in total physician assessment scores from baseline to day 60 was observed with AG (-74.69%) compared to PL (-48.68%). There was a greater improvement in TEWL, skin hydration, and skin elasticity (R2 ratio) with AG as compared to placebo ($p<0.0001$). However, the change in melanin index was similar in the two groups at the end of day 60 ($p=0.969$). The percentage increase in melanin index from baseline to day 60 in the PP dataset was by -2.82% with AG and -1.78% with PL, whereas the percentage reduction in TEWL from baseline to day 60 in the PP dataset was by -15.12% with AG and -8.34% with PL. Similarly, greater percentage improvements were seen with AG as compared to PL for skin hydration (20.66% with AG and 9.5% with PL) and elasticity was assessed by the R2 ratio (16.34% with AG and 3.73% with PL). Adverse events were comparable in the two groups. Conclusions: Topical application of a lotion containing Ashwagandha standardized root extract improves the skin condition and quality of life in photoaged healthy individuals. Further studies with different skin types and standard comparators are warranted to substantiate these claims of benefit.

P. Detudom, N. Kamanamool, A. Paichitrojjana, P. Udompataikul, M. Udompataikul, **Efficacy of anti-sebum moisturizing cream containing 2% L-carnitine and 5% epigallocatechin gallate in seborrhea: A randomized clinical trial**, J Cosmet Dermatol. 2023;22: p. 3058–3064

Background: Seborrhea leads to facial greasiness and unpleasant feeling. People with seborrhea also have trouble with selecting moisturizers. l-Carnitine and epigallocatechin gallate (EGCG) are reported anti-sebum properties. However, neither efficacy comparison nor the combination effect of the two topical anti-sebum agents was studied. Moisturizing cream with these agents is supposed to provide skin with an optimal water–oil balance. Aims: To compare the efficacy of moisturizer containing 2% l-carnitine or 5% EGCG alone on sebum controlling, and the synergistic effect of these two agents. Methods: Three study creams were formulated by adding three kinds of anti-sebum agents which were 2% l-carnitine, 5% EGCG, and 2% l-carnitine plus 5% EGCG in moisturizing cream base of dimethicone and glycerin. A randomized clinical trial was conducted. Ninety subjects, divided into three groups, applied the cream for 4 weeks. Sebum level, skin capacitance, and transepidermal water loss (TEWL) were evaluated at Weeks 0, 1, 2, and 4. Life qualities and subjective outcomes were assessed before and after treatment. Results: The mean sebum reduction from baseline was statistically significant in all treatment groups ($p < 0.01$). The median time to oil control was longer in l-carnitine group. The combine group had significantly greater anti-sebum efficacy than lcarnitine group ($p = 0.009$). All three groups had significant improvement of other objective parameters and subjective outcomes. Conclusions: The anti-sebum moisturizing cream exhibited beneficial effect on the sebum reduction with improve skin hydration in people with seborrhea and made users satisfied. The EGCG group and the combine group show the greater anti-sebum effect than the l-carnitine group.

K. Miyamoto, Y. Inoue, X. Yan, S. Yagi, S. Suda, M. Furue, **Significant Reversal of Facial Wrinkle, Pigmented Spot and Roughness by Daily Application of *Galactomyces* Ferment Filtrate-Containing Skin Products for 12 Months—An 11-Year Longitudinal Skin Aging Rejuvenation Study**, J. Clin. Med. 2023, 12, 1168

Facial skin aging is an important psychophysical and social concern, especially in women. We compared facial parameters reflecting aging of the skin in 1999 and 2010 in 86 female volunteers. Then, all subjects applied three Galactomyces ferment filtrate-containing skin care products (G3 products; SK-II Facial Treatment Essence, SK-II Cellumination Essence, and SK-II Skin Signature Cream) twice daily for 12 months (M), with the skin parameters being measured at 2 M, 8 M, and 12 M during this period. Facial skin aging parameters such as wrinkles, hyperpigmented spots, and roughness significantly deteriorated during the 11-year interval. This 11-year aging process was associated with reduced hydration and increased transepidermal water loss (TEWL). Notably, treatment with G3 products significantly and cumulatively increased skin hydration with a correlated reduction of TEWL during the 12 M treatment period. Such treatment also significantly and cumulatively reversed the 11-year facial skin aging in the three parameters of wrinkles, spots, and roughness. These results suggest that facial skin retains the potential to recover from the aging process when it is applied with appropriate cosmetic agents.

R.R. Aruan, H. Hutabarat, A. Astasari Widodo, M.T.C.C. Firidiyono, C. Wirawanty, L. Fransziska, **Double-blind, Randomized Trial on the Effectiveness of Acetylhexapeptide-3 Cream and Palmitoyl Pentapeptide-4 Cream for Crow's Feet**, Clin Aesthet Dermatol. 2023;16(2): p. 37–43.

Background: Crow's feet is one of the signs of skin aging. Many studies regarding skin aging have been carried out in Caucasians, as for Asians, there are different genotypes and phenotypes. Some anti-aging treatments carry a slightly higher risk of side effects and irritation in Asian skin. Currently, the use of topical active peptides for anti-aging, Acetylhexapeptide-3 (AHP-3) and Palmitoyl pentapeptide-4 (PPP-4), has been widely developed. This study aimed to investigate the anti-aging e_ ects of AHP-3 and PPP-4 on the Asian patient with crow's feet. Methods: This study was a double-blind randomized trial using 21 Indonesian female subjects aged 26 to 55 years for eight weeks and divided into three groups: AHP-3 cream, PPP-4 cream, and placebo. The cream was applied twice daily to the periorbital area. The three groups were assessed using Corneometer, Tewameter, Cutometer, digital photography and Crow's Feet Grading Scale. Results: Based on clinical photos and data, improvements were found in several subjects using AHP-3 and PPP-4. PPP-4 appeared to demonstrate better results when compared to AHP-3 based on data, clinical photos, and self-assessment questionnaire. Conclusion: PPP-4 demonstrated better results when compared to AHP-3 and placebo. This initial study provides an opportunity for further study with a more adequate number of samples and duration.

B.R. Thomas, X.L. Tan, S. Van Duijvenboden, S.C. Hogan, A.J. Hughes, S.S. Tawfk, S. Dhoat, R. Atkar, E.J. Robinson, S.R. Rahman, S. Rahman, R.A. Ahmed, R. Begum, H. Khanam, E.L. Bourne, E.L. Wozniak, C.A. Mein, D.P. Kelsell, E.A. O'Toole, **Deep palmar phenotyping in atopic eczema: patterns associated with flaggrin variants, disease severity and barrier function in a South Asian population**, Br J Dermatol 2023; 188: p. 785–792

Background: Hyperlinear palms are described as a feature of loss-of-function (LoF) variants in flaggrin (FLG).Objectives To explore the phenotype of participants (age<31 years) with atopic eczema of Bangladeshi ancestry from East London and investigate which factors best associate with LoF FLG variants. Methods: A cross-sectional study with participants recruited between May 2018 and December 2020. Patterns of palmar linearity were categorized and modelled with the Eczema Area and Severity Index (EASI), transepidermal water loss (TEWL), skin hydration (SH) and LoF FLG variants. Results: There were 506 complete cases available. Five palm patterns were noted. The 'prominent diamond' pattern associated best with EASI [marginal effects (ME) 2.53, 95% confdence interval (CI) 1.74–3.67], SH (ME 0.85, 95% CI 0.78–0.96) and TEWL (ME 1.32, 95% CI 1.11–1.62). Using fve palm patterns had some ability to discriminate LoF FLG variants [area under the receiver operator characteristic (AUROC) 76.32%, 95% CI 71.91–80.73], improving to 77.99% (73.70–82.28) with the addition of SH. In subgroup analysis with only fne perpendicular/prominent diamond patterns the AUROC was 89.11% (95% CI 84.02–94.19). Conclusions: This was a single-centre study design with humans classifying clinical patterns. The stability of temperature and humidity was not guaranteed across TEWL and SH measurements despite using a climate-controlled room. Palm patterns associate with EASI and TEWL. The fne perpendicular/prominent diamond patterns are markers to detect the absence/presence of LoF FLG variants, respectively.

H. Minna, K. Arie, **The Effect of Oral Collagen Drink on TEWL Score and Wrinkle: a Case Series**, International Journal of Current Research Vol. 15, Issue, 02, p. 23922-23923, February, 2023

Wrinkles are visible folds or creases in the skin. One of the factors that can cause wrinkling is the decline of skin hydration that can be known from measuring the TEWL score. Collagen is the scaffold for skin hydration, strength, and stability. It can lower the TEWL score and therefore reduce the appearance of wrinkles. However, until now there have not been many clinical studies on the use of collagen drink to improve TEWL score and wrinkle. We reported 3 patients with normal, borderline, and critical TEWL score with thin size wrinkle who were given an oral collagen drink. We measured improvement in TEWL scores with the Tewameter TM 300 and improvement in wrinkles with the A1 Smart Skin Analyzer. At the beginning of this study, the mean TEWL score for all patients was 26 while wrinkle was 3.89.The patients were given 0.5 gram collagen drink for 14 days. There is an improvement in the TEWL score to 17 and wrinkle to 3.13. All TEWL and wrinkle results in these three patients were classified as normal and thin at the end of therapy.

J. Kim, Y.I. Lee, S. Mun, J. Jeong, D.-G. Lee, M. Kim, H.W. Jo, S. Lee, K. Han, J.H. Lee, **Efficacy and Safety of Epidermidibacterium Keratini EPI-7 Derived Postbiotics in Skin Aging: A Prospective Clinical Study**, Int. J. Mol. Sci. 2023, 24, 4634

The present study investigated the effect of topical application of Epidermidibacterium Keratini (EPI-7) ferment filtrate, which is a postbiotic product of a novel actinobacteria, on skin aging, by performing a prospective randomized split-face clinical study on Asian woman participants. The

investigators measured skin biophysical parameters, including skin barrier function, elasticity, and dermal density, and revealed that the application of the EPI-7 ferment filtrate-including test product resulted in significantly higher improvements in barrier function, skin elasticity, and dermal density compared to the placebo group. This study also investigated the influence of EPI-7 ferment filtrate on skin microbiome diversity to access its potential beneficial effects and safety. EPI-7 ferment filtrate increased the abundance of commensal microbes belonging to Cutibacterium, Staphylococcus, Corynebacterium, Streptococcus, Lawsonella, Clostridium, Rothia, Lactobacillus, and Prevotella. The abundance of Cutibacterium was significantly increased along with significant changes in Clostridium and Prevotella abundance. Therefore, EPI-7 postbiotics, which contain the metabolite called orotic acid, ameliorate the skin microbiota linked with the aging phenotype of the skin. This study provides preliminary evidence that postbiotic therapy may affect the signs of skin aging and microbial diversity. To confirm the positive effect of EPI-7 postbiotics and microbial interaction, additional clinical investigations and functional analyses are required.

Y. Matsumoto, N. Mochimaru, H.i Yasuda, K. Pak, T. Kobayashi, K. Yamamoto-Hanada, Y. Ohya, M. Kiuchi, M. Kurokawa, K. Yoshida, **In vivo analysis of the stratum corneum of Japanese neonates and infants using confocal Raman spectroscopy: a pilot study,** Skin Res Technol. 2023;29

It is well known that transepidermal water loss (TEWL) and moisturization are implicated in atopic dermatitis (AD) onset. The amount of ceramide in the stratum corneum (SC), which is important for skin barrier function, has also been implicated in AD. However, how the physiological properties of the skin change over time remains unclear. There are a few reports on the natural moisturizing factor (NMF) and water content in the SC of neonates and infants using confocal Raman spectroscopy (CRS), but no reports on ceramide. Identifying the specific SC components involved in AD onset may aid with early intervention in high-risk patients and efficiently prevent AD by replenishing these components upon depletion.

V. Nobile, I. Schiano, L. Germani, E. Cestone, P. Navarro, J. Jones, N. Caturla, **Skin Anti-Aging Efficacy of a Four-Botanical Blend Dietary Ingredient: A Randomized, Double Blind, Clinical Study**, Cosmetics 2023, 10, 16

Plant polyphenols have been found to be effective in preventing or reducing different skin alterations. A dietary approach based on these compounds could be a safe and effective method to slow down or prevent age-associated deterioration of skin appearance and function. In a previous study, a specific combination of four botanical extracts (pomegranate, sweet orange, herba *Cistanche,* and *Centella asiatica*) exhibited potential anti-aging effects in a dermal fibroblast cell model. The present study aims to clinically evaluate the safety and anti-aging efficacy of this new botanical ingredient (eternalyoung®). To this end, a 12-week randomized, double-blind, placebo-controlled study was carried out in 60 Caucasian women with evident signs of both chronoand photoaging. Product efficacy was measured as follows: skin moisturization (corneometer), transepidermal water loss (tewameter), skin radiance, and color (spectrophotometer), skin elasticity and firmness (cutometer), skin roughness (image analysis), and skin thickness (ultrasound). Both intergroup and intragroup analysis proved that the daily intake of 225 mg of the active ingredient was enough to produce visible and structural improvements to the skin and to the signs of aging without any side effects. Statistically significant improvements compared to the placebo group were observed as early as 4 weeks regarding wrinkle depth, elasticity, firmness, skin thickness, skin moisturization, transepidermal water loss, and dark spots pigmentation. In addition, the subjects who consumed the blend reported better scores on the self-assessment questionnaires. Our results suggest that the intake of the test product can positively affect the appearance, barrier function, and skin density of aged skin after 12 weeks of treatment.

A.S. Evora, N. Abiakam, H. Jayabal, P.R. Worsley, Z. Zhang, S.A. Johnson, M.J. Adams, D.L. Bader, **Characterisation of superfcial corneocytes in skin areas of the face exposed to prolonged usage of respirators by healthcare professionals during COVID-19 pandemic**, Journal of Tissue Viability 32 (2023) 305–313

Introduction: During the COVID-19 pandemic healthcare workers (HCWs) have used respiratory protective equipment for prolonged periods, which has been associated with detrimental effects on the underlying skin. The present study aims to evaluate changes in the main cells (corneocytes) of the stratum corneum (SC) following prolonged and consecutive use of respirators. Methods: 17 HCWs who wore respirators daily during routine hospital practice were recruited to a longitudinal cohort study. Corneocytes were collected via tape stripping from a negative control site (area outside the respirator) and from the cheek which was in contact with the device. Corneocytes were sampled on three occasions and analysed for the level of positive-involucrin cornifed envelopes (CEs) and the amount of desmoglein-1 (Dsg1), as indirect measurements of immature CEs and corneodesmosomes (CDs), respectively.

These were compared to biophysical measurements (Transepidermal water loss, TEWL, and SC hydration) at the same investigation sites. Results: A large degree of inter-subject variability was observed, with maximum coeffcients of variation of 43% and 30% for the level of immature CEs and Dsg1, respectively. Although it was observed that there was not an effect of prolonged respirator usage on the properties of corneocytes, the level of CDs was greater at the cheek than the negative control site ($p < 0.05$). Furthermore, low levels of immature CEs correlated with greater TEWL values after prolonged respirator application ($p < 0.01$). It was also noted that a smaller proportion of immature CEs and CDs was associated with a reduced incidence of self-reported skin adverse reactions ($p < 0.001$). Conclusions: This is the frst study that investigated changes in corneocyte properties in the context of prolonged mechanical loading following respirator application. Although differences were not recorded over time, the levels of CDs and immature CEs were consistently higher in the loaded cheek compared to the negative control site and were positively correlated with a greater number of self-reported skin adverse reactions. Further studies are required to evaluate the role of corneocyte characteristics in the evaluation of both healthy and damaged skin sites.

L. Ma, Y. Niu, C. Yuan, T. Bai, S. Yang, M. Wang, Y. Li, L. Shao, **The Characteristics of the Skin Physiological Parameters and Facial Microbiome of "Ideal Skin" in Shanghai Women**, Clinical, Cosmetic and Investigational Dermatology 2023: 16, p. 325–337

Purpose: Everyone pursues perfect skin, but there exist significant differences between cultures, and no commonly accepted standards have been established. Therefore, our study attempted to define the "ideal skin" of oriental women and analyze the relationship between different skin physiological parameters and microbiomes. Patients and Methods: Based on our customized grading standard, the VISIA CR photos of 111 young women aged from 18 to 25 in Shanghai were collected and scored by the severity of pores, acne, spots, and wrinkles. The volunteers were then divided into "ideal skin" (W1), "normal skin" (W2), and "undesirable skin" (W3) groups. The physiological parameters of facial skin were measured by non-invasive instrumental methods, and the skin microbiome was analyzed by 16S rRNA and ITS high-throughput sequencing. Results: From "ideal skin" to "undesirable skin", the skin physiological parameters, α-diversity, and composition of the facial microbiome showed noticeable regular changes. Compared with the "normal skin" (W2) and "undesirable skin" (W3), the "ideal skin" (W1) group had lower sebum content, TEWL, melanin, hemoglobin, and roughness but higher hydration content and skin pH value. Furthermore, the Shannon index of skin bacteria was significantly increased in W1 ($P = 0.004$), suggesting that the ideal skin had higher species diversity. From W1 to W3, the species composition was changed significantly. The abundance of *Actinobacteria* was increased, while *Proteobacteria* and *Bacteroidetes* were decreased. Correspondingly, the abundances of lipophilic *Propionibacterium* and *Malassezia* were increased, while the abundances of *Stenotrophomonas, Pseudomonas, Ralstonia*, and *Streptococcus*, were significantly decreased. Additionally, Spearman correlation analysis revealed strong correlations between the physiological parameters and the microbiota. Notably, the Shannon index of skin bacteria was significantly positively correlated with skin hydration ($P = 0.03$) but negatively correlated with the abundance of *Cutibacterium* ($P = 0.000$), hemoglobin content ($P = 0.025$), and sebum content ($P = 0.5$). Therefore, the skin hydration content and the abundance of *Cutibacterium* played an important role in maintaining the α-diversity and skin homeostasis. Conclusion: Ideal skin had better water-oil balance and barrier function, higher microbial diversity, and more reasonable species distribution. Therefore, daily skincare needs to control skin oil and maintain skin microecological balance to achieve ideal skin conditions for young women aged 18–25 years old.

M. Lee, E. Kim, H Ahn, S. Son, H. Lee, **Oral intake of collagen peptide NS improves hydration, elasticity, desquamation, and wrinkling in human skin: a randomized, double-blinded, placebo-controlled study**, Food Funct., 2023, 14, 3196

Collagen hydrolysate, which contains bioactive peptides, is used as a dietary supplement for the refinement of elasticity, hydration, desquamation, and wrinkling of aging human skin. Here, we conducted a double-blind, randomized, and placebo-controlled oral administration study on the effects of a collagen peptide (CPNS) containing dipeptides, including Gly-Pro and Pro-Hyp, on skin wrinkling, desquamation, elasticity, and hydration. Our results show that an intake of 1650 mg per day of CPNS for 12 weeks hadbeneficial effects on skin health in a cohort of women aged from 30 to 60 years ($n = 100$). Compared with the placebo group, skin desquamation, hydration, skin wrinkling, and elasticity were significantly improved after 4, 4, 12, and 12 weeks of administration, respectively. In a safety test of CPNS ingestion, none of the participants showed any side effects during the clinical study period. These results demonstrate that the low molecular weight bioactive peptides contained in CPNS, such as Gly-Pro and Pro-Hyp, exert positive effects on skin hydration, elasticity, desquamation, and wrinkling.

C. Uhl, **How to Prove the Concept of Microbiotic Skin Care,** EURO COSMETICS 1-2 2023, p. 18-22

When the Human Genome Project 1 was launched in autumn 1990 with the aim of identifying and mapping all of the genes of the human genome, no-one would have thought that we would discover a new microcosmos revolving around and mingling with our human cells. Of course, already long before this project, it was well-known that our body is not sterile and there are many bacteria living within and on it. These bacteria were however mainly classified as being malicious, threatening our health and causing problems. Until the 70s of the last century, a germ-free personal environment was considered as most desirable, and strong cleaning products became quite popular. Only starting in the early 1980s, these ideas and information were carefully reevaluated.

X. Wang, Z. Jin, L. Mao, L. Tu, Y. Sun, J. Tao, **Study on the Skin Hydration and Trans Epidermal Water Loss of Aloe Viscose Seamless Knitted Fabric for Autumn and Winter**, Materials 2023, 16, 212

To explore the skin moisturizing performance of aloe viscose fiber seamless knitted fabric, this experiment takes the different yarn-blending ratios of aloe viscose fiber and viscose fiber, as well as three different tissue structures as factors, establishes a sample scheme according to full factor experimental tests on skin hydration and trans epidermal water loss (TEWL) after the sample fabric had been wrapped around the skin, and uses two-way and one-way ANOVA in SPSS and the Duncan multiple comparison method. The test data were analyzed to study the influence of different materials and the structure of the veil on the moisture retention of the fabric. The results show that the sample scheme with the largest change rate of skin hydration is when the raw material of the veil is aloe viscose/viscose 100/0 yarn, and the structure is 1 + 3 simulated rib. The sample scheme with the minimum change rate of TEWL is when aloe viscose/viscose 75/25 yarn is used as the raw material of the veil, and the structure is 1 + 1 simulated rib, which provides a theoretical basis for the research and development of moisturizing knitted fabric.

P. Minoretti, A.S. Santiago Sáez, Á.F. García Martín, M. Liaño Riera, M. Gómez Serrano, E. Emanuele, **Skin biophysical parameters and serum dermokine levels in airline pilots: a comparative study with office workers**, Adv Dermatol Allergol 2023; XL (6): p. 757–761

Introduction: Concerns are growing in the aviation industry about occupational skin diseases like malignant melanoma (MM) among airline pilots (APs), due to the unique working environment that exposes them to various skin stressors. Aim: To compare fve skin biophysical parameters in a group of 40 male APs, each matched in terms of age and service tenure (minimum of 5 years) with a control group of 40 male ofce workers (OWs). Considering the potential role of dermokine (DMKN) in skin barrier dysfunction and the pathogenesis of MM, we further analyzed the serum levels of this molecule and correlated them with the measured skin parameters. Material and methods: Stratum corneum skin hydration, transepidermal water loss (TEWL), sebum content, erythema index (EI), and melanin index (MI) were quantifed by non-invasive instruments in the cheek region. Serum DMKN levels were measured using a commercially available enzyme-linked immunosorbent assay kit. Results: Compared with OWs, the skin of APs exhibited a decrease in hydration levels in the stratum corneum,coinciding with a higher TEWL. However, there was no signifcant variance in sebum content between the groups. MI was notably higher in APs than in OWs, as was EI. In APs, serum DMKN levels were independently associated with MI ($\beta = 0.56$, $p < 0.05$). Conclusions: We found a signifcant link between the profession of an airline pilot and changes in skin biophysical parameters. Further research into the interplay between serum DMKN levels and the risk of MM in APs is warranted.

*M. Gina, K. Wichert, G. Kutz, T. Brüning, M. Fartasch***, Applying skin protective cream and the wearing of gloves?—A randomized controlled experimental study**, Contact Dermatitis. 2023;88: p. 372–382

Background: Glove occlusion might enhance skin sensitivity to a subsequent detergent challenge (occlusion effect). Thus, some skin protection creams (PC) claim to protect against this effect of occlusion, and are recommended to be used before wearing liquid-proof gloves.Objectives: To evaluate the effect of PC applied prior to glove occlusion on the‘occlusion effect’—refers to increased susceptibility of the skin to a model detergent.Methods: One hundred and eleven volunteers were enrolled in a single-blind, randomized study. Seven PCs were applied before glove occlusion over 7 days (D1–D7). After sodium lauryl sulphate (SLS) challenge, we compared the irritation between the areas treated with PC and occlusion alone. Clinical scoring and bioengineering methods (capacitance, transepidermal water loss [TEWL], and colourimetry [erythema]) were used to quantify the irritant reactions. Results: After 1 week of occlusion and PC application, we did not observe significant changes in TEWL, nor in erythema, whereas skin hydration raised in three creamtreated areas. On day 10, after a challenge with SLS, some products significantly aggravated the skin irritation as compared to

occlusion alone. Conclusions: The ‘occlusion effect’—shown as higher skin susceptibility to a modeldetergent—was not mitigated by PCs when applied prior to glove occlusion. On thecontrary, some PCs might have negative effects on skin barrier function and augment such sensitivity.

D. Martinovic, D. Tokic, M. Usljebrka, S. Lupi-Ferandin, L. Cigic, L.V. Rogosic, S. Ercegovic, M. Kontic, M. Kumric, D. Rusic, M. Vilovic, M. Leskur, J. Bozic, **The Association between the Level of Advanced Glycation End Products and Objective Skin Quality Parameters**, Life 2023, 13

Advanced glycation end products (AGEs) represent an endogenously produced or exogenously derived group of compounds derived from nonenzymatic glycation. Recent experimentalstudies are suggesting that AGEs could play an important role in the skin’s quality and its aging process. Hence, the aim of this study was to clinically evaluate the AGEs and skin quality parameters across different age groups in the general population. The study included 237 participants. Melanin, erythema, hydration, friction and transepidermal water loss (TEWL) were evaluated using noninvasive probes, while AGEs were evaluated using a skin autofluorescence reader. There was a significant positive correlation between AGEs and the amount of melanin ($p < 0.001$), erythema ($p < 0.001$) and TEWL ($p < 0.001$), while there was a significant negative correlation between AGEs and hydration ($p < 0.001$) and friction ($p < 0.001$). After dividing the sample into three groups depending on their age, in all three groups, there was a significant positive correlation between AGEs and the melanin count ($p < 0.001$) and TEWL ($p < 0.001$), while there was a significant negative correlation between AGEs and skin hydration ($p < 0.001$). Multiple linear regression analysis showed that the level of AGEs as a dependent variable retained a significant association with age ($p < 0.001$), melanin ($p < 0.001$), erythema ($p = 0.005$) and TEWL ($p < 0.001$) as positive predictors. Moreover, AGEs retained a significant association with skin hydration ($p < 0.001$) and friction ($p = 0.017$) as negative predictors. These outcomes imply that AGEs could be linked with the complex physiology of the skin and its aging process.

V. Rego Moraes, M. Oliveira Melo, P.M.B.G. Maia Campos, **Evaluation of Morphological and Structural Skin Alterations on Diabetic Subjects by Biophysical and Imaging Techniques**, Life 2023, 13, 579

Diabetes causes increased production of advanced glycation end products (AGEs), which may lead to irreversible damage to collagen fibers, and early and more accentuated signs of skin aging. Thus, the objective of this study was to evaluate diabetic skin’s mechanical and morphological characteristics and compare these to healthy skin. Twenty-eight female participants aged between 39 and 55 years were enrolled: half had type 2 diabetes, and the others were healthy. Wrinkles, transepidermal water loss (TEWL), stratum corneum water content, skin color, elasticity, morphological and structural characteristics of epidermis and dermis echogenicity were evaluated using biophysical and skin imaging techniques. Higher TEWL values were observed in participants with diabetes, who also showed lower skin elasticity and wrinkles with greater volume, area, and depth. In addition, the Reflectance Confocal Microscopy (RCM) imaging analysis showed that all participants with diabetes presented polycyclic papillae and deformed and amorphous collagen fibers. The obtained data showed significant differences between healthy and diabetic skin and could help develop more specific topical treatments to improve the treatment of skin conditions in people with diabetes. Finally, RCM is an advanced imaging technique that allows for a more profound analysis of diabetic skin, which could assist in the evaluation of dermocosmetic treatments to improve the skin alterations caused by this disease.

V.H. Pacagnelli Infante, P.M.B. Gonçalves Maia Campos, **Applying sunscreen SPF 50 with high antioxidant capacity during fifteen days improves the dermis echogenicity and reduces the reddish skin undertone**, J Cosmet Dermatol. 2023;22: p. 872–879

Background: Of the many effects induced by UV radiation on the skin, erythema is one of the most well-known features, which is a cutaneous inflammatory reaction correlated with acute photodamage. The utilization of sunscreen may reduce this process. Aims: To evaluate the utilization of a sunscreen SPF50 with high antioxidant capacity during 15 days by young men without photoprotection habits. Methods: For this, we evaluated erythema, skin hydration properties, and dermis echogenicity using skin imaging techniques. Forty male participants (aged between 18 and 28 years old), 36 without previous photoprotection habits, were recruited, and the erythema was evaluated using a visual score and skin colorimeter. Macroscopic images (VivaCam®) were also obtained. Dermis echogenicity was evaluated using high-frequency ultrasonography. All the participants received a sunscreen SPF 50 touse for 15 days. Results: The visual score presented a strong correlation ($r = 0.8657$) with the colorimeter results. Visually and using the biophysical methodologies was possible to observe the reduction of the visual erythema. The dermis echogenicity also improved, probably correlated with the acute inflammation reduction. No alterations were observed in the skin hydration and skin barrier parameters. Conclusions: The utilization of complementary and correlated different skin biophysical and

imaging techniques in this study allows a better comprehension regarding the skin early photoaging process due the direct sun exposure. The utilization with a SPF 50 sunscreen with high antioxidant potential allows for a reduction in the erythema after 15 days of usage, a quick result, however, did not improved the skin barrier or SC hydration.

H. Falholt Elvebakken, A. Bech Bruntse, C. Vedel, S. Kjærulff, **Topical *Lactiplantibacillus plantarum* LB244R® ointment alleviates skin aging: An exploratory trial**, J Cosmet Dermatol. 2023;22: p. 1911–1918

Background: The skin is of vital importance for health and well-being. As people age, the skin undergoes visual and morphological changes such as wrinkling, loss of elasticity, increased pigmentation, and decreased cell turnover. This is not only visually unappealing to many but can also pose health issues. Aim: In this study, a probiotic ointment (PO) containing live lactic acid bacteria (LAB) (Lactiplantibacillus plantarum LB244R®) was investigated for its ability to alleviate symptoms of skin aging in an exploratory clinical trial. Methods: The PO was applied twice daily for 56 days by 21 subjects. Anti-aging efficacy was evaluated by skin ultrasonography, skin biomechanical properties, skin hydration, and clinical evaluations at day 0, 28, and 56. Results: Sub-epidermal low echogenic band thickness decreased (0.261 ± 0.069 mm to 0.247 ± 0.055 mm) after 56 days. Dermal density increased (324.689 ± 57.506 pixel/mm2 to 367.831 ± 75.790 pixel/mm2). Skin hydration increased (34.1 ± 6.9 to 51.3 ± 10.0 AU). Additionally, skin firmness increased, as shown by decreasing values (0.264 ± 0.038 to 0.228 ± 0.037 mm). Skin elasticity increased (0.578 ± 0.045 to 0.618 ± 0.044). Trans-epidermal water loss decreased (9.1 ± 2.0 g/h/m2 to 8.5 ± 1.3). All clinical evaluations, Crow's feet, spot score, smoothness score, and complexionradiance, were improved. Conclusion: The PO improved all measured parameters with statistical significance after 56 days of application, clearly demonstrating the potential of the PO as an antiaging agent and reaffirming the potential of topical probiotic LAB. Future studies need to elucidate the mode of action of anti-aging effects by probiotics, but at present time, this study paves the way for the use of probiotic LAB topically to alleviate aging of the skin.

M. Gina, K. Wichert, B. Pieper, T. Behrens, T. Brüning, M. Fartasch, **Irritant potential of different washing procedures used for heavy-duty soiling: Short and intense or longer and mild?** Contact Dermatitis. 2023; 88, p. 363–371

Background: To prevent irritant contact eczema even in occupational fields with heavy-duty soiling, it is generally recommended to use ‘mild’ hand cleansers (mild detergent without grits, MC). On the other hand, since grit-containing cleansers (GC) show a higher washing power that minimizes washing time, their usage is generally preferred in specific occupational fields. Objectives: To compare whether a shorter, intense washing period might cause less skin damage than a longer washing period with an MC. Methods: Differences in cleaning time were first verified in a pilot study using standardized model dirt. In the main study, the forearms of 35 healthy volunteers were washed with three standardized procedures over a period of 3 days, either using 2 min of MC with/without hand brush or 1-min GC. Clinical scoring, transepidermal water loss (TEWL), corneometry, colourimetry and scaliness/roughness (Visioscan) were used to evaluate the epidermal barrier, topography and irritation. Results: The pre-study showed that washing time doubled when using MC vs. GC. Using GC resulted in stronger barrier disruption, even after a shorter washing period – median ΔT4–T1 TEWL 0.96 g/m2/h vs. 4.91 g/m2/h respectively, $p < 0.0001$. The most harmful procedure for the skin was the additional application of a hand brush (18.86 g/m2/h). Conclusions: Short-time washing with GC damages the skin barrier more significantly in comparison to a longer application of an MC. When washing with MC, the strongest irritant reaction occurred when accompanied with hand brushing.

L.T. Thuy Le, B.-K. Kim, P.N. Chien, K.-W. Choi, H.-B. Kim, U.-J. Hwang, H.S. Han, C.-Y. Heo, **Investigating the Anti-Aging Effects of Caviar Oil on Human Skin**, in vivo 37: p. 2078-2091 (2023)

Background/Aim: As the largest organ of the human body, the skin serves as a critical barrier against environmental damage. However, many factors, such as genetics, sun exposure, and lifestyle choices can lead to skin damage creating wrinkles, sagging, and loss of elasticity. The use of skincare products containing natural ingredients has become increasingly popular as a way to combat the signs of aging. Caviar oil is one such ingredient that has gained attention due to its rich composition of fatty acids, vitamins, and minerals. The objective of this study was to investigate the potential anti-aging effects of caviar oil and to develop a product, Cavi Balm, which could potentially reduce wrinkles and skin sagging. Materials and Methods: An in vitro model using the 3T3-L1 cell line was employed to assess the effect of caviar oil on adipocyte differentiation. An ex vivo study using human skin tissue was conducted to investigate the impact of caviar oil on collagen and elastin formation and the expression of matrix metalloproteinase-1,2,9 (MMP-1, MMP-2, MMP-9). Furthermore, 102 participants were enrolled in five clinical studies to evaluate the anti-aging efficacy of our product, “Cavi Balm”, in facial

and neck wrinkles, facial and eye area lifting, and various skin parameters, such as skin moisture, skin elasticity, skin density, skin tightening relief, skin clarity, and skin turnover. Results: In vitro, caviar oil enhanced adipocyte differentiation, and increased lipid accumulation inside the cells. The ex vivo analysis revealed that caviar oil reduced the expression levels of MMP-1, MMP-2, and MMP-9, and increased the formation of elastin and collagen I, III. Moreover, in the clinical study, Cavi Balm improved skin parameters after one-time use, with more significant effects observed after four weeks of usage. Conclusion: Caviar oil has a substantial impact on mitigating skin aging and holds potential for application in anti-aging products.

F. Yi, X.-X. Yang, R.-Y. Yang, M.-M. Zhao, Y.-M. Dong, L. Li, Y.-F. He, M.-M. Guo, J. Li, X.-H. Zhang, Z. Lu, J. Gu, J.-L. Bao, H. Meng, **A cross-sectional study of Chinese women facial skin status with environmental factors and individual lifestyles,** Scientifc Reports, (2022) 12:18110

Geographical, environmental and pollution conditions afect facial skin health, but their efects on skin appearance have not been elucidated. This study aimed to describe the skin barrier and skin tone characteristics of Chinese subjects according to lifestyle and environmental conditions using in vitro measurements. In total, 1092 women aged 22–42 years were recruited from 7 representative Chinese cities. Eight skin parameters (hydration, sebum, pH, transdermal water loss, individual type angle, melanin index, erythema index, yellowness) were measured using noninvasive instruments; individual lifestyle data were also collected. Data on four meteorological factors (air temperature, relative humidity, sunshine duration, wind speed) and seven air pollution indicators (air quality index, fne particulate matter, breathable particulate matter, sulfur dioxide, nitrogen dioxide, carbonmonoxide and ozone) were collected in each city from the China Meteorological Administration. Facialskin characteristics difered signifcantly between cities. Facial skin barrier characteristics and skin tones showed regional diferences, with a better skin barrier associated with the western region, as indicated by high skin hydration and sebum secretion and a low pH value. According to the value of transdermal water loss, lighter and darker skin tones were found in the western and southern regions, respectively. Environmental conditions afected facial skin status. Air pollution induced facial skin issues, with fne particulate matter and nitrogen dioxide contributing the most. Individual lifestyles afected the facial skin barrier and skin tone.

A. Polańska, A. Łojko-Dankowska, A. Czyż, Z. Adamski, R. Żaba1, L. Gil, A. Dańczak-Pazdrowska, **Epidermal barrier function in patients after allogeneic hematopoietic stem cell transplantation – a pilot study**, Adv Dermatol Allergol 2022; XXXIX (6), December/2022: p. 1083–1087

Introduction: The skin is the typically and predominantly affected organ in patients after allogeneic hematopoietic stem cell transplantation (alloHSCT). The supportive therapy in patients after alloHSCT includes especially ultraviolet protection and the use of emollients. Aim: Due to the lack of studies regarding epidermal barrier function in patients with alloHSCT, our aims were to monitor dermatologically patients 1 year after the procedure with special emphasis on epidermal barrier function and to evaluate the properties of epidermal barrier function in patients with confrmed chronic GvHD (cGvHD). Material and methods: Our pilot study included 30 patients after alloHSCT and 20 healthy controls. In the group of patients after alloHSCT there were 10 individuals who were monitored dermatologically (including evaluation of skin, mucosae, nails and hair) within 1 year after the procedure (subgroup 1) and 20 patients with previously confrmed cGvHD (subgroup 2). We evaluated transepidermal water loss (TEWL), skin hydration and skin color. The clinical assessment and all noninvasive evaluations in patients included in subgroup 1 were performed before (at baseline) and 3, 6, 9 and 12 months after the procedure, while in subgroup 2 they were performed once. Results: In subgroup 1 we did not observe signifcant differences between baseline results and periods of assessments in TEWL values or corneometry, erythema and melanin measurements. In subgroup 2 the highest TEWL values and the lowest corneometry results were observed in patients with sclerodermoid chronic cutaneous GvHD in comparison to patients with lichenoid chronic cutaneous GvHD and patients with cGvHD but without skin lesions. TEWL values and melanin level were signifcantly higher in patients with cGvHD than in controls. Conclusions: Our pioneer observations proved the disturbed epidermal barrier function among patients after alloHSCT. Therefore it seems that proper skin care, including photoprotection, should be recognized as a crucial component in long-term management of these patients.

T. Marcílio Cândido, M. Bueno Ariede, C. Aparecida Sales de Oliveira Pinto, F. Vieira Lima, W. Vidal Magalhães, N. Mencacci Esteves Pedro, G. Padovani, B. da Silva Sufi, P. Rijo, M.V. Robles Velasco, C. Rosado, A. Rolim Baby, **Rosmarinic Acid Multifunctional Sunscreen: Comet Assay and In Vivo Establishment of Cutaneous Attributes**, Cosmetics 2022, *9*, 141

The skin acts as a protective barrier, guarding the body against microorganisms, chemicals, and several environmental factors. Accordingly, this all-important organ must be kept healthy to maintain its

optimal functionality. One approach to maintain skin health is the application of multifunction bioactive sunscreens containing antioxidant molecule(s). Rosmarinic acid (RA), a phenolic compound, is known for its antioxidant activity. Herein, the safety and efficacy of a multifunction prototype sunscreen were investigated, aiming to evaluate the performance of this polyphenol with two known and widely used UV filters (bemotrizinol and octyl *p*methoxycinnamate). Samples protected the DNA fragmentation compared to UV control, by the comet assay, and showed good skin compatibility in subjects. Formulations F1 and F3 were able to increase skin hydration, and, possibly, the RA interfered with this attribute. An increase in transepidermal water loss was observed for formulations F1, F2, and F4, which may be related to the vehicle, containing the RA or not. No decreases were observed in the inflammatory reaction caused by the ethyl nicotinate with any of the samples. As a perspective, we suggest trials with a greater number of subjects or protocol modifications. Altering the vehicle qualitative and quantitative composition is also a pertinent perspective.

E. Alves, J. Gregorio, P. Rijo, C. Rosado, L.M. Rodrigues, **The Regular Intake of Kefir Improves Epidermal Barrier in Atopic Dermatitis**, SPFisiologia Confrence, Coimbra, November 2022

Kefir, an ancient food with probiotic characteristics is known to present several health benefits including a positive impact on the general condition of the digestive system, and intestinal microbiota. Atopic Dermatitis (AD), a chronic inflammatory skin disease, is associated to both skin barrier dysfunction and intestinal dysbiosis. This exploratory study aimed to assess the potential relationship between the ingestion of kefir and the skin barrier function of atopic skin subjects. Our volunteers (n = 18) were all females with a diagnosis of AD, mean age 32.1 ± 12.2 years, assigned to either the kefir intake (K) or the control (C) group, according to their preference. All participants were given instructions on how to proceed during the study. The kefir group intervention consisted on the daily consumption of kefir for eight weeks. The control group did not consume kefir. Skin measurements were made by reference technology (CK electronics G) in the forearm. AD severity was assessed using the Scoring Atopic Dermatitis Severity Index (SCORAD). Regular consumption of kefir for 8 weeks was associated to a significant improvement on skin barrier parameters, TEWL and hydration ($p<0.001$ and $p<0.001$, respectively) and AD severity ($p<0.001$). No similar differences were observed in the control group. Both TEWL and hydration improvement correlated with ADseverity decrease ($rho=0.532$, $p=0.023$ and $rho=0.766$, $p<0.001$, respectively), which supports the skin physiology improvement. Despite the small number of participants this study was able to find a beneficial effect of kefir intake in cutaneous conditions. A correlation between AD severity and skin barrier function was found in previous observations supporting the potential modulatory capacity of kefir on the gut-skin axis. To our knowledge no similar information on the effect of kefir intake on skin barrier function of AD individuals was published. These results justify this interest on kefir as a gut-skin axis modulator.

S.Y. Joo, Y.S. Cho, J.W. Yoo, Y.H. Kim, R.I. Sabangan, S.Y. Lee, C.H. Seo, **Clinical Utility of the Portable Pressure-Measuring Device for Compression Garment Pressure Measurement on Hypertrophic Scars by Burn Injury during Compression Therapy**, J. Clin. Med. 2022, 11, 6743

Compression therapy for burn scars can accelerate scar maturation and improve clinical symptoms (pruritus and pain). This study objectively verified the effect of pressure garment therapy in maintaining a therapeutic pressure range for hypertrophic scars. Sixty-five participants (aged 20~70 years) with partial- or full-thickness burns, Vancouver scar scale score of ▫4, and a hypertrophic scar of ▫4 cm x 4 cm were enrolled. Compression pressure was measured weekly using a portable pressure-monitoring device to regulate this pressure at 15~25 mmHg for 2 months. In the control group, the compression garment use duration and all other burn rehabilitation measures were identical except for compression monitoring. No significant difference was noted in the initial evaluations between the two groups ($p > 0.05$). The improvements in the amount of change in scar thickness ($p = 0.03$), erythema ($p = 0.03$), and sebum ($p = 0.02$) were significantly more in the pressure monitoring group than in the control group. No significant differences were noted in melanin levels, trans-epidermal water loss, or changes measured using the Cutometer® between the two groups. The efficacy of compression garment therapy for burn-related hypertrophic scars can be improved using a pressure-monitoring device to maintain the therapeutic range.

S. Falloni Andrade, C. Rocha, E.J. Pinheiro, A.C. Figueiredo, C. Pereira Leite, M. do Ceu Costa, L.M. Rodrigues, **About the Cymbopogon Citratus Essential Oil Anti-Inflammatory Potential - Data from the Human in vivo Methylnicotinate Model**, SPFisiologia Confrence, Coimbra, November 2022

Cymbopogon citratus leaves preparations are used in traditional medicine to mitigate inflammatory processes but a strong science demonstration to support these properties is still missing. Methylnicotinate (MN) is often used to imitate an inflammatory process in human skin. Here we investigate the antioxidant and anti-inflammatory properties of a formulation containing C. *citratus*

essential oil (EOCC) using this MNmodel. The study involved 14 healthy participants (9 women and 5 men; mean age 32.9 ± 17.6 years old). All procedures respected the principles of good clinical practice previously approved by the Ethics Committee (P. 04/13). Three areas were drawn on both forearms (3cm x 3cm). One randomly chosen areawas treated for 14 days, 2 times/day with polyacrylic acid gel containing 5% EOCC (0.1 mL of the formulation). The other were used as controls. The study was carried out in a single-blind manner. By the end of the application period the MN model was applied (0.5% methylnicotinate for 1 minute) and skin reaction measured in terms of blood perfusion, erythema, transepidermal water loss, and edema. Highresolution sonography images were also obtained. Results revealed a significant decrease in TEWL, blood perfusion, erythema, and edema in the areas treated with EOCC, suggesting that formulations containing EOCC could prevent and mitigate skin inflammatory disorders. Besides, the methodology here developed is also an innovative safe approach to study the clinical impact of some topical substances of natural origin in human skin.

S. Faloni Andrade, T. Matos Ferreira, T. Fontes, S. Lopes, C. Ferreira-Pego, L.M. Rodrigues, **Dietary Patterns and Skin Physiology**, SPFisiologia Confrence, Coimbra, November 2022

The impact of dietary patterns on skin functions is still unclear. We examined cutaneous physiology characteristics between vegan-vegetarian (VG) and omnivorous (OM) participants, involving 122 healthy participants, both sexes, 82 OM (32.0 ± 13.1 y.o.) and 40 VG (34.0 ± 9.62 y.o) with similar Body Mass Indices. The protocol was previously approved by the institutional Ethical Commission. Main indicators were transepidermal water loss (TEWL), hydration, and biomechanics skin parameters in five anatomical sites (forehead, cheek, neck, hand, and leg). Carotene skin content was determined in the hand palm by MultipleSpatially Resolved Reflection Spectroscopy. The food group intake was assessed using a validated Food Frequency Questionnaire. The dietary patterns and their impact on the skin were compared using MannWhitney test and correlations were investigated by the Spearman rank correlation coefficient ($p<0.05$). The carotenoid content was significantly higher in the VG group. TEWL has shown higher values in the VG group but significant differences could only be detected in the neck and leg. Concerning skin biomechanical parameters and hydration we could not find significant differences between the two groups. Looking for a potential relationship between the most frequent foods consumed by the two groups and skin physiology we found that vegetables, vegetable drinks, milk, yogurt, and cheese had a significant positive relationship with epidermal water balance. Alcoholic beverages and fast food showed a significant negative relationship with the same variables. Other significant correlations included a VG group positive correlation with the carotenoid content, and a OM group a negative correlation with red meat, viscera, alcoholic beverages, and sugar-sweetened beverages consumption. These results clearly suggest that skin physiology can beinfluenced by regular dietary patterns and should be further investigated.

A. Chioreanu, I.C. Mot, D.I. Horhat, N.C. Balica, C.A. Sarau, R. Morar, E.M. Domuta, C. Dumitru, R.A. Negrean, B.A. Bumbu, M. Ravulapalli, S. Alambaram, R. Akshay, M. Pricop, **Development and Preliminary Characterization of Polyester-Urethane Microparticles Used in Curcumin Drug Delivery System for Oropharyngeal Cancer**, Medicina 2022, 58, 1689

Background and Objectives: Curcumin (Cc) as an active substance is known for its antiinflammatory, anticoagulant, antioxidant, and anti-carcinogenic effects, together with its role in cholesterol regulation, and its use in different gastrointestinal derangements. On the other hand, curcumin can be used for its properties as an inactive substance, with Cc particles being more often tested in pharmaceutical formulations for drug delivery, with promising safety records and kinetics. The aim of this research was to obtain and characterize polyurethane microparticles that can be used as a carrier with a controlled Cc release. Materials and Methods: The in vitro samples were characterized by the Zetasizer procedure, and UV–Vis spectroscopy, while the in-vivo measurements on human subjects were performed by non-invasive skin assays (trans-epidermal water loss, erythema, and skin hydration). A total of 16 patients with oropharyngeal cancer stages II and III in equal proportions were recruited for participation. Results: The experimental values of sample characteristics using the Zetasizer identified a mean structural size of 215 nm in the polyester-urethane preparate (PU), compared to 271 nm in the curcumin-based PU. Although the size was statistically significantly different, the IPDI and Zeta potential did not differ significantly (22.91 mV vs. 23.74 mV). The average age during the study period was 57.6 years for patients in the PU group, respectively, and 55.1 years in those who received the curcumin preparations. The majority of oropharyngeal cancers were of HPV-related etiology. There were no significant side effects; 75.0% of patients in the PU group reporting no side effects, compared to 87.5% in the Cc group. The 48 h TEWL measurement at the end of the experiment found a statistically significant difference between the PU and the Cc group (2.2 g/h/m2 vs. 2.6 g/h/m2). The erythema assessment showed a starting measurement point for both research groups with a 5.1-unit difference. After 48 h, the difference between PU and PU_Cc was just 1.7 units (p-value = 0.576). The overall

difference compared to the reference group with sodium lauryl sulfate (SLS) was statistically significant at a 95% significance level. Conclusions: Our findings indicate the obtaining of almost homogeneous particles with a medium tendency to form agglomerations, with a good capacity of encapsulation (around 60%), a medium release rate, and a non-irritative potential. Therefore, this polyester-urethane with Cc microparticles can be tested in other clinical evaluations.

A. Ziemlewska, Z. Nizioł-Łukaszewska, M. Zagórska-Dziok, M. Wójciak, D. Szczepanek, I. Sowa, **Assessment of Cosmetic and Dermatological Properties and Safety of Use of Model Skin Tonics with Kombucha-Fermented Red Berry Extracts**, Int. J. Mol. Sci. 2022, 23

Kombucha is a health-promoting beverage that is produced by fermenting sweetened tea using symbiotic cultures of bacteria belonging to the genus Acetobacter, Gluconobacter, and yeast of the genus Saccharomyces. This study compared the cosmetic and dermatological properties of theextracts of the following redberries: R. rubrum, F. vesca, and R. idaeus, and their ferments, which were obtained by fermentation for 10 and 20 days using tea fungus. For this purpose, the fermented and non-fermented extracts were compared in terms of their chemical composition using the HPLC/ESIMS chromatographic method, demonstrating the high content of biologically active compounds that were present in the ferments. The antioxidant activity of the tested samples was evaluated using DPPH and ABTS tests, as well as by evaluating the scavenging of the external and intracellular free radicals. The cytotoxicity of the extracts and the ferments, as well as the cosmetic formulations, were also determined by conducting Alamar Blue and Neutral Red tests assessing the cell viability and metabolism using skin cell lines: fibroblasts and keratinocytes. In addition, application tests were conducted showing the positive effects of the model cosmetic tonics on the TEWL, the skin hydration, and the skin pH. The results indicate that both the extracts and the ferments that were obtained from kombucha can be valuable ingredients in cosmetic products.

B. Chen, N. Lu, K.S. Lee, L. Ye, C. Hasegawa, K. Maeda, **Application of mevalonolactone prevents deterioration of epidermal barrier function by accelerating the lamellar granule lipid transport system**, Skin Research & Technology, Volume 28, Issue 6, November 2022, p. 804-814

Background: Fatty acids increase ATP-binding cassette ABC transporter A12 (ABCA12) levels via an increase in peroxisome proliferator-activated receptor *β/δ* (PPAR *β/δ*). Promoting lipid transport to lamellar granules has been suggested to improve epidermal barrier function in patients with dry skin. Objective: We investigated whether mevalonolactone (MVL) produced by *Saccharomycopsis fibuligera* improves dry skin by promoting ABCA12 expression and the amount of free fatty acids in epidermal keratinocytes. Methods: We examined whether MVL increases ABCA12 mRNA and protein levels and the amount of Nile red-positive lipids in cultured epidermal keratinocytes and in a three-dimensional epidermal model by cell staining. Promotion of fatty acid production by MVL was analyzed by liquid chromatography-mass spectrometry. We also evaluatedwhetherMVL addition increases PPAR *β/δ* mRNA expression in cultured keratinocytes. Based on the results, a randomized controlled trial was conducted in which milky lotions containing MVL and placebo were applied to dry facial skin of healthy female volunteers in winter. Results: MVL increased ABCA12 mRNA and protein levels and lamellar granule number and size. Fatty acid analysis revealed that MVL elevated myristic acid, palmitic acid, and palmitoleic acid levels as well as PPAR *β/δ* mRNA expression. In human tests, milky lotions containing MVL were shown to significantly improve transepidermal water loss (TEWL) in the stratum corneum compared to placebo. Conclusion: The results suggest that MVL increases fatty acid uptake and ABCA12, promotes fatty acid transport to lamellar granules, and improves epidermal barrier function in dry skin through increased expression of PPAR *β/δ*

J.L. Schiefer, F.G. Aretz, P.C. Fuchs, R. Lefering, P. Yary, C. Opländer, A Schulz, M. Daniels, **Comparison of Long-Term Skin Quality and Scar Formation in Partial-Thickness Burn Wounds Treated with Suprathel® and epicite$^{hydro®}$ Wound Dressings**, Medicina 2022, 58, 1550

Background and Objectives: Scar formation after burn trauma has a significant impact on the quality of life of burn patients. Hypertrophic scars or keloids can be very distressing to patients due to potential pain, functional limitations, or hyper- or hypopigmentation. In a previous study comparing Suprathel® and the new and cheaper dressing epicite$^{hydro®}$, we were able to show that pain reduction, exudation, and time until wound-healing of partial-thickness burn wounds were similar, without any documented infections. No study exists that objectively measures and compares skin and scar quality after treatment with Suprathel® and epicitehydro® at present. Materials and Methods: In this study, the scar quality of 20 patients who had been treated with Suprathel® and epicite$^{hydro®}$ was objectively assessed using the Cutometer®, Mexameter®, and Tewameter®, as well as subjectively with the Patient and Observer Scar Assessment Scale, 3, 6, and 12 months after burn injury. Results: In all performed measurements, no significant differences were detected in scar formation after treatment of

partial-thickness burn wounds with the two dressings. Conclusions: Both the newer and less expensive wound-dressing epicite$^{hydro®}$ and the well-known wound-dressing Suprathel® resulted in stable wound closure and showed good cosmetic results in the follow-up examinations.

B. Bravo, P. Correia,| J.E. Gonçalves Junior, B. Sant'Anna, D. Kerob, **Benefits of topical hyaluronic acid for skin quality and signs of skin aging: From literature review to clinical evidence**, Dermatologic Therapy. 2022;35

Skin aging goes beyond a chronological process and also results from extrinsic factors referred to as the exposome. Hyaluronic acid (HA) is an important component of the extracellular matrix, with loss starting at 25 years old. While many studies of HA concern topical use, few literature reviews only address the use of topical HA in dermatology. This review describes the different characteristics of HA-containing cosmeceuticals, with a focus on skin aging and the impact of exposome factors on HA synthesis and degradation. A review was performed using the terms HA, hyaluronan, topical, dermatology, cosmetic, aging treatment, exposome, and cosmeceuticals. Results are also presented from a recent randomized controlled trial (RCT), which investigated the additional benefit of using a HA epidermic filler (HA-filler serum) combined with Botulinum toxin type A (BoNTA) to treat signs of skin aging. Subjects were randomized to two groups: HA-filler serum starting 24 h after the BoNTA injection then twice daily for 24 weeks, or the control group, which received BoNTA. HA is a key ingredient used in cosmeceuticals for its hydration/antiaging properties (hygroscopic, rheological, and viscoelastic). Several clinical studies indicate that HA is both well tolerated and effective, adjuvant to both post-surgical and facial rejuvenation procedures. In the RCT, one of few studies to combine BoNTA and HA with a 6-month follow-up, the HA-filler serum lengthened the duration of BoNTA's effect in reducing wrinkles. Numerous studies support HA-based cosmeceuticals as a noninvasive, effective solution for improving skin hydration and rejuvenation.

C. Ye, Y. Zhang, Z. Su, S. Wu, Y. Li, J. Yi, W. Lai, J. Chen, Y. Zheng, **hMSC exosomes as a novel treatment for female sensitive skin: An in vivo study**, Frontiers in Bioengineering and Biotechnology, 10, 2022

Background: Recent studies have reported that the incidence of sensitive skin is increasing. Skin sensitivity and skin barrier functions were related to many skin diseases including atopic dermatitis, psoriasis, rosacea, and so on. Mesenchymal stem cell (MSC)-derived exosomes (hMSC) might be considered as a new effective therapeutic scheme. Aims: This study aims to investigate the safety and efficacy of hMSC exosomes as a novel topical treatment for sensitive skin. Patients/Methods: Exosomes were extracted from primary hMSC via ultracentrifugation method. The morphology of hMSC exosomes was studied via transmission electron microscope. Expression of exosome specific surface marker was detected via Western blot. 22 subjects (female, aged 18–55) diagnosed with sensitive skin were enrolled. Follow-up was conducted before, 7-day, 14-day, and 28-day after hMSC exosomes use. Transepidermal water loss (TEWL), surface hydration, sebum secretion, and L*a*b* value were simultaneously tested at the same time point in an environment-controlled room. Results: Under transmission electron microscopy, the extracted hMSC exosomes were circular or elliptical with intact membrane structure, and their diameters ranged mainly from 40 to 80 nm. Western blot showed that the expression of markers CD63, CD9, and Tsg101 was positive. Brownian motion based nanoparticle trajectory analysis (NTA) showed that the main peak of particle size distribution occurred around 96 nm, the average particle size was 122 nm, and the main peak accounted for 96.7%. All this conformed to the biological characteristics of exosomes standardized by the International Society for Extracellular Vesicles. In the clinical trial, scores of objective symptoms including roughness, scales, erythema, and subjective symptoms including tension, burning, or itching, were improved after 7-, 14-, and 28- day using hMSC-exosomes. TEWL, hydration, sebum, pH, and a* values were tended to return to the level of healthy skin.

J. Baumann, F. Wandrey, F. Zülli, **Restoring skin with a novel Ca^{2+} delivery system**, PERSONAL CARE MAGAZINE, October 2022, p. 29-32

Ageing and metabolic disorders such as diabetes are key drivers that can lead to skin barrier disruption. Despite the increasing demand for cosmetic treatments for old/diabetic skin, current options are limited and often include occlusive formulations. A major characteristic of a disrupted skin barrier is a defective calcium gradient in the epidermis. Therefore, replenishing the aged/diabetic skin's calcium stores with topicalcalcium could be a potential therapeutic approach. Both *in vitro* and clinical studies have shown, that a novel calcium ion (Ca2+) vector system enables the successful delivery of bioavailable Ca2+ ions into the skin, aiding not only in recovery but also in protection of the skin from SLS stress.This highlights the use of this vector system as a new and superior approach to treat a damaged barrier present in diabetic, aged, or atopic skin

C. Alonso, X. Qu, A. Rani Ram, P. Vichare, S. Patil, T. Nuutinen, K. Kapsime, **Improving the efficacy and skin feel of hand sanitisers**, PERSONAL CARE MAGAZINE, October 2022, p. 75-77

The COVID-19 pandemic have heightened consumer awareness of hand hygiene, which has resulted in increased use of hand sanitisers. To address a larger market, more brands have launched products, resulting in a saturated market with a multitude of offerings often undistinguished from one another. So, the question then becomes – how to differentiate your product in a crowded marketplace? The answer lies in improved performance, consumer experience and sustainability.

T. Puaratanaarunkon, C. Washrawirul, N. Chuenboonngarm, N. Noppakun, P. Asawanonda, C Kumtornrut, **Efficacy and safety of a facial serum containing snail secretion filtrate, *Calendula officinalis*, and *Glycyrrhiza glaba* root extract in the treatment of maskne: A randomized placebo-controlled study**, Journal of Cosmetic Dermatology, Volume 21, Issue 10, October 2022, p. 4470-4478

Introduction: During the ongoing COVID-19 outbreak, face mask use has increased and became a part of our daily lives. While wearing, prolonged contact time and microenvironmental change profoundly lead to an acne flare-up, defined as “maskne.” Aims: We aimed to assess the efficacy and safety of snail secretion filtrate, *Calendula officinalis*, and *Glycyrrhiza glaba* root extract combination serum (SCGS) in treating the maskne. Methods: This was a randomized, double-blind, placebo-controlled trial study. This study enrolled 66 participants with mild-to-moderate maskne. The SCGS and placebo were randomly assigned for participants to use twice daily for 12 weeks. Percentage change of acne lesion count, acne severity by Investigator Global Evaluation Acne (IGEA), sebum levels, corneometry levels, transepidermal water loss (TEWL), erythema score by Visia®, and adverse events were evaluated 4-weekly at baseline to Week 12. At Week 12, all participants evaluated their satisfaction scores using a 10-point visual analog scale (VAS). Results: In the mask-covered area, the percent reduction in inflammatory acne lesions from the treatment group was significantly greater than the placebo group at all time points (coefficient of percentage change of inflammatory lesions = −33.89 [95% CI −65.24, −2.53]; $p = 0.03$). Also, a subgroup analysis with participants using concurrent acne treatments revealed similar results (12 participants, coefficient = −50.30 [95% −88.65, −11.95]; $p = 0.01$). However, there were no significant differences in non-inflammatory lesions, all skin biophysics, and VAS between groups. Adverse events were mild and occurred in a few cases in both groups. Conclusions: The SCGS could significantly improve inflammatory acne lesions and had a favorable tolerability profile, suggesting its role as an adjunctive treatment in maskne.

M.B. Young, W. Lai, T. Kononov, A.S. Zahr, **A Rejuvenating treatment targeting “tech neck” lines and wrinkles in Chinese women: A prospective, open-label, single-center study**, J Cosmet Dermatol. 2023;22: p. 226–235

Background: Aging of neck and jawline skin is caused by intrinsic and extrinsic factors and is evidenced by wrinkling, laxity, skin dyspigmentation, loss of the mandibular contour, accumulation of submental fat, density loss, and prominent platysma bands. Early intervention with topical cosmeceuticals, especially in younger subjects with “tech neck,” can offer a solution and potentially mitigate aging of the neck and jawline. Aim: The objective of this prospective, open-label, single-center clinical study was to assess the efficacy and tolerability of a topical anti-aging neck treatment (TNT) in a cohort of Chinese women with mild to moderate signs of aging on the neck and jawline. Subjects/Methods: This study was approved by an ethics committee and involved healthy Chinese subjects. Thirty-five female subjects, 25–50 years old, with mild to moderate signs of aging of the neck and jawline were recruited. Subjects applied the TNT to the neck and jawline twice daily for 84 days. Long-term efficacy and tolerability, clinical photography, bioinstrumentation, and a self-assessment questionnaire were performed at baseline and post-baseline. Results: The TNT significantly improved horizontal neck fold lines and neck skin elasticity, hydration, gloss/radiance, and skin tone evenness post-baseline. Clinical photography and ultrasound corroborated these findings. The product was well perceived and well tolerated by subjects. Conclusion: This study demonstrated the TNT was effective against both extrinsic and intrinsic aging of the neck and jawline. The TNT provides a topical solution for Chinese women concerned with an aging appearance of the neck including “tech neck.”

N. Kaul, **Clinical testing for a booming men’s sector**, Personal Care Magazine, October 2022

The male grooming industry is growing at a rapid pace Entlre ailes of drug stores are dedicated to men s grooming products. Product demand in the skin care, hair care, and fragrance Industries has grown dramatically and is expected to keep pace in the coming years. Whether this growth stems from celebrity advertising or social media influence, one thing is clear: men have come a long way from the days of merely using a soap bar as face and body wash. The modern man stands ready and willing to invest in skin and hair products that maintain their health and youth.

N. Abiakam, H. Jayabal, K. Mitchell, D. Bader, P. Worsley, **Biophysical and biochemical changes in skin health of healthcare professionals using respirators during COVID-19 pandemic**, Skin Research & Technology, October 2022

Background: Personal protective equipment, including respirator devices, has been used to protect healthcare workers (HCWs) during the COVID-19 pandemic. These are fitted to skin sites on the face to prevent airborne transmission but have resulted in reports of discomfort and adverse skin reactions from their continued usage. The present study addresses the objective changes in both the structural integrity and biological response of the skin following prolonged and consecutive use of respirators. Materials and methods: A longitudinal cohort study, involving 17 HCWs who wear respirators daily, was designed. Changes in the barrier properties and biological response of the skin were assessed at three facial anatomical sites, namely, the nasal bridge, left cheek and at a location outside the perimeter of respirator. Assessments were made on three different sessions corresponding to the first, second and third consecutive days of mask usage. Skin parameters included transepidermal water loss (TEWL), stratum corneum (SC) hydration and erythema, as well as cytokine biomarkers sampled from sebum using a commercial tape. Results: The cheek and the site outside the perimeter covered by the respirator presented minimal changes in skin parameters. By contrast, significant increases in both the TEWL (up to 4.8 fold) and SC hydration (up to 2.7 fold) were detected at the nasal bridge on the second consecutive day of respirator-wearing. Therewas a high degree of variation in the individual expression of pro-and anti-inflammatory cytokines. Increasing trends in nasal bridge TEWL values were associated with the body mass index ($p < 0.05$). Conclusions: The most sensitive objective parameter in detecting changes in the skin barrier proved to be the increase in TEWL at the nasal bridge, particularly on the second day of consecutive respirator usage. By contrast, other measures of skin were less able to detect remarkable variations in the barrier integrity. Consideration for protecting skin health is required for frontline workers, who continue to wear respirators for prolonged periods over consecutive days during the pandemic.

N. Kaul, E. Kohoot, B. Drewitt, **Clinical Testing of Dermo-Protective Products against Environmental, Chemical and Climatic insults**, 32nd IFSCC Congress London, September 2022

Our skin reflects the state of our health. Exposure of the skin to external insults like chemicals (detergents, soaps), climate (dry, cold, hot conditions) and environment (pollution), besides harming the protective ability of the skin, impacts skin properties and causes acute or chronic damage to the skin barrier. There is need to protect the skin from onslaught of various insults and to restore and conserve hydration, barrier function and protect it from pollutants. Many dermo-protective products are available and new ones are being introduced with actives to clean, soothe, restore, reinforce, protect, treat and maintain our skin in good condition. Our objective was to assess the efficacy of dermo-protectants against environmental, chemical, and climatic insultsusing clinical grading, imaging, along with bioinstrumentation in three *in-vivo* models.Methods: Three clinical studies were carried out each following a randomized, blinded, untreatedcontrol design in 35 healthy female subjects. The methodology included clinical grading, imaging and the use of various bio-instruments to measure the parameters of interest. Results: Our results from the three skin models using test methods presented under standardizedconditions show the extent of dermo-protection in relation to hydration, barrier protection and removal of pollution evident with the test articles used.Conclusions: Being in direct contact with the skin, dermo-protectants help protect and modulate skin characteristics and functioning, thus making them unique and versatile, outstepping the original boundaries of a product for providing beauty alone. Clinical trials with dermo-protectants for proving product efficacy and its extent, with proper study designs and techniques, is important in not only adding value for the consumer but also important for maintaining a competitive edge.

I. Dolečková, P. Orzol, K. Vašíčková, S. Karel, L. Petrovičová, G. Huerta-Angeles, M. Štěpánová, V. Velebný, **The anti-acne and anti-ageing activity of a new hexapeptide in complex with zinc and its comparison to retinol**, 32nd IFSCC Congress London, September 2022

Background: In this study, we evaluated a new hexapeptide in complex with zinc (Zn-peptide) for its ability to inhibit key acne-related processes *in vitro* and to improve the appearance of the acne-prone skin *in vivo* and compared it with retinol. Materials and methods: The hexapeptide was prepared by solid phase peptide synthesis and zinc sulfate was used for the preparation of the Zn-peptide complex. Expression of the selected genes was evaluated using quantitative RT-PCR in HaCaT or NIH-3T3 cells irradiated or not irradiated with UVB and treated with Zn-peptide. The antimicrobial activity was determined spectrophotometrically using *C. acnes* culture. We also performed a split-face, placebocontrolled in vivo study on 40 Caucasian volunteers with acne-prone skin treated with 13 µg/mL Zn-peptide or 0.2 % retinol for 6 weeks and evaluated various skin parameters.Results and discussion:

Zn-peptide inhibited all four key processes in acne pathogenesis *in vitro*: downregulated 5α-reductase involved in sebum production, suppressed keratinization and showed anti-inflammatory and antimicrobial effects. In the vivo study Zn-peptide significantly reduced number of inflammatory lesions, skin pores, skin redness, sebum level and *C. acnes* number. We also observed anti-ageing effect represented by wrinkle reduction, elasticity improvement and collagen increase. The effects of Zn-peptide were comparable or better than that of 0.2 % retinol. No negative adverse effects were observed in contrast to retinol which irritated the skin at the beginning of treatment and worsened skin barrier function. Conclusion: Zn-peptide proved to be a new retinol alternative exerting anti-acne and antiageing properties with no negative side effects.

M.C. Reimberg, H. Chajra, M. Frechet, ***In vivo*** **performance of a social and environmentally sustainable blend of Brazilian Kaolin**, 32nd IFSCC Congress London, September 2022

Background: Clays are used since ancient times for medicinal and beauty purposes and their mineral compositions depend on their geological origins. Clays originated from volcanic soil are colored and rich in minerals while clays derived from the Amazonian lateritic soil are richin minerals and organic matter. Combining these different sources of clays opens the way to the creation of an infinite variety of clays with amazing cosmetic and aesthetic properties. This work demonstrates new skin benefits and multifunctional properties of Brazilian clays containing kaolinites, “the kaolin” for cosmetic applications. Methods: Proof of concept clinical study: skin hydration (Corneometer™), TEWL (Tewameter™), sebum (Sebumeter™) and firmness /tensor (Cutometer™). Short term or long term of product use respectively after 4 hours or 7 days of consecutive use. Results: The positive impact of kaolin on skin health was demonstrated such as the maintenance of hydration, protection of skin barrier function and increase of skin firmness (tensor effect). The use of kaolin was not associated with an increase in sebum secretion, a phenomenon classically observed with the use of clays and known as “rebound effect” due to the constant use of clays. Conclusion: The positive attributes show that kaolin can be used in multifunctional formulations, even for skin care. Kaolin provides also rheological stability for the formulations and can bring benefits to the mineral make up, color cosmetic products, face products, besides sunscreens, BB creams and CC creams. New formulations and uses of kaolin can be addressed with several benefits for skin and hair care.

S. Hettwer, E. Besic Gyenge, B. Suter, B. Obermayer, **A multi-sensorial active ingredient to reduce stress and improve skin condition**, 32nd IFSCC Congress London, September 2022

Background: The recently discovered olfactory receptors on skin cells paved the way to develop cosmetic active ingredients which stimulate those receptors and drive keratinocyte differentiation and maturation. As such, scents can not only stimulate the brain and act de-stressing but can also act positively on the skin. Methods: A scenting cosmetic active ingredient from the resurrection bush *Myrothamnus flabellifolia* (INCI: Caprylic/Capric Triglyceride, Myrothamnus Flabellifolia Leaf/Stem Extract) was used for studies stimulating the mood of test subjects and to investigate the effects on skin. Characterisation of the scent profile has been done with a panel of 12 trained people. The composition of the essential oil fraction was determined by GC-MSD. Double-blind, placebo controlled studies were performed (n = 25 - 75). Mood parameters were evaluated by hormone measurements of saliva, questionnaire and EEG recording. Skin parameters were evaluated with standard equipment. Corneometer values were mapped on the images of representativefaces by means of computer aided colour mapping. Investigation of bitter taste receptor activation on keratinocytes was assessed by measuring the calcium influx and the cAMP level.Conclusion: Myrothamnus extract was able to improve the mood of study participants using an emulsion containing 3 % of the active. It further improved skin parameters like hydration, TEWL and anti-ageing parameters. The mode of action combines subconscious smelling via olfactory sensory neurons in the nose and activation of bitter receptors on keratinocytes. This combination is the first-of-its-kind approach of a cosmetic active ingredient to destress the mind and skin at the same time.

L. Williams, G. Dell’Acqua, **Quillaja saponaria saponin-rich extract shows anti-inflammatory activity, protecting and repairing against UV-induced skin damage**, 32nd IFSCC Congress London, September 2022

The saponin-rich extract from Quillaja saponaria’s tree has been used in the cosmetic industry as a natural surfactant to create natural derived emulsions. We have tested the extract for its antiinflammatory properties both in vitro and clinically. Experiments in PMA induced keratinocytes showed the extract (either at 9% or 15% saponin content) being able to reduce PMA stimulated proinflammatory markers CXCL5, CCL3, IL23A, IL17C, IL6ST. The reduction of the interleukins (but not of the chemokines) was dose dependent on the saponin concentration. To further confirm the antiinflammatory action of the extract and explore its clinical significance, a clinical study was run.

Twenty healthy volunteers were UV irradiated and changes in skin redness and TEWL were measured. The Quillaja extract (15% saponin) at 0.5% or 1% in a gel formulation was tested as prevention (before irradiation) or as treatment (after irradiation). When redness was measured, both Quillaja formulations at 0.5% and 1% were significantly effective ($p<0.05$) as prevention (reduction of 10% and 12% respectively) and even more effective as treatment (reduction of 20% and 25% respectively). When TEWL was evaluated, the highest dose Quillaja formulation (1%) as a pre-treatment was significantly effective in reducing TEWL (-27.5%, $p<0.05$) and both formulations significantly more effective as a posttreatment (-37%, -39.2% for 0.5% and 1% Quillaja respectively, $p<0.01$). Our in vitro and clinical data show the ability of Quillaja extract to reduce the damaging effects of pro-inflammatory inducers. The extract can be considered a powerful and natural adjuvant in topical formulations designed for before and after sun exposure.

I.M. Gidado, M. Qassem, I.F. Triantis, P.A. Kyriacou, **Review of Advances in the Measurement of Skin Hydration Based on Sensing of Optical and Electrical Tissue Properties**, Sensors 2022, 22, 7151

The presence of water in the skin is crucial for maintaining the properties and functions of the skin, in particular its outermost layer, known as the stratum corneum, which consists of a lipid barrier. External exposures can affect the skin's hydration levels and in turn, alter its mechanical and physical properties. Monitoring these alterations in the skin's water content can be applicable in clinical, cosmetic, athletic and personal settings. Many techniques measuring this parameter have been investigated, with electrical-based methods currently being widely used in commercial devices. Furthermore, the exploration of optical techniques to measure hydration is growing due to the outcomes observed through the penetration of light at differing levels. This paper comprehensively reviews such measurement techniques, focusing on recent experimental studies and state-of-the-art devices.

T. Nakamura, H. Yoshida, M. Haneoka, S. Nakamura, Y. Takahashi, **Season- and facial site-specific skin changes due to long-term mask wearing during the COVID-19 pandemic,** Skin Reasearch & Technology, Volume 28, Issue 5, September 2022, p. 749-758

Background: As people have regularly worn facial masks due to the coronavirus disease 2019 (COVID-19) pandemic, mask-wear-related adverse effects on the skin have been recognized. The aim of this study was to explore skin changes, their seasonal variations in the general population caused by commonly used masks and a possible mechanism underlying negative effects of mask-wearing. Materials and methods: Eighteen Japanese females participated in the study during summer and winter in Japan. Skin characteristics were measured in the non-mask-wearing preauricular area and the mask-wearing cheek and perioral areas. Results: Trans-epidermal water loss (TEWL) on the cheek area tended to be increased in winter, which was positively correlated with skin scaliness on the same area. Ceramide (CER) content and composition in the mask-covered stratum corneum (SC) were slightly changed between summer and winter, and CER [NP]/[NS] ratio was negatively correlated with the TEWL on the perioral skin in winter. Skin hydration and sebum secretion were higher on the cheek compared to the perioral area in summer. Skin redness was particularly high on the cheek in winter. Conclusion: Mask-wear-related skin changes were season- and facial site-specific, and alterations in SC CER may play a role in barrier-related skin problems caused by mask use.

K. Kappler, T. Grothe1, S. Srivastava, M. Jagtap, **Evaluation of the Effcacy and Safety of Blue Fenugreek Kale Extract on Skin Health and Aging: In-vitro and Clinical Evidences**, Clinical, Cosmetic and Investigational Dermatology, September 2022:15 2051–2064

Background: The skin is primarily affected by aging, especially when it is exposed to particulate matter present in the environment. It has been hypothesized that consumption of products with known antioxidant properties would help combat factors associated with both intrinsic and extrinsic aging factors. Objective: The aim of the present study was to evaluate the effect of the formulation Blue Fenugreek Kale Extract (BFKE) on skin aging. Methods: In this study, the effect of BFKE on protein oxidation was determined in human dermal fbroblasts by analysis of the levelof protein carbonylation after cells were stressed with either H_2O_2 or urban pollution consisting of particulate matter and UV-A. Furthermore, a randomized, double-blind, placebo-controlled clinical study that evaluated the effect of BFKE consumption over a period of 56 days in 59 volunteers was performed. The major parameter studied was skin barrier dysfunction through the assessment of Transepidermal Water Loss (TEWL). Additional parameters analyzed clinically include skin moisture content, participant selfassessment of skin parameters, wrinkle severity, skin sagging and elasticity. Furthermore, low grade and allergic inflammatory biomarker levels were measured at the start and end of the treatment period, along with oxidative stress assessment using blood malondialdehyde levels. Results: BFKE signifcantly reduced protein carbonylation in human dermal fbroblasts stressed with urban pollution. In the clinical study, the

TEWL level reduced signifcantly and at the same time the skin moisture content levels increased by end of the treatment period. No signifcant changes were observed in wrinkle severity, skin sagging, elasticity, inflammatory and oxidative stress biomarker levels. Participant and investigator perception of treatment was signifcantly greater after product consumption, as was the improvement in skin parameters based on participant self-assessment. Conclusion: BFKE reduces protein oxidation induced by H_2O_2 and restores skin barrier function and skin hydration, while also combating early signs of aging.

C.R. Sigit Prakoeswa, Damayanti, S. Anggraeni, M.A. Umborowati, S.A. Febriana, K. Oginawati, I. Tanziha, **Profile of Transepidermal Water Loss (TEWL), Skin Hydration, and Skin Acidity (pH) in Indonesian Batik Workers**, Hindawi Dermatology Research and Practice Volume 2022

Chemical substances used during batik processing may affect the physiological function of the batik worker's skin barrier. (is study assessed the level of transepidermal water loss (TEWL), skin hydration, and skin acidity in 61 batik workers from the batik center in Paseseh village, Tanjung Bumi subdistrict, Madura Island, Indonesia. Forty-five batik workers involved in dry work including drawing patterns on the cloth with wax and sixteen batik workers involved in wet work including dyeing the cloth with a dye bath were included in this study. (e mean TEWL level in the dry work section was 59.87± 11.94 g/m2/h on the palmar and 29.00± 13.09 g/m2/h on the dorsal side of the hand, while the mean TEWL in the wet work section were 47.39± 9.66 g/m2/h on the palmar and 37.07± 10.00 g/m2/h on the dorsal side of the hand. (e mean skin hydration level in the dry work section was 49.80± 19.16 arbitrary units (a.u.) for the palmar side and 52.77± 16.21 a.u. for the dorsal side of the hand, while the mean levels of skin hydration in the wet work section were 47± 12.73 a.u. and 62.94± 10.09 a.u. for palmar and dorsal side, respectively. (e mean levels of skin acidity in the dry work section were 5.45± 0.19 for the palmar side and 5.30± 0.20 for the dorsal side of thehand, while the wet work section had 5.30± 0.19 and 5.10± 0.19 for the palmar and dorsal side of the hand, respectively. (e TEWL levels were found to be higher on the palmar side of the hand in both the dry work and wet work sections, which was consistent with the measurement of skin hydration levels that were lower on the palmar side of the hand. (e mean skin pH levels for both work sections were considered within the normal range.

A. Hohmuth, **Vergleich der klassischen Atopischen Dermatitis mit der Prurigoform der Atopischen Dermatitis sowie der Prurigo Nodularis bei Nicht-Atopikern hinsichtlich der Anamnese, der Klinik, des Immunsystems, der Molekulargenetik und des Mikrobioms,** Dissertation aus der Klinik für Dermatologie, Venerologie und Allergologie im Universitätsklinikum Schleswig-Holstein an der Christian-Albrechts-Universität zu Kiel

Die Haut besteht aus drei Schichten: Epidermis, Demis und Subkutis. Die Epidermis ist die äußere Schicht und schützt den Organismus vor dem Eindringen von Umweltstoffen. Sie bildet die Grenzschicht zur Umwelt und ist nicht nur einemechanische, sondern auch eine chemische und immunologische Barriere. Aufgebaut ist die Epidermis vorwiegend aus Keratinozyten.

C.M. Keck, E.-O. Chaiprateep, H. Dietrich, S. Sengupta, **Influence of Mechanical Skin Treatments on Dermal Penetration Efficacy of Active Ingredients**, Pharmaceutics 2022, 14, 1788

The effective dermal penetration of active ingredients (AI) is a major task in the formulation of topical products. Besides the vehicle, the mechanical skin treatments are also considered to impact the penetration efficacy of AI. In particular, professional skin treatments, i.e., professional cosmetic skin treatments, are considered to be optimal for the dermal delivery of AI. However, a systematic study that proves these theories is not yet available and was therefore performed in this study while utilizing an ex vivo porcine ear model with subsequent digital image analysis. Hydrophilic and lipophilic fluorescent dyes were used as AI surrogates and were applied onto the skin without and with professional skin treatments. The skin hydration and the penetration efficacy were determined, respectively. Results showed that professional skin treatments with massage were able to increase the skin hydration, whereas a professional skin treatment without massage could not increase the skin hydration when compared to skin without professional skin treatment. Regarding the penetration efficacy, it was found that all parameters tested, i.e., type of professional skin treatment, lipophilicity of the AI, and the time point at which the AI are applied onto the skin, can have a tremendous impact on the penetration efficacy of the AI. The most effective penetration and the most effective skin hydration is achieved with a professional skin treatment that includes a professional skin massage. This kind of skin treatment can therefore be used to improve dermal drug delivery.

A. Ziemlewska, M. Wójciak, K. Mroziak-Lal, M. Zagórska-Dziok, T. Bujak, Z. Nizioł-Łukaszewska, D. Szczepanek, I. Sowa, **Assessment of Cosmetic Properties and Safety of Use of Model Washing Gels with Reishi, Maitake and Lion's Mane Extracts**, Molecules 2022, 27, 5090

Natural cosmetics are becoming more and more popular every day. For this reason, this work

investigates the properties of mushroom extracts, which are not as widely used in the cosmetics industry as plant ingredients. Water extracts of Grifolafrondosa (Maitake), Hericiumerinaceus (Lion's Mane) and Ganoderma lucidum (Reishi) were tested for their antioxidant properties, bioactive substances content, skin cell toxicity, ability to limit TEWL, effect on skin hydration and pH, and skin irritation. Our research showed that Maitake extract contained the highest amount of flavonoids and phenols, and also showed the most effective scavenging of DPPH and ABTS radicals as well as Chelation of Fe2+ and FRAP radicals, which were 39.84% and 82.12% in a concentration of 1000 µg/mL, respectively. All tested extracts did not increase the amount of ROS in fibroblasts and keratinocytes. The addition of mushroom extracts to washing gels reduced the irritating effect on skin, and reduced the intracellular production of free radicals, compared with the cosmetic base.Moreover, it was shown that the analyzedcosmetics had a positive effect on the pH and hydration of the skin, and reduced TEWL.

D. Dobrou, **Cosmetic Polysaccharides as Prebiotics for Skin**, Cosmetic & Toiletries, Vol. 137, No. 7, July/August 2022

The human skin provides a living space for a rich and diverse population of microorganisms collectively known as the skin microbiome. This consists of bacteria, archaea, fungi, viruses and mites, most of which are harmless commensals providing benefits for us. For example, they protect the skin against colonization by pathogens, produce various antimicrobial peptides and influence host innate and adaptive immunity; for a review, see Byrd et al. Microbial lipases also hydrolyze sebum triglycerides, releasing glycerol and moisturizing the skin; and free fatty acids, maintaining the acid mantle, which is important for skin barrier formation and, together with proper skin hydration, for desquamation. The most common members of the human skin microbiome are bacteria, with Cutibacterium acnes (formerly Propionibacterium) and Staphylococcus epidermidis being the most abundant species. Notably, an imbalance in the skin microbiome is often associated with a wide range of skin diseases such as acne, psoriasis, atopic and seborrheic dermatitis, etc.

S. Caggiari, D.L. Bader, F. Foxell, N. Pipe, S. Couch, A. Turner, P.R. Worsley, **Biomechanical and Physiological Evaluation of Respiratory Protective Equipment Application**, Medical Devices: Evidence and Research 2022:15, p. 241–252

Purpose: Respiratory protective equipment is widely used in healthcare settings to protect clinicians whilst treating patients with COVID-19. However, their generic designs do not accommodate the variability in face shape across genders and ethnicities. Accordingly, they are regularly overtightened to compensate for a poor ft. The present study aims at investigating the biomechanical and thermal loads during respirator application and the associated changes in local skin physiology at the skin–device interface. Materials and Methods: Sixteen healthy volunteers were recruited and reflected a range of gender, ethnicities and facial anthropometrics. Four single-use respirators were evaluated representing different geometries, size and material interfaces. Participants were asked to wear each respirator in a random order while a series of measurements were recorded, including interface pressure, temperature and relative humidity. Measures of transepidermal water loss and skin hydration were assessed pre- and post-respirator application, and after 20 minutes of recovery. Statistical analysis assessed differences between respirator designs and associations between demographics, interface conditions and parameters of skin health. Results: Results showed a statistically signifcant negative correlation ($p < 0.05$) between the alar width and interface pressures at the nasal bridge, for three of the respirator designs. The nasal bridge site also corresponded to the highest pressures for all respirator designs. Temperature and humidity signifcantly increased ($p < 0.05$) during each respirator application. Signifcant increases in transepidermal water loss values ($p < 0.05$) were observed after the application of the respirators in females, which were most apparent at the nasal bridge. Conclusion: The results revealed that specifc facial features affected the distribution of interface pressures and depending on the respirator design and material, changes in skin barrier function were evident. The development of respirator designs that accommodate a diverse range of face shapes and protect the end users from skin damage are required to support the long-term use of these devices.

D. Sobkowska, J. Gornowicz-Porowska, A. Seraszek-Jaros, D. Słomińska, Z. Adamski, M. Pawlaczyk, **Evaluation of Skin Biophysical Parameters and Angiogenesis Using CD34 as a Biomarker in Older Diabetic Women Treated with Radiofrequency**, Clin Cosmet Investig Dermatol, 2022 Jul 14:15: p. 1347-1355

Background: The prevalence of type 2 diabetes mellitus (t2DM) has been steadily increasing. Patients with t2DM need to slow down the skin ageing processes and to obtain a rejuvenating effect. Treatments that do not damage the superficial layers of the epidermis could be a promising solution for those patients. Purpose: The aim of this study was to evaluate the effects of radiofrequency therapy on the biophysical parameters and angiogenesis of facial skin, using CD34 as a biomarker in older diabetic

women treated with metformin. Patients and methods: A total of 45 subjects with phototype 2 or 3 (Fitzpatrick scale) were investigated (25 t2DM - study group, 20 - healthy controls). A series of 6 treatments (once a week) with a Radio Frequency Skin Rejuvenation System device was used on facial skin. Measurements of skin hydration, transepidermal water loss (TEWL), melanin and erythema index, temperature, and pH, at baseline and after radiofrequency therapy were performed with the Courage + Khazaka MPA-9 device. Immunohistochemistry on paraffin-embedded sections was used to evaluate the intensity of CD34 expression. Results: Radiofrequency treatment significantly improved facial skin hydration ($p < 0.0001$). Enhancement of the epidermal barrier observed, by reduced TEWL as a result of a series of treatments with radiofrequency on the facial skin ($p < 0.0001$), was observed. CD34 was more abundantly expressed after radiofrequency treatment. No side effects were observed. Conclusion: Treatment with radiofrequency is an effective and non-invasive method of facial skin rejuvenation in older women with t2DM, with a relatively short post-procedure recovery time and low potential for severe adverse effects.

D. Martinovic, S. Lupi-Ferandin, D. Tokic, M. Usljebrka, A. Rados, A. Pojatina, S. Kadic, E. Puizina, A. Mihovilovic, M. Kumric, M. Vilovic, D. Leskur, J. Bozic, **Objective Skin Quality Assessment after Reconstructive Procedures for Facial Skin Defects**, J. Clin. Med. 2022, 11

Abstract: Local random skin flaps and skin grafts are everyday surgical techniques used to reconstruct skin defects. Although their clinical advantages and disadvantages are well known, there are still uncertainties with respect to their long-term results. Hence, the aim of this study was to evaluate outcomes more than one-year post operatively using objective measurement devices. The study included 31 facial defects reconstructed with local random flap, 30 facial defects reconstructed with split-thickness skin grafts (STSGs) and 30 facial defects reconstructed with full-thickness skin grafts (FTSGs). Skin quality was objectively evaluated using MP6 noninvasive probes (Courage + Khazaka GmbH, Cologne, Germany), which measure melanin count, erythema, hydration, sebum, friction and transepidermal water loss. The results showed that there were no significant differences in melanin count, erythema, hydration, sebum level, friction value and transepidermal water loss (TEWL) between the site reconstructed with random local flaps and the same site on the healthy contralateral side of the face. However, both FTSGs and STSGs showed significantly higher levels in terms of TEWL and erythema, whereas the levels of hydration, sebum and friction were significantly lower compared to the healthy contralateral side. Moreover, STSGs resulted in a significant difference in melanin count. These findings imply that the complex pathophysiology of the wound-healing process possibly results in better skin-quality outcomes for random local flaps than skin autografts. Consequently, this suggests that random local flaps should be implemented whenever possible for the reconstruction of facial region defects.

H. Cheng, R. Zhang, F. Zhuo, **Synergistic effect of microneedle-delivered extracellular matrix compound and radiofrequency on rejuvenation of periorbital wrinkles**, Frontiers in Medicine July 2022

Background: A combination of minimally invasive modalities can induce collagen regeneration more quickly and promote the penetration of topical agents, thus promoting skin rejuvenation. In this study, we aimed to investigate the synergistic e_cacy of extracellular matrix compound (ECM-C) *via* microneedle (MN) and radiofrequency (RF) on periorbital wrinkles. Method: A total of 25 participants with periorbital wrinkles were selected for this study. The left and right side of the periorbital area was randomly given ECM-C *via* MN or ECM-C *via* MN combined with RF. MN combined with ECM-C treatment was given 5 times at 2 weeks intervals, whereas RF treatment was given 3 times at 4-week intervals. The following items were assessed: wrinkles by VISIA® system; biophysical parameters such as skin hydration, transepidermal water loss (TEWL), erythema index, and melanin index by CK multiple probe adapter; and skin elasticity and skin thickness by DermaLab Combo®; photographs were taken at the baseline and 2 weeks after the last treatment. Subjective assessments, such as Crow's Feet Grading Scale (CFGS) and Global Aesthetic International Scale (GAIS), were also recorded. Result: A total of 25 participants with an average age of 43 years participated in this trial. Periorbital wrinkles on both sides decreased after the treatment, and the side treated with ECM *via* MN and RF showed better improvement than the other side with ECM-C *via* MN alone. Skin hydration increased after the treatment on both sides. TEWL, skin erythema, and skin melanin indexes were not changed. Skin elasticity and skin thickness increased more on the side of ECM-C *via* MN and RF than on the other side of ECM-C *via* MN alone. The evaluation scores for CFGS improved on either side; however, no difference was found for CFGS and GAIS between intergroup comparisons after the treatment. Conclusion: The objective assessment of wrinkles, elasticity, and thickness of periorbital skin improved more on the side with ECM-C treatment *via* MN combined with RF than on the other side of ECM-C treatment *via* MN

only. However, no statistically significant difference was found between the subjective CFGS and GAIS evaluation of the two sides.

D.Y. Yoon, J.H. Eun, J.Y. Hyon, **Correlation between tear film lipid layer thickness and transepidermal water loss from the ocular area in patients with dry eye disease and in healthy controls**, PLoS One, 2022 Jul 20;17(7)

Purpose: This study aimed to evaluate the correlation between tear film lipid layer thickness and transepidermal water loss (TEWL) from the ocular area in patients with short tear break-up time (TBUT)-type dry eye and healthy controls. Methods: This prospective study included 25 eyes of patients with short TBUT-type dry eye disease and 25 eyes of healthy controls. Results: Tear film lipid layer thickness was measured using an interferometer, and TEWL from the ocular area was measured using a Tewameter TM300 with custom-made goggles. The correlation between tear film lipid layer thickness and TEWL was evaluated. Additionally, other parameters such as TBUT, Schirmer I score, ocular surface staining, the presence and type of meibomian gland dysfunction (MGD), ocular surface disease index (OSDI), and visual analog scale (VAS) scores were evaluated. Tear film lipid layer thickness did not show a significant correlation with TEWL from the ocular area measured using a Tewameter TM300. However, tear film lipid layer thickness was significantly correlated with tear break-up time ($p = 0.004$) and ocular surface staining by NEI (National Eye Institute) scheme ($p = 0.03$). TEWL showed positive correlation with the Schirmer I score ($p = 0.004$). Conclusions: The tear film lipid layer affected the stability of the tear film more than the amount of TEWL in patients with short TBUT dry eye and healthy controls.

E. Peltier, S. Trapp, R. de Salvo, C. Sun, M. Brandt, S. Laing, N. Hennighausen, A. Barrionuevo-Gonzalez, **A new dexpanthenol-containing liquid cleanser for atopic-prone skin: Results from two prospective clinical studies evaluating cutaneous tolerability, moisturization potential, and effects on barrier function**, J Cosmet Dermatol. 2022;21: p. 3859–3866

Background: Gentle cleansing of the skin without further compromising its barrier function and moisture content and being simultaneously devoid of adverse effects on the skin microbiome are important features of body cleansers for atopic-prone skin sufferers. For this population, a new dexpanthenol-containing liquid cleanser (DCLC) was developed. Methods: Two prospective 4-week studies have been conducted. Study 1 investigated the effect of once-daily DCLC on stratum corneum (SC) hydration, transepidermal water loss (TEWL), skin pH, and skin microbiome (all on the volar forearm) in adult subjects with dry skin ($N = 44$). Study 2 explored the cutaneous tolerability of DCLC and its effect on the microbiome biodiversity of the volar forearm skin in infants/children with atopic-prone skin ($N = 33$, aged 6 months to 6 years). In the latter study, DCLC was applied 2–3 days/week in combination with an emollient applied at least twice daily. Results: In Study 1, on Day 29, the mean change in skin surface capacitance from baseline was significantly greater in the forearm test area treated with DCLC than in the contralateral test area (control) treated with water only (5.16 vs. 3.65 a.u.; $p = 0.011$), suggesting long-term SC hydration. DCLC use was not associated with changes in TEWL, skin pH, or microbiome biodiversity if compared to control. In Study 2, the 4-week use of DCLC in combination with an emollient was well tolerated according to pediatrician skin assessment, and no flare-ups were recorded. The microbiome biodiversity did not shift during the study. Conclusion: These findings support the use of DCLC in subjects with atopic-prone skin.

L. Shao, S. Jiang, Y. Li, Y. Shi, M. Wang, T. Liu, S. Yang, L. Ma, **Regular Late Bedtime Signifcantly Affects the Skin Physiological Characteristics and Skin Bacterial Microbiome**, Clinical, Cosmetic and Investigational Dermatology 2022:15, p. 1051–1063

Background: Late bedtime is a common form of unhealthy sleep pattern in adulthood, which influences circadian rhythm, and negatively affects health. However, little is known about the effect of regular late bedtime on skin characteristics, particularly on skin microbiome. Objective: To investigate the changes and effects of the regular late bedtime on skin physiological parameters and facial bacterial microbiome of 219 cases of Chinese women aged 18–38 years living in Shanghai. Methods: Based on the Self-Evaluation Questionnaire, bedtime was categorized as 11:00 PM; thus, the volunteers were divided into early bedtime group (S0) and late bedtime group (S1). The physiological parameters of facial skin were measured by non-invasive instrumental methods, and the skin microbiome was analyzed by 16S rRNA high-throughput sequencing. Results: The skin physiological parameters of the late bedtime group exhibited signifcant decrease in skin hydration content, skin frmness (F4) and elasticity (R2), while TEWL, sebum and wrinkle signifcantly increased. The result indicated that late bedtime signifcantly impaired the integrity of skin barrier, damaged skin structure, and disrupted water–oil balance. Furthermore, the analysis of α-diversity, Sobs, Ace and Chao index were found to signifcantly decrease ($P < 0.05$) in the late bedtime group, suggesting that late bedtime reduced both

the abundance and the diversity of facial bacterial microbiota. Moreover, the abundance of *Pseudomonas* increased signifcantly, while *Streptococcus*, *Stenotrophomonas*, *Acinetobacter, Haemophilus, Actinomyces* and *Neisseria* decreasedsignifcantly. In addition, Spearman correlation analysis revealed strong correlations between the microbiota and the physiologicalparameters. Notably, the abundance of *Pseudomonas* signifcantly positively correlated with skin frmness and elasticity, butsignifcantly negatively correlated with skin hemoglobin content, melanin content and skin hydration. Conclusion: Bedtime is an important factor in maintaining skin health. Regular late bedtime not only damages the skin barrier and skin structure but also reduces the diversity and composition of facial bacterial microbiome.

A. Kazmierska, I. Bolesławska, A. Polanska, A. Danczak-Pazdrowska, P. Jagielski, S. Drzymała-Czyz, Z Adamski, J. Przysławski, **Effect of Evening Primrose Oil Supplementation on Selected Parameters of Skin Condition in a Group of Patients Treated with Isotretinoin—A Randomized Double-Blind Trial**, Nutrients 2022, 14, 2980

Background: Retinoids, which include isotretinoin, reduce sebum levels, the degree ofepidermal wetness (CORN) and cause an increase in transepidermal water loss (TEWL). Weight gain has also been observed in isotretinoin-treated patients. An agent that can reduce the severityof isotretinoin side effects is evening primrose oil (*Oenothera paradoxa*). The purpose of this study was to evaluate the effect of evening primrose oil supplementation in patients with acne vulgaristreated with isotretinoin on skin hydration status (CORN), transepidermal water loss (TEWL), skin oiliness (sebum) and changes in body weight and BMI. Methods: Patients diagnosed with acne were assigned to the isotretinoin-treated group ($n = 25$) or the isotretinoin and evening primrose oil-treated group ($n = 25$). The intervention lasted 9 months. CORN (with a corneometer), TEWL (with a tewameter) and sebum (with a sebumeter) were assessed twice, as well as body weight and BMI (Tanita MC-780). Results: The isotretinoin-treated group showed statistically significantreductions in CORN ($p = 0.015$), TEWL ($p = 0.004$) and sebum ($p < 0.001$) after the intervention. In the group treated with isotretinoin and evening primrose oil, TEWL and sebum levels also decreased significantly ($p < 0.05$), while CORN levels increased from 42.0 ± 9.70 to 50.9 ± 10.4 ($p = 0.017$). A significant decrease in body weight ($p < 0.001$) and BMI ($p < 0.001$) was observed in both groupsafter 9 months of intervention. Conclusions: During isotretinoin treatment, supplementation with evening primrose oil increased skin hydration. However, there were no differences between groups in transepidermal water loss, skin oiliness, weight loss and BMI.

L. Shao, S. Jiang, Y. Li, Y. Shi, M. Wang, T. Liu, S. Yang, L. Ma, **Regular Late Bedtime Signifcantly Affects the Skin Physiological Characteristics and Skin Bacterial Microbiome**, Clinical, Cosmetic and Investigational Dermatology 2022:15, p. 1051–1063

Background: Late bedtime is a common form of unhealthy sleep pattern in adulthood, which influences circadian rhythm, and negatively affects health. However, little is known about the effect of regular late bedtime on skin characteristics, particularly on skin microbiome. Objective: To investigate the changes and effects of the regular late bedtime on skin physiological parameters and facial bacterial microbiome of 219 cases of Chinese women aged 18–38 years living in Shanghai. Methods: Based on the Self-Evaluation Questionnaire, bedtime was categorized as 11:00 PM; thus, the volunteers were divided into early bedtime group (S0) and late bedtime group (S1). The physiological parameters of facial skin were measured by non-invasive instrumental methods, and the skin microbiome was analyzed by 16S rRNA high-throughput sequencing. Results: The skin physiological parameters of the late bedtime group exhibited signifcant decrease in skin hydration content, skin frmness (F4) and elasticity (R2), while TEWL, sebum and wrinkle signifcantly increased. The result indicated that late bedtime signifcantly impaired the integrity of skin barrier, damaged skin structure, and disrupted water–oil balance. Furthermore, the analysis of α-diversity, Sobs, Ace and Chao index were found to signifcantly decrease ($P < 0.05$) in the late bedtime group, suggesting that late bedtime reduced both the abundance and the diversity of facial bacterial microbiota. Moreover, the abundance of *Pseudomonas* increased signifcantly, while *Streptococcus*, *Stenotrophomonas*, *Acinetobacter, Haemophilus, Actinomyces* and *Neisseria* decreasedsignifcantly. In addition, Spearman correlation analysis revealed strong correlations between the microbiota and the physiologicalparameters. Notably, the abundance of *Pseudomonas* signifcantly positively correlated with skin frmness and elasticity, butsignifcantly negatively correlated with skin hemoglobin content, melanin content and skin hydration. Conclusion: Bedtime is an important factor in maintaining skin health. Regular late bedtime not only damages the skin barrier and skin structure but also reduces the diversity and composition of facial bacterial microbiome.

T.K. Leo, E.S. Sing Tan, F. Amini, N. Rehman, E.S. Chye Ng, C.K. Tan, **Effect of Rice (*Oryza sativa* L.) Ceramides Supplementation on Improving Skin Barrier Functions and Depigmentation: An**

Open-Label Prospective Study, Nutrients 2022, 14, 2737

Ceramides plays a crucial role in maintaining skin barrier function. Although foregoing evidence supported beneficial effects of topical ceramides for restoration of the skin barrier, studies on oral ceramides are extremely scarce, with most published data collected from in vivo and in vitro models. Thus, this study aimed to evaluate the efficacy of rice ceramides (RC) supplementation to improve skin barrier function and as a depigmenting agent through comprehensive clinical assessments. This study investigated the beneficial effects of orally administered RC supplementation in 50 voluntary participants. Skin hydration, firmness and elasticity, transepidermal water loss (TEWL), melanin index (MI), erythema index (EI), sebum production, pH, and wrinkle severity were assessed at baseline and during monthly follow-up visits. RC supplementation was found to significantly ($p < 0.01$) improve skin hydration, sebum production, firmness and elasticity, and wrinkle severity for three assessed areas, namely the left cheek, dorsal neck, and right inner forearm. Additionally, RC significantly ($p < 0.01$) reduced the rates of TEWL, levels of MI and EI. Analyses of data indicated that participants at older age were more responsive towards the effect of RC supplementation. Our findings suggest that RC supplementation can effectively improve skin barrier function, reduce wrinkle severity, and reduce pigmentation.

R. Darlenski, G. Wiora, D.G. Nikolaeva, J.W. Fluhr, **A new, multi-sensor open chamber water evaporation device: TEWA-Hex in a controlled study and in an Antarctica expedition**, ISBS Congress Berlin, June 2022

Background and aims of the study Instrumentation technology for transepidermal water loss (TEWL) measurements has not been substantially modified since its introduction by Nilsson in 1977. Recent progresses in sensor development allow new designs in sensor arrangement and innovative data evaluation techniques make new skin parameters accessible. A new generation of probes for TEWL measurements using a matrix of 30 sensors instead of the typical two has been developed. It uses spatial statistical analysis of raw measurement values. The objective of an in vivo study was to compare the new, multi-sensor open chamber water evaporation probe (TM-Hex) for epidermal barrier assessment with the established TM300 probe. The primary endpoint was to test the equivalence or comparability of the established tewameter measurement probe TM300 with the new TM-Hex. Material and methods: Baseline measurements on the volar forearam, repeated measurements and assessement on eight different anatomical locations were performed in 24 healthy volunteers of both gender with the TEWA Hex and the TM300. Real life data were assessed in a very recent study for the TEWA Hex in an Antarctica expedition. Results: We could show an excellent correlation $p<0.001$; R-coefficient=0.9) between TEWA Hex and the TM300. The coefficient of variance (CV) was 11% for TEWA Hex and 19% for TM300. At the different anatomical locations the CV ranked between 7% (right inner upper arm) and 14% (palms).The real life data showed robust results under harsh external conditions. Conclusion: The correlation between TEWA Hex and TM300 along with the robustness of the measurements with TEWA Hex provide evidence that the new probe for assessement of epidermal barrier function is comparable to the TM 300. In most conditions TEWA Hex shows even more accurate measurements than the TM300 probe.

R. Darlenski, P. Menzel, R. Schwarzer, B. Kaestle, M. Arens-Corell, L. Praefke, N. Tsankov, D.G. Nikolaeva, L. Miséry, J.W. Fluhr, **Acidic skin care promotes cutaneous microbiome recovery and skin physiology in an acute stratum corneum stress model**, ISBS Congress Berlin, June 2022

Background *context*: skin microbiome and skin physiology are important indicators of the epidermal homeostasis status. Stress models are able to reveal pathological conditions and modulating effects. *Purpose:* we investigated the cutaneous microbiome (16S-rRNA-gene amplicon sequencing) in relation to skin physiology (barrier function, stratum corneum hydration, surface-pH) after mild tape stripping (TS) without treatment compared to two cosmetic leave-on lotions (pH5.5 vs. pH9.3) in 25 healthy volunteers. Results: TS reduced the alpha-diversity with a recovery over 7 days without treatment. Both lotions significantly accelerated the recovery of the alpha-diversity after 2 days with a slightly higher rate for lotion pH5.5. After TS, the relative abundance of Proteobacteria was increased, whereas Actinobacteria were reduced. TS reduced the relative abundances of skin-associated genera. Taxa compositions normalized after 7 days in all treatment groups. Both lotions accelerated the normalization. Lotion pH9.3 induced a significant increase of skin-pH. Both lotions induced an increase in stratum corneum hydration. Conclusion: The study proved the suitability of an experimental stress model to assess skin surface microbiome in relation to skin physiology. The positive effect of an (acidic) skin care on cutaneous microbiome in relation to skin physiology has a significant modulatory effect on exogenous stress-induced epidermal alterations.

S. Faloni de Andrade, E. José Pinheiro, C. Pereira Leite, M. do Céu Costa, L.M. Rodrigues,

***Cymbopogon citratus* essential oil: Unraveling potential benefits on human skin**, ISBS Congress Berlin, June 2022

Cymbopogon citratus (DC.) Stapf, commonly known as lemongrass, is an important aromatic medicinal plant cultivated in different regions of the world. Its essential oil is widely used for the production of fragrances, cosmetics, detergents, and pharmaceuticals. However, there is no clear evidence of the alleged effects of *C. citratus* (EOCC) on human skin. Thus, the aim of this study was to evaluate the effects of one formulation containing EOCC on skin's physiology in healthy volunteers. A Carboxymethyl cellulose (CMC) gel containing 5% EOCC (Cantinho das Aromaticas, Portugal) was prepared. Twelve healthy volunteers (4 men and 8 women) mean age 36.2 ± 16.3 years old were selected after informed written consent. All procedures were conducted respecting all principles of good clinical practice and approved by the institutional Ethics Committee (approval reference ECTS 04/13). Two areas (3cmx3cm) were drawn in forearm. In one area one formulation containing EOCC was applied with a spatula while in the other only gel (control) was applied. This procedure was repeated for 14 days twice/day (morning and night). In the beginning and by the end of the experiment, transepidermal water loss (Tewameter® CK electronics), hydration (Moisturemeter® DTec), and biomechanics skin (Cutiscan® CK electronics) parameters were measured. Images from High Resolution Sonography (HRS) were also taken at those sites with the Dermascan C (Cortex Tec). A methylnicotinate-provocation test was applied and followed with Laser Doppler Flowmetry (LDF, Perimed AB). A significant decrease in Transepidermal Water Loss (TEWL), as well as a significant increase in epidermal hydration, were observed at these areas treated with the formulation containing EOCC. An increase in firmness and elasticity was also noted. The HRS showed that epidermis is more echogenic after the application of formulation indicating that essential oil penetrates only the most superficial layers of the skin. Noteworthy, the site previously "protected" with the EOCC formulation revealed a reduced microinflammatory reaction following the methylnicotinate challenge. In conclusion, our results suggest that this formulation with EOCC is safe for topical application showing an interesting potential to be applied in skin care.

S. Faloni de Andrade, T. Matos Ferreira, T. Fontes, S. Lopes, R. Menezes, C. Ferreira-Pêgo, L Monteiro Rodrigues, **Associating skin variables to dietary patterns**, ISBS Congress Berlin, June 2022

The link between nutrition and skin physiology has been explored in the last few years. However, the effect of dietary patterns on skin health is still unclear. Here we investigate potential differences in the cutaneous physiology related to omnivorous and vegan-vegetarian regimens and relate with the relevant food groups. Eighty seven healthy volunteers both sexes were recruited after informed written consent. These included 63 omnivores (OM) (28.60±11.35 y.o.) and 24 vegetarian-vegan (VG) (39.80±7.48 y.o.) with similar Body Mass Index (23.20Kg/m2±4,16 and 23.20 Kg/m2±3.22, respectively). Representative variables were transepidermal water loss (Tewameter® CK electronics), epidermal hydration (Moisturemeter® DTec), and biomechanics (Cutometer® CK electronics) measured in five anatomical sites (forehead, cheek, neck, hand, and leg). Skin carotenes were also measured by the Multiple Spatially Resolved Reflection Spectroscopy (MSRRS) (Biozoom® GmbH). Food group intake was assessed using a validated Food Frequency Questionnaire. The statistical analysis was done by Jamovi® Software. The dietary patterns and their impact on the skin were compared using Mann–Whitney test and correlations were investigated by the Spearman rank correlation coefficient ($p<0.05$). Vegetable based diets are believed to bring multiple health benefits. Regarding skin physiology we could not find significant differences between the two groups, including the carotenoid content. TEWL was consistently higher in the VG group but significant differences could only be detected in the neck and leg. Looking for a potential relationship between the most frequent foods consumed by these two groups of participants and skin physiology we found that vegetables, vegetable drinks, milk, yogurt, and cheese showed a significant positive relationship with epidermal water balance. By opposition, alcoholic beverages and fast food showed a significant negative relationship with those variables. The VG group depicted a positive correlation with the carotenoid content, while red meat, viscera, alcoholic beverages, and sugar-sweetened beverages consumption typical of the OM group depicted a negative correlation. Our results are still exploratory being obvious that larger samples are needed for consistency. Nevertheless it is clear that dietary patterns might influence skin physiology and that this theme should be further explored.

Y. Friedewald, C. Heidecke, I. Vogel, **Phospholipids - nature's skin care all-rounders**, PERSONAL CARE Magazine, June 2022, p. 6-7

Phospholipids are highly versatile materials offering both technical and physiological benefits for cosmetic formulations. They number among the body's own building blocks and are essential constituents of the human cell membrane. These compounds are therefore highly biocompatible and benign, and hence predestined for use in superior high-end skin care products. Owing to their

amphiphilic nature and their ability to interact with human skin, phospholipids can serve as active ingredients for skin protection and skin rejuvenation, as carrier systems for cosmetic active ingredients, and as skin friendly emulsifier systems.

A. Charpentier, **How testing innovations is meeting beauty trends**, PERSONAL CARE Magazine, June 2022, p. 25-28

For many years now, every cosmetic product launched on markets around the world has been validated for its safety and efficacy in accordance with the cosmetic regulations of each country. Product performance is changing along with consumer expectations, shopping habits, beauty routines and lifestyles. For the past two years, the health crisis has had an impact on the use of hand hygiene products specifically and on care and make-up products with new products resistant to the conditions of wearing a mask and the increase on the surface of the skin of temperature, humidity, $C0_2$ and friction. In addition, after the decrease in human activities related to confinement, large cities are regaining significant levels of pollution that have a significant impact on the condition of the skin.

A. Kroma, M. Pawlaczyk, A. Feliczak-Guzik, M. Urbańska, D. Jenerowicz, A. Seraszek-Jaros, M. Kikowska, J. Gornowicz-Porowska, **Phytoecdysteroids from *Serratula coronata* L. for Psoriatic Skincare,** Molecules 2022, 27, 3471

Phytoecdysones from Serratula coronata seem to be promising agents for skincare in patients with psoriasis. The aim of the study was to determine the effects of creams containing the extract of S. coronata on psoriatic lesions. Creams with different formulas were prepared: 0-Lekobaza®, 1-Lekobaza®, S. coronata, 2-Lekobaza®, Salicylic acid, 3-Lekobaza®, S. coronata, Salicylic acid. After examination of skin penetration and biosafety, the designated cream was applied twice daily for 6 weeks on 72 psoriatic plaques located on elbows or knees. The lesions were assessed at baseline and follow-up of 6 weeks. The lesions area was measured, and severity of scaling, erythema, and infiltration was assessed using a 5-point scale (from 0—none to 4—very severe). Skin hydration and structure, pH, transepidermal water loss, erythema, and melanin index were analyzed instrumentally. Creams 1, 2, and 3 significantly reduced the area of psoriatic plaques. Improvement in erythema and infiltration was observed for creams 1 and 3. Creams 1–3 reduced scaling. Our study confirmed a beneficial effect of creams containing S. coronata extract on psoriatic lesions.

M.A. Yoo, S.H. Kim, H.S. Han, J.W. Byun, K.H. Park, **The effects of wearing a face mask and of subsequent moisturizer use on the characteristics of sensitive skin,** Skin Research & Technology, May 2022

Background: COVID-19 is a serious respiratory disease, and wearing masks has become essential in daily life. Nevertheless, the number of people complaining of skin problems caused by wearing masks is increasing. Therefore, we investigated the characteristics of changes in sensitive skin caused by wearing a mask. Materials and methods: Twenty healthy Korean women with sensitive skin participated in this study. To determine any skin-related changes caused by mask-wearing, we evaluated redness, hydration, transepidermal water loss (TEWL), and moisture at 2.5 mm below the surface before and 4 h after wearing a Korea Filter 94 mask. In addition, we tested whether applying a moisturizer for 30 min after mask removal could reverse any mask-induced changes. Results: Skin redness and TEWL were significantly increased at 4 h after wearing a mask ($p < 0.05$), otherwise skin hydration and the 2.5 mm moisture were significantly decreased ($p < 0.05$). After applying the moisturizer, skin redness and TEWL were significantly decreased compared to their values 4 h after wearing masks ($p < 0.05$), whereas skin hydration and the 2.5 mm moisture were significantly increased ($p < 0.05$). Moreover, after applying the moisturizer, skin redness and TEWL were significantly reduced compared to the pre-masking baseline ($p < 0.05$), whereas skin hydration was significantly increased ($p < 0.05$); the 2.5 mm moisture showed no significant change. Conclusion: We observed that wearing masks causes physiological changes in sensitive skin, whereas applying a moisturizer after removing the mask improved skin conditions.

D.A. Schmid, M.P. Domingues, A. Nanu, N. Kluger, R. de Salvo, S. Trapp, **Exploratory evaluation of tolerability, performance, and cosmetic acceptance of dexpanthenol-containing dermo-cosmetic wash and sun-care products for tattoo aftercare**, Health Sci. Rep. 2022;5

Background and Aims: Tattoo prevalence has significantly increased over the last decades. Proper tattoo aftercare, such as cleansing, moisturizing, and protection against sunlight, is essential to prevent complications and to keep the beauty of the tattoo. The tolerability, performance, and cosmetic acceptability of two dexpanthenol- containing dermo-cosmetic products, a wash and a sun-care, were investigated on tattooed skin in two separate trials. Methods: Two single-center, exploratory, open-label cosmetic studies were conducted between August and November 2020 to evaluate the dexpanthenol-

containing dermo-cosmetic products. In the first study, healthy adults applied the 2.5% dexpanthenol-containing wash right after their tattoo session daily for 14 consecutive days. In the second study, healthy adults applied the 2.5% dexpanthenol-containing sun-care sun protection factor 50+ cream on existing tattoos that were daily exposed to sunlight for 28 consecutive days. Clinical examination by a dermatologist and self-assessment through subject questionnaires were used to assess the tolerability, acceptance, ease of use, and cosmetic outcomes of both products. Additionally, transepidermal water loss and moisturization assessments were performed to evaluate skin hydration after use of the sun-care product. Results: Both study products were well tolerated, and no product related adverse events were reported during the studies. At least 90% of the study participants appreciated the performance of the dexpanthenol-containing wash and sun-care product, including moisturizing properties, relief of unpleasant sensations, and preservation of the cosmetic appearance of the tattoo. For the sun-care, it was shown that its application supported maintaining the skin barrier of tattooed skin, while keeping it hydrated.

Y. Ahn, M.G. Kim, K. Jo, K.-B. Hong, H.J. Suh, **Effects of Sphingomyelin-Containing Milk Phospholipids on Skin Hydration in UVB-Exposed Hairless Mice**, Molecules 2022, 27, 2545

Reactive oxygen species (ROS) generated by ultraviolet (UV) exposure cause skin barrier dysfunction, which leads to dry skin. In this study, the skin moisturizing effect of sphingomyelincontaining milk phospholipids in UV-induced hairless mice was evaluated. Hairless mice were irradiated with UVB for eight weeks, and milk phospholipids (50, 100, and 150 mg/kg) were administered daily. Milk phospholipids suppressed UV-induced increase in erythema and skinthickness, decreased transepidermal water loss, and increased skin moisture. Milk phospholipidsincreased the expression of filaggrin, involucrin, and aquaporin3 (AQP3), which are skin moisturerelated factors. Additionally, hyaluronic acid (HA) content in the skin tissue was maintained by regulating the expression of HA synthesis- and degradation-related enzymes. Milk phospholipids alleviated UV-induced decrease in the expression of the antioxidant enzymes superoxidase dismutase1 and 2, catalase, and glutathione peroxidase1. Moreover, ROS levels were reduced by regulating heme oxygenase-1 (HO-1), an ROS regulator, through milk phospholipid-mediated activation of nuclear factor erythroid-2-related factor 2 (Nrf2). Collectively, sphingomyelin-containing milk phospholipids contributed to moisturizing the skin by maintaining HA content and reducing ROS levels in UVBirradiated hairless mice, thereby, minimizing damage to the skin barrier caused by photoaging.

M.T. Truchuelo, Ú. Pielasinski-Rodriguez, M. Vitale, **Evaluation of Effectiveness and Tolerance of a Cosmeceutic Regimen Based on Topical Retinoids**, Journal of Clinical & Experimental Dermatology Research, Vol.13 Iss.2, April 2022

Aim: Treatment of aging is challenging. Topical retinol is one of the actives with the most published evidence onits efficacy. The aim of the study was to determine the efficacy and tolerance of a protocol based on the use of high concentrations of retinol (0.5% and 1%). Materials and methods: A prospective pilot study of clinical experience was conducted in 20 volunteers with some degree of skin aging. They used a treatment protocol for 12 weeks, consisting in a progressively increasing concentration of retinol at nights (beginning 0,5% and 1% within the subsequent weeks) combined with a nourishing cream based on growth factors and sunscreen at daytime. Five evaluations were registered (D0, D15, D50, D70, D90). Objective measurements were made (cutometer, tewameter and Visia) together with the determination of the severity of aging, patient and investigator global assessment (PGA and IGA), and improvement in skin aging based on patient and investigator opinion and side effects on a semiquantitative scale (0-3). Results: A significant improvement in skin firmness was obtained starting at D50, reaching its maximum increase (20%) at D90. This improvement was consistent with researcher and patient determinations and with the improvement obtained in D90 on the RAO Goldman aging scale. Regarding tolerance, the increase in transepidermal water loss was, as expected, higher between visits at the beginning of the study. Side effects were greater at D50 when the retinol-based formulation was applied more frequently, but decreased subsequently. In most of the patients the side effects were null or slight in all visits. Conclusion: This specific regimen of retinization consisting of the progressive use of high concentrations of retinol (0.5% and 1%), showed efficacy in improving the firmness and visible signs of skin aging. Furthermore, it was very well tolerated by most of the patients.

D. Kocsis, S. Horváth, Á. Kemény, Z. Varga-Medveczky, C. Pongor, R. Molnár, A. Mihály, D. Farkas, B. Márton Naszlady, A. Fülöp1, A. Horváth, B. Rózsa, E. Pintér, R. Gyulai, Franciska Erdő, **Drug Delivery through the Psoriatic Epidermal Barrier - A "Skin-On-A-Chip" Permeability Study and Ex Vivo Optical Imaging**, Int. J. Mol. Sci. 2022, 23, 4237

Psoriasis is a chronic inflammatory disease with unmet medical needs. To clarify potential therapeutic targets, different animal models have been developed. In the current study, imiquimod-

induced psoriasiform dermatitis was used for monitoring the changes in skin thickness, transepidermal water loss, body weight, blood perfusion and drug permeability for a topical cream formulation of caffeine, both in wild type and in knock out mice. Morphological characterization of control and diseased tissues was performed by scanning electron microscopy and two-photonmicroscopy. The chemically induced psoriatic group showed increased skin permeability for the model drug during disease progression. In wild type and TRPA1 KO mice, however, enhanced skin thickness and hyperkeratosis blocked further increase of drug penetration at the late phase (96 h).These results indicate that topical drug therapy can be more effective in early phases of plaque development, when skin thickness is lower. Although paracellular connections (tight junctions) are looser in the advanced phase, hyperkeratosis blocks drug delivery through the transappendageal routes. Novel drug formulations may have the potency for effective drug delivery across the epidermal barrier even in the advanced phase. For development of more effective topical drugs, further research is proposed to explore drug penetration both in healthy and diseased conditions.

I. De Decker, H. Hoeksema, E. Vanlerberghe, A. Beeckman, J. Verbelen, P. de Coninck, M.M. Speeckaert, P. Blondeel, S. Monstrey, K.E.Y Claes, **Occlusion and hydration of scars: moisturizers versus silicone gels**, Burns, April, 2022

Background: The mainstay of non-invasive scar management, consists of pressure therapy with customized pressure garments often combined with inlays, hydration by means of silicones and/or moisturizers as well as UV protection. It is generally accepted that scar dehydration resulting from impaired barrier function of the stratum corneum and expressed by raised transepidermal water loss (TEWL) values, can lead to increased fibroblast activity and thereby hypertrophic scar formation. However, we have reached no consensus on exactly what optimal scar hydration is nor on barrier function repair: by means of silicone sheets, liquid silicone gels or moisturizers. Occlusive silicone sheets almost completely prevent TEWL and have been shown to be effective. Nevertheless, many important disadvantages due to excessive occlusion such as difficulties in applying the sheets exceeding 10-12 h, pruritus, irritation, and maceration of the skin are limiting factors for its use. To avoid these complications and to facilitate the application, liquid silicone gels were developed. Despite a reduced occlusion, various studies have shown that the effects are comparable to these of the silicone sheets. However, major limiting factors for general use are the long drying time, the shiny aspect after application, and the high cost especially when used for larger scars. Based on excellent clinical results after using three specific moisturizers for scar treatment in our patients, we wanted to investigate whether these moisturizers induce comparable occlusion and hydration compared to both each other and the widely recognized liquid silicone gels. We wanted to provide a more scientific basis for the kind of moisturizers that can be used as a full-fledged and cost-effective alternative to silicone gel. Methods: A total of 36 healthy volunteers participated in this study. Increased TEWL was created by inducing superficial abrasions by rigorous (20x) skin stripping with Corneofix® adhesive tape in squares of 4 cm^2. Threemoisturizers and a fluid silicone gel were tested: DermaCress, Alhydran, Lipikar and BAP Scar Care silicone gel respectively. TEWL reducing capacities and both absolute (AAH) and cumulative (CAAH) absolute added hydration were assessed using a Tewameter® TM300 and a Corneometer® CM825 at different time points for up to 4 h after application. Results: We found an immediate TEWL increase in all the zones that underwent superficial abrasions by stripping. Controls remained stable over time, relative to the ambient condition. The mean percentage reduction (MPR) in TEWL kept increasing over time with Alhydran and DermaCress, reaching a maximum effect 4 h after application. Silicone gel reached maximal MPR almost immediately after application and only declined thereafter. The silicone gel never reached the minimal MPR of Alhydran or DermaCress. Hydration capacity assessed through CAAH as measured by the Corneometer was significantly less with silicone gel compared to the moisturizers. Compared to silicone gel Lipikar provided similar occlusion and the improvement in hydration was highly significant 4 h after application. Conclusion: Based on the results of both our previous research and this study it is clearly demonstrated that the occlusive and hydrative effect of fluid silicone gel is inferior to the moisturizers used in our center. Lipikar hydrates well but is less suitable for scar treatment due to the lack of occlusion. A well-balanced occlusion and hydration, in this study only provided by Alhydran and DermaCress, suggests that moisturizers can be used as a scar hydration therapy that replaces silicone products, is more cost-effective and has a more patient-friendly application.

A. Ziemlewska, Z. Nizioł-Łukaszewska, M Zagórska-Dziok, T. Bujak, M. Wójciak, I. Sowa, **Evaluation of Cosmetic and Dermatological Properties of Kombucha-Fermented Berry Leaf Extracts Considered to Be By-Products**, Molecules 2022, 27, 2345

Leaves of *Rubus fruticosus* L., *Vaccinum myrtillus* L., *Ribes nigrum* L. and *Fragaria vesca* L. are considered agro-waste of the berry industry, but they can be a rich source of valuable bioactive

compounds used in cosmetic industry. In this study, kombucha-fermented and non-fermented extracts were compared in terms of chemical composition and biological activity. Polyphenol compounds were identified by HPLC/DAD/ESI-MS. The antioxidant potential was analyzed by evaluating the scavenging of intracellular free radicals contained in keratinocytes and fibroblasts and by DPPH and ABTS assay, obtaining a higher radical scavenging capacity for the ferments, especially for *R. fruticosus* and *V. myrtillus* ferments. Assessment of the cytotoxicity on skin cell lines showed their positive effect on the viability of fibroblasts and keratinocytes (especially for the ferments after 10 days of fermentation). The potential anti-ageing properties were determined by their ability to inhibit the activity of metalloproteinases, obtaining almost 30% inhibition of collagenase and elastase in the case of fermented *V. myrtillus*. Moreover, when the samples were applied to the skin, the positive effect of ferments on skin hydration and pH was demonstrated, which indicates that kombucha berry leaf extracts may be an innovative cosmetic ingredient.

J. Sahmel, G. Ramachandran, **Potential Influence of Skin Hydration and Transepidermal Water Loss on the Dermal Transfer and Loading of Elemental Metallic Lead**, Ann Work Expo. Health, April 2022

The factors influencing transfer of chemicals or other contaminants to and from the surface of the skin are often poorly understood. Previous research has indicated that environmental conditions, skin hydration, and repeated contacts may all influence the quantity of dermal transfer. The aim of this analysis was to evaluate the influence of skin hydration and condition on quantitative chemical transfer in a series of systematic measurements using human subjects for 5 and 10 repeated contacts. Elemental metallic lead was used as the exemplar test substance for the measurements collected. Skin hydration index (HI) was assessed using a corneometer and skin condition and barrier function were measured using an open-chamber transepidermal water loss (TEWL) instrument. Results indicated that for the palmar surface of the index finger where sampling was conducted, the relative hydration level of the skin was higher for males (n = 6) versus females (n = 4) (mean HI = 4.0 for females; mean HI = 5.5 for males) but this difference was not statistically significant. Overall, the skin hydration level was not significantly associated with dermal loading for either the 5 contact scenario (Pearson correlation = 0.27; R2 = 0.07; P = 0.45) or the 10 contact scenario (Pearson correlation = 0.26; R2 = 0.07; P = 0.47). When the results were stratified by higher versus lower hydration levels (HI = 1-5 versus HI = 5-10), for the higher hydration levels (HI = 5-10; mean HI = 7), there was a moderately positive association between skin hydration and loading, but this was not statistically significant for either the 5 contact scenario (Pearson correlation = 0.75; R2 = 0.56; P = 0.15) or the 10 contact scenario (Pearson correlation = 0.6; R2 = 0.36; P = 0.28). No clear relationship was observed between the lower hydration levels (HI = 1-5) and dermal loading. For the palmar index finger, there was a negative correlation between the TEWL measurements and both the 5 contact (Pearson correlation = -0.45; R2 = 0.2; P = 0.19) and 10 contact (Pearson correlation = -0.3; R2 = 0.09; P = 0.4) scenarios, but this was not statistically significant. The results of this study are consistent with the limited results of other analyses, which have suggested that there may be nuances with respect to the effects of skin hydration on the quantitative dermal transfer to and from the skin, although additional data are needed to better understand these potential differences.

H. Stettler, R. de Salvo, M. Brandt, A.-K. Effertz, S. Laing, S. Trapp, **Performance and Acceptability of a New Dexpanthenol-Containing Hand Cream in Subjects with Sensitive and Very Dry Skin: A Randomized Controlled Study,** Cosmetics 2022, 9, 44

Dry, sensitive skin is a common condition that is associated with lack of water in the stratum corneum (SC). The SC of dry skin sufferers displays an altered lipid organization/composition and lipid content, thereby markedly contributing to the development of impaired skin barrier function with increased transepidermal water loss (TEWL) and consequently reduced skin hydration. Often, dry skin involves the hands. Dry handscan be a condition in itself, but in most instances, it is triggered by environmental factors, such as frequent washing, cold weather, or exposure to chemicals/detergents. The hands feel dry and rough; they are tense, reddened, and painful cracks appear. People with dry hands have an increased risk of eczema formation. Regular use of a moisturizing hand cream can help to restore hydration and barrier function of the skin as illustrated by a study in healthy subjects showing that skin dryness and roughness caused by frequent hand washing can be alleviated by applying a moisturizing hand cream after each hand wash. However, to be accepted by users, a hand cream must have special features in addition to its moisturizing effect. It must be absorbed quickly so that the hands are immediately ready for use again. The hand cream should be non-greasy and non-sticky and instantly relieve the feeling of tightness and roughness of dry hands.

S.Y. Kim, T. Hong Yoon, J. Na, S.J. Yi, Y. Jin, M. Kim, T.-H. Oh, T.-W. Chung, **Mesenchymal Stem Cells and Extracellular Vesicles Derived from Canine Adipose Tissue Ameliorates Inflammation,**

Skin Barrier Function and Pruritus by Reducing JAK/STAT Signaling in Atopic Dermatitis, Int. J. Mol. Sci. 2022, 23, 4868

Canine atopic dermatitis (AD) is a common chronic inflammatory skin disorder resulting from imbalance between T lymphocytes. Current canine AD treatments use immunomodulatory drugs, but some of the dogs have limitations that do not respond to standard treatment, or relapse after a period of time. Thus, the purpose of this study was to evaluate the immunomodulatory effect of mesenchymal stem cells derived from canine adipose tissue (cASCs) and cASCs-derived extracellular vesicles (cASC-EVs) on AD. First, we isolated and characterized cASCs and cASCs-EVs to use for the improvement of canine atopic dermatitis. Here, we investigated the effect of cASCs or cASC-EVs on DNCB-induced AD in mice, before using for canine AD. Interestingly, we found that cASCs and cASC-EVs improved AD-like dermatitis, and markedly decreased levels of serum IgE, (49.6%, $p = 0.002$ and 32.1%, $p = 0.016$ respectively) epidermal inflammatory cytokines and chemokines, such as IL-4 (32%, $p = 0.197$ and 44%, $p = 0.094$ respectively), IL-13 (47.4%, $p = 0.163$, and 50.0%, $p = 0.039$ respectively), IL-31 (64.3%, $p = 0.030$ and 76.2%, $p = 0.016$ respectively), RANTES (66.7%, $p = 0.002$ and 55.6%, $p = 0.007$) and TARC (64%, $p = 0.016$ and 86%, $p = 0.010$ respectively). In addition, cASCs or cASC-EVs promoted skin barrier repair by restoring transepidermal waterloss, enhancing stratum corneum hydration and upregulating the expression levels of epidermal differentiation proteins. Moreover, cASCs or cASC-EVs reduced IL-31/TRPA1-mediated pruritus and activation of JAK/STAT signaling pathway. Taken together, these results suggest the potential of cASCs or cASC-EVs for the treatment of chronic inflammation and damaged skin barrier in AD orcanine AD.

W. Liu, L. Jie, D. Liu, E.T. Makino, J. Krutmann, R.C. Mehta, **Protective effects of a day/night dual-antioxidant serum on skin: A randomized, regimen-controlled study in Chinese women exposed to air pollution**, J Cosmet Dermatol. 2022

Background: Chronic exposure to air pollution can negatively affect skin health. Aims: To assess the efficacy of the LUMIVIVE® System (LVS), a skincare system consisting of individual day and night serums, in Chinese women exposed to air pollution. Patients/Methods: In this single-center, vehicle-controlled study, eligible females (mean age, 49.02 years) were randomized 1:1 to treatment group (LVS plus basic moisturizer) or control group (basic moisturizer). Skin color, sebum content, barrier function, elasticity, and texture were measured at baseline and at each follow-up visit (days 28, 56, and 84). Air pollution parameters were collected throughout the study. Results: Air pollution levels, including PM2.5 and NO2, were consistently high during the study. The treatment group showed significantly higher skin color L* ($p \leq 0.0001$) and lower a* values ($p \leq 0.05$) at all follow-up visits compared with the control group, indicating lower skin pigmentation and redness, respectively. Skin color L* and a* values remained unchanged over time for the control group but were significantly different at all follow-up visits compared to baseline ($p \leq 0.0001$ and $p \leq 0.05$, respectively) for the treatment group. There was an increasing trend for sebum content in the control group, which was not observed in the treatment group. Both groups showed improvements over time in other skin physiology parameters. Conclusions: The current analysis demonstrates the efficacy of LVS plus basic moisturizer compared with basic moisturizer alone to reduce skin pigmentation and redness, as well as to mitigate sebum production, in Chinese women exposed to air pollution.

Y.-M. Ham, S.-A. Yoon, H. Hyeon, H.-B. Hyun, S.-C. Kim, B. Go, Y.-H. Jung, W.-J. Yoon, **Clinical Evidence of Effects of Green Mandarin (Putgyul) Extract on Skin Aging: A Randomized, Double Blind, Placebo-Controlled Study**, Nutrients 2022, 14, 1352

Green mandarins are widely consumed unripe as mandarin oranges (Citrus unshiu Marcov.), which exhibit anti-inflammatory and anti-wrinkle effects by inhibiting the production of inflammatory cytokines and matrix metalloproteinase. A randomized, double-blind, placebo-controlled clinical study was performed to verify the skin improvement efficacy and safety of green mandarin extract (PTE). For the standardization of PTE, narirutin was set as a marker compound, and PTE with a constant narirutin content was prepared for the study. After randomizing subjects with periorbital wrinkles, they were orally administered PTE (300 mg/day) or a placebo for 12 weeks. Periorbital wrinkles were measured using PRIMOSCR SF. Skin elasticity, moisture content, transepidermal water loss, and gloss were also measured. In the study results, the depth, volume, and skin roughness of the periorbital wrinkles were significantly improved compared to the control group ($p = 0.011$, 0.009, and 0.004, respectively). The survey confirmed that the skin condition improved after PTE consumption for 12 weeks. No adverse reactions associated with PTE were observed during the study period. Thus, the results demonstrate that PTE effectively improves UV-induced skin wrinkles. Therefore, it is considered that PTE has sufficient value as a functional food ingredient that can prevent skin aging.

H.M. Kim, Y.M. Lee, E.H. Kim, S.W. Eun, H.K. Sung, H. Ko, S.J. Youn, Y. Choi, W. Yamada, S.M. Shin, **Anti-Wrinkle Efficacy of Edible Bird's Nest Extract: A Randomized, Double-Blind, Placebo-Controlled, Comparative Study**, Front. Pharmacol., Volume 13, March 2022

This study aimed to evaluate skin health's functional improvement, such as wrinkles, elasticity, moisture, and whitening, and safety following the consumption of "edible bird's nest extract" for 12 weeks by women. This single-center, double-blinded, parallel-group, placebo-controlled study included women aged 40–60 years. Our primary purpose was to assess improvement in skin wrinkles, elasticity, and moisture after 12 weeks using an SV700, cutometer, and corneometer, respectively, compared to baseline measurements. Our secondary purpose was to evaluate skin wrinkle, elasticity, and moisture changes at 4 and 8 weeks from baseline using the aforementioned equipment, and measure transdermal water loss and melanin and erythema indexes using a tewameter and mexameter, respectively. Experts performed the visual evaluation of skin wrinkles at 4, 8, and 12 weeks from baseline. The participants were randomly allocated in a 1:1 ratio into the edible bird's nest extract or the placebo group with 43 participants each, where they consumed 100 mg of the extract or placebo, respectively, daily for 12 weeks. The outcomes were measured at every visit. In this study, upon comparing changes in the skin elasticity value between the two intake groups at 12 weeks of ingestion, skin elasticity in the edible bird's nest extract group decreased significantly compared with that in the placebo group. Adverse reactions were absent in both groups. In the case of laboratory test results, changes before and after the ingestion of the extract were within the normal range, thus indicating no clinically significant difference. The edible bird's nest extract was effective in improving skin wrinkles. Moreover, it is beneficial for skin health and can be used as a skin nutritional supplement. Compared with the placebo, the edible bird's nest extract was identified as safe.

J.I. Seo, H.I. Ham, J.H. Baek, M.K. Shin, **An objective skin-type classification based on non-invasive biophysical parameters**, J Eur Acad Dermatol Venereol, Volume 36, Issue 3, March 2022, p. 444-452

Background: Despite the invention of various non-invasive bioengineering tools, skin-type analysis has largely been based on subjective assessments. However, advancements in the functional cosmetic industry and artificial intelligence-assisted dermatology are creating a greater demand for an objective skin-type classification system. Objectives: To propose an objective skin-type classification system solely based on non-invasive, bioengineering devices; provide reference values applicable to the Korean population; and compare our reference values with those of published studies. Methods: Biophysical parameter measurements were obtained from the 2018 International Skin Characteristics Data Bank Project conducted by the Foundation of Korea Cosmetic Industry Institute. The participants were 434 healthy South Korean adults. Each participant was assessed using eight bioengineering devices (Tewameter®, pH-meter®, Corneometer®, Sebumeter®, Cutometer®, Spectrophotometer®, PRIMOS® lite, and Janus®). The measurements were divided into tertiles to determine reference points. Results: Our objective skin-type classification consists of five main categories (sensitivity, hydration, oiliness, elasticity, and skin tone) and five corresponding subcategories (erythema, roughness, pores, wrinkles, and pigmentation, respectively). Each skin type was assigned based on the reference point of the biophysical parameter, which was established as the tertile value associated with 'unfavourable' skin characteristics. Individuals were categorized as having sensitive skin when the TEWL scores were over 18.0 $g/m^2/h$ or the pH was over 5.45; dehydrated skin when the corneometric value measured below 47.17 A.U.; oily skin when the sebumetric value exceeded 70 $\mu g/cm^2$; and loose skin when the cutometric R^2 value was below 0.68 E/mm. Conclusions: This study is the first to provide a comprehensive skin-type classification system based solely on non-invasive biophysical parameters. As measurement data accumulate, the reference points will progress to become more accurate, and they will be subdivided according to gender, age, and ethnic group. Therefore, our classification system serves as a basis for artificial intelligence-based skin-type analysis.

C. Pichler, J. Freidl, M. Bischof, M. Kiem, R. Weißböck-Erdheim, D. Huber, G. Squarra, P.C. Murschetz, A. Hartl, **Mountain Hiking vs. Forest Therapy: A Study Protocol of Novel Types of Nature-Based Intervention**, Int. J. Environ. Res. Public Health 2022, 19, 3888

Introduction: The global rise of urbanization has much triggered scientific interest in how nature impacts on human health. Natural environments, such as alpine landscapes, forests, or urban green spaces, are potential high-impact health resources. While there is a growing body of evidence to reveal a positive influence of these natural environments on human health and well-being, further investigations guided by rigorous evidence-based medical research are very much needed. Objective: The present study protocol aims at testing research methodologies in the context of a prospective clinical trial on nature-based interventions. This shall improve the standards of medical research in human–nature interactions. Methods: The ANKER Study investigates the influence of two novel types of nature-based

therapy—mountain hiking and forest therapy—on physiological, psychological, and immunological parameters of couples with a sedentary lifestyle. Two intervention groups were formed and spent a seven-day holiday in Algund, Italy. The “forest therapy group” participated in daily guided low-power nature connection activities. The “hiking group”, by contrast, joined in a daily moderate hiking program. Health-related quality of life and relationship quality are defined as primary outcomes. Secondary outcomes include nature connection, balance, cardio-respiratory fitness, fractional exhaled nitric oxide, body composition and skin hydration. Furthermore, a new approach to measure health-related quality of life is validated. The so-called “intercultural quality of life” comic assesses the health-related quality of life with a digitally animated comic-based tool.

T. Klotz, A. Ibrahim, G. Maddern, Y. Caplash, M. Wagstaff, **Devices measuring transepidermal water loss: A systematic review of measurement properties,** Skin Research & Technology, March 2022

Objective: The objective of this review is to examine the reliability and measurement error of devices that measure transepidermal water loss (TEWL). Introduction: TEWL is a physiological property of skin which increases when the epidermis is damaged. It is, therefore, a commonly utilised measure of skin barrier integrity. Devices measuring TEWL are available as open, semi-open or closed chamber. Studies of reliability examine the consistency of measurement, and/or responsiveness whereas measurement error scores in absolute terms the amount of error due to sources of variation. Inclusion criteria: Studies examining the reliability and/or measurement error of TEWL measurement devices were included. Studies that only report on measurement of TEWL outcomes without examination of reliability and/or measurement error were excluded. Methods: The search strategy aimed to locate published and unpublished studies. Databases searched included PubMed, Embase, CINAHL and Web of Science, utilising identified keywords and limited to studies in English. Grey literature sources were searched to identify any unpublished documents. Study selection using the inclusion criteria was then assessed by two reviewers for methodological quality utilising the COnsensus-based Standards for the selection of health Measurement Instruments (COSMIN) risk of bias tool to assess the reliability and measurement error of outcome measurement instruments. Results: A total of 22 devices were examined in the 38 included studies. The quality of study design was on average rated as ‘Adequate’ however reliability and measurement error statistical methods were on average rated as ‘Doubtful’. Discussion and conclusion: TEWL measurement devices were found to demonstrate good reliability and frequently correlated with other devices. However, measurement error was highly variable but improves under in vitro conditions. Future research should consider risk of bias factors when designing studies.

C. Zanchetta, D. Vilanova, C. Jarrin, A. Scandolera, E. Chapuis, D. Auriol, P. Robe, J. Dupont, L. Lapierre, R. Reynaud, **Bacterial taxa predictive of hyperpigmented skins**, Health Sci. Rep. 2022;5: e609.

Background and Aims: Dark spots, brown spots, or hyperpigmented spots (HPS) are oval or irregular brown areas of skin. Their emergence is associated with dysregulation of the immune system, and may also be caused by a deficiency in stromal cell-derived factor-1, leading to perturbed melanogenesis and accumulation of melanosomes within neighboring keratinocytes. The skin microbiota (living microorganisms present on the surface of the skin) is known to play essential roles in maintaining skin homeostasis and in regulating the immune system. Here, we investigated whether the microbiota could play a role in the emergence of HPS. Methods: The clinical study involved 38 European women, selected from among 74 volunteers. Participants were divided into two groups depending on the spot areas measured on their faces. The study was designed to avoid conflicting factors: both groups presented similar skin pH, hydration, transepidermal water loss, and sebum levels. The two cohorts were also age-matched, with a mean of 29-years-old for both. Results: Alpha-diversity of the microbiota was similar for the two groups. On skins with more HPS, seven bacterial genera were identified in significantly higher proportions and included opportunistic pathogens and inflammatory bacteria. Six bacterial genera, including bacteria showing antioxidant and anti-UV properties, were identified in significantly higher proportions on less spotted skins. Cross- domain association networks revealed distinct co-occurrences of genera between the two groups, suggesting nonidentical community structures and exchanges, depending on the HPS status. Conclusion: Our results reveal specific microbiota composition and networks on skins based on HPS status. Changes could alter communication with the immune system, leading to the emergence of dark spots. As an essential part of the overall skin ecosystem, and through its interaction with the skin matrix, the skin microbiota and its maintenance could be considered a new target for skincare applications.

C.M. Keck, A. Abdelkader, O. Pelikh, S. Wiemann, V. Kaushik, D. Specht, R.W. Eckert, R.M. Alnemari, H. Dietrich, J. Brüßler, **Assessing the Dermal Penetration Efficacy of Chemical Compounds with the Ex-Vivo Porcine Ear Model**, Pharmaceutics 2022, 14, 678

Background: The ex vivo porcine ear model is often used for the determination of the dermal penetration efficacy of chemical compounds. This study investigated the influence of the post-slaughter storage time of porcine ears on the dermal penetration efficacy of chemical compounds. Methods: Six different formulations (curcumin and different fluorescent dyes in different vehicles and/or nano carriers) were tested on ears that were (i) freshly obtained, (ii) stored for 24 or 48 h at 4 ◦C after slaughter before use and (iii) freshly frozen and defrosted 12 h before use. Results: Results showed that porcine ears undergo post-mortem changes. The changes can be linked to rigor mortis and all other well-described phenomena that occur with carcasses after slaughter. The post-mortem changes modify the skin properties of the ears and affect the penetration efficacy. The onset of rigor mortis causes a decrease in the water-holding capacity of the ears, which leads to reduced penetration of chemical compounds. The water-holding capacity increases once the rigor is released and results in an increased penetration efficacy for chemical compounds. Despite different absolute penetration values, no differences in the ranking of penetration efficacies between the different formulations were observed between the differently aged ears. (4) Conclusions: All different types of ears can be regarded to be suitable for dermal penetration testing of chemical compounds. The transepidermal water loss (TEWL) and/or skin hydration of the ears were not correlated with the ex vivo penetration efficacy because both an impaired skin barrier and rigor mortis cause elevated skin hydration and TEWL values but an opposite penetration efficacy. Other additional values (for example, pH and/or autofluorescence of the skin) should, therefore, be used to select suitable and non-suitable skin areas for ex vivo penetration testing. Finally, data from this study confirmed that smart Films and nanostructured lipid carriers (NLC) represent superior formulation strategies for efficient dermal and transdermal delivery of curcumin.

C. Theerawattanawit, P. Phaiyarin, S. Wanichwecharungruang, N. Noppakun, P. Asawanonda, C. Kumtornrut, **The Efficacy and Safety of Chitosan on Facial Skin Sebum**, Skin Pharmacol Physiol 2022;35: p. 23–30

Introduction: Seborrhea or oily skin has been one of the most common complaints affecting both men and women physically and psychologically. Chitosan is a biopolymer obtained from the alkaline deacetylation of chitin. Due to its positively charged nature, chitosan can effectively bind to lipids. Therefore, chitosan nanoparticle (CN) formulation may benefit in the reduction of skin sebum. Objective: The aim of this study was to evaluate the efficacy and safety of CN formulation in the reduction of skin sebum. Method: The study was a randomized, double-blinded, placebo-controlled trial in 24 participants aged 18-40 years with clinical seborrhea. Participants were randomly assigned to apply the CN and gum (CN-G) or placebo (gum alone) twice daily for 4 weeks. Sebum level, corneometry, transepidermal water loss (TEWL), and clinical seborrhea grading were evaluated at baseline and week 2 and 4. Results: In the T-zone, sebum levels in the CN-G group were significantly lower than the placebo group at week 4 ($p = 0.043$), while for the U-zone, sebum levels were not different between groups. There were no statisticaldifferences in corneometry and TEWL at any visit. Although the clinical seborrhea grading in CN-G was lower, itwas not significantly different from the placebo. A few cases reported mild and self-limiting scaling and acneiform eruption. Conclusion: The CN-G gel could significantly reduce sebum levels on seborrhea patients with acceptable safety profiles.

P. Montero, M. Pérez-Leal, J.A. Pérez-Fidalgo, C. Sanz, C. Estornut, I. Roger, J. Milara, A. Cervantes, J. Cortijo, **Paclitaxel Induces Epidermal Molecular Changes and Produces Subclinical Alterations in the Skin of Gynecological Cancer Patients**, Cancers 2022, 14, 1146

Background: Paclitaxel is a microtubule-stabilizing chemotherapeutic agent. Despite its widespread use, it damages healthy tissues such as skin. The goal of this study was to prove that the real impact of paclitaxel-induced skin toxicity could be underestimated because the adverse events might appear asymptomatic. Methods: Gynecological cancer patients were recruited. Skin parametersmeasurements were taken after three and six paclitaxel cycles. Measurements were conducted using specific probes which measure hydration, transepidermal water loss (TEWL), sebum, elasticity and firmness, erythema, roughness, smoothness, skin thickness, and desquamation levels. Further, a 3D epidermis model was incubated with paclitaxel to analyze gene and protein expression of aquaporin 3, collagen type 1, elastin, and fibronectin. Results: Paclitaxel induced alterations in the skin parameters with no visible clinical manifestations. Gynecological cancer patients under paclitaxel treatment had a decrease in hydration, TEWL, sebum, elasticity, and thickness of the skin, while erythema, roughness, and desquamation were increased. The molecular markers, related to hydration and the support of the skin layers, and analyzed in the 3D epidermis model, were decreased. Conclusions: Results suggest that paclitaxel modifies gene and protein expression of skin-related molecular markers, and impairs different physical, physiological, and biomechanical properties of the skin of cancer patients at a subclinical level.

M. Termer, A. Jaeger, C. Carola, A. Salazar, C. Keck, H. Kolmar, J. von Hagen, **MeO-MBM: Protect Skin from UV induced-Damage and Prevent Signs of Inflammation While Improving the Skin Barrier**, IFSCC Magazine Volume 24, No. 4, February 2022

Sun protection is important in skin care and requires special attention as ineffcient protection may trigger severe diseases like skin cancer and less serious effects with a physiological and psychological impact on humans like polymorphic light eruption (PLE). The reduce-improve-protect (RIP) concept is of importance in skin care for avoiding onset of UV irradiation-induced diseases or damage to human skin. Potential molecular targets of methoxymonobenzoylmethane (MeO-MBM) were identifed by in silico docking experiments followed by microarray analysis of genes after MeO-MBM treatment. Randomized, double-blind, intraindividual comparison vs. placebo studies were conducted to assess the effect of MeO-MBM in vivo. The effect after UV-induced inflammation was evaluated in a protective and curative set-up on the basis of the change in blood flow. The barrier function of the skin after treatment with MeO-MBM was studied by measuring the change in transepidermal water loss (TEWL), skin scaling and skin thickness. Additionally, the effect of MeO-MBM after UV-induced stress on the activation of ferritin in human explants was determined ex vivo. From this study, it can be concluded that MeO-MBM reduces (R) inflammation and prevents downstream effects like irritation, redness and itching. Moreover, MeO-MBM improves (I) the skin barrier and protects (P) the skin from UV-induced cellular damage. The benefcial combinatorial effects of MeO-MBM were demonstrated with in silico, in vitro, ex vivo and in vivo experiments.

M. Green, N. Kashetsky, A. Feschuk, H.I. Maibach, **Transepidermal water loss (TEWL): Environment and pollution—A systematic review**, Skin Health and Disease, 2022

Introduction: Transepidermal water loss (TEWL) is an objective measurement of skin integrity measured as the amount of water lost across the stratum corneum. TEWL varies greatly across variables such as age and anatomic location, and disruptions in the skin barrier have been linked to inflammatory dermatoses such as psoriasis and atopic dermatitis. Impact of environmental conditions and pollution on TEWL has yet to be determined. Accordingly, this review summarizes effects of environmental conditions and pollution on TEWL. Methods: A comprehensive literature search was performed using Embase, PubMed, and Web of Science to fnd human studies that provided data on environmental conditions and/or pollution and TEWL. Results: In total, 15 studies were included, with 11 studies examining environmental and seasonal conditions on TEWL and four examining pollution. All studies examining pollution showed increased TEWL in people exposed to particulate matter or NO2. Contradictory results were found on the effects of season and climate across the 11 studies, with no consensus reached. Conclusion: Exposure to pollution is reported to cause increases in TEWL, likely through free radical damage. Signifcant discrepancies exist among current literature as to the effects of season and climate on TEWL. There is a need to continue examining environmental variables other than temperature and relative humidity, such as atmospheric and steam pressure that may impact TEWL.

D. Léger, C. Gauriau, C. Etzi, S. Ralambondrainy, C. Heusele, S Schnebert, A. Dubois, D. Gomez-Merino, M. Dumas, **"You look sleepy…" The impact of sleep restriction on skin parameters and facial appearance of 24 women**, Sleep Medicine 89 (2022), p. 97-103

Background: Total sleep deprivation has a visible impact on subjective facial appearance. However, there is a lack of knowledge on how moderate sleep restriction objectively impairs skin quality and facial aspect. Methods: Twenty-four healthy good-sleeping women, aged 30e55, volunteered for this study on the impact of sleep restriction (SR) on their facial skin. SR was limited to 3 h per night for 2 consecutive nights. We assessed the following parameters at the same time of day, before and after SR: sebumetry (Sebumeter SM 815), hydration (Corneometer CM 825), trans-epidermal water loss (Tewameter TM 210), biomechanical properties (Cutometer MPA 580), pH (PH-meter 900), desquamation quantification (DSquameter and microscopy), and image analysis (ColorFace - Newtone Technologies). We also obtained skin samples (swab) for malondialdehyde quantification (MDA). Results: We observed that some skin parameters are significantly associated with SR in both the morning and afternoon, including: lower hydration ($p < 0.001$), increased trans-epidermal water loss (PIE) ($p < 0.001$), and decreased extensibility (Uf; p ¼ 0.015) and viscosity (Uv; $p < 0.001$) of the skin. The average pH increased from 4.8 (±0.2) to 4.9 ± 0.4; $p < 0.001$. For face photography, brightness and saturation also significantly decreased with SR in mornings and afternoons ($p < 0.001$ for all tests). Finally, we observed a significant decrease in isolated corneocytes after desquamation associated with SR ($p < 0.001$ for all tests). SR was also associated with significantly increased MDA levels ($p < 0.001$ for all tests). Conclusions: Two nights of SR significantly altered the skin and facial appearances in our test group of typically good-sleeping women.

R. Folster-Holst, C. Naß, S. Dahnhardt-Pfeiffer, S. Freitag-Wolf, **Analysis of the structure and function of the epidermal barrier in patients with ichthyoses—clinical and electron microscopical investigations**, JEADV 2022, 36, p. 726–738

Background: Ichthyoses are pathogenetically characterized by a pronounced disorder of the epidermal barrier. Clinically, hyperkeratosis, severe scaling and erythroderma are present on the entire integument. The time-consuming therapy includes daily baths and the application of skin care products to restore the epidermal barrier. Objectives and methods: To enhance the knowledge about the structure and function of the epidermal barrier in ichthyoses, we conducted clinical, biophysical and electron microscopical measurements on 46 patients with ichthyoses, including autosomal recessive ichthyoses, keratinopathic ichthyoses, X-chromosomal-recessive ichthyosis and Netherton syndrome. Results: The patients displayed a significantly decreased skin hydration along with unexpectedly low transepidermal waterloss values. Electron microscopical examinations demonstrated a severe occlusion of the epidermis by lipid remnants of skin care products in the stratum corneum. We found decreased intercellular lipid lamellae and an increased undulation of the corneocyte membrane of all ichthyoses, mostly pronounced in Netherton syndrome. The lipid profiles of ichthyoses showed decreased esterified Ω-hydroxy-sphingosine (EOS) ceramide levels. Conclusions: The results demonstrate the extent of the epidermal barrier disruption in ichthyoses. In combination with the knowledge about pathogenetic causes, individually improved therapeutic options can be derived from our results. In the future, the analyses of the organization of intercellular lipid lamellae and corneocyte membrane undulation will enable improved investigations of the epidermal barrier in ichthyoses and may be used to study and evaluate possible effects of topical skin preparations.

S. Gladstone, R. Ott, **Postbiotic care for sensitive skin from golden millet**, PERSONAL CARE Magazine, January 2022

In a functioning ecosystem, all living beings are coordinated in their function. Externalinfluences throw the ecological system out of balance – and can even throw it off completely. The same applies to our skin. Healthy skin requires a balanced variety of bacteria. If this is out of balance, our skin becomes vulnerable.

H. van der Hoeven, **The skin and its microbiota are one entity**, PERSONAL CARE Magazine, January 2022

'Microbiome skincare' is a booming business. The cosmetic industry is constantly looking for new and exciting claims which resonate with consumers and the skin microbiome claims seem to be its latest favorite topic.

M. Herrero-Fernandez, T. Montero-Vilchez, P. Diaz-Calvillo, M. Romera-Vilchez, A. Buendia-Eisman, S. Arias-Santiago, **Impact of Water Exposure and Temperature Changes on Skin Barrier Function**, J. Clin. Med. 2022, 11, 298

The frequency of hand hygiene has increased due to the COVID-19 pandemic, but there is little evidence regarding the impact of water exposure and temperature on skin. The aim of this study is to evaluate the effect of water exposure and temperature on skin barrier function in healthy individuals. A prospective observational study was conducted. Temperature, pH, transepidermal water loss (TEWL), erythema and stratum corneum hydration (SCH) were measured objectively before and after hot- and cold-water exposure and TempTest® (Microcaya TempTest, Bilbao, Spain) contact. Fifty healthy volunteers were enrolled. Hot-water exposure increased TEWL (25.75 vs. 58.58 g·h-1·m-2), pH (6.33 vs. 6.65) and erythema (249.45 vs. 286.34 AU). Cold-water immersion increased TEWL (25.75 vs. 34.96 g·h-1·m-2) and pH (6.33 vs. 6.62). TEWL (7.99 vs. 9.98 g·h-1·m-2) and erythema (209.07 vs. 227.79 AU) increased after being in contact with the hot region (44 °C) of the TempTest. No significant differences were found after contact with the cold region (4 °C) of the TempTest. In conclusion, long and continuous water exposure damages skin barrier function, with hot water being even more harmful. It would be advisable to use cold or lukewarm water for handwashing and avoid hot water. Knowing the proper temperature for hand washing might be animportant measure to prevent flares in patients with previous inflammatory skin diseases on their hands.

M. Nagae, T. Nishio, K. Ohnuki, K. Shimizu, **Effects of oral administration of equine placental extract supplement on the facial skin of healthy adult women: A randomized, double-blind, placebo-controlled study**, Health Sci Rep., January 2022;5

Introduction: Placenta extract is used as an ingredient in ointments for treating dermatological diseases, skin dryness, and for skin beautification. However, the clinical effects of the equine placenta on humans and the underlying mechanism of action are unclear. This randomized, controlled, double-blind study aimed to clinically evaluate the effect of oral intake of equine placental extract on human

skin quality. Methods: Healthy women volunteers between the ages of 30 and 59 years (n = 29) were randomly assigned to receive 220 mg of equine placental extract–placebo orally, once daily for 4 weeks. Skin quality parameters such as skin hydration, skin barrier function (transepidermal water loss [TEWL]), and melanin index were assessed at baseline and after 4 weeks of administration. Results: The melanin index was significantly increased in the placebo group, whereas it remained unchanged in the equine placenta group. The pattern of melanin index change was significantly different due to intake or no intake of equine placenta supplements over 4 weeks. No significant difference was found in skin hydration and TEWL between the two groups at 4 weeks of postadministration. It was shown that the intake of the equine placenta was more effective in protecting the skin condition against the change of ultraviolet (UV) sensitively than the change in temperature and humidity. Conclusions: Effect of equine placental extract intake was evident on the cheek skin of the equine placenta group where participants were protected from UV-induced pigmentation. Equine placental extract is useful for decreasing melanin synthesis and melanin content in the human skin and can be used as an effective food supplementto maintain human skin quality.

S.H. Kim, J.H. Kim, S.J. Lee, M.S. Jung, D.H. Jeong, K.H. Lee, **Minimally invasive skin sampling and transcriptome analysis using microneedles for skin type biomarker research,** Skin Research & Technology, January 2022

Background: Minimally invasive skin sampling is used in various fields. In this study, we examined whether it was possible to obtain skin specimens using biocompatible microneedles composed of sodium hyaluronate and performed transcriptome analysis. Materials and methods: Thirty-three subjects with different skin conditions, such as skin aging, skin hydration, skin pigmentation, oily skin and sensitive skin, were recruited. Skin types were evaluated based on age, non-invasive measurement devices, 10% lactic acid stinging test and visual assessment; the skin specimens were sampled from the face using microneedles. Total RNA was extracted, and microarray was performed. Correlations between various biomarkers and skin condition parameters were analysed. Results: Several skin-type biomarkers are correlated with age, non-invasive device measurements, LAST score and visual assessment of acne lesions. Representatively, COL1A1 (Collagen type 1 alpha 1 chain), FN1 (Fibronectin 1) and PINK1 (PTEN-induced putative kinase protein 1) for skin aging, FLG (Filaggrin), KLF4 (Kruppel-like factor 4) and LOR (Loricrin) for skin hydration, GPNMB (Glycoprotein non-metastatic melanoma protein B), MLANA (Melan-A) and TYR (Tyrosinase) for skin pigmentation, IGF1 (insulin-like growth factor-1), MPZL3 (Myelin protein zero like 3) and AQP3 (Aquaporin 3) for oily skin and PGF (placental growth factor), CYR61 (cysteine-rich angiogenic inducer 61), RBP4 (retinol-binding protein 4), TAC1 (Tachykinin precursor 1), CAMP (Cathelicidin antimicrobial peptide), MMP9 (Matrix metallopeptidase 9), MMP3, MMP12 and CCR1 (C-C motif chemokine receptor 1) for sensitive skin. Conclusion: Microneedle skin sampling is a new and minimally invasive option for transcriptome analysis of human skin and can be applied for diagnosis and treatment efficacy evaluation, as well as skin type classification.

Y. Ahn, M.G. Kim, Y.J. Choi, S.J. Lee, H.J. Suh, K. Jo, **Photoprotective effects of sphingomyelin-containing milk phospholipids in ultraviolet B–irradiated hairless mice by suppressing nuclear factor-κB expression**, J. Dairy Sci. 2022, 105: p. 1929–1939

Ceramide-containing phospholipids improve skin hydration and barrier function and are ideal for use in skin care products. In this study, we evaluated the photoprotective effect of milk phospholipids on the skin condition of UVB-irradiated hairless mice. Skin parameters were assessed following oral administration of milk phospholipids. The UVB irradiation induced photoaging in mice. The animals were divided into 5 groups: a control group (oral administration of saline with no UBV irradiation), UVB group (oral administration of saline with UVB irradiation), and 3 UVB irradiation groups receiving the milk phospholipids at 3 different concentrations of oral administration, 50 mg/ kg (ML group), 100 mg/kg (MM group), and 150 mg/ kg (MH group), for 8 wk. An increase in skin hydration and transepidermal water loss were improved in the150 mg/kg of milk phospholipid–administered group.Hematoxylin and eosin staining revealed a decrease inepidermal thickness in the milk phospholipid–administered groups (50, 100, and 150 mg/kg of body weight). In particular, the 100 and 150 mg/kg groups showed significant changes in the area, length, and depth of the wrinkles compared with the UVB group. Moreover, the gene expression of matrix metalloproteins was attenuated, and that of proinflammatory cytokines, especially tumor necrosis factor-α, was significantly reduced inthe milk phospholipid–administered groups than inthe UVB group. The reduced ceramide and increased sphingosine-1-phosphate levels in the skin tissue due to UVB exposure were restored to levels similar to those of the control group following milk phospholipid administration. These results were confirmed to be due to the downregulation of protein expression of nuclear factor kappa-B (NF-κB) and phosphorylated IκB-α (inhibitor of κB α). Collectively, oral administration of milk phospholipids improves skin health through a synergistic effect

on photoprotective activity.

V. Rasmont, A. Valois, A. Gueniche, G. Sore, D. Kerob, M. Nielsen, E. Berardesca, **Vichy volcanic mineralizing water has unique properties to strengthen the skin barrier and skin defenses against exposome aggressions**, JEADV 2022, 36 (Suppl. 2), p. 5–15

Exposome aggressions are known to weaken certain skin functions, such as skin barrier and skin defense functions. Vichy volcanic mineralizing water (VVMW) percolates through volcanic and magmatic rocks in the Auvergne region in France to create a pure, highly mineralized water containing 15 minerals for a total mineral concentration of 5.2 g/L. Here, we provide an overview of the main results of in vitro and ex vivo studies (keratinocyte cultures, 3D reconstructed skin model, skin explants) and clinical studies to evaluate the effect of VVMW on key skin functions to help elucidate how it counteracts exposome aggressions on the skin. Properties to strengthen the skin barrier: VVMW stimulated the synthesis of tight junction proteins and keratinocyte differentiation markers in vitro. In clinical studies, VVMW accelerated cell turnover and improved skin hydration. Properties to strengthen skin antioxidant defense: VVMW stimulated the expression of antioxidant defense markers and had a higher stimulatory effect than a competitor thermal water on the expression of superoxide dismutase, catalase, and glutathione peroxidase in keratinocytes in vitro. In vivo, VVMW restored endogenous catalase activity after exposure to UVA radiation. Anti-inflammatory action: VVMW reduced substance P-induced inflammation ex vivo and lactic acid-induced stinging in vivo. Topical application of VVMW in subjects with sensitive skin showed soothing and decongestant effects by reducing skin dryness and erythema. After sodium lauryl sulfate -induced skin barrier disruption, recovery from redness and erythema was faster following application of VVMW compared to a competitor water or untreated skin. These studies illustrate that VVMW has unique properties to repair and regenerate the skin barrier, as well as to strengthen antioxidant and immune defenses, which help protect the skin against exposome aggressions.

P. Tumsutti, M. Maiprasert, P. Sugkraroek, R. Wanitphakdeedecha, A. Bumrungpert, **Effects of a combination of botanical actives on skin health and antioxidant status in post-menopausal women: A randomized, double-blind, placebo-controlled clinical trial**, J Cosmet Dermatol. 2022;21: p. 2064–2072

Background: Skin aging is one of the most concerning issues during the post-menopausal period. Despite the promising effects of hormonal therapy, there is still concerned about the long-term outcomes from the treatment. Therefore, nutraceuticals that contain estrogenic and antioxidative effects have gained a lot of attention as an alternative therapy for slowing down skin age-related changes in women after menopause. Objective: This study was aimed at evaluating the effects of a combination of nutraceuticals on skin health and antioxidant status in women after menopause. Methods: Post-menopausal women aged 45–60 years old were enrolled and randomly allocated (n = 110) equally to either treatment or placebo group (n = 55 per group). The test product, a nutraceutical containing a blend of Glycine max, Cimicifuga racemosa, Vitex agnus-castus, and Oenothera biennis extracts, was administered over a 12-week period, with dermatological parameters evaluated at baseline, week 6, and week 12 of the study. Additionally, glutathione (GSH) and malondialdehyde (MDA) levels were detected at baseline and week 12 to evaluate the antioxidant status. Results: At week 6, skin roughness was significantly improved in the treatment group (n = 50 completed), while at week 12, a significant improvement and large effect sizes observed in skin elasticity (Cohen's d = 1.56, [SDpooled = 0.10]), roughness (d = 1.53, [0.67]), smoothness (d = −1.33, [34.65]), scaliness (d = −0.80 [0.095]), and wrinkles (d = −1.02 [13.68]) compared to placebo (n = 51 completed). Moreover, GSH was significantly increased (d = 1.54 [32.52]) whereas MDA was significantly decreased (d = −1.66, [0.66]) in the test group, compared to placebo. Blood biochemistry, along with vital signs, did not differ between groups, and no subjects reported any adverse throughout the trial. Conclusion: These data indicate the supplementation with the formulated blend of four herbal extracts is supportive of skin health and antioxidant status in women of menopausal age.

S. Koudounasa, D.L. Badera, D. Voegeli, **An Exploratory Study of the Effects of the pH of Synthetic Urine on Skin Integrity in Healthy Participants**, Skin Pharmacol Physiol 2022;35: p. 166–173

Background: Incontinence-associated dermatitis (IAD) develops from prolonged exposure of skin to urine and/or stool and represents a common complication in older adults, reducing the quality of life. Increased pH is an important etiologic factor of IAD; however, the relationship between urinary pH and skin barrier disruption remains unclear. Objective: The aim of this study is to examine the effects of synthetic urine (s-urine) at various pHs on transepidermal water loss (TEWL), stratum corneum hydration (SCH), and skin surface pH. Methods: S-urine solutions (pH 5.0–9.0) were applied to the volar forearms of 15 healthy participants for 2 h, with another site serving as the untreated control.

Measurements of TEWL, SCH, and skin surface pH were obtained at baseline (BL) and after each challenge. Skin buffering capacity was also examined in 5 volunteers by recording skin pH at BL, after 2 h exposure and every 5 min for 40 min. Results: TEWL and SCH were increased following exposure to s-urine compared to BL values. Although there was a tendency for pH to increase after exposure, further investigation showed that changes are only temporal as pH value is restored to BL within 5 mins. There were no significant differences between solutions. Conclusions: This study revealed that urine disrupts healthy skin integrity; however, its effects are not pH dependent. Transient changes were observed on the acid mantle of the skin due to its innate buffering capacity. Future studies need to examine the effects of urine combined with bacteria responsible for pH elevation in patients with urinary incontinence.

M. Matsuoka, K. Okoshi, S. Ito, T. Kume, T. Seki, T. Nishizaka, J. Okada, A. Nagasawa, M. Iijima, M. Abe, O. Nemoto, **Effcacy of Heparinoid Cream Containing Pseudo-Ceramide for Remission of Atopic Dermatitis**, Clinical, Cosmetic and Investigational Dermatology 2021:14, p. 1839–1847

Purpose: Atopic dermatitis (AD) is characterized by chronic inflammation, which frequently recurs, is exacerbated, and enters remission. A maintenance remission period is important for AD patients. We developed a formulation for use during AD remission, containing heparinoid and pseudo-ceramide that forms a lamellar structure. We evaluated the allergen permeability and examined the formulation's effcacy in maintaining remission in patients with AD. Materials and Methods: Seventeen AD patients applied a cream containing 0.3% heparinoid and pseudo-ceramide (test cream group, n = 10), or a general cream containing 0.3% heparinoid (control cream group, n = 7) to their arm for four weeks after inducing remission with the application of a steroid cream for two weeks. Results: The lamellar structure of the test cream was confrmed with small- and wide-anglex-ray scattering analysis and observation by transmission electron microscopy. The test cream inhibited the penetration of V8 protease signifcantly compared to the control cream in vitro. According to AD severity score by dermatologists, the effects remission maintenance of the test cream group were comparable to those of the control cream group. However, the testcream group had a signifcantly increased skin hydration value compared to the control cream group. A signifcant decrease in transepidermal water loss, an indicator of skin barrier function, was shown in the test cream group compared to the control cream group. Conclusion: The cream with lamellar structures containing heparinoid and pseudoceramides may inhibit allergen penetration. Moreover, skin properties improved during the remission period; thus, the formulation we developed was suitable for use during the AD remission period.

K.L. Hon, A.H.Y. Ng, C.C.C. Chan, P.X.Y. Ho, E.P.M. Tsoi, K.Y.C. Tsang, F.W. Ko, T.F. Leung, **Evaluation of bronchial challenge test results for use in assessment of paediatric eczema: a retrospective series**, Hong Kong Medical Journal, 2021

Background: Atopic dermatitis (AD), asthma, and allergic rhinitis are associated diseases involved inthe atopic march. The bronchial challenge test (BCT) is a tool that evaluates airway hyperresponsiveness in patients with asthma. This study aimed to evaluate whether a positive BCT result is useful in assessment of paediatric AD. Methods: This retrospective case series included 284 patients with AD who had BCT results. Clinical information and laboratory parameters were reviewed, including AD severity (using the SCORing Atopic Dermatitis [SCORAD]), skin hydration, and transepidermal water loss. Results: Of the 284 patients who had BCT, 106 had positive BCT results and 178 had negative BCT results. A positive BCT result was associated with a history of asthma (P<0.0005), sibling with asthma (P=0.048), serum immunoglobulin E (P=0.045), eosinophil count (P=0.017), and sensitisation to food allergens in the skin prick test (P=0.027). There was no association between a positive BCT result and personal allergic rhinitis, parental atopy, sibling allergic rhinitis or AD, skin prick response to dust mites, objective SCORAD score, skin hydration, transepidermal water loss, exposure to smoking, incense burning, cat or dog ownership, or AD treatment aspects (eg, food avoidance and traditional Chinese medicine). Logistic regression showed significant associations of a positive BCT result with a history of asthma (adjusted odds ratio=4.05; 95% confidence interval=1.92-8.55; P<0.0005) and sibling atopy (adjusted odds ratio=2.25; 95% confidence interval=1.03-4.92; P=0.042). Conclusions: In patients with paediatric AD, a positive BCT result was independently and positively associated with personal history of asthma and sibling history of atopy, but not with any other clinical parameters.

A. Addae, A. Zahr, L. Jiang, S. Desai, T. Kononov, **Clinical Study to Evaluate the Efficacy and Tolerability of Cosmeceuticals Targeting the Dermal-Epidermal Junction**, J Drugs Dermatol, 2021 Dec 1;20(12): p. 1314-1321

Objective: The dermal-epidermal junction (DEJ), composed of rare proteins, plays a significant role in facial skin aging. A newly enhanced multi-ingredient anti-aging facial moisturizer (MFM) and eye

cream (MEC) were formulated to target DEJ-related aging. The objective of this study is to assess the efficacy and tolerability of a dual-product regimen MFM and MEC as a treatment in improving intrinsically and extrinsically aged facial and periorbital skin. Method: Forty-two female subjects, 42 to 65 years, Fitzpatrick skin type I–VI, with mild to moderate droopy eyelids, moderate crow's feet wrinkles, and moderate global photodamage completed this institutional review board (IRB)-approved study. Subjects applied the MFM and MEC twice-daily for 12 weeks. Clinical grading of efficacy and tolerability parameters, VISIA®-CR imaging, image analysis of wrinkles, skin pH, Tewameter, and pinch recoil measurements were performed at baseline, weeks 4, 8, and 12. Optical coherence tomography (OCT) imaging was performed at baseline and week 12. Results: Statistically significant improvement was shown in both clinically graded parameters and bioinstrumentational analyses at all time points. Both products were well tolerated by subjects. Conclusion: This IRB-approved clinical study demonstrated effectiveness in improving intrinsic and extrinsic signs of the global face and periorbital eye area aging after twelve weeks of twice-daily application.

M. Basałygo, J. Śliwińska, M. żbikowska-Gotz, K. Lis, E. Socha, L. Nowowiejska, Z. Bartuzi, B. Zegarska, **Evaluation of the effect of the interleukin-25 serum concentration on the intensity of the symptoms of atopic dermatitis and epidermal barrier,** Advances in Dermatology and Allergology 6, December/2021

Introduction**:** Interleukin 25 (IL-25) is a cytokine with proinflammatory and anti-inflammatory effects, and its biological function of reciprocal epidermal hyperplasia and of inhibiting the flaggrin synthesis points to an essential role connecting the inflammatory process with damage to the epidermal barrier in the course of atopic dermatitis (AD). Aim**:** To assess the IL-25 in serum concentration in AD patients and to analyse its possible correlation with the disease intensity and selected epidermal barrier parameters such as transepidermal water loss (TEWL). Material and methods**:** The study involved 43 patients with AD and 22 healthy volunteers. The IL-25 concentration was measured using the ELISA method. The intensity of disease symptoms was investigated using W-AZS and EASI indicators. The epidermal barrier was evaluated using a Tewameter TM300 and Corneometer CM825. Results**:** The concentration of IL-25 in serum was higher in the study group than in the control group. IL-25 serum concentration correlates with W-AZS/EASI in patients with a severe and moderate course of AD. The concentration of IL-25 affects the TEWL within the affected, evaluated skin surface. Conclusions**:** An elevated IL-25 concentration in serum is characteristic for patients with moderate and severe AD intensity. The IL-25 concentration in serum correlates with TEWL and with the moisture level in the affected area. However, further studies are necessary to determine the role played by IL-25 in the course of the disease and how it affects the functional parameters of the epidermal barrier.

H.R. Yun, S.W. Ahn, B. Seol, E.A. Vasileva, N.P. Mishchenko, S.A. Fedoreyev, V.A. Stonik, J. Han, K.S. Ko, B.D. Rhee, J.E. Seol, H.K. Kim, **Echinochrome A Treatment Alleviates Atopic Dermatitis-like Skin Lesions in NC/Nga Mice via IL-4 and IL-13 Suppression**, Mar. Drugs 2021, 19, 622

Atopic dermatitis (AD) is a chronic inflammatory skin disease in which skin barrier dysfunction leads to dryness, pruritus, and erythematous lesions. AD is triggered by immune imbalance and oxidative stress. Echinochrome A (Ech A), a natural pigment isolated from sea urchins, exerts antioxidant and beneficial effects in various inflammatory disease models. In the present study, we tested whether Ech A treatment alleviated AD-like skin lesions. We examined the anti-inflammatory effect of Ech A on 2,4-dinitrochlorobenzene (DNCB)-induced AD-like lesions in an NC/Nga mouse model. AD-like skin symptoms were induced by treatment with 1% DNCB for 1 week and 0.4% DNCB for 5 weeks in NC/Nga mice. The results showed that Ech A alleviated AD clinical symptoms, such as edema, erythema, and dryness. Treatment with Ech A induced the recovery of epidermis skin lesions as observed histologically. Tewameter® and Corneometer® measurements indicated that Ech A treatment reduced transepidermal water loss and improved stratum corneum hydration, respectively. Ech A treatment also inhibited inflammatory-response-induced mast cell infiltration in AD-like skin lesions and suppressed the expression of proinflammatory cytokines, such as interferon-γ, interleukin-4, and interleukin-13. Collectively, these results suggest that Ech A may be beneficial for treating AD owing to its anti-inflammatory effects.

V. Kaushik, Y. Ganashalingam, R. Schesny, C. Raab, S. Sengupta, C.M. Keck, **Influence of Massage and Skin Hydration on Dermal Penetration Efficacy of Nile Red from Petroleum Jelly—An Unexpected Outcome**, Pharmaceutics 2021, 13, 2190

The study aimed at comparing the influence of direct and indirect skin hydration as well as massage on the dermal penetration efficacy of active compounds. Nile red was used as a lipophilic drug surrogate and was incorporated into Vaseline (petroleum jelly). The formulation was applied with and

without massage onto either dry skin or pre-hydrated, moist skin. It was expected that the occlusive properties of Vaseline in combination with massage and enhanced skin hydration would cause a superposition of penetration-enhancing effects, which should lead to a tremendous increase in the dermal penetration efficacy of the lipophilic drug surrogate. Results obtained were diametral to the expectations, and various reasons were identified for causing the effect observed. Firstly, it was found that Vaseline undergoes syneresis after topical application. The expulsed mineral oil forms a film on top of the skin, and parts of it penetrate into the skin. The lipophilic drug surrogate, which is dissolved in the mineral oil, enters the skin with the mineral oil, i.e., via a solvent drag mechanism. Secondly, it was found that massage squeezes the skin and causes the expulsion of water from deeper layers of the SC. The expulsed water can act as a water barrier that prevents the penetration of lipophilic compounds and promotes the penetration of hydrophilic compounds. Based on the data, it is concluded that dermal penetration is a complex process that cannot only be explained by Fick's law. It is composed of at least three different mechanisms. The first mechanism is the penetration of active ingredients with their solvents into the skin (convection, solvent drag), the second mechanism is the penetration of the active ingredient via passive diffusion, and the third mechanism can involve local penetration phenomena, e.g., the formation of liquid menisci and particle-associated penetration enhancement, which occur upon the evaporation of water and/or other ingredients from the formulation on top of the skin.

T.A. Hakala, A. García Pérez, M. Wardale, I.A. Ruuth, R.T. Vänskä, T.A. Nurminen, E. Kemp, Z.A. Boeva, J.-M. Alakoskela, K. Pettersson-Fernholm, E. Hæggström, J. Bobacka, **Sampling of fuid through skin with magnetohydrodynamics for noninvasive glucose monitoring**, Scientifc Reports, (2021) 11: 7609

Out of 463 million people currently with diabetes, 232 million remain undiagnosed. Diabetes is a threat to human health, which could be mitigated via continuous self-monitoring of glucose. In addition to blood, interstitial fuid is considered to be a representative sample for glucose monitoring, which makes it highly attractive for wearable on-body sensing. However, new technologies are needed for efcient and noninvasive sampling of interstitial fuid through the skin. In this report, we introduce the use of Lorentz force and magnetohydrodynamics to noninvasively extract dermal interstitial fuid. Using porcine skin as an ex-vivo model, we demonstrate that the extraction rate of magnetohydrodynamics is superior to that of reverse iontophoresis. This work seeks to provide a safe, efective, and noninvasive sampling method to unlock the potential of wearable sensors in needle-free continuous glucose monitoring devices that can beneft people living with diabetes.

V.M. Tadić, A. Žugić, M. Martinović, M. Stanković, S. Maksimović, A. Frank, Nešić, **Enhanced Skin Performance of Emulgel vs. Cream as Systems for Topical Delivery of Herbal Actives (Immortelle Extract and Hemp Oil),** Pharmaceutics 2021, 13, 1919

Immortelle, as rich source of chlorogenic acid and the phloroglucinol alpha-pyrone compound arzanol, possesses anti-inflammatory and antioxidant properties, affects cell regeneration, and has positive effect on many skin conditions. Hemp oil, characterized by a favorable omega-6 to omega-3 ratio, as well as an abundance of essential fatty acids and vitamin E, participates in immunoregulation and also act as an anti-inflammatory. In the present study, we examined the effect on the skin of creams and emulgels with immortelle extract and hemp oil, by comparing them to placebo samples and a non-treated control. A long-term in vivo study of biophysical skin characteristics, which lasted for 30 days, was conducted on 25 healthy human volunteers. Measured parameters were electrical capacitance of the stratum corneum, trans-epidermal water loss (TEWL), and skin pH and erythema index. Further, a sensory study was carried out in which the panelists had to choose descriptive terms for sensory attributes in questionnaire. The results showed that application of all preparations led to increase of skin hydration and TEWL reduction, while the skin was not irritated, and its normal pH was not disrupted. This study also showed importance of the carrier. Not only were emulgels described by panelists as preparations with better sensory properties, there was a significant difference between the skin hydration effect of emulgel with immortelle extract and hempoil compared to the placebo emulgel, which was not the case with creams. Such findings indicated enhanced delivery of herbal active substances from emulgel compared to the cream.

E. Alves, J. Gregório, A. Rolim Baby, P. Rijo, L.M. Rodrigues, C. Rosado, **Homemade Kefir Consumption Improves Skin Condition - A Study Conducted in Healthy and Atopic Volunteers**, Foods, 2021, 10, 2794

Diet has a fundamental role in the homeostasis of bodily functions, including the skin,which, as an essential protective barrier, plays a crucial role in this balance. The skin and intestine appear to share a series of indirect metabolic pathways, in a dual relationship known as the "gut-skin axis". Hence, the gut-skin axis might be receptive to modulation via dietary modification, where probiotics can be included,

thus representing a potential therapeutic target in inflammatory skin diseases, such as atopic dermatitis (AD), in order to control and/or ameliorate symptoms. Kefir is one of the most ancient fermented foods, with probiotic characteristics that have been associated with a wide variety of health-promoting benefits, and it presents a microbiological diversity that makes its application as a probiotic in the gut-skin relationship of the utmost interest. However, the impact of a diet containing kefir on skin health has yet to be reported in scientific literature. This study aimed to assess the impact of the intake of homemade kefir in the skin of healthy and atopic volunteers. The intervention resulted in a boost on barrier function in both skin types verified only in the respective kefir intake groups. An improvement in the degree of severity of AD was alsoconfirmed for the kefir intake group. Atopic individuals may benefit from kefir intake, especially in regard to their skin hydration. Finally, the effects observed on skin barrier function in this study probably culminate from the effects of all the ingredients in kefir, including the complex microbiota, its metabolites and macro- and micronutrients resulting from the fermentation. This work opens the way for more advanced research on the impact of the probiotic kefir on cutaneous health, further clarifying its mechanism of action namely via gut-skin axis.

Z. Khosrowpour, S.A. Nasrollahi, A. Samadi, A. Ayatollahi, M. Shamsipour, A. Rajabi-Esterabadi, S. Yadangi, A. Firooz, **Skin biophysical assessments of four types of soaps by forearm in-use test**, J Cosmet Dermatol, Nov 2021

Background: While soaps are the most commonly used cleansing agents for human skin, they also damage the epidermal barrier and potentially increase the risk of disorders such as contact dermatitis. Aims: This study set out to compare the potential skin irritancy of four types of soaps and their effects on the skin barrier function and biophysical parameters. Methods: In a nonblinded comparative study, three types of soaps (alkaline, creamy, and glycerin soaps), and a syndet were applied to four different groups of 15 healthy subjects. Subjects washed their left forearm with the respective soap at home at least four times a day for seven days. Biophysical skin parameters, including transepidermal water loss (TEWL), erythema, friction, and pH, were measured at various time points using the Cutometer MPA 580. Results: After the first wash, a significant increase in TEWL was observed for all groups compared to the preintervention period. For the alkaline soap, a substantial increase in pH was observed at all time points compared to the baseline. Syndet, the only acidic soap in this study, showed a significant decrease in pH at the last time compared to all time points. The mean value of erythema was significantly higher in alkaline soap users than glycerin and creamy soap users. Conclusion: Our study showed that alkaline-based soaps could cause erythema and increase TEWL and skin pH due to their strong cleansing action, and the addition of compounds such as glycerin can modify these effects. A newer generation of soap containing a mild surfactant such as syndets causes less skin damage.

S. El Moussaoui, I. Abo-Horan, L. Halbaut, C. Alonso, L. Coderch, M.L. Garduño-Ramírez, B. Clares, J.L. Soriano, A.C. Calpena, F. Fernández-Campos, M. Mallandrich, **Polymeric Nanoparticles and Chitosan Gel Loading Ketorolac Tromethamine to Alleviate Pain Associated with Condyloma Acuminata during the Pre- and Post-Ablation**, Pharmaceutics 2021, 13, 1784

This study describes the preparation and evaluation of two formulations, a hydrogel and a nanostructured system, containing ketorolac tromethamine as an anti-inflammatory agent for the local therapy against the inflammatory process derived from the surgical excision of Condyloma acuminata. Both formulations were physicochemically characterized. In vitro release profiles show that the nanoparticles release 92% ± 2.3 of the total ketorolac tromethamine encapsulated, while the chitosan gel releases 18.6% ± 0.2. The ex vivo permeation and distribution through human skin were also assayed and was observed how the main amount of ketorolac tromethamine is retained in the epidermis. In vivo studies were accomplished to evaluate the anti-inflammatory efficacy in mice which also involved the histological analysis to confirm the in vivo results. The nanoparticles present a significantly higher anti-inflammatory efficacy than chitosan gel. The tolerability of developed formulations was assessed by monitoring the biomechanical properties of the skin before and after application of both formulations. No statistical differences in trans-epidermal water loss and skin hydration with respect to the basal values were observed and the formulations exhibited higher anti-inflammatory activity compared to a reference ketotorlac tromethamine solution. Therefore, it can be concluded that both formulations can be proposed as outstanding candidates for offering a local anti-inflammatory therapeutical tool with potential clinical application.

M. Basałygo, J. Śliwińska, M. żbikowska-Gotz, K. Lis, E. Socha, Z. Bartuzi, B. Zegarska, **Assessment of serum concentrations of matrix metalloproteinase 1, matrix metalloproteinase 2 and tissue inhibitors of metalloproteinases 1 in atopic dermatitis in correlation with disease severity and epidermal barrier parameters**, Advances in Dermatology and Allergology 5, October/2021

Introduction: Matrix metalloproteinases (MMPs) are a group of proteolytic enzymes, conditioning the integrity of skin cells, however, their role in the inflammatory process of atopic dermatitis (AD) and the direct effect on the epidermal barrier parameters remain unexplained. Aim: To assess MMP-1, MMP-2, tissue inhibitors of metalloproteinases (TIMP)-1 concentrations in blood serum in the context of transepidermal water loss (TEWL) and stratum corneum hydration in AD. Moreover, serum levels of MMPs and TIMP-1 were analysed in relation to the Eczema Area and Severity Index (EASI). Material and methods: Forty-three AD patients and 22 control group subjects have been investigated. Serum concentrations of MMP-1, MMP-2, and TIMP-1 have been evaluated with ELISA. TEWL and stratum corneum hydration have been assessed with a TM300 Tewameter and a CM825 Corneometer. Skin lesions in patients with AD have been evaluated with the Eczema Area and Severity Index. Results: MMP-1 and MMP-2 serum concentrations were signifcantly higher in the AD group. The results of TIMP-1 serum concentration were similar for both groups. The correlation between the serum concentration and the EASI was demonstrated only for MMP-2 for patients with severe and moderate AD. Patients with AD and TIMP-1 serum concentration greater than MMP-1 presented lower TEWL and higher epidermal hydration. Conclusions: The results of this study warrant further investigation. The predominance of TIMP-1 over MMP-1 in blood serum can potentially limit TEWL and maintain the proper water content of the epidermis. Future work is necessary to establish how reliable the role of MMP-2 concentration is as an indicator of the severity of AD.

T. Esposito, T. Mencherini, F. Sansone, G. Auriemma, P. Gazzerro, R.V. Puca, R. Iandoli, R.P. Aquino, **Development, Characterization, and Clinical Investigation of a New Topical Emulsion System Containing a *Castanea sativa* Spiny Burs Active Extract**, Pharmaceutics 2021, 13, 1634

The study focused on the development and characterization of an O/W emulsion for skincare containing *Castanea sativa* spiny burs extract (CSE) as functional agent. The emulsion was stable and had suitable physicochemical and technological properties for dermal applicationand CSE showed no cytotoxicity in spontaneously immortalized keratinocytes (HaCaT) at active concentrations. A single-blind, placebo-controlled, monocentric study was designed to evaluate the skin tolerability and the skin performance of the CSE-loaded emulsion on healthy human volunteers. An improvement was observed in skin biomechanical properties such as hydration, skin elasticity and a reduction in the periorbital wrinkles in 30 days without altering the skin barrier function, sebum, pH, and erythema values. A significant skin moisturizing effect was detected while the skin barrier function was preserved. The selected natural ingredient combined with the designed formulation and the optimized preparation method has led to a final product that satisfies the physico-chemical and technological requirements underlying the safety of use and the formulative stability over time. With no negative skin reactions and highly significant effects on skin elasticity, wrinkles, and moisturization, the CSE-based emulsion achieved very satisfying outcomes representing a promising functional formulation for skin care.

H. Hyein, J. Baek, J. Koh, **Comparison of two conventional methods for diagnosing sensitive skin**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

There is a growing a demand for cosmetics targeted at sensitive skin. Accordingly, studies analyzing the diagnosis and evaluation of sensitive skin are also needed. Despite extensive studies, no clear understanding of sensitive skin exists. Sensitive skin is characterized by extensive reaction to the external environment, and is not a specific disease. Symptoms of sensitive skin include itching, burning, stinging and tight sensation. Although no signs of objective irritation exist in most cases, it is marked by occasional erythema, dryness or rash. We used two diagnostic methods for the classification of sensitive skin. Following a classification the groups based on lactic acid stinging tests, we compared the subjects' skin characteristics. Using the questionnaire method designed by Leslie Baumann, M.D., we also classified and compared the skin characteristics of the sensitive groups.

T.-C.Hsiao X.-F Lin, Y.-Y. Gao, Y.-F. Zhang, F.-W. Pan, C.-C-Chyau, **Beneficial Effects on Skin Health of Narcissus Bulb Polysaccharides**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Numerous works of literature have reported that polysaccharides-basedcosmetics present multifunctional effects in the skin for reducing transepidermal water loss (TEWL) and protecting the skin barrier function. The aim of the study was to investigate the chemical properties of a polysaccharide extracted from Narcissus Bulb (NBP) and to evaluate its effects on skin moisture, as well as anti-allergy and anti-inflammation effects. Results indicated that a yield of 6% (w/w) of polysaccharides was obtained from Narcissus Bulb by using cold water extraction and ethanol precipitation methods. In the monosaccharide of NBP, mannose was the predominant sugar followed by glucose. In the basophils RBL-2H3 cell model tests, NBP concentrations at 100-250 μg/mL showed doseresponsive effects on histamine release and 600-1000 μg/mL NBP could significantly inhibited the release of NO from

Raw264.7 cells. These findings demonstrated that the prepared NBP in the study could present potential skin protection effects, including moisture content and TEWL, anti-allergy, and anti-inflammation effects. It could therefore be considered an excellent candidate for polysaccharide-based cosmetics.

M.A. Kim, Y.C. Jung, E. Kim, **Correlation between various skin biophysical properties and erythemal response to ultraviolet radiation**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Ultraviolet (UV) radiation induces acute and long term damages on human skin, such as sunburn, photocarcinogenesis and photoaging. As an indicator of individual skin response to UV radiation, minimal erythema dose (MED) is commonly used. MED is defined as the lowest erythemal effective radiant dose that produces the first perceptible unambiguous erythema with defined borders appearing over more than 50% of exposure subsite, 16 h to 24 h after UV exposure. MED has been known to be affected by various factors including Fitzpatrick skin types, skin color, pigmentation, anatomical body sites, and so on. A number of studies found that individuals with the lower skin type and with the lighter skin color showed the lower MED, indicating the higher sensitivity to UV radiation. However, studies on the relation between skin biophysical properties and erythemal response to UV radiation remain rare. Therefore, the aim of this study was to investigate various skin biophysical properties determining individual skin sensitivity to UV radiation.

Z. Zhang, W. Wang, H. Li, L. Yao, Y. Zou, **Chemical composition analysis of Himalayan cedar essential oils and its effect on StressInduced Skin-Barrier Disruption**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Aromatherapy is a holistic healing treatment that uses aromatic essential oils to enhance both physical and emotional health. Currently, fragrance-related products are very popular with consumers, and the application of aromatic essential oils has become increasingly widespread in healthcare industries. Previous studies suggest that psychological stress can link to the onset or aggravation of multiple skin diseases, and inhalation of certain anxiolytic-like essential oil can be a potential strategy for prevention or relief of chronic stress-induced skin-barrier disruption *Cedrus deodara* (also known as Himalayan cedar, Pinaceae family), is a large evergreen coniferous tree natively growing in Himalayan area from the altitude of 1300 to 3300 meters. The crude oils prepared from steam distillation are often yellowish or darker in color, and its applications include aromatic medicine, soap perfumes, household sprays, cleaning oils, etc. However, few studies have investigated the stress relief effects of CEOs and their potential skin benefits. The purpose of this research is to screen a kind of CEO and to evaluate its effects on stress-induced skin-barrier disruption

E. Sturion, J. Wada, M. Spadoto, S. Arandas Monteiro e Silva, **Development and Efficacy of Tonic Formulation Containing a Green multi-functional Active: An Innovative Cosmetic Strategy for Scalp with Dandruff**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Dandruff is a chronic scalp condition affecting greater than 50% of the population, in some regions of the map. In addition to desquamation (primary symptom), dandruff can be associated with several additional discomfort. Dandruff is restricted to the scalp, and involves itchiness, flaking skin without visible inflammation. It is also more prevalent in males than females Dandruff starts at puberty, reaches its peak incidence and severity at the age of about 20 years old, and becomes less prevalent among people over 50.

L.-D. Zhou, Y.-N. Lu, L. Zhang, J. Tian, **Efficacy of a Multi-herb Extraction SGS for Skin Sensitivity and Barrier Function**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Sensitive skin is a clinical syndrome defined by the occurrence of unpleasant sensations (stinging, burning, pain, pruritus, and tingling sensations) in response to normal stimuli. The possible pathogenesis of sensitive skin includes disturbed barrier, neurogenic inflammation and related immune cells. The multi-herb extraction SGS, extracted from *Sophora flacescens* root, *Glycyrrhiza inflata* root and *Scutellaria baicalensis* root, was used to study its effect on skin inflammation and barrier function.

J.W. Park, J. Han, E. Kim, **Relationship between water-sebum ratio and skin barrier function**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

People often use the term “oil and moisture balance” to describe their skin condition subjectively. However, there is no existing research on what the appropriate watersebum ratio is, and there is not enough explanation for their effects on skin characteristics. In this study, we studied the relationship between water-sebum ratio and skin barrier function.

Z. Zhou, Y. Guo, M Guo, Z. Miao, J. Zhang, F. Yang, W. Zhang, Weiyang, X. Li, **Formulating “Clean**

Beauty" cosmetics with natural origin ngredients, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

The skin, like the other organs, is subject to a complex physiological process of aging. Intrinsic or chronological aging is the consequence of a genetically programmed senescence and of biochemical alterations due to endogenous factors. The aging process is characterized by a slow-down in the regeneration of cells and extracellular matrices, a gradually loss of dermal collagen and elastic fibers resulting in dermal and epidermal atrophy, dryness, a reduction in elasticity and firmness of the skin, the appearance of fine lines and wrinkles hyperpigmentation or hypopigmentation blemishes. Extrinsic aging, on the other hand, is due to environmental attack such as pollution, sun light irradiation (including UV radiation) and diseases.

Z. Qiao, S. Huang, F. Leng, Y. Bei, Y. Chen, M. Chen, Y. Hu, Y. Huang, Q. Xiang, **Analysis of the Bacterial Flora of Sensitive Facial Skin Among Women in Guangzhou**, Clinical, Cosmetic and Investigational Dermatology 2021:14, p. 655–664

Background: Sensitive skin (SS) is easily irritated by various environmental stimuli, and epidemiological surveys surprisingly fnd that self-perceived SS is widespread worldwide. Objective: To investigate whether SS is linked to changes in the skin bacterial population using 16S rRNA sequencing and bioinformatic analysis. Patients and Methods: According to both the Huaxi SS Questionnaire and Lactic Acid Stimulation Test, 60 female volunteers in Guangzhou were classifed into normal skin (NS) and SS groups. Skin barrier parameters were assessed by the CK skin tester. The DNA of the bacterial flora on the facial skin surface was extracted and was subjected to 16S rRNA sequencing. Results: The skin hydration was signifcantly lower in the SS group compared to the NS group (P =0.032). Based on 16S rRNA sequencing and bioinformatic analysis, the number of operational taxonomic units (OTUs) signifcantly decreased in the SS group (P =0.0235, SS vs NS). The relative abundance of *Neisseriaceae* in SS group decreased significantly (P <0.05, SS vs NS), while that of *Neisseria* (within the *Neisseriaceae* family) increased signifcantly (P <0.05, SS vs NS). Conclusion: SS is accompanied by a decrease in species diversity and richness, which may be relevant to the weakening of the microbial barrier (due to the increase of *Neisseria* or the decrease of *Neisseriaceae*). Thus, corresponding treatment for *Neisseriaceae* may be a new idea in the treatment of SS.

Y. Pan, X. Ma, Y. Song, J. Zhao, S. Yan, **Questionnaire and Lactic Acid Sting Test Play Different Role on the Assessment of Sensitive Skin: A Cross-sectional Study**, Clinical, Cosmetic and Investigational Dermatology 2021:14, p. 1215–1225

Background: Questionnaires and lactic acid sting test (LAST) are two widely used methods to identify sensitive skin. However, the self-perceived sensitive skin by questionnaires was not consistent with the determination of LAST. Objective: The aim of the study was to measure the biophysical properties noninvasively of sensitive skin evaluated by questionnaire and LAST and to investigate their correlations with the scores of questionnaire and LAST. Methods: A total of 209 healthy Chinese females completed the study. Self-assessment questionnaire and LAST were both performed to identify sensitive skin. Epidermal biophysical properties, including skin hydration, transepidermal water loss (TEWL), sebum content, erythema index (EI), a* value, L* value, skin elasticity, and skin pH, were measured with noninvasive instruments. Results: The frequency of sensitive skin was 50.2% and 66.0% by questionnaire and LAST, respectively. Subjects with self-assessed sensitive skin had a slightly higher LAST positive rate. Skin hydration, sebum content, a* and EI values were signifcantly higher in the selfassessed sensitive skin group, while TEWL, a* and EI values increased but L* value decreased with signifcance in the LAST positive group. The LAST stingers among sensitive skin subjects had higher EI but not in the healthy skin subjects. In addition, questionnaire scores positively correlated with skin hydration, sebum content, a* and EI values, while a positive relationship of LAST scores with TEWL, a* and EI values was observed. The scores of questionnaire and LAST both negatively related to L* value. Conclusion: Self-assessed questionnaire is associated with sensitive skin featured by oily and red face without impaired barrier function, whereas LAST is suitable to identify fragile skin barrier and enhanced blood flow on the face. Combination of both methods to diagnose sensitive skin might be more reliable.

Y.I. Lee, S.G. Lee, J. Kim, S. Choi, I. Jung, J.H. Lee, **Proteoglycan Combined with Hyaluronic Acid and Hydrolyzed Collagen Restores the Skin Barrier in Mild Atopic Dermatitis and Dry, Eczema-Prone Skin: A Pilot Study**, Int. J. Mol. Sci. 2021, 22, 10189

Dry and eczema-prone skin conditions such as atopic dermatitis and xerotic eczema primarily indicate an impaired skin barrier function, which leads to chronic pruritus. Here, we investigated the effects of a novel emollient containing H.ECMTM liposome, which contains a soluble proteoglycan in combination with hydrolyzed collagen and hyaluronic acid. A prospective, singlearm study was conducted on 25 participants with mild atopic dermatitis or dry skin to assess the hydration and anti-

inflammatory effect of the novel emollient applied daily over four weeks. All efficacy parameters, including itching severity, transepidermal water loss, and skin hydration, improved significantly after four weeks. The in vitro and ex vivo studies confirmed the restoration of the skin's barrier function. The study revealed the clinical and laboratory efficacy of H.ECMTM liposome in reducing itching and improving the skin's barrier integrity. Thus, the use of H.ECMTM liposome can be considered a therapeutic option for dry and eczema-prone skin.

S.-J. Lee, S.-E. Kim, K.-O. Shin, K. Park, S.E. Lee, **Dupilumab Therapy Improves Stratum Corneum Hydration and Skin Dysbiosis in Patients with Atopic Dermatitis**, Allergy Asthma Immunol Res. 2021 Sep;13(5):p. 762-775

Purpose: We aimed to investigate the effects of dupilumab on 1) the permeability and antimicrobial barrier, 2) the composition of the skin microbiome, and 3) the correlation between changes in skin barrier properties and microbiota in atopic dermatitis (AD) patients. Methods: Ten patients with severe AD were treated with dupilumab for 12 weeks. Disease severity was assessed using the Eczema Area and Severity Index (EASI). Skin barrier function was evaluated by measuring transepidermal water loss, stratum corneum (SC) hydration, and pH. The following parameters were analyzed in the pre- and post-treatment SC samples; 1) skin microbiota using 16S rRNA gene sequencing, 2) lipid composition using mass spectrometry, and 3) human β-defensin 2 (hBD-2) expression using quantitative reverse transcription polymerase chain reaction. Results: SC hydration levels in the lesional and non-lesional skin increased afer 12-week dupilumab therapy (24.2%, $P < 0.001$ and 59.9%, $P < 0.001$, respectively, vs. baseline) and correlated with EASI improvement ($r = 0.90$, $P < 0.001$ and $r = 0.85$, $P = 0.003$, respectively). Dupilumab increased the long-chain ceramide levels in atopic skin (118.4%, $P = 0.028$ vs. baseline) that correlated with changes in SC hydration ($r = 0.81$, $P = 0.007$) and reduced the elevated hBD-2 messenger RNA levels (-15.4%, $P = 0.005$ vs. baseline) in the lesional skin. Dupilumab decreased the abundance *of Staphylococcus aureus.* In contrast, the microbial diversity and the abundance of *Cutibacterium* and *Corynebacterium species* increased, which were correlated with an increase in SC hydration levels (Shannon diversity, $r = 0.71$, $P = 0.027$; *Cutibacterium*, $r = 0.73$, $P = 0.017$; *Corynebacterium*, $r = 0.75$, $P = 0.012$). Increased abundance of *Cutibacterium species* was also correlated with EASI improvement ($r = 0.68$, $P = 0.032$). Conclusions: Th2 blockade-induced normalization of skin microbiome in AD patients is associated with increased SC hydration.

I. Konya, H. Iwata, M. Hayashi, T. Akita, Y. Homma, H. Yoshida, R. Yano, **Reliability and validity of the Japanese version of the overall dry skin score in older patients**, Skin Research and Technology, Volume 27, Issue 5; September 2021

Background: Dry skin is the most common skin problem, especially in the elderly. However, there is no effective instrument to assess dry skin in Japan. This study aimed to evaluate the reliability and validity of the Japanese version of the overall dry skin score (ODS-J), the gold standard for dry skin assessment. Materials and methods: A cross-sectional study was conducted on 47 patients aged > 65 years. Images of skin on their limbs were captured using a digital camera; both upper and lower limbs were assessed ($n = 4$/patient). One dermatologist; two wound, ostomy, and continence nurses; and three nursing researchers independently evaluated the images using the ODS-J to assess the intraclass correlation coefficient (ICC) for inter-rater reliability. Stratum corneum hydration (SCH) and transepidermal water loss (TEWL) were the external criteria used to verify concurrent and knowngroups validity. Results: In total, 182 sites at which the SCH and TEWL could be measured were evaluated for the ODS-J. The ICC for inter-rater reliability of the six raters was 0.939 ($p < 0.001$). A higher ODS-J was associated with lower SCH ($\rho = -0.374$; $p < 0.001$) and lower TEWL ($\rho = -0.287$; $p < 0.001$) values. The ODS-J for the lower legs was significantly higher than that of the forearms ($p < 0.001$). Conclusions: The ODS-J showed good inter-rater reliability, concurrent validity, and known-groups validity. It can be used by clinical nurses in Japan to observe patients' skin and is an effective indicator for the evaluation of skin care.

N. Kaul, **Clinical testing for a booming men's sector,** PERSONAL CARE Magazine, September 2021, p. 25-28

The male grooming industry is growing at a rapid pace. Entire aisles of drug stores are dedicated to men's grooming products. Product demand in the skin care, hair care, and fragrance industries has grown dramatically and is expected to keep pace in the coming years. Whether this growth stems from celebrity advertising or social media influence, one thing is clear: men have come a long way from the days of merely using a soap bar as face and body wash. The modern man stands ready and willing to invest in skin and hair products that maintain their health and youth. Globe News Wire reports the men's grooming market worldwide will reach $183.2 Billion by 2027, with the U.S. market alone estimated at $38 Billion, and China Forecast to grow at 6.9%.1 As men continue to open their wallets for new and

improved grooming products, brands catering to this market are stepping up to meet those needs by expanding offerings to include anti-ageing, SPF and antiacne products. Customisation of products is proving equally important, such as specialized regimens for every combination of skin and hair.

T. Montero-Vilchez, A. Martinez-Lopez, A. Sierra-Sanchez, M. Soler-Gongora, E. Jimenez-Mejias, A. Molina-Leyva, A. Buendia-Eisman, S. Arias-Santiago, **Erythema Increase Predicts Psoriasis Improvement after Phototherapy**, J. Clin. Med. 2021, *10*, 3897

Psoriasis is a major global health problem. There is a need to develop techniques to help physicians select the most appropriate cost-effective therapy for each patient. The main objectives of this study are (1) to evaluate changes in epidermal barrier function and skin homeostasis after phototherapy and (2) to explore potentially predictive values in epidermal barrier function and skin homeostasis to assess clinical improvement after fifteen sessions of phototherapy. A total of 76 subjects, 38 patients with plaque-type psoriasis and 38 gender- and age-matched healthy volunteers, were included in the study. Erythema, transepidermal water loss (TEWL), temperature, stratum corneum hydration (SCH), pH, sebum, and antioxidant capacity were measured before and after the first and fifteenth phototherapy session. Erythema (401.09 vs. 291.12 vs. 284.52 AU, $p < 0.001$) and TEWL (18.23 vs. 11.44 vs. 11.41 g·m-2·h-1, $p < 0.001$) were significantly higher at psoriatic plaques than in uninvolved psoriatic skin and healthy volunteers, respectively, while SCH was lower (9.71 vs. 44.64 vs. 40.00 AU, $p < 0.001$). After fifteen phototherapy sessions, TEWL (–5.19 g·m-2·h-1, $p = 0.016$) decreased while SCH (+7.01 AU, $p = 0.013$) and erythema (+30.82 AU, $p = 0.083$) increased at psoriatic plaques. An erythema increase exceeding 53.23 AU after the first phototherapy session, with a sensitivity of 71.4% and specificity of 84.2%, indicates that a patient may improve Psoriasis Area and Severity Index (PASI) by ≥3 points after fifteen phototherapy sessions. In conclusion, phototherapy improves epidermal barrier function in psoriatic patients and the erythemaincrease after one phototherapy session could help doctors select psoriasis patients who are more likely to respond to phototherapy.

K. Ooi, **Onset Mechanism and Pharmaceutical Management of Dry Skin**, Biol. Pharm. Bull., Vol**.** 44, No. 8, p. 1037–1043 (2021)

Dry skin is a common symptom of various conditions, and elderly individuals commonly exhibit this physiological symptom. Dry skin develops owing to sebum deficiency; however, the use of moisturizers can typically overcome this issue, particularly in patients in whom there are no other skin problems. If dry skin is left untreated, itching and eczema can occur, resulting in skin damage. Additionally, hemodialysis patients exhibit reduced barrier function and can experience pain associated with repeated needle insertion; the repeated use of lidocaine tape to manage the pain can cause further skin damage. To reduce the occurrence of dry skin, the skin is hydrated using moisturizers. Dry skin is also prominent in patients with varicose veins in the lower extremities, and many biochemical studies have shown that skin immunity is altered in patients with dry skin. Moreover, the incidences of dry skin and pruritus differ in male and female patients. Furthermore, in elderly patients, zinc deficiency is likely to cause dry skin, and zinc supplementation may maintain skin hydration. To date, few reports have described dry skin from a clinical point of view. In this review, research on dry skin is presented, and the findings of basic research studies are integrated.

J.L. Santiago, J.R. Muñoz-Rodriguez, M.A. de la Cruz-Morcillo, C. Villar-Rodriguez, L. Gonzalez-Lopez, C. Aguado , M. Nuncia-Cantarero, F.J. Redondo-Calvo, J.M. Perez-Ortiz, E.M. Galan-Moya, **Characterization of Permeability Barrier Dysfunction in a Murine Model of Cutaneous Field Cancerization Following Chronic UV-B Irradiation: Implications for the Pathogenesis of Skin Cancer**, Cancers 2021, 13, 3935

Chronic ultraviolet B (UV-B) irradiation is known to be one of the most important hazards acting on the skin and poses a risk of developing photoaging, skin with cutaneous field cancerization (CFC), actinic keratosis (AKs), and squamous cell carcinomas (SCCs). Most of the UV-B light is absorbed in the epidermis, affecting the outermost cell layers, the stratum corneum, and the stratum granulosum, which protects against this radiation and tries to maintain the permeability barrier. In the present work, we show an impairment in the transepidermal water loss, stratum corneum hydration, and surface pH after chronic UV-B light exposure in an immunologically intact mouse model (SKH1 aged mice) of skin with CFC. Macroscopic lesions of AKs and SCCs may develop synchronically or over time on the same cutaneous surface due to both the presence of subclinical AKs and in situ SCC, but also the accumulation of different mutations in keratinocytes. Focusing on skin with CFC, yet without the pathological criteria of AKs or SCC, the presence of p53 immunopositive patches (PIPs) within the epidermis is associated with these UV-B-induced mutations. Reactive epidermis to chronic UV-B exposure correlated with a marked hyperkeratotic hyperplasia, hypergranulosis, and induction of keratinocyte hyperproliferation, while expressing an upregulation of filaggrin, loricrin, and involucrin

immunostaining. However, incidental AKs and in situ SCC might show neither hypergranulosis nor upregulation of differentiation markers in the upper epidermis. Despite the overexpression of filaggrin, loricrin, involucrin, lipid enzymes, and ATP-binding cassette subfamily A member 12 (ABCA12) after chronic UV-B irradiation, the permeability barrier, stratum corneum hydration, and surface pH were severely compromised in the skin with CFC. We interpret these results as an attempt to restore the permeability barrier homeostasis by the reactive epidermis, which fails due to ultrastructural losses in stratum corneum integrity, higher pH on skin surface, abundant mast cells in the dermis, and the common presence of incidental AKs and in situ SCC. As far as we know, this is the first time that the permeability barrier has been studied in the skin with CFC in a murine model of SCC induced after chronic UV-B irradiation at high doses. The impairment in the permeability barrier and the consequent keratinocyte hyperproliferation in the skin of CFC mightplay a role in the physiopathology of AKs and SCCs.

M. Tasic-Kostov, M. Martinović, D. Ilic, M. Cvetkovic, **Cotton versus medical face mask influence on skin characteristics during COVID-19 pandemic: A short-term study,** Skin Research & Technology, August 2021

Background: In the still ongoing COVID-19 pandemic, one of the main prevention strategy remain to be the use of protective face masks. Changes in skin characteristics and dermatological problems related to wearing different types of masks have been observed. The aim of this study was to compare the short-term effects of cotton versus medical masks on skin biophysical parameters in general population. Materials and methods: Twenty-eight human volunteers were enrolled and divided in cotton mask and medical mask wearing groups. We measured four skin biophysical parameters: trans-epidermal water loss (TEWL), stratum corneum hydration (SCH), skin pH, and erythema index (EI) before and 3 h after wearing masks on both uncovered and mask-wearing face area.Results: TEWL increased after 3 h on exposed skin in cotton mask group and slightly decreased in medical mask group There was an increase in SCH after 3 h of wearing protective face masks in both groups. pH of the covered skin slightly decreased whileEI increased after 3 h in both groups; changes were not statistically significant. Parameters did not change significantly on uncovered skin. Conclusion: There were no differences between the influence of cotton versus medical protective masks on the skin of healthy volunteers in our study. Both types of masks could be recommended for short-time protection in individuals with healthy skin during COVID-19 pandemic.

I. Konya, H. Iwata, M. Hayashi, T. Akita, Y. Homma, H. Yoshida, R. Yano, **Reliability and validity of the Japanese version of the overall dry skin score in older patients,** Skin Research & Technology, August 2021

Background: Dry skin is the most common skin problem, especially in the elderly. However, there is no effective instrument to assess dry skin in Japan. This study aimed to evaluate the reliability and validity of the Japanese version of the overall dry skin score (ODS-J), the gold standard for dry skin assessment. Materials and methods: A cross-sectional study was conducted on 47 patients aged > 65 years. Images of skin on their limbs were captured using a digital camera; both upper and lower limbs were assessed (n = 4/patient). One dermatologist; two wound, ostomy, and continence nurses; and three nursing researchers independently evaluated the images using the ODS-J to assess the intraclass correlation coefficient (ICC) for inter-rater reliability. Stratum corneum hydration (SCH) and transepidermal water loss (TEWL) were the external criteria used to verify concurrent and knowngroups validity. Results: In total, 182 sites at which the SCH and TEWL could be measured were evaluated for the ODS-J. The ICC for inter-rater reliability of the six raters was 0.939 ($p < 0.001$). A higher ODS-J was associated with lower SCH (ρ = -0.374; $p < 0.001$) and lower TEWL (ρ = -0.287; $p < 0.001$) values. The ODS-J for the lower legs was significantly higher than that of the forearms ($p < 0.001$). Conclusions: The ODS-J showed good inter-rater reliability, concurrent validity, and known-groups validity. It can be used by clinical nurses in Japan to observe patients' skin and is an effective indicator for the evaluation of skin care.

F. Havas, S. Krispin, M. Cohen, M. Shevach, N. Borenstein-Auerbach, E. Loing, J. Attia-Vigneau, **Restore and Renew – Inula Helenium Powers Up Skin's Anti-pollution Defenses,** Cosmetic & Toiletries, August 2021

Sources of air pollution include industry and vehicle exhaust, cigarette smoke, open fires, paints, pesticides and more. According to the Word health Organistation (WHO), 95 % of the world population is exposed to air pollution including particulates, aromatic hydrocarbons and volatile organic compounds.

*R. Nitiyarom, T. Withitanawanit, W. Wisuthsarewong***, Capacitance and transepidermal water loss**

after soaking in water for different durations: A pilot study, Skin Research & Technology, August 2021

Background: There is a scarcity of data on the effects of duration of bathing and cutaneous properties. Aims: This study aimed to investigate the changes of capacitance and transepidermal water loss (TEWL) after soaking in water for the different durations. Method: This experimental biophysical study included healthy volunteers whose forearms were randomized to receive 3, 5, 10, 15, or 20 min of soaking of the volar aspect of the forearm. Skin hydration and integrity were assessed capacitance and TEWL measurement before and after soaking. Results: Sixty-five subjects (130 forearms) were enrolled with an average age of 33 ± 10.8 years. The change in capacitance after soaking for durations of 3, 5, 10, 15, and 20 min was 41.54 ± 14.57, 47.13 ± 11.80, 40.25 ± 14.95, 40.48 ± 14.19, and 39.97 ± 9.47 AU, respectively. The highest capacitance was observed after soaking for 5 min; however, there was no significant correlation between bathing duration and capacitance ($p = 0.256$). The capacitance measured immediately after soaking was at the uppermost level, but it rapidly decreased within 5 min. The change in TEWL after soaking for durations of 3, 5, 10, 15, and 20 min was 30.27 ± 9.74, 30.57 ± 7.45, 33.78 ± 9.25, 33.44 ± 7.24, and 35.13 ± 9.37 g/m2/h, respectively. There was also no significant correlation between duration of soaking and TEWL ($p = 0.191$); however, TEWL tended to increase with longer soaking duration. Limitations: This study had a small sample size and measured only capacitance and TEWL. Future studies with more subjects, and that measure other physiologic parameters may further improve our understanding of the effect of bathing on skin. Conclusions: There was no significant correlation between bathing duration and cutaneous properties including capacitance and TEWL. However, a 5-min soaking provided the highest skin hydration for healthy skin.

D. Maroto-Morales, T. Montero-Vilchez, S. Arias-Santiago, **Study of Skin Barrier Function in Psoriasis: The Impact of Emollients**, Life 2021, 11, 651

Psoriasis is a chronic multi-systemic inflammatory disease that affects the epidermal barrier. Emollients can be used as a coadjutant therapy for psoriasis management, but little is known about how the epidermal barrier function in psoriatic patients is modified by moisturizers. The objective of this study is to evaluate the effect of Vaseline jelly and a water-based formula on epidermal barrier function in psoriatic patients. Thirty-one patients with plaque-type psoriasis and thirty-one gender and age-matched healthy controls were enrolled in the study. Temperature, transepidermal water loss (TEWL), stratum corneum hydration (SCH), pH, elasticity and the erythema index were measured using non-invasive tools before and after applying Vaseline jelly and a water-based formula. TEWL was higher in psoriatic plaques than uninvolved psoriatic skin (13.23 vs. 8.54 g·m-2·h-1; $p < 0.001$). SCH was lower in psoriatic plaques than uninvolved psoriatic skin and healthy skin (13.44 vs. 30.55 vs. 30.90 arbitrary units (AU), $p < 0.001$). In psoriatic plaques, TEWL decreased by 5.59 g·m-2·h-1 ($p = 0.001$) after applying Vaseline Jelly, while it increased by 3.60 g·m-2·h-1 ($p = 0.006$) after applying the water-based formula. SCH increased by 9.44 AU after applying the water-based formula ($p = 0.003$). The use of emollients may improve epidermal barrier function in psoriatic patients. TEWL is decreased by using Vaseline, and SCH is increased by using the water-based formula.

M. Dąbrowska, I. Nowak, **Lipid Nanoparticles Loaded with Selected Iridoid Glycosides as Effective Components of Hydrogel Formulations**, Materials 2021, 14, 4090

One possibility of improving active ingredient penetration into deeper skin layers to enhance the cosmetic product effectiveness, is the application of lipid nanoparticles. The aim of the study presented in this paper was to evaluate the potential of hydrogel formulations enriched with iridoid glycosides-loaded lipid nanoparticles. Lipid nanocarriers were produced using an emulsification-ultrasonication method based on multiple emulsions. The encapsulation efficiency was determined at the level of 89% and 77% for aucubin and catalpol, respectively. The next stage was the incorporation of the obtained dispersions of lipid nanoparticles into hydrogel formulations, followed by determination of their physicochemical properties, shelf-life stability, and application properties (in vivo tests). The introduction of lipid nanoparticles increased the stabilization of the consistency of the obtained hydrogel formulations, and was confirmed by viscosity measurements. No effect of lipid nanoparticle incorporation on shelf-life stability of the hydrogels was detected. In vivo studies showed improvements in moisture content of the epidermis, transepidermal water loss, skin topography, and macrorelief parameters. In particular, a synergistic effect of the active ingredients and lipid nanoparticles on the anti-wrinkle effect, moisturizing effect, and regeneration of the protective barrier of the stratum corneum was evidenced. The attractiveness of aucubin and catalpol as cosmetic raw materials in hydrogel formulations was evidenced, especially when the iridoid glycosides were applied in the form of lipid nanoparticles.

L. Rüther, W. Voss, **Hydrogel or ointment? Comparison of five different galenics regarding tissue breathability and transepidermal water loss,** Heliyon 7, 2021

Purpose: Five different galenics were analyzed and compared concerning tissue breathability and gas exchange with the environment after an application period of 6 h on pig ear skin. Aim was to find the most suitable galenics for efficient moist treatment for everyday injuries (abrasions, lacerations and cuts) without influencing the transepidermal water loss. Methods: A quantity of 0.1 g of the different test preparations was applied once topically to an area of 2 cm2. The analysis of the breathability was performed by TEWL (transepidermal water loss) measurements in the first hour after product application. The moisture retention effect was assessed by corneometry in the first 5 h after product application. Results: The hydrogel preparations showed a higher breathability in contrast to a semi-occlusive ointment and petrolatum. The same applies to the moisture penetration of the skin. Here, all hydrogel formulations showed the highest tissue hydration. After 3 h an additional increase in moisture was observed for the areas treated with Tyrosur® CareExpert Wound Gel and the ointment. Conclusion: In contrast to petrolatum and the semi-occlusive ointment, treatment with the hydrogels led to a preservation of the breathability and good moistening of the tissue, which is due to the galenics of the gels consisting of water, carbomer and propylene glycol. The increase in moisture after 3 h in areas treated with Tyrosur® CareExpert Wound Gel and the semi-occlusive ointment indicates a sustained moisturizing effect mediated by dexpanthenol.

J. Liu, L. Liu, L. Zhou, L. Chen, X. Chen, X. Xiong, Y. Deng, **The Effect of Intense Pulsed Light on the Skin Microbiota and Epidermal Barrier in Patients with Mild to Moderate Acne Vulgaris**, Lasers in Surgery and Medicine 53: p. 1348–1355 (2021)

Background and Objectives: The skin microbiota partly determined by epidermal barrier plays an important role in acne vulgaris and intense pulsed light (IPL) has been verified as a safe and effective therapeutic option for this disease. Nevertheless, the exact role of the IPL treatment on the skin microbiota and epidermal barrier for patients with acne vulgaris remains unclear. This article was designed to solve this problem. Study Design/Materials and Methods: Nineteen healthy controls and 20 patients with mild to moderate acne were enrolled in this study, who received IPL treatment for 12 weeks. The epidermal barrier and skin samples were collected at baseline and after treatment. The microbial diversity was analyzed based on a high-throughput sequencing approach, which targets the V3–V4 region of the bacteria 16S ribosomal RNA genes. Results: After treatment of IPL, the Global Acne GradingSystem (GAGS) scores, sebum, sclererythrin, and red area of patients were significantly improved by IPL treatment ($P < 0.05$). Although there was no difference in microbiota diversity before and after IPL treatment, the Nonmetric Multidimension Scaling (NMDS) analysis showed thatthe samples of the acne patients before and after treatment could be divided into two different sets by skin microbiota ($P = 0.011$), which could be verified by heatmap analysis. Moreover, we found that the relative abundance of Staphylococcus epidermidis (S. epidermidis) significantly increased, but Cutibacterium acnes (C. acnes) decreased after IPL treatment. The sebum concentration was positively correlated with PH value ($R = 0.525$, $P = 0.017$), and the GAGS was positively associated with both sclererythrin ($R = 0.477$, $P = 0.002$) and red area ($R = –0.503$, $P = 0.001$). Conclusions: IPL could successfully improve the GAGS scores of acne vulgaris, as well as regulate the equilibrium between C. acnes and S. epidermidis, and inhibit the sebum secretion.

M.A. Nilforoushzadeh, M. Heidari-Kharaji, S. Alavi, M. Nouri, N. Nikkhah, F. Jahangiri, M. Mahmoudbeyk, A. Peyrovan, B. Baiat Tork, E. Torkamaniha, S. Zare, **Transplantation of autologous fat, stromal vascular fraction (SVF) cell, and platelet-rich plasma (PRP) for cell therapy of atrophic acne scars: Clinical evaluation and biometric assessment**, J Cosmet Dermatol, 2021 Jul

Background: Scarring is an unfortunate result of acne because it causes the psychological and cosmetic problems for the patients. Unfortunately, no single treatment is suitable, and using multiple methods may have a better result. The autologous fat and stromal vascular fraction (SVF) cells and their secretory factors can enhance the angiogenesis, collagen synthesis, and migration of fibroblasts, therefore regenerate hurt tissues. Moreover, other treatments for acne scarring, such as platelet-rich plasma (PRP), induce the increase in scare. Aims: This study aimed to verify the effectiveness of transplantation of autologous fat, SVF cells, and PRP as cell therapy techniques on atrophic acne scars. Patients/methods: This study included 9 adult patients with atrophic acne scars on face. All patients received the transplantation of autologous fat, stromal vascular fraction (SVF) cells, and PRP. The treatment outcome was measured by biometric assessment (VisioFace 1000 D, Colorimeter, multi-probe adapter Cutometer, Tewameter, Mexameter, and skin ultrasound imaging system), and also, the satisfaction of patients was evaluated. The patients were followed 6 months after the treatment. Results: There was a significant improvement in the skin pores, spots, skin lightness and melanin content of skin, skin elasticity, and TEWL (transepidermal water loss) after 6 months of the treatment. Furthermore,

denser skin layers were observed both in the epidermis and in the dermis. Moreover, 66.6% of patients showed good satisfaction after the treatment. Conclusion: In brief, the transplantation of autologous fat, SVF cells, and PRP is an effective cell therapy for atrophic acne scars.

T. Yazdanparast, K. Yazdani, S.A. Nasrollahi, L. Izadi Firouzabadi, P. Humbert, A. Khatami, A. Firooz, **Biophysical and ultrasonographic changes in pityriasis rosea compared with uninvolved skin**, International Journal of Women's Dermatology 7 (2021) 331–334

Background: Pityriasis rosea (PR) is a common, self-limited, inflammatory papulosquamous skin disease with a possible viral etiology. Objective: The goal of this study was to evaluate skin biophysical properties in patients with PR compared with uninvolved skin to better understand the pathogenesis of PR. Methods: Stratum corneum hydration, transepidermal water loss, surface friction, pH, sebum, melanin, erythema, temperature, elasticity parameters (R0, R2, R5), thickness, and echodensity of the epidermis and dermis were measured on lesions of classic PR in 21 patients and compared with control sites (average of uninvolved perilesional and symmetrical skin) with a paired t test. Results: Stratum corneum hydration ($p < .001$), R0 ($p = .003$), R2 ($p = .001$), R5 ($p = .003$), and echodensity of the dermis ($p = .006$) were significantly lower, whereas transepidermal water loss ($p = .001$), pH ($p < .001$), and erythema ($p < .001$) were significantly higher in PR lesions. There was no significant difference in friction index, sebum, melanin content, temperature, thickness of the epidermis and dermis, and echodensity of the epidermis between PR and normal skin. Conclusion: PR skin is characterized by certain alterations in biophysical properties, which are mostly correlated with histologic changes. These changes may be helpful in early, noninvasive diagnosis of PR.

R.D. Pârvănescu (Pană), C.G. Watz, E.-A. Moacă, L. Vlaia, I. Marcovici, I.G. Macas, F. Borcan, I. Olariu, G. Coneac, G.-A. Drăghici, Z. Crăiniceanu, D. Flondor (Ionescu), A. Enache, C.A. Dehelean, **Oleogel Formulations for the Topical Delivery of Betulin and Lupeol in Skin Injuries—Preparation, Physicochemical Characterization, and Pharmaco-Toxicological Evaluation**, Molecules 2021, *26*, 4174

The skin integrity is essential due to its pivotal role as a biological barrier against external noxious factors. Pentacyclic triterpenes stand as valuable plant-derived natural compounds in the treatment of skin injuries due to their anti-inflammatory, antioxidant, antimicrobial, and healing properties. Consequently, the primary aim of the current investigation was the development as well as the physicochemical and pharmaco-toxicological characterization of betulin- and lupeol-based oleogels (Bet OG and Lup OG) for topical application in skin injuries. The results revealed suitable pH as well as organoleptic, rheological, and textural properties. The penetration and permeation of Bet and Lup oleogels through porcine ear skin as well as the retention of both oleogels in the skin were demonstrated through ex vivo studies. In vitro, Bet OG and Lup OG showed good biocompatibility on HaCaT human immortalized cells. Moreover, Bet OG exerted a potent wound-healing property by stimulating the migration of the HaCaT cells. The in ovo results demonstrated the non-irritative potential of the developed formulations. Additionally, the undertaken in vivo investigation indicated a positive effect of oleogels treatment on skin parameters by increasing skin hydration and decreasing erythema. In conclusion, oleogel formulations are ideal for the local delivery of betulin and lupeol in skin disorders.

M. Mendes Fossa Shirata, P.M. Berardo Gonçalves Maia Campos, **Sunscreens and Cosmetic Formulations Containing Ascorbyl Tetraisopalmitate and Rice Peptides for the Improvement of Skin Photoaging: A Double-blind, Randomized Placebo-controlled Clinical Study**, Photochem Photobiol., 2021 Jul;97(4): p. 805-815

Photoprotective formulations containing substances with antioxidant properties in combination have been used as a strategy for the improvement of photoaged skin conditions. However, there is a lack of studies evaluating the clinical efficacy of these substances in young women with signs of photoaging. Thus, the objective of the present study was to evaluate the clinical efficacy of sunscreens and cosmetic formulations containing ascorbyl tetraisopalmitate and rice peptides for the improvement of skin photoaging in young women. A double-blind, randomized placebocontrolled clinical efficacy study was conducted on 60 female subjects aged 20-30 years with skin changes related to photoaging and without photoprotective habits. The hydrolipidic layer conditions and structural and morphological characteristics of the skin were evaluated by Photoprotective formulations containing substances with antioxidant properties in combination have been used as a strategy for the improvement of photoaged skin conditions. However, there is a lack of studies evaluating the clinical efficacy of these substances in young women with signs of photoaging. Thus, the objective of the present study was to evaluate the clinical efficacy of sunscreens and cosmetic formulations containing ascorbyl tetraisopalmitate and rice peptides for the improvement of skin photoaging in young women. A double-blind, randomized placebocontrolled clinical efficacy study was conducted on 60 female subjects aged 20-30 years with

skin changes related to photoaging and without photoprotective habits. The hydrolipidic layer conditions and structural and morphological characteristics of the skin were evaluated by biophysical and skin imaging techniques. The results showed that the daily use of the formulations under study improved the skin conditions by increasing skin hydration and dermis echogenicity. In addition, the application of the active substances reduced skin hyperpigmentation and increased epidermal cell renewal. In summary, the present study showed the importance of daily application of sunscreens and formulations with antioxidant properties for the prevention and attenuation of skin changes related to photoaging in young women.

J. Kim, S. Yoo, O.-S. Kwon, E.-T. Jeong, J.M. Lim, S.G. Park, **Influence of quarantine mask use on skin characteristics: One of the changes in our life caused by the COVID-19 pandemic**, Skin Research & Technology, Volume 27, Issue 4, July 2021, p. 599-606

Background: The influence of various environmental factors on skin properties is well known. However, there is a lack of research into the effect of quarantine masks on skin properties, even though the use of masks has significantly increased after the COVID-19 outbreak. Therefore, this study aimed to investigate the influence of mask use on skin properties. Materials and Methods: Twenty subjects were enrolled in this study. The subjects used approved quarantine masks for 6 hours a day for 2 weeks. We measured eight skin biophysical parameters: temperature, redness, pore volume, texture, elasticity, trans-epidermal water loss (TEWL), sebum content, and pH, and evaluated acne lesions before and after using quarantine masks. The evaluation was performed on the mask-wearing area of the face. Results: Skin temperature, redness, and TEWL increased significantly after a 6-hour mask use, while the sebum content increased marginally. Skin elasticity was reduced by the use of masks over 1 and 2 weeks, whereas the pore volume and the number of acne lesions increased after a 2-week mask use. The skin changes caused by mask use showed sex-based differences in the skin elasticity (after 6 hours), redness, and roughness (after 2 weeks). Conclusions: The use of quarantine masks causes a change in the skin temperature, redness, and TEWL in the short term and in skin elasticity, pores, and acne in the long term.This study revealed that prolonged mask use could have negative effects on the skin.

T.-F. Hsu, Z.-R. Su, Y.-H. Hsieh, M.-F. Wang, M. Oe, R. Matsuoka, Y. Masuda, **Oral Hyaluronan Relieves Wrinkles and Improves Dry Skin: A 12-Week Double-Blinded, Placebo-Controlled Study,** Nutrients 2021, 13, 2220

Hyaluronan (HA) is present in all connective tissues and organs, including the skin and joint fluid. However, few clinical trials have comprehensively evaluated the impacts of oral HA on skin conditions, including wrinkles and moisturization. In this study, we conducted a placebocontrolled, randomized, double-blind trial of daily HA (120 mg) intake for 12 weeks in 40 healthy Asian men and women (aged 35–64 years). Skin condition was determined by the evaluation of wrinkles, stratum corneum water content, the amount of transepidermal water loss, elasticity, and through image analysis. After 12 weeks, skin condition was significantly improved in terms of wrinkle assessment, stratum corneum water content, transepidermal water loss, and elasticity in the HA group compared to the placebo group. Regarding the percentage change from baseline, wrinkle assessment, stratum corneum water content, and skin elasticity were significantly improved in the HA group versus the placebo group after 8 and 12 weeks of ingestion. The present findings indicate that oral ingestion of HA may suppress wrinkles and improve skin condition.

A. Ayatollahi, A. Samadi, A. Bahmanjahromi, R.M. Robati, **Efficacy and safety of topical spironolactone 5% cream in the treatment of acne: A pilot study**, Health Sci Rep. 2021

Background: Spironolactone is an effective treatment for female patients with acne vulgaris. However, topical spironolactone could be a valuable treatment option in both male and female acne patients due to the less possibility of systemic side effects with its topical formulation. Objective: To evaluate the efficacy and safety of 5% spironolactone cream in the treatment of mild to moderate acne vulgaris. Methods: In this pilot clinical trial, topical spironolactone 5% was evaluated to treat patients with mild to moderate acne twice a day for 8 weeks. The rate of improvement as any alterations in the number of open and closed comedones, facial inflammatory papules, and acne global grading scores were assessed. Moreover, skin biometric characteristics including skin hydration, erythema, transepidermal water loss (TEWL), pH, sebum, and Propionibacterium acnes bacteria activity were also assessed following the treatment.Results: Fifteen patients participated in our study with a mean age of 25 ± 4.87 years old. A total of 66.6% (n = 10) were female and 33.4% (n = 5) were male. The number of acne papules, open and closed comedones, and acne global grading score decreased significantly 4 and 8 weeks after the beginning of treatment ($P < .05$). No considerable side effect was reported. Moreover, there was no significant difference between the skin hydration, melanin, erythema, TEWL,

pH index, sebum, and P acnes bacteria activity before, 4, and 8 weeks after the treatment with topical spironolactone cream (P > .05). Conclusion: The topical 5% spironolactone cream seems to be an effective and safe treatment of acne vulgaris in both male and female patients.

Y. Ye, P. Zhao, L. Dou, Y. Zhang, K. Ken, H. Gu, Y. Dou, W. Gao, L. He, X. Chen, X. Huang, L. Zhang, Y. Li, L. Wang, W. Yan, **Dynamic trends in skin barrier function from birth to age 6 months and infantile atopic dermatitis: A Chinese prospective cohort study**, Clin Transl Allergy. 2021

Background: Skin barrier functions develop after birth and may be related to skin disorders in infants. We aimed to assess associations between dynamic trends of four skin barrier functional parameters in early life with infant atopic dermatitis (AD). Methods: Based on the prospective cohort MKNFOAD (NCT02889081), we examined transepidermal water loss (TEWL), stratum corneum hydration (SCH), skin pH, and sebum content at five anatomical sites (cheek, forehead, forearm, abdomen, and lower leg) in 418 term infants at birth, 42 days, and 6 months. Trend differences by sex and association with AD at age 1 year were tested using variance analyses. Associations of the parameters with AD risk were tested using discrete time survival analysis, adjusting extensive covariates including parental history ofallergy, infant's sex, birth weight (kg), and delivery mode. Odds ratios (ORs) and 95%confdence interval (CIs) were reported. Results: Overall TEWL and SCH appeared trends of increase while skin surface pH and sebum content showed trends of decrease within the frst six postnatal months. Sex differences were signifcant for sebum content only ($p < 0.001$). After adjustment for parental and children covariates, cheek TEWL at birth (OR = 1.26, 95% CI 1.00– 1.57, $p = 0.045$) and 42 days (OR = 1.52, 95% CI 1.17–1.97, $p = 0.002$) were signifcantly associated with increased AD risk. Associations were not observed between SCH, skin pH, and sebum content at birth or 42 days with AD. Conclusions: Skin barrier functions of Chinese term infants varied nonlinearly after birth. Higher postnatal TEWL levels in early life indicate higher risk of early-onset AD.

A. Cekiera, J. Popiel, M. Siemieniuch, Z. Jaworski, M. Slowikowska, N. Siwinska, A. Zak, A. Niedzwiedz, **The examination of biophysical parameters of the skin in Polish Konik horses**, PLoS ONE 16(6), June 2021

This study aimed to assess the biophysical parameters of the skin in Polish Konik horses (Polish primitive horses). According to the authors, this is the first assessment performed on such a wide scale in this group of animals. The evaluation carried out is innovative both with regards to the breed of the animals and the wide scope of the physicochemical skin assessment. The study group comprised mares, stallions and geldings, and the evaluations concerned transepidermal water loss, corneometry, pH, skin temperature assessment and mexametry. These parameters were assessed in five skin regions: the lips, the right ear, the prosternum, the right side of the neck and the chest. The measurements were taken after spreading the hair apart, with the use of a Multiprobe Adapter System (MPA®) and dedicated probes (Courage + Khazaka electronic GmbH, Cologne, Germany). The measurements revealed statistically significant differences in the values of transepidermal water loss in the lips in mares compared with stallions (P = 0.023) and also in stallions compared with geldings (P = 0.009). Corneometry showed significantly higher results in the neck region in mares compared with stallions (P = 0.037) and the prosternum areas in mares and geldings compared with stallions (P = 0.037 and P = 0.018). Skin pH measurement on the right side of the neck rendered significantly higher values in stallions than in mares (P = 0.037). In geldings, the skin temperature was significantly higher than in stallions (P = 0.049). Once the appropriate physicochemical values for specific animal species and breeds are determined, non-invasive methods of skin examination in many diseases and also methods of evaluation of the efficacy and/or adverse effects of applied medications can be established.

A. Piotrowska, K. Aszklar, A. Dzidek, B. Ptaszek, O. Czerwińska-Ledwig, W. Pilch, **The impact of a single whole body cryostimulation treatment on selected skin properties of healthy young subjects**, Cryobiology, June 2021; 100, pP: 96-100

Introduction: Systemic cryotherapy is a popular treatment involving a short stay in a cryogenic chamber at a temperature below -100 °C. This leads to a number of physiological reactions, some of them also observed in the skin. The aim of the study was to analyze the effect of a single cryogenic treatment on selected skin characteristics (skin pH, level of hydration and TEWL - Transepidermal Water Loss) in young, healthy people. Materials and methods: Skin characteristics in 77 young people (23.63 ± 1.36 years) were assessed. In the study, 43 women and 33 men who took part in a one-time treatment (-120 °C) lasting 3 min. Measurements were made on the forearm skin and (in men) on the face twice: before and immediately after the procedure. Results: Initial differences in hydration of the stratum corneum and TEWL were observed between the group of women and men. After one treatment, the examined characteristics of the forearm skin did not change, and an unfavorable increase in TEWL in men was indicated in the facial area. Conclusions: A single stay in the cryogenic chamber, while

maintaining the correct methodology of the treatment, is safe for the skin. The changes taking place depend on the body surface area tested, which indicates that the skin on the limbs and on the face reacts differently to the cryogenic stimulus.

S. Faloni de Andrade, C. Rocha, L.M. Rodrigues, **Skin Irritation and Inflammation – new data from an old (methylnicotinate) challenger,** Poster at the ISBS Digital Congress 2021, 3-5 June 2021, Berlin, Germany

Skin inflammation has many different expressions in clinical dermatology, with a wide variety of clinical signs and subjective symptoms. Nevertheless inflammation is a key feature in multiple dermatological problems, and at times the mechanisms involved are difficult to identify and understand. Several human models have been developed to study the impact on the skin barrier resulting from contact with various exogenous molecules, such as methylnicotinate (MN). However, skin responses to this challenger are widely varied, with no clear cause.

S. Faloni de Andrade, P. Rijo, C. Rocha, L. Zhu, K. Chen, L.M. Rodrigues, **High Resolution Sonography confirms that essential oils benefit epidermal water barrier *in vivo*,** Poster at the ISBS Digital Congress 2021, 3-5 June 2021, Berlin, Germany

Essential oils are complex mixtures of volatile low molecular weight compounds (terpenoids and phenylpropanoids) extracted from plants and are responsible for the characteristic aroma in those plants. Despite the wide use of these in cosmetic and dermatological formulations, information about its mechanism of action and efficacy is still insufficient.

G. Boyer, S. Brédif, G. Bellemère, C. de Belilovsky, C. Baudouin, **Investigation of Pediatric Sensitive Skin: Characterization by in vivo approach and development of an in vitro model,** Poster at the ISBS Digital Congress 2021, 3-5 June 2021, Berlin, Germany

Skin sensitivity is a self-reported syndrome which affects about 50% of adult population. Recently, a group of expert defined sensitive skin as “A syndrome defined by the occurrence of unpleasant sensations (stinging, burning, pain, pruritus, and tingling sensations) in response to stimuli that normally should not provoke such sensations.These unpleasant sensations cannot be explained by lesions attributable to any skin disease. The skin can appear normal or be accompanied by erythema. Sensitive skin can affect all body locations, especially the face” [2]. There are therefore two kinds of signs that defined sensitive skin, objective signs characterized by erythema and subjective signs characterized by sensations like stinging, burning or tingling. Concerning children, previous work indicates a prevalence of sensitive skin over 30% under 6 years old [3]. The differences between a “normal” immature skin of infant and a “specific” sensitive skin remain unclear. A clinical study was performed to investigate the sensitive skin syndrome in a pediatric population. Based on clinical findings, an in vitro skin model mimicking the features of pediatric sensitive skin was developed.

D. Niwa, N. Izawa, A. Imaoka, T. Sone, **Development of a Novel Convenient Method for Analysis of the Relationship Between Human Skin Bacteria and Skin Properties**, IFSCC Magazine Volume 24, No. 2, June 2021

Recently, it is becoming important to relate the skin microbiome to the compounds on the skin to understand the relationship between the microbiome and its host. We evaluated a novel, convenient method for collecting skin samples using polyvinyl alcohol. Samples were prepared by dissolving the formed thin membrane in water after pasting polyvinyl alcohol on the skin. We compared this method with conventional methods. The polyvinyl alcohol samples were fully occupied by stratum corneum in the form of a few piled-up layers compared with conventional tape-stripping samples. The a-diversity of the bacteria and the number of Cutibacterium acnes (C. acnes) in the polyvinyl alcohol samples were not smaller than those in the other conventional swabs, whereas Propionibacteriaceae were the primary microbes in both samples. In addition, the values of fatty acids, triglycerides and the number of C. acnes in the polyvinyl alcohol samples were positively correlated signifcantly with each other in the study on healthy subjects of different genders and ages, which was consistent with previous fndings obtained using different methods. Our results indicate that the polyvinyl alcohol method makes it possible to analyze both sebum components and bacteria from the same sample and is promising for evaluating the relationship between the skin microbiome and its host.

A. Butera, **Probiotic Mixtures Effective in Managing Atopic Dermatitis in Children**, HCP Live, June 2021

Recent studies conducted in Korea suggested oral administration of probiotic mixtures were effective inreducing the severity of atopicdermatitis (AD) in children. Probiotics were also effective in restoring gut microbiota and reducing intestinal inflammation.

L. Weiß, **Charakterisierung hautphysiologischer, lokal inflammatorischer und penetrationsdynamischer Parameter nach milder Hautbarriereschädigung - Praktische Bedeutung für transkutane Vakzinierungsstrategien**, Dissertation an der Medizinischen Fakultät Charité – Universitätsmedizin Berlin, Germany, June 2021 (in German)

Introduction: Transcutaneous vaccination strategies have been in the focus of research for several years. Amongst these, needle-free vaccination methods avoid many challenges associated with conventional vaccination. Concomitantly, overall efficacy for various different approaches has been shown by other authors with delivery via the cutaneous route favoring the induction of cellular immune responses. Furthermore, an increase in penetration and immune activation have been discovered to be significant aspects in transcutaneous vaccination. Whether physical, chemical or biochemical stimuli are able to procure this is has not been thoroughly investigated. Methods: Based on clinical studies using skin surface treatment in transcutaneous vaccination this project analysed the effects of physical and chemical skin barrier disruption in combination with topical vaccine application. Firstly, skin-physiological parameters were analysed to determine the degree of barrier disturbance by the disruption methods. Secondly, the inflammatory milieu of the epidermis was investigated with ELISA and Array analyses and a more detailed investigation using RT-qPCR was conducted for Cyanoacrylat Skin Surface Stripping (CSSS). Finally, the influence of skin barrier disruption on the penetration of topically applied vaccine was analysed using histological staining and ELISA. Results: For physical disruption no persistent impairment of the skin physiology was found. The evaluation of different inflammation markers however showed signs of IL-1alpha stimulation after tape stripping, and array analyses indicated increased immune response to CSSS compared to tape stripping. RT-qPCR uncovered an increased gene-expression of various pro-inflammatory molecules after CSSS and CSSS combined with topical vaccine application. In regard to the chemical disruption methods, occlusion of water and imiquimod indicated a mild effect on skin physiology, while more severe disruption was seen after 2 % SLS occlusion. Occlusion with water and imiquimod also showed a stimulating effect on the excretion of IL- 1alpha. Penetration was increased following occlusion of SLS. 9 Discussion: Tape stripping and CSSS seemed to result in improved penetration of topically applied vaccine despite only causing mild and temporary skin barrier impairment. Furthermore, CSSS has shown itself to be an efficient immune-stimulus, causing a diverse immune response in combination with topical application of vaccine.

C. Uhl, D. Khazaka, **Skin sensitization in pandemic times,** PERSONAL CARE MAGAZINE, June 2021

For almost a year and a half, an unprecedented pandemic has had us in its grip worldwide, forcing us to abandon many cherished activities and realign our entire daily lives. It is particularly important in these times to prevent the spread of the pandemic through protective measures, distance and significantly increased requirements for hygiene measures such as the wearing of protective mouth-nose masks and the frequent use of sanitisers on all kinds of surfaces and naturally also on the skin.

P. Bhargava, H. Singdia, S. Nijhawan, D.K. Mathur, R.K. Bhargava, **A study of biophysical profle of inguinal skin: An implication for health and disease**, Indian Journal of Sexually Transmitted Diseases and AIDS Volume 42, Issue 1, January-June 2021

Context: Inguinal skin is prone to various infectious dermatological conditions such as erythrasma, intertrigo, hidradenitis suppurativa, folliculitis, dermatophytic infection, and various sexually transmitted diseases, ascompared to the skin elsewhere. Aim: Our study attempts to compare the biophysical profle parameters (BPPs) of the genital skin with that of the rest of the body, while taking skin of the upper back as control. It alsoattempts to fnd out if there is a difference in BPPs of the two sites and that how the change in the BPPs, bring about change in microbiome and make inguinal skin more prone to infections. Materials and Methods: This was a hospital-based comparative study conducted over 976 patients (600 males and 376 females) of age group 18–60 years, where BPP parameters such as hydration, skin pH, transepidermal water loss (TEWL), and sebum content were measured over the skin of the upper back and right inguinal region, and the results were summarized and presented as proportions (%). Chi-square test was used to compare abnormalfndings. $P \leq 0.05$ was taken as statistically signifcant. MedCalc 16.4 version software was used for all statistical calculations. Results: Signifcant difference was noted in skin pH and TEWL, where *P* value came out to be <0.05, which was statistically signifcant, whereas there was minimal difference in sebum content and skin hydration in both the areas, in males and females. Conclusion: Raised skin pH disturbs organization of lipid bilayers (disturbed barrier), decreases lipid processing (impaired SC cohesion), and increases serine protease activity (reduced AMP). Increased TEWL (defect in physical barrier) and decreased hydration predispose the genital skin to infections. Use of pH buffered solutions (3–4), barrier repair creams containing ceramides, and barrier protective creams with dimethicone can help preventthese

inguinal dermatoses.

T. Bujak, M. Zagórska-Dziok, A. Ziemlewska, Z Nizioł-Łukaszewska, T. Wasilewski, Z. Hordyjewicz-Baran, **Antioxidant and Cytoprotective Properties of Plant Extract from Dry Flowers as Functional Dyes for Cosmetic Products**, Molecules 2021, 26, 2809

Nowadays, natural dyes are expected by the cosmetic and food industries. In contrast to synthetic dyes, colorants derived from natural sources are more environmentally friendly and safer for human health. In this work, plant extracts from *Gomphrena globasa* L., *Clitoria ternatea* L., *Carthamus tinctorius* L., *Punica granatum* L. and *Papaver rhoeas* L. as the natural and functional dyes for the cosmetics industry were assessed. Cytotoxicity on keratinocyte and fibroblast cell lines was determined as well as antioxidant and anti-aging properties by determining their ability to inhibit the activity of collagenase and elastase enzymes. In addition, the composition of the extracts was determined. The obtained extracts were also applied in face cream formulation and color analyses were performed. It has been shown that the obtained extracts were characterized by no cytotoxicity and a high antioxidant potential. The extracts also show strong ability to inhibit the activity of collagenase and moderate ability to inhibit elastase and provide effective and long-lasting hydration after their application on the skin. Application analyses showed that the extracts of *P. rhoeas* L., *C. ternatea* L. and *C. tinctorius* L. can be used as effective cosmetic dyes that allow for attainment of an intense and stable color during the storage of the product. The extracts of *P. granatum* L. and *G. globasa* L., despite their beneficial effects as active ingredients, did not work effectively as cosmetic dyes, because cosmetic emulsions with these extracts did not differ significantly in color from emulsions without the extract.

I. Dolečková, A. Čápová, L. Machková, S. Moravčíková, M. Marešová, V. Velebný, **Seasonal variations in the skin parameters of Caucasian women from Central Europe,** Skin Research & Technology, Volume 27, Issue 3, May 2021, p. 353-357

Background: The human skin is greatly affected by external factors such as UV radiation (UVR), ambient temperature (T), and air humidity. These factors oscillate during the year giving rise to the seasonal variations in the skin properties. The aim of this study was to evaluate the effect of seasons, environmental T, relative and absolute humidity on the skin parameters of Caucasian women, perform a literature review and discuss the possible factors lying behind the found changes.Materials and Methods: We measured stratum corneum (SC) hydration, transepidermal water loss (TEWL), sebum level, erythema index, and elasticity parameters R2 and R7 on the forehead and the cheek of Caucasian women from the Czech Republic throughout the year. We also performed a non-systematic literature review focused on the seasonal variations in these skin parameters. Results: We confirmed a well-documented low SC hydration and sebum production in winter. In spring, we found the lowest TEWL (on the forehead) and the highest SC hydration but also the highest erythema index and the lowest elasticity presumably indicating skin photodamage. For most of the skin parameters, the seasonal variations probably arise due to a complex action of different factors as we extensively discussed. Conclusion: The data about the seasonal variations in the skin parameters are still highly inconsistent and further studies are needed for better understanding of the normal skin changes throughout the year.

H. Ohshima, M. Kurosumi, H. Kanto, **New solution of beauty problem by *Staphylococcus hominis*: Relevance between skin microbiome and skin condition in healthy subject**, Skin Research & Technology, Volume 27, Issue 3, May 2021

Background/aims: Recently, it was suggested that skin microbiome is related to some skin disease. The possibility of affecting the skin might be high, but there were few reports of the influence on the skin condition in healthy subjects. Our aim was to evaluate the relationship between skin condition and skin microbiome in healthy subjects. Methods: Experiment 1: 293 Japanese healthy women were divided into two groups, good skin properties and poor skin properties by 14 skin physiology parameter values on the cheek using noninvasive method. Differences of abundance of bacterial species on the cheek between the two groups were evaluated. Experiment 2: 11 Japanese healthy women were applied *Staphylococcus hominis* (*S. hominis*) on halfside of cheek for eight times in 1 month. Difference of change of physiology parameter values comparing to placebo side was evaluated. Results: Experiment 1: Multiple skin bacterial species were found to be significantly relevant in 14 physiology parameters. The abundance of *S. hominis* on the cheek with good skin properties group was significantly higher than poor skin properties group. Experiment 2: The application of *S. hominis* improved significantly the conspicuous pore number, melanin index, and the wrinkle count compared to placebo side. Conclusion: We found many skin bacterial species that might improve the skin condition in healthy women. In particular, *S. hominis* might have the potential to improve multiple skin beauty problems.

Y. Gabe, K. Takeda, M. Tobiishi,| S. Kikuchi, K. Tsuda, Y. Haryuu, Y. Nakajima, Y. Inomata, S. Nakamura, D. Murase, S. Tokunaga, M. Miyaki, Y. Takahashi, **Evaluation of subclinical chronic sun damage in the skin via the detection of long-lasting ultraweak photon emission**, Skin Research & Technology, Volume 27, Issue 3, May 2021

Background: It is well known that solar radiation accelerates skin photoaging. To evaluate subclinical photodamage in the skin especially from the early phase of ultraviolet (UV)-induced damage, we have focused on ultraweak photon emission (UPE), also called biophotons. Our previous study reported that the amount of long-lasting UPE induced by UV, predominantly from lipid peroxidation, is a valuable indicator to assess cutaneous photodamage even at a suberythemal dose, although it was only applied to evaluate acute UV damage. The aim of this study was to further investigate whether long-lasting UPE could also be a useful marker to assess subclinical chronic sun damage in the course of skin photoaging. Materials and Methods: Forty-three Japanese females in their 20s were recruited and were divided into two groups according to their history of sun exposure based on a questionnaire (high- and low-sun-exposure groups). Several skin properties on the cheek and outer forearm were measured in addition to UV-induced UPE. Results: Among the skin properties measured, water content, average skin roughness, and the lateral packing of lipids in the stratum corneum were significantly deteriorated in the high-sun-exposure group as were changes in some skin photoaging scores such as pigmented spots and wrinkles. In addition, those skin properties were correlated with the UPE signals, suggesting the possible impact of oxidative stress on chronic skin damage. Conclusion: Subtle oxidative stress detected by long-lasting UPE may contribute to subclinical cutaneous damage at the beginning phase of chronic sun exposure, which potentially enhances skin photoaging over a lifetime.

R. Nitiyarom, L. Anuntarumporn, W. Wisuthsarewong, **Skin hydration and transepidermal water loss after bathing compared between immersion and showering**, Skin Research & Technology, 2021, Volume 27

Background: Various methods of bathing may affect skin properties differently. Aims: To compare the effects of immersion and showering on skin hydration and transepidermal water loss (TEWL). Method: This experimental study included healthy volunteers whose forearms were immersed and showered for 3 minutes. Skin hydration and TEWL were assessed serially before and after immersion and showering of volunteer forearms. Results: Seventy-eight healthy volunteers (49 females, 29 males) were enrolled with an age range of 12-55 years (mean 31.41 ± 10.33). Both methods significantly increased skin hydration and TEWL ($P < .001$). The capacitance value significantly increased immediately after bathing, and then rapidly decreased within 3 minutes. It returned to baseline by 10 minutes after bathing. There was no statistically significant difference of capacitance between the two methods at any measurement ($P > .05$). TEWL at every measurement after bathing was significantly increased compared to baseline for both bathing methods ($P < .001$). The highest TEWL was observed immediately after bathing, but then significantly decreased compared to the previous measurement ($P < .001$). Conclusion: Immersion and showering similarly demonstrated significant increase in skin hydration and TEWL. The increment of capacitance after bathing returned to baseline level within 10 minutes.

A. Kyritsi, S. Kikionis, A. Tagka, N. Koliarakis, A. Evangelatou, P. Papagiannis, A. Stratigos, V. Karalis, P. Dallas, A. Vitsos, E. Ioannou , V. Roussis, M. Rallis, **Management of Acute Radiodermatitis in Non-Melanoma Skin Cancer Patients Using Electrospun Nanofibrous Patches Loaded with *Pinus halepensis* Bark Extract**, Cancers 2021, 13, 2596

Abstract: Acute radiodermatitis is the most common side effect in non-melanoma skin cancer patients undergoing radiotherapy. Nonetheless, despite the ongoing progress of clinical trials, no effective regimen has been found yet. In this study, a non-woven patch, comprised of electrospun polymeric micro/nanofibers loaded with an aqueous extract of *Pinus halepensis* bark (PHBE), was fabricated and clinically tested for its efficacy to prevent radiodermatitis. The bioactivity of the PHBE patch was evaluated in comparison with a medical cream indicated for acute radiodermatitis. Twelve volunteer patients were selected and randomly assigned to two groups, applying either the PHBE patch or the reference cream daily. Evaluation of radiation-induced skin reactions was performed during the radiotherapy period and 1 month afterwards according to the Radiation Therapy Oncology Group (RTOG) grading scale, photo-documentation, patient-reported outcomes (Visual Analog Scale, questionnaire), biophysical measurements (hydration, transepidermal water loss, erythema, melanin), and image analysis. In contrast with the reference product, the PHBE patch showed significant antiinflammatory activity and restored most skin parameters to normal levels 1 month after completion of radiation therapy. No adverse event was reported, indicating that the application of the PHBE patch can be considered as a safe medical device for prophylactic radiodermatitis treatment.

H. Stettler, R. de Salvo, R. Olsavszky, E.A. Nanu, V. Dumitru, S. Trapp, **Performance and Tolerability of a New Topical Dexpanthenol-Containing Emollient Line in Subjects with Dry Skin: Results from Three Randomized Studies**, Cosmetics 2021, *8*, 18

Three studies were conducted with three new dexpanthenol-containing emollients containing increasing lipid contents (Emollients 1–3) to assess their performances in healthy adults with dry skin. All three studies (N = 42 each) followed virtually the same design. A single skin application of the study product was performed followed by once-daily usage. Skin hydration, transepidermal water loss (TEWL), skin biomechanical properties, and lipid content of the stratum corneum (SC) were regularly assessed over the 28-day study period; a subset (N = 22) underwent a sodium lauryl sulfate (SLS) challenge prior to product application. All three emollients were well tolerated and showed good performances with only minor differences in instrumental measurements. After single and prolonged once-daily applications of Emollients 1–3 to dry skin and dry SLS-damaged skin, skin hydration significantly increased from baseline (BL) (by 38.1–72.4% in unchallenged skin, $p < 0.001$ for all three). This was paralleled by significant increases in skin elasticity parameters. Usage of Emollients 1 and 3 caused increases from BL in SC cholesterol (by 9.8–12.5%, $p < 0.05$ for both) and SC free fatty acid levels (by 3.7–26.3%, $p < 0.05$ for both) at the end of the study. No sustained effects on TEWL were recorded. Our findings support the once-daily use of all three emollients in adults with dry skin.

R. Reynaud, Y. Rolland, B. Sennelier-Portet, A. Scandolera, M. Pélican, M. de Tollenaere, E. Chapuis, **Talgregulierung, der ethische Weg!**, sofw journal, 147, 05/21

Mangixyl™ (auch als “ wonnen und ist ein wirksamer kosmetischer Inhaltsstoff, der mikrobiomfreundlich ist und nachweislich durch Talgregulation *Mangifera Indica* Blätter aktiv” bezeichnet) wird aus der grünen Fraktionierung von Mangoblättern gegegen Ölhaut wirkt. Die kosmetische Innovation aktiviert spezifsche Rezeptoren des Genweges, der normalerweise durch die hochwirksame Retinsäure reguliert wird. In einer Zeit, in der Nachhaltigkeit und Rückverfolgbarkeit für die Verbraucher im Vordergrund stehen, unterstreicht die Sourcing-Geschichte von Mangixyl™ unser Engagement für unseren Unternehmenszweck. Die Mangoblätter werden in Zusammenarbeit mit der Association Bendia aus dem Dorf Koro (Burkina Faso, Afrika) gesammelt. Der Verein ist eine von Frauen geführte Initiative, um zur Verbesserung der Lebensbedingungen der Gemeinde beizutragen. So ist *Mangifera Indica* Leaves Active eine Zutat, die gut für die Verbraucher, gut für den Planeten und gut für die Menschen ist. Dieser Inhaltsstoff soll die Verbraucher von den Beschwerden befreien, die durch fettige Haut verursacht werden. Es aktiviert einige Rezeptoren des Retinsäure-regulierten Genweges und verringert *in vitro*, *ex vivo* und *in vivo* die Synthese von Lipiden bei allen Hautethnien. Zusätzliche klinische Daten zeigten eine Wirksamkeit gegen zu Akne neigende Haut und zur Regulierung von Talg auf der Kopfhaut. Inmitten der aktuellen COVID-19-Krise bietet es auch eine wirksame Antwort auf das Phänomen der „Maskne“, das in letzter Zeit an Dynamik gewonnen hat

D. Sobkowska, I. Micek, M. Urba□ska, A. Seraszek-Jaros, G. Nowak, L. Zaprutko, R. Czajkowski, Z. Adamski, J. Gornowicz-Porowska, **The effects of baths and wet wraps with a sweet whey solution on the level of hydration and barrier function of the epidermis**, Adv Dermatol Allergol 2021; XXXVIII (5): p. 798–803

Introduction: Sweet whey is known for its various pharmacological uses as an anti-inflammatory and antioxidant agent. This is because whey proteins accelerate the release of bioactive peptides, increase the level of intracellular glutathione and the production of interleukin IL-8. However, the potential skin care effects of whey, especially in its unprocessed state, are still not clear. Aim: To evaluate in vivo the cosmetic features of sweet whey baths and wet wraps on human skin. Material and methods: Thirteen healthy Caucasian adult females with no dermatological diseases were examined. We used the Courage-Khazaka MPA-9 device to evaluate the effects of sweet whey baths/wet wraps on skin hydratation, transepidermal water loss (TEWL) and melanin and erythema index and pH level in human skin. Results: It appeared that bathing in the sweet whey solution significantly improved the barrier function of the skin in comparison with tap water treated control area on the face cheek as well as on the forearm by decreasing the value of transepidermal water loss with statistical significance. Skin hydration was enhanced only on the facial skin. No significant differences concerning other parameters were observed. Conclusions: We showed that sweet whey may have decreased the TEWL level and fixed the barrier function of epidermis in this way. It seems that a bath solution with sweet whey is well tolerated and may promote local blood circulation without affecting the pH value of the skin.

F. Spada, I.P. Harrison, T.M. Barnes, K.A. Greive, D. Daniels, J.P. Townley, N. Mostafa, A.T. Fong, P.L. Tong, S. Shumack, **A daily regimen of a ceramide-dominant moisturizing cream and cleanser restores the skin permeability barrier in adults with moderate eczema: A randomized trial**, Dermatologic Therapy. 2021;34

The dysfunctional skin barrier in eczema patients may be attributed to decreased levels of ceramides in the stratum corneum. The aim of this study was to determine whether a two-part system consisting of a ceramide-dominant physiological lipidbased moisturizing cream and cleanser could ameliorate the signs and symptoms of moderate eczema in adults over 28 days compared to placebo. Assessments were conducted at baseline and every 7 days thereafter. Eczema area severity index core decreased significantly across all time points in both groups compared to baseline (P < .0001), however, this decrease was not significant between groups at day 28 (P = .7804). In contrast, transepidermal water loss and skin hydration significantly improved over time in the active group, while it either stayed the same or worsened in the placebo group (P = .0342 and P < .0001, respectively). There was no difference in the use of mometasone furoate as rescue medication over time between groups (P = .1579). Dermatology life quality index scores improved significantly in both groups (P < .0001), with no difference between groups (P = .5256). However, patient satisfaction was greater in the active compared to the placebo group for several parameters including relief of itch, dry skin, skin softness and smoothness (all P < .05). No patients withdrew from the study due to adverse events (AEs) and there were no serious AEs. The ceramide-dominant moisturizing cream and cleanser safely restores skin permeability and improves the signs and symptoms of eczema in adults.

A. Samadi, S. Ahmad Nasrollahi, M. Nateghi Rostami, Z. Rezagholi, F. Abolghasemi, A. Firooz, **Long-term effects of two 24-hour moisturizing products on skin barrier structure and function: A biometric and molecular study**, Health Science Reports, 2021;4

Introduction: Recently, there are a few moisturizers showing hydrating effects up to 24 hours after single application. Aquaporin 3 might be associated with the degree of skin hydration. We aimed to assess the effects of two brands of 24-hour moisturizers on the skin barrier function, as well as the AQP3 gene expression. Method: Two moisturizers were applied once daily by 20 participants age 36.15 ± 9.55 years. Upper right and left forearms were randomly assigned to application of each product, whereas the right lower forearm served as control site for application of a cream base formulation. Biophysical assessments including trans epidermal water loss (TEWL), skin hydration, pH, surface lipids, and elasticity parameters were performed before intervention, 1, 4, and 24 hours after single application, following 2 weeks daily application and 1 week after termination of use. Also 5-mm punch biopsies were performed from application sites of product B and cream base formulation in for five participants after 2 weeks of application. Results: A single treatment with both products led to 24-hour increase in skin moisture in comparison with the control site (P-value <.01). Daily application of both products for 14 days also led to significant improvement in skin moisture (P-value <.01), TEWL (P-value <.01), and elasticity parameters. The increase in skin hydration was associated with upregulation of AQP3 gene expression in treated area for one of the formulations (P-value = .04). Conclusion: The tested 24-hour moisturizers only need to be applied once daily to improve skin barrier function and hydration and up-regulate AQP3 mRNA expression.

H. Heo, J. Madhavan, S. Eun, H. Jung, H. Lee, **Pre-Clinical Evaluation of Proprietary Lutein, Zeaxanthin, and Rosemary Formulation for Its Dermal Protective Activity in Male Swiss Albino Mice**, Prev. Nutr. Food Sci. 2021;26(4): p. 425-433

This study aimed to evaluate the efficacy of the proprietary lutein, zeaxanthin, and rosemary formulation for its dermal protection against ultraviolet (UV) irradiated skin dehydration. A total of 48 male Swiss albino mice of 8~12 weeks of age were divided into eight groups of 6 mice: mice in group 1 (G1) were considered the normal control, without treatment and without skin shaving; mice in G2 had their skins were shaved, but did not receive treatment; mice in G3were the pathological control; mice in G4 were treated as standard (hyaluronic acid); mice in G5~G8 were treated with low and high doses of 2 different test substances, respectively. Mice were anaesthetized and then depilatory was applied on the dorsal skin area (2 cm×2 cm) on alternate days, then UV/blue light irradiation was carried out for 15 min for 6 weeks. Collagen type 1 gene expression was determined via densitometric analysis, skin elasticity was assessed, and stratum corneum water contents were measured using a cutometer and corneometer. Skin hydration was assessed through transepidermal water loss, and several serum biochemical parameters (collagenase, hydroxyproline, hyaluronic acid, and ceramide levels) were determined to assess the skin moisturizing activity of the product. Images for assessing photoaging were considered between different groups on day 42. All these subjective parameters reached statistical significance (P< 0.05) in groups treated with the proprietary lutein and rosemary formulation compared with the placebo-treated group. In conclusion, the proprietary lutein, zeaxanthin, and rosemary formulation showed better protection of skin subjected to UV irradiated skin dehydration.

J. Jegal, N.-J. Park, B.-G. Jo, T.-Y. Kim, S.-K. Bong, S. Choi, J.-H. Paik, J.-W. Kim, S.-N. Kim, M.H. Yang, **Wikstroemia ganpi Extract Improved Atopic Dermatitis-Like Skin Lesions via Suppression**

of Interleukin-4 in 2,4-Dinitrochlorobenzene-Induced SKH-1 Hairless Mice, Molecules 2021, 26, 2016

Plants of the genus Wikstroemia are used in Chinese traditional medicine to treat inflammatory diseases, such as arthritis, bronchitis, and pneumonia. The present study was designed to determine whether Wikstroemia ganpi (Siebold and Zucc.) Maxim. offers a potential means of treating 2,4-dinitrochlorobenzene (DNCB)-induced atopic dermatitis (AD) in mice. Symptoms such as redness, edema, and keratinization in AD mice induced by DNCB were alleviated by the co-application of an ethanolic extract of W. ganpi for 2 weeks. The severity of skin barrier function damage was evaluated by measuring TEWL (transepidermal water loss). TEWLs of DNCB sensitized mouse dorsal skin were reduced by the application of a W. ganpi ethanolic extract, and skin hydration was increased. In addition, the infiltration of inflammatory cells into the dermis was significantly reduced, as were blood levels of IgE and IL-4, which play an important role in the expression of AD. The results of this experiment suggest that W. ganpi is a potential therapeutic agent for AD.

M.A. Nilforoushzadeh, S. Zare, S. Farshi, M. Mahmoudbeyk, M. Nouri, F. Jaffary, N. Nikkhah, **Clinical, biometric, and ultrasound assessment of the effects of the autologous fibroblast cells transplantation on nasolabial fold wrinkles**, J Cosmet Dermatol,. 2021 Apr 27

Background: Feeling beautiful and staying young have always been important to the people. Therefore, an extensive body of research has focused on the efforts made to remove the skin problems, especially wrinkles. Fibroblast cells of the skin are the various autologous cells currently used in repairing several wounds, scars, and skin aging. Thus, the present study was conducted to assess the efficacy of the transplantation of the fibroblast cells in eliminating the facial wrinkles using the biometric assessment and to optimize the application of this technique in this treatment. Methods: The present study was conducted on 22 male and female patients aged between 35 and 60 years old. Samples were collected from the retro-auricular region, and the fibroblast cells were isolated and cultured. Subjects received three injections with autologous fibroblasts at 2-week intervals. The patients were followed up for 6 months, and structural changes in their wrinkles were assessed by the sonography and the VisioFace software, cutometer, tewameter, and colorimeter. Results: The results obtained using the VisioFace software showed the significant phenotypic changes in the patients after the nasolabial injections (81.42 ± 23.97 vs. 60.91 ± 21.91, p = 0.0001). The results showed a significant increase in the total skin density (13.73 ± 6.30 vs. 26.27 ± 7.93, p = 0.0001), dermis density (11.28 ± 5.21 vs. 31.88 ± 7.96, p = 0.0001), epidermis density (27.68 ± 23.15 vs. 49.21 ± 45.68, p = 0.046), and dermis thickness (798.09 ± 133.51 μm vs. 905.59 ± 240.67 μm, p = 0.036) compared to pre-treatment. Conclusion: The findings of the study revealed that the injection of autologous fibroblasts can be effective in restoring the aging skin, especially in the nasolabial region, and can be used as a safe rejuvenating strategy.

N. Cameli, M. Silvestri, MMariano, E. Berardesca, **Effects of food supplements and a topical solution containing nanosilicon on skin hydration, barrier function, and elasticity**, J Cosmet Dermatol, 2021 Apr;20 Suppl 1: p. 32-35

Background: Silicon is an abundant element in the human body and plays an important role in the skin, taking part in the synthesis of collagen and glycosaminoglycans. The use of nanotechnology methods, which processes materials at an atomic and molecular scale, has allowed the development of nanosilicons. Aims: The study evaluates the effectiveness of a food supplement and a topical solution containing nanosilicon in improving skin hydration and elasticity. Methods: A total of 30 female subjects were randomized to receive the placebo (n = 15) and the active compound (n = 15). All enrolled subjects took the food supplement twice a day for 20 days and then once a day for the next 20 days, and they also had to apply the nanosilicon solution on the right forearm four times a day. Evaluation of several parameters was performed after 20 and 40 days through the use of non-invasive instrumental methods (Corneometer® CM 825, Cutometer® MPA 580, Visioscan® VC, Tewameter® TM 200). Results: Both treatment groups showed a statistically significant improvement in barrier function and in skin hydration on the right forearm after 20 days; increase in skin elasticity was observed only in the group taking the active compound. Conclusions: The study showed that the administration of a food supplement and a topical solution, both containing nanosilicon, improves hydration, elasticity, and skin barrier function.

H. Dumbuya, X. Yan, Y. Chen, J. Wangari-Olivero, S. Lynch, P. Brieva, Q. Zheng, C. Bouez, **Efficacy of Ceramide-Containing Formulations on UV-Induced Skin Surface Barrier Alterations**, J Drugs Dermatol. 2021 Apr 1;20(4), Supplement: p. 29-35.

The human skin, particularly the stratum corneum, serves as a protective barrier against exogenous factors, including ultraviolet radiation (UVR) and pathogen invasions. The impact of UVR on skin cancer and photoaging has been extensively studied. However, the direct impact of UVR on skin barrier integrity under clinical settings remains poorly explored. Due to their benefits in reducing

inflammation and promoting skin barrier repair, ceramide-containing formulations can provide added photoprotection benefits. In this study, the efficacy of a ceramide-containing sunscreen and moisturizer were evaluated in preventing UV-induced skin surface barrier changes. Expert grading, instrumental, and tape-stripping assessments demonstrated that UVR induced erythema and hyperpigmentation and caused changes in skin cells surface morphological organization and maturation. Treatment with a ceramide-containing sunscreen and moisturizing cream routine reduced erythema and hyperpigmentation, improved skin hydration, and maintained normal superficial skin cells morphology and turnover after UVR. Our results indicate that barrier-enforcing lipids formulations can provide additional benefits in patients' daily routine by strengthening the barrier and improving skin health overall against chronic sun exposure.

L.E. Bostan, C.E. Clarkin, M. Mousa, P.R. Worsley, D.L. Bader, J.I. Dawson, N.D. Evans, **Synthetic Nanoclay Gels Do Not Cause Skin Irritation in Healthy Human Volunteers**, ACS Biomaterials Science & Engineering, Vol 7/Issue 6, April 2021

Synthetic clays are promising biomaterials for delivery of therapeutic molecules in regenerative medicine. However, before their use can be translated into clinical applications, their safety must be assessed in human volunteers. The aim of this study was to test the hypothesis that a synthetic nanoclay (LAPONITE) does not cause irritation to the human skin. To achieve this, a nanoclay gel at two different concentrations (1.5 and 3% w/v) was applied on the forearm of healthy volunteers for 24 h. 1% sodium lauryl sulfate (SLS) and 3% (w/v) polyacrylic acid were used as the positive and negative controls, respectively. The compromise in the skin barrier function was measured by trans-epidermal water loss (TEWL), erythema by spectroscopic measurements, and skin inflammatory biomarkers (IL-1¤ and IL-1RA) by the enzyme-linked immunosorbent assay. We found that the nanoclay caused no prolonged increase in TEWL, erythema, or induction of inflammatory cytokines. This was in contrast to 1% SLS, a known irritant, which induced significant increases in both skin erythema and TEWL. We conclude that the nanoclay is not an irritant and is thus suitable for therapeutic interventions at the skin surface.

G. Boyer, S. Bredif, A. Ferret, S. Leclere-Bienfait, M. Le Roux, **Algae-derived active for sensitive skin**, PERSONAL CARE, April 2021, p. 29-35

Born from a close collaboration between two French companies, the active ingredient Algaenia®, made from the green gold produced by the culture of *Chlamydomonas acidophila* (Glycerin, Propanediol, Water, *Chlamydomonas Acidophila* Extract) was developed through a biotechnological process (enzymatic hydrolysis). Algaenia®, a 100% made-in-France active ingredient, is thus bio-inspired from the ecosystem of this microalgae: as it prospered in very inhospitable waters, the resulting peptides allow the skin to withstand the harsh conditions of its environment.

S. Sipos, E.-A. Moacă, I.Z. Pavel, S. Avram, O.M. Cret, D. Coricovac, R.-M. Racoviceanu, R. Ghiulai, R.D. Pană, C.M. Şoica, F. Borcan, C.A. Dehelean, Z. Crăiniceanu, ***Melissa officinalis* L. Aqueous Extract Exerts Antioxidant and Antiangiogenic Effects and Improves Physiological Skin Parameters**, Molecules 2021, 26, 2369

Melissa officinalis (MO) is a medicinal plant well-known for its multiple pharmacological effects, including anti-inflammatory, anticancer and beneficial effects on skin recovery. In this context, the present study was aimed to investigate the in vitro and in vivo safety profile of an MO aqueous extract by assessing cell viability on normal (HaCaT—human keratinocytes) and tumor (A375—human melanoma) cells and its impact on physiological skin parameters by a non-invasive method. In addition, the antioxidant activity and the antiangiogenic potential of the extract were verified. A selective cytotoxic effect was noted in A375 cells, while no toxicity was noticed in healthy cells. The MO aqueous extract safety profile after topical application was investigated on SKH-1 mice, and an enhanced skin hydration and decreased erythema and transepidermal water loss levels were observed. The in ovo CAM assay, performed to investigate the potential modulating effect onthe angiogenesis process and the blood vessels impact, indicated that at concentrations of 100 and 500 µg/mL, MO aqueous extract induced a reduction of thin capillaries. No signs of vascular toxicity were recorded at concentrations as high as 1000 µg/mL. The aqueous extract of MO leaves can be considered a promising candidate for skin disorders with impaired physiological skin parameters.

A. Prokopová, J. Pavlačková, P. Mokrejš, R. Gál, **Collagen Hydrolysate Prepared from Chicken By-Product as a Functional Polymer in Cosmetic Formulation**, Molecules 2021, 26, 2021

Chicken stomachs can be processed into collagen hydrolysate usable in cosmetic products. The aim of the study was to verify the effects of a carbopol gel formulation enriched with 1.0% (*w*/*w*) chicken hydrolysate on the properties of the skin in the periorbital area after regular application twice a day for eight weeks in volunteers ageed 50 ± 9 years. Skin hydration, transepidermal water loss (TEWL), skin

elasticity and skin relief were evaluated. Overall, skin hydration increased by 11.82% and 9.45%, TEWL decreased by 25.70% and 17.80% (always reported for the right and left area). Generally, there was an increase in skin elasticity, a decrease in skin roughness, as the resonancetimes decreased by 85%. The average reduction of wrinkles was 35.40% on the right and 41.20% on the left. For all results, it can be seen that the longer the cosmetic gel formulation is applied, the better the results. Due to the positive effect on the quality and functionality of the skin, it is possible to apply the cosmetic gel formulation in the periorbital area. The advantage of the product with chicken collagen hydrolysate is also the biocompatibility with the skin and the biodegradability of the formulation.

J. Nawrot, J. Budzianowski, G. Nowak, I. Micek, A. Budzianowska, J. Gornowicz-Porowska, **Biologically Active Compounds in *Stizolophus balsamita* Inflorescences: Isolation, Phytochemical Characterization and Effects on the Skin Biophysical Parameters**, Int. J. Mol. Sci. 2021, 22, 4428

Three germacranolides, as well as five flavonoids, natural steroid and simple phenolic compounds, were isolated from the inflorescence of Stizolophus balsamita growing in Iran. The paper presents active compounds found for the first time in the inflorescence of this species. The flavonoids, simple phenolic compounds and natural steroids have been isolated for the first time in the genus Stizolophus. The MTT assay was employed to study in vitro cytotoxic effects of the taxifolin against human fibroblasts. We also evaluate the possible biological properties/cosmetic effects of Stizolophus balsamita extract and taxifolin on the human skin. Sixty healthy Caucasian adult females with no dermatological diseases were investigated. We evaluate the effects of S. balsamita extract and taxifolin on skin hydration and transepidermal water loss (TEWL). It was revealed that S. balsamita extract might decrease TEWL level and fixed the barrier function of the epidermis. The presence of bioactive phytochemical constituents in S. balsamita inflorescences makes them a valuable and safe source for creating new cosmetics and medicines.

V. Nobile, I. Schiano, A. Peral, S. Giardina, E. Spartà, N. Caturla, **Antioxidant and reduced skin-ageing effects of a polyphenolenriched dietary supplement in response to air pollution: a randomized, double-blind, placebo-controlled study**, Food & Nutrition Research 2021, 65: 5619

Background: Air pollution exposure is one of the major threats to skin health and accelerates skin ageing mainly through oxidative stress mechanisms. Since it is diffcult to minimize skin exposure to air pollutants, especially in urban areas, strategies to protect the skin are needed. Plant phenolic compounds have been found to be effective in attenuating cellular oxidative stress and inflammation induced by different air pollutants and a dietary approach based on these compounds could provide an effcient protection measure. Objective: Here we investigated the effcacy of a commercially available polyphenol-enriched dietary supplement (Zeropollution®) in reducing pollution-induced oxidative stress and in improving different skin parameters related to skin ageing of Caucasian and Asian subjects exposed to air pollution. Zeropollution is composed of four standardized herbal extracts: Olea europaea leaf, Lippia citriodora, Rosmarinus offcinalis, and Sophora japonica. Design: A double-blind randomized, parallel group study was carried out on 100 outdoor workers living in a polluted urban European area (Milan) to assess the effcacy of the dietary supplement. The total antioxidant capacity on saliva (FRAP), the oxidative damage on skin (lipoperoxides content), skin moisturization (corneometer), transepidermal water loss (tewameter), skin radiance and colour (spectrophotometer), skin elasticity (cutometer), skin sebum content (sebumeter), and the skin roughness (image analysis) were measured. Results: Both inter-group and intra-group analysis proved that the dietary supplement improved all clinical and biochemical-monitored parameters, in both Caucasian and Asian individuals. Some of the positive effects such as decreased wrinkle depth, increased elasticity and frmness, improved skin moisturization and transepidermal water loss, and reduced dark spots pigmentation were statistically signifcant as early as 2 weeks of product consumption. Conclusions: The results of the study indicate reduced oxidative stress-induced skin damage in both Asian and Caucasian women living in a polluted urban area. Therefore, the oral intake of this four-plant based supplement could be considered a complementary nutrition strategy to avoid the negative effects of environmental pollution exposure.

S.J. Oh, D. Yoon, J.-H. Park, J.H. Lee, **Effects of Particulate Matter on Healthy Skin: A Comparative Study between High- and Low-Particulate Matter Periods**, Ann Dermatol Vol. 33, No. 3, 2021, p. 263-270

Background: The influence of airborne particulate matter (PM) on skin has primarily been studied in patients with skin diseases such as atopic dermatitis. Recently, the effect of PM on healthy human skin has gained attention. Objective: To evaluate the relationship between PM concentration and objective skin changes in healthy subjects. Methods: This prospective study enrolled 25 healthy volunteers without any skin disease. Data regarding daily meteorological parameters and air pollution

were collected during a high-PM period and a low-PM period for 14 days. Environmental and lifestyle factors that might influence skin conditions of subjects were also collected during the study period. Biophysical parameters of the skin such as transepidermal water loss (TEWL), hydration, erythema index, and melanin index were measured. Pores, wrinkles, sebum, and skin tone were evaluated using a facial analysis system. Results: Mean TEWL value during the high-PM period was significantly higher than that during the low-PM period (10.16 g/m2/h vs. 5.99 g/m2/h; p=0.0005). Mean erythema index was significantly higher in the highPM period than that in the low-PM period (4.3 vs. 3.42; p=0.038). For facial analysis system indices, uniformity of skin tone was higher in the low-PM period than that in the high-PM period ($p<0.0001$). In addition, with increasing PM10 and PM2.5, TEWL also showed increase when other environmental components were constant (regression coefficient [RC]=0.1529, $p<0.0001$ for PM10; RC=0.2055, p=0.0153 for PM2.5). Conclusion: Increased PM concentrations may contribute to disturbed barrier function, increased facial erythema, and uneven skin tone even in healthy human skin.

H.S. Han, S.H. Shin, J.W. Park, K. Li, B.J. Kim, K.H. Yoo, **Changes in skin characteristics after using respiratory protective equipment (medical masks and respirators) in the COVID-19 pandemic among healthcare workers**, Contact Dermatitis. 2021;85: p. 225–232

Background: The coronavirus disease-2019 (COVID-19) outbreak has presented unique dermatologic challenges due to respiratory protective equipment (RPE)– related skin conditions. Objective: To objectively evaluate the effects of RPE including medical masks and respirators on the skin barrier by measuring various physiological properties of the skin. Methods: A cross-sectional study was designed. Twenty healthy healthcare workers were included in this study. Skin parameters including skin hydration, transepidermal water loss (TEWL), erythema, sebum secretion, pH, and skin temperature were measured in the RPE-covered and RPE-uncovered areas of the face 4 and 8 hours after wearing RPE and 14 hours after not wearing RPE. Results: Skin hydration, TEWL, erythema, pH, and skin temperature increased in the RPE-covered areas after wearing RPE for 4 and 8 hours. By contrast, in the RPEuncovered areas, skin hydration decreased and TEWL, erythema, and pH showed minimal changes over time. Based on the repeated-measure analysis, the changes in skin physiological properties over time were significantly different between RPEcovered and RPE-uncovered areas. Conclusion: We observed that skin physiological characteristics change with the prolonged use of RPE such as medical masks and respirators. These changes may lead to various adverse skin reactions after long-term use.

H. Kim, S.Y. Park, D.K. Chung, **Effect of the Oral Administration of Common Evening Primrose Sprout (*Oenothera biennis L.*) Extract on Skin Function Improvement in UVB-Irradiated Hairless Mice**, Pharmaceuticals 2021, 14, 222

Most of the studies on common evening primrose (*Oenothera biennis L.*) are focused on its oils (isolated from seed, root, and stem tissues). We aimed to investigate the effect of the oral administration of OBS-E on the improvement of skin function in skin-damaged hairless mice exposed to excessive ultraviolet B (UVB) radiation owing to the preliminary in vitro findings regarding the antioxidant, anti-wrinkle, and skin moisturizing activities of OBS-E. OBS-E administration for 14 weeks did not significantly affect the body weight or clinical signs. Significant reductions were observed in wrinkle parameters (area, number, length, and depth, and metalloproteinase levels) in OBS-E-administered mice compared with those in UVB-irradiated control mice. OBS-E significantly increased skin elasticity and hyaluronic acid content, but it significantly decreased transepidermal water loss. Histomorphometrical analysis revealed that OBS-E significantly reduced the epidermal thickness, area of the collagen-occupied region, and number of microfolds and inflammatory and mast cells. These results demonstrate that OBS-E can effectively enhance skin functions in terms of ameliorating wrinkle formation, promoting skin-moisturization, enhancing skin barrier function, and inhibiting inflammatory reactions. The obtained results provide good starting point for the continuation in the process of developing new inner beauty products based on OBS-E.

C. Uhl, D. Khazaka, A. Pouladi, **"Classic" biophysical methods for hair & scalp**, PERSONAL CARE, March 2021, p. 23-26 and **Métodos biofísicos 'clásicos' de análisis capilar,** Revista técnica de la Industria Cosmética, Perfumería e Higiene Personal, Primavera 2021 No. 018, p. 34-37

Hair is not only strands of horn made mainly of keratin. Hair indicates someone's personal beliefs or social status. The matter of hair care / grooming is not entirely all about women. For men, a well-kept, thick head of hair brings added good looks. However, there is more to it. Nowadays, social media, most of all Instagram, influences different generations. Besides skin, hair is the characteristic attribute for health, youth and attraction. Hair can even be a communication and political instrument. Just take as an example the men who let grow a moustache of their own style every November of a

year, the so called Movember, to raise funds for men's health. Plenty of products and treatments are ready to fit the modern hair care market for thin, thick, curly, dry, oily, blonde, coloured, ethnic, young, or old hair. Imagine a claim, the product is already invented. As hair is unique, personalised products flood the hair care market. Respectively, a great number of claims around the various products exists. Hair care rituals can be complemented with food supplements and treatment devices.

Además de la piel, el cabello representa un atributo social característico de la salud, la juventud y la atracción. Multitud de productos y tratamientos están listos para ser adaptados al nuevo mercado de cuidado del cabello, específicamente para tratar cabellos finos, gruesos, rizados, secos, grasos, coloreados, jóvenes, envejecidos... Existe un gran número de afirmaciones en torno a los distintos productos existentes en el ámbito del cuidado capilar.

M. Dąbrowska, I. Nowak, **Noninvasive evaluation of the influence of aucubin-containing cosmetic macroemulsion on selected skin parameters,** J Cosmet Dermatol, 2021 Mar;20(3),:p. 1022-1030

Background: Objective evaluation of skin condition on the basis of noninvasive methods has become obligatory and may be a good strategy for verifying the efficiency of new cosmetic active ingredients. Aim: The aim of this study was to assess the influence of aucubin-containing cosmetic macroemulsion on skin parameters using the skin testing equipment. Patients/methods: The study was carried out on the group of 25 female volunteers of the mean age 27 ± 2 years. The skin parameters were measured using the following devices: Tewameter® TM 300 (transepidermal water loss, TEWL), Corneometer® CM 825 (skin hydration), Cutometer® MPA 580 (skin elasticity), Visioscan® VC 98 (skin topography), and Visioline® VL 650 (skin macrorelief). All measurements were performed on the inner part of the left forearm. Results: The skin parameters measured revealed the beneficial influence of aucubin on TEWL and skin hydration level. The application of aucubin-enriched cream caused more significant improvements of all determined SELS parameters, in comparison with cream without it. An analogous tendency was noticed in the case of skin macrorelief parameters; the addiction of the active ingredient led to a decrease in the value of total wrinkle area and diminished the mean length and depth of single wrinkles. Conclusions: Noninvasive methods of skin testing have provided a possibility of objective evaluation of the action of new active ingredients in cosmetic formulations. The study has proved the positive influence of aucubin on effectiveness of cosmetic macroemulsions, diminishing TEWL, increasing skin hydration level, and improving the values of SELS and skin macrorelief parameters.

D. Leskur, I. Perišić, K. Romac, H. Šušak, A. Šešelja Perišin, J. Bukić, D. Rušić, N. Kladar, B. Božin, D. Modun, **Comparison of mechanical, chemical and physical human models of in vivo skin damage: Randomized controlled trial**, Skin Research & Technology, Volume 27, Issue 2, March 2021 p. 208-216

Introduction: Human in vivo models of skin damage were often used in research of cutaneous disorders. The most commonly used models were tape-stripping as mechanical, sodium lauryl sulphate-induced irritation as chemical and ultraviolet radiation as physical damage model. In regard to differences between models, they were expected to have different responses to damage and recovery, with unique skin parameters' changes over time. Objective: The aim was to compare skin parameters in three different skin damage models on the same anatomical location, with and without topical treatment. Methods: Four test sites on each forearm were randomly assigned to three skin damage models with the fourth sites on each forearm chosen as a control, undamaged site. Skin parameters were assessed using non-invasive methods. Results: Sodium lauryl sulphate irritation caused the strongest damage with delayed reaction to the irritant. Tape stripping leads to highest initial skin barrier disruption but afterwards it showed the fastest skin recovery. Ultraviolet radiation did not affect skin barrier function, but it elevated skin erythema and melanin level. Tested preparation did not lead to changes in measured parameters. Conclusion: The skin of the participants had different response to three skin damage models with distinct changes of skin parameters and recovery.

E. Besic Gyenge, S. Hettwer, B. Suter, B. Obermayer, **Genderless cosmetics with gender-specific efficacy**, PERSONAL CARE, March 2021, p. 50-52

Unisex was yesterday's trend – genderless beauty is here to stay. The definition of gender has become very fluid. It now goes beyond simply 'male' and 'female', taking the form of a desire for acceptance and empowerment in one's own person. Man, woman, transgender and those who fall under any other definitions of gender should be able not only to share fashion but also their lotions and potions. From the consumers' point of view, this makes cosmetics more practical and sustainable. Nevertheless, genderless cosmetics should not be defined in terms of non-binary fragrances but rather by their mode of action, which should adapt to the respective needs of various skin types. However, where to start?

Can genderless skin care truly cater to the distinct needs of male and female skin? Are there differences between male and female skin? With this in view, our approach has been to develop Reforcyl®-Aion, an active ingredient with the capability to spring clean skin cells, activating and rejuvenating them, improving overall skin appearance and positively influencing the personal perception of beauty. Reforcyl-Aion meets the individual needs of skin regardless of gender or age.

J. Kottner, U. Blume-Peytavi, **Reliability and agreement of instrumental skin barrier measurements in clinical pressure ulcer prevention research**, Int Wound J. 2021; p. 1-12
In skin and wound research the instrumental measurement of skin function is established. Despite the widespread use, empirical evidence about measurement errors is widely lacking. The aim of this study was to measure reliability and agreement of skin temperature, transepidermal water loss, epidermal hydration, and erythema at the heel and sacral skin. Four experienced researchers performed skin measurements in 15 subjects. Lowest reliability was observed for transepidermal water loss at the sacral skin (ICC (1) 0.46 (95% CI 0.00-0.78)) and highest for skin temperature at the heel skin (ICC (1) 0.99 (95% CI 0.99-1.00)). Lowest Standard Errors of Measurement were calculated for skin temperature measurements at the heels (0.11°C) and highest for erythema measurements at the sacral skin (26.7 arbitrary units). There was a clear association between variability of estimates and reliability coefficients. Single measurements of skin temperature, stratum corneum, and epidermal hydration at the sacral and heel skin areas can be used in clinical research and practice. Means of at least two measurements should be used for estimating transepidermal water loss and erythema. Evidence is needed to inform researchers about relative and absolute measurement errors of commonly applied instruments and measurements in skin and wound research.

M. Mayer-Yousif, W. Konschake, H. Haase, M. Jünger, H. Riebe, **Influence of Medical Compression Stockings on Skin Hydration in Mainly Health Care Givers with Occupational Leg Symptoms and Edema**, Skin Pharmacol Physiol 2021;34: p.57–73
Background and Objective: Although compression therapy is a very effective therapy in reducing stasis-induced complaints, the wearing comfort is not always as requested. Most frequent problems are dryness of the skin and itching. This randomized, cross-over trial investigated 33 healthy participants and compared 2 different medical compression stockings: conventional stockings (type A = MCS) versus compression stockings with integrated care emulsion (type B = MCSSkC). Methods: Participants were divided into 2 cohorts. Both compression types were worn one after the other, 1 week each. The cohorts were named according to the sequence of the wearing periods (cohort AB/BA). Primary outcome: skin hydration. Secondary outcomes: transepidermal water loss (TEWL), skin roughness, leg volume, interface pressure, and questionnaires about stasis-induced complaints and wearing comfort. Results: Skin hydration: significant reduction after wearing MCS in both cohorts ($p < 0.001$); preservation of skin moisture after wearing MCS-SkC ($p = 0.546$ and $p = 0.1631$). TEWL: significant increase after wearing MCS ($p = 0.007$ and $p = 0.0031$); significant reduction by wearing MCS-SkC ($p = 0.006$ and $p = 0.0005$). Skin roughness: significant increase after wearing MCS ($p = 0.0015$ and $p = 0.010$), and nonsignificant decrease of skin roughness after wearing MCS-SkC ($p = 0.933$ and $p = 0.4570$). Leg volume: significantly reduced with both stockings ($p = 0.004$ and $p = 0.0047$). Regarding stasis-induced complaints, both stockings achieved good results. Conclusions: Both compression stockings are appropriate to reduce leg edema and minimize leg symptoms. MCS-SkC helps to obtain the natural skin barrier function in preserving the epidermal water content and reducing the TEWL.

M. Zagórska-Dziok, T. Bujak, A. Ziemlewska, Z. Nizioł -Łukaszewska, **Positive Effect of *Cannabis sativa L.* Herb Extracts on Skin Cells and Assessment of Cannabinoid-Based Hydrogels Properties**, Molecules 2021, 26, 802
The skin is an organ that is constantly exposed to many external factors that can affect its structure and function. Due to the presence of different cannabinoid receptors on many types of skin cells, cannabinoids can interact directly with them. Therefore, as part of this work, the impact of two types of *Cannabis sativa L.* herb extracts on keratinocytes and fibroblasts was assessed. The content of biologically active compounds such as phenols, flavonoids, chlorophylls and cannabinoids was evaluated. The antioxidant capacity of prepared extracts using the DPPH radical, H2DCFDA probe and measurement of superoxide dismutase activity was also assessed. The cytotoxicity of hemp extracts was determined using the Alamar Blue, Neutral Red and LDH assays. The ability of the extracts to inhibit the activity of matrix metalloproteinases, collagenase and elastase, was assessed. Preparations of model hydrogels were also prepared and their effect on transepidermal water loss and skin hydration was measured. The obtained results indicate that hemp extracts can be a valuable source of biologically active substances that reduce oxidative stress, inhibit skin aging processes and positively affect the

viability of skin cells. The analysis also showed that hydrogels based on cannabis extracts have a positive effect on skin hydration.

H.R. Moldovan, I. Manole, A. Suru, A.-I. Butacu, A.L. Tatu, A. Lupu, M. Dascalu, G.-S. Tiplica, C.M. Salavastru, **Prevention of Hand Eczema among Nurse Apprentice (PREVEDERM): An Interventional Study**, Annals of Work Exposures and Health, 2021, Vol. 65, No. 2, p. 67–175

Background: Workers in the healthcare sector are at high risk of developing occupational hand eczema mainly due to frequent exposure to irritants and/or allergens. Amongst workers in healthcare, nurses are at higher risk of developing hand dermatitis. Objectives: To evaluate the effectiveness of a short educational intervention program in preventing occupational hand eczema in nurse apprentices, using two objective tools, namely TEWL and EH, and the HECSI score. Methods: Data regarding professions, wet work exposure, activities performed during working hours, self-reported eczema were collected from 230 nurse students, divided in two study groups: the intervention and the control group (CG). The intervention group (IG) was given education about risks and proper skin care and was provided with cosmeceuticals to be used for skin care during hospital activity. The evaluation of skin properties was performed using questionnaires, HECSI score, measurement of transepidermal water loss (TEWL) and epidermal hydration (EH). Results: A number of 139 apprentice nurses completed the study. Of those participants who completed the study, 19.1% from CG and 19.6% from IG reported, at T1, hand eczema in the last 3 months, while at T2 (3 months later), 59.52 % of the CG and only 11.34 % from the IG stated having eczema in the last 3 months. In the IG, results showed an improvement of CM with 17% and of TEWL with 16%, with only a 0.5% improvement of CM in CG and a marked impairment of TEWL by 33%. Conclusion: Hand eczema is a common occupational dermatosis affecting the medical staff, even during apprenticeship. Early preventive training programs are effective in reducing the burden of occupational contact dermatitis.

C. Uhl, D. Khazaka, **Pomiar Rzeczywistego Wieku Skóry,** CHEMIA I BIZNES. 1/2021

Nagłówki w czasopismach i blogi coraz częściej ogłaszają, że „50 lat to nowe 30". Czy to faktycznie prawda? Czy osoby „po pięćdziesiątce" rzeczywiście są dziś bardziej sprawne fzycznie i umysłowo – i wyglądają młodziej – niż kiedyś?

A. Tortora, M. Bimonte, A. Tito, C. Zappelli, F. Apone, **Soothing Moves - Cannabis Sativa Cell Culture Alleviates Inflammation**, Cosmetics & Toiletries, January 2021, p. 34-44

Originating from central Asia, Cannabis sativa is an annual herbaceous flowering plant. Although used medicinally for centuries, it recently has experienced a significant resurgence in interest, becoming a buzzword in beauty. The main reasons behind this are the richness of chemical compounds produced by the plant and the significant opening up of regulatory markets. Cannabis plants contain more than 500 known compounds.

S. Leoty-Okombi, F. Gillaizeau, S. Leuillet, B. Douillard, S. le Fresne-Languille, T. Carton, A. de Martino, P. Moussou, C. Bonnaud-Rosaye, V. André, **Effect of Sodium Lauryl Sulfate (SLS) Applied as a Patch on Human Skin Physiology and Its Microbiota**, Cosmetics 2021, *8*, 6

In this study, we assessed the change in skin microbiota composition, relative abundance, and diversity with skin physiology disruption induced by SLS patch. Healthy women declaring to have a reactive skin were submitted to a 0.5% aqueous sodium lauryl sulfate solution application under occlusive patch condition for 24 h. Skin properties were characterized by tewametry, corneometry, and colorimetry and bacterial diversity was assessed by 16S rRNA sequencing. Analysis before and one day after SLS patch removal revealed an increase of skin redness and a decrease of stratum corneum hydration and skin barrier function. The relative abundance of taxa containing potential pathogens increase (Firmicutes: Staphylococcaceae; Proteobacteria: Enterobacteriaceae, Pantoea) while some of the most occurring Actinobacteria with valuable skin protection and repair capacities decreased (Micrococcus, Kocuria, and Corynebacterium). We observed an impaired skin barrier function and dehydration induced by SLS patch disturb the subtle balance of skin microbiota towards skin bacterial community dysbiosis. This study provides new insights on the skin bacterial composition and skin physiology simultaneously impaired by a SLS patch.

E. Öksüm Solak, G. Emel Gökçek, D. Kartal, N. Kalay, S. Levent Çinar, G. Savaş, M. Borlu, **The relationship between the severity of coronary artery disease and skin measurement parameters,** Skin Research & Technology, Volume 27, Issue 1, January 2021, p. 101-107

Purpose: This study aimed to investigate the relationship between skin parameters and CAD. Materials and Methods: The study included 50 patients diagnosed with coronary artery disease as the patient group and 45 volunteers without any known coronary artery disease as the control group. The

participants' skin TEWL, pH, temperature, electrical capacitance, sebum, and elasticity values were measured using noninvasive methods at the forehead, back, and forearm. Findings: Skin temperature was significantly higher in the back and forehead regions in the patient group. No difference was found between the sebum values of the patient and control groups at the back and forehead. A significantly higher result was obtained for the forearm area. The pH was significantly lower in the patients' forearm, although the obtained values were within the normal range. The TEWL was significantly higher in patients in all three regions. In terms of flexibility, R2 was significantly higher in the back and forehead regions of the patient group, and the R6 was significantly higher in the patient group in all three regions. In addition, there was no correlation between skin parameter and SYNTAX score increase measurements. Conclusion: It can be suggested that skin sebum and TEWL measurements can be accepted as cheap and noninvasive methods of predicting CAD.

H. Stettler, J.M. Crowther, M. Brandt, B. Lu, A. Boxshall, R. de Salvo, S. Laing, N. Hennighausen, S. Bielfeldt, P. Blenkiron, **Targeted dry skin treatment using a multifunctional topical moisturizer**, International Journal of Cosmetic Science, 2021, 43, p. 191–200

Objective: The development of dry skin is a complex process, with a wide variety of factors each playing different roles in its evolution. Given this, it is important when designing a formulation to tackle dry skin that these varied aspects of skin behaviour are addressed. Presented here are the results of a 3-week moisturization study carried out on dry legs. A wide range of traditional and more recently developed biophysical measurement methods have been combined with visual assessment of skin condition to enable multiple aspects of skin function to be determined. The observed changes in the skin are discussed in terms of the ingredients used in the moisturizing formulation. Methods: A range of novel and traditional skin assessment methods and techniques were used to assess the effects of an oil in water-based moisturizing product compared to an untreated site during a 3-week in vivo study on dry lower leg skin. Results: Statistically significant improvements were observed in a range of skin parameters as a result of product usage. Skin hydration assessed using Corneometer, Epsilon and visual dry skin grading all increased after 3 weeks of use. Skin barrier function measured using transepidermal water loss also improved. Levels of cholesterol, free fatty acids and Ceramide NH increased, as well as the average length of the stratum corneum (SC) lipid lamella bilayers, and the ratio of lipid to protein increased (measured using Lipbarvis and in vivo Confocal Raman Spectroscopy). Increases in the levels of Ceramide EOS and NP were also observed, along with an improvement in corneocyte maturity, although these were not statistically significant. Conclusions: Using a variety of traditional and novel skin assessment techniques, a wide range of factors associated with the evolution of dry skin have been assessed upon treatment with a new topical moisturizer. Product usage resulted in significant improvements to skin hydration and barrier function, the levels and morphology of SC barrier lipids, and overall epidermal differentiation. As a result there was a significant reduction in the characteristics associated with the development of dry skin after use of the test product.

H. Stettler, J. M. Crowther, M. Brandt, A. Boxshall,B. Lu, R. de Salvo, S. Laing, N. Hennighausen, S. Bielfeldt, P. Blenkiron, **Multi parametric biophysical assessment of treatment effects on xerotic skin**, Health and Disease, 1, 2021

Background: Topical moisturizing products are widely used to alleviate the problems associated with xerotic skin. Their use affects many properties of the stratum corneum (SC) in a complex and interrelated manner. The range of measurement techniques available to the researcher has increased in recent years. However, few studies have looked for correlations between the different techniques for assessing how aspects of xerotic skin change over time as a result of topical moisturizer usage. Objectives: A 3-week in vivo study using an oil-in-water based moisturizing product and an untreated site was conducted to determine the clinical signifcance of and any correlations between a range of different approaches for the measurement of skin lipid content and also skin hydration and visual grading of dry skin. Methods: A range of traditional and more recently developed skin measurement techniques have been used to examine a variety of SC properties in normal and xerotic skin during topical moisturizer usage. Results: In vivo confocal Raman spectroscopy and analysis of SC lipids from tape strips both showed an increase in SC lipid level and organization after 3 weeks of moisturizer usage on xerotic skin. Hydration, measured both optically and electrically, also increased and skin barrier function improved, with strong correlations between the different measures of dryness being observed. Conclusions: Strong correlations were observed between the skin measurements for lipid assessment and skin hydration with regard to the assessment of xerotic skin, providing valuable new information for future in vivo clinical research into dry and atopic skin.

P. Saraogi, V. Kaushik, R. Chogale, S. Chavan, V. Gode, S. Mhaskar, **Virgin coconut oil as prophylactic therapy again,t alcohol damage on skin in COVID times**, J Cosmet Dermatol. 2021;20: p. 2396–2408, J Cosmet Dermatol. 2021;20: p. 2396–2408

Background: Increased frequency of using alcohol-based hand sanitizers (ABHS) by consumers during COVID times have resulted in increased incidences of skin issues on palms. Objective: (1) To quantify skin damage with increased usage frequency of ABHS by consumers and (2) To evaluate Virgin Coconut Oil (VCO) as natural prophylactic agent to counter the adverse effects. Methods: In-home usage study was carried out with 60 volunteers for a 15-day intervention—Control Group: 6 applications per day of ABHS and Test Group: Overnight VCO use (6–8 drops) followed by 6× usage per day of ABHS. This leg included dermatological evaluation and WHO Self-Assessment Scale for skin health. Another leg of measurement included non-invasive instrumental study (Moisture & TEWL Probes, Tape Strip for protein content and IR spectroscopy for protein & lipid content) on forearm of 12 subjects (25–60 years age) with and without VCO application and repeated alcohol exposure. Results: In-home usage study established consumer experiencing skin protective effect of VCO in the context of ABHS onslaught. 25% increase in perceived moisture content was recorded for VCO users, using WHO Self-Assessment Scale. Instrumental studies confirmed an increase in TEWL and decrease in lipids & protein content. Overnight VCO application resists the extraction which builds up with repeated application. Conclusions: Current work provides evidence of compromised hand skin barrier with ABHS daily usage. Overnight VCO application helps prepare the skin for next day alcohol use. Based on the findings, a regimen of overnight VCO application on hands as a natural prophylactic is recommended.

T. Montero-Vilchez, M.-V. Segura-Fernández-Nogueras, I. Pérez-Rodríguez, M. Soler-Gongora, A. Martinez-Lopez, A. Fernández-González, A. Molina-Leyva, S. Arias-Santiago, **Skin Barrier Function in Psoriasis and Atopic Dermatitis: Transepidermal Water Loss and Temperature as Useful Tools to Assess Disease Severity**, J. Clin. Med. 2021, 10, 359

Multiple diagnostic tools are used to evaluate psoriasis and atopic dermatitis (AD) severity, but most of them are based on subjective components. Transepidermal water loss (TEWL) and temperature are skin barrier function parameters that can be objectively measured and could help clinicians to evaluate disease severity accurately. Thus, the aims of this study are: (1) to compare skin barrier function between healthy skin, psoriatic skin and AD skin; and (2) to assess if skin barrier function parameters could predict disease severity. A cross-sectional study was designed, and epidermal barrier function parameters were measured. The study included 314 participants: 157 healthy individuals, 92 psoriatic patients, and 65 atopic dermatitis patients. TEWL was significantly higher, while stratum corneum hydration (SCH) (8.71 vs. 38.43 vs. 44.39 Arbitrary Units (AU)) was lower at psoriatic plaques than at uninvolved psoriatic skin and healthy controls. Patients with both TEWL > 13.85 g·m-2h-1 and temperature > 30.85 ◦C presented a moderate/severe psoriasis (psoriasis area severity index (PASI) ≥ 7), with a specificity of 76.3%. TEWL (28.68 vs. 13.15 vs. 11.60 g·m-2 h-1) and temperature were significantly higher, while SCH (25.20 vs. 40.95 vs. 50.73 AU) was lower at AD eczematous lesions than uninvolved AD skin and healthy controls. Patients with a temperature > 31.75 ◦C presented a moderate/severe AD (SCORing Atopic Dermatitis (SCORAD) ≥ 37) with a sensitivity of 81.8%. In conclusion, temperature and TEWL values may help clinicians to determine disease severity and select patients who need intensive treatment.

P. Torreao, E. Phua, R. Clark, E. Fernandes, T. Pontes, A.P. Fonseca, N. Singh, B. Seesurn, M. Nielsen, A. Valois, D. Kerob, **Evaluation of the efficacy and tolerance of a cosmetic mask containing 89% of vichy volcanic mineralizing water and hyaluronic acid after facial laser procedures**, J Cosmet Dermatol. 2021;20, p. 2860–2866

Background: M89 M (Mineral 89 mask, Laboratoires Vichy, France), containing 89% Vichy volcanic mineralizing water and hyaluronic acid, aims to strengthen and repair skin barrier. Aims: To assess the efficacy, tolerance, patient satisfaction, and quality of life (QOL) using M89 M after laser procedures (LP). Methods: M89 M was applied immediately post-LP for 10 minutes, then daily for 5 days and 2-3 times a week, up to 28 days on the faces of 51 women. Evaluations were performed immediately post-LP, immediately after M89 M application at D0, D1, D5, and D28, and included criteria such as erythema and skin dryness. Subjects scored burning and warm sensations, itching, skin tightness, and stinging. Skin hydration using a Corneometer, skin barrier integrity using a Tewameter, and erythema using a Chromameter were assessed. Local tolerance and adverse events were recorded. After 28 days, subjects answered a questionnaire regarding the M89 M subjective cosmetic properties and QOL. Results: All subjects were in their mid-forties with a phototype of II, III, or IV. M89 M significantly ($P <$ .001) reduced the immediate cutaneous discomfort sensation and laser procedure-related symptoms (burning, warmth sensation, itching/stinging, skin tightness). Skin hydration, and erythema, assessed using instrumental measures, were also significantly improved immediately after mask application ($P \leq$

.01). Subjects highly appreciated M89 M and their QOL improved after 28 days of use. Local tolerance was good to excellent in both studies. Conclusion: M89 M is effective and safe immediately after esthetic procedures such as ablative and nonablative lasers and also improves the subject's QOL.

G. Park, B.C. Moon, S M. Ryu, W.J. Kim, H.-S. Lim, **Cicadidae Periostracum Attenuates Atopic Dermatitis Symptoms and Pathology via the Regulation of NLRP3 Inflammasome Activation**, Oxidative Medicine and Cellular Longevity, Volume 2021

Atopic dermatitis (AD) is a multifactorial inflammatory skin disease of complex etiology. Despite its increasing prevalence, treatment for AD is still limited. Crude drugs, including herbal extracts or natural resources, are being used to treat AD symptoms, with minimum side effects. Cicadidae Periostracum (CP), derived from the slough of insects belonging to the family Cicadidae, is a commonly used crude drug in traditional Asian medicine to treat/control epilepsy, shock, and edema. However, the effect of CP on AD-like skin lesions is unknown. In this study, we examined the effect of a CP water extract on AD disease development in vivo, using a house dust mite-induced AD mouse model, and in vitro, using HaCaT keratinocytes and a 3D human skin equivalent system. Importantly, CP administration alleviated house dust mite-induced AD-like symptoms, suggested by the quantified dermatitis scores, animal scratching behaviors, skin moisture retention capacity, and skin lesion and ear thickness. Furthermore, histopathological analysis demonstrated that CP decreased intralesional mast cell infiltration. In addition, CP treatments decreased the systemic levels of immunoglobulin E, histamine, and thymic stromal lymphopoietin (TSLP) and the local mRNA expression of TSLP and several Th1/Th2 cytokines. Our data suggest that these effects were mediated by the inhibition of nucleotide-binding oligomerization domain-like receptor protein 3 (NLRP3) inflammasome activation. In vivo and in vitro CP treatments resulted in the downregulation of inflammasome components, such as ASC and cleaved caspase-1, as well as related mediators such as IL-1*ß* and reactive oxygen species. Collectively, our results suggest that CP is a potential therapeutic agent for AD, controlling inflammatory responses through the suppression of NLRP3 inflammasome activation.

M.I. Quiñones-Vico, A. Fernández-González, E. Pérez-Castejón, T. Montero-Vílchez, S. Arias-Santiago, **Cytotoxicity and Epidermal Barrier Function Evaluation of Common Antiseptics for Clinical Use in an Artificial Autologous Skin Model**, J. Clin. Med. 2021, 10, 642

Bioengineered artificial skin substitutes (BASS) are the main treatment used in addition to autografts when skin injuries involve a large body surface area. Antiseptic/antibiotic treatment is necessary to prevent infections in the BASS implant area. This study aims to evaluate the effect of antiseptics and antibiotics on cell viability, structural integrity, and epidermal barrier function in BASS based on hyaluronic acid during a 28 day follow-up period. Keratinocytes (KTs) and dermal fibroblasts (DFs) were isolated from skin samples and used to establish BASS. The following antibiotic/antiseptic treatment was applied every 48 h: colistin (1%), chlorhexidine digluconate (1%), sodium chloride (0.02%), and polyhexanide (0.1%). Cell viability (LIVE/DEAD® assay), structural integrity (histological evaluation), and epidermal barrier function (trans-epidermal water loss, (TEWL), Tewameter®) were also evaluated. Cell viability percentage of BASS treated with chlorhexidine digluconate was significantly lower ($p \leq 0.001$) than the other antiseptics at day 28. Compared to other treatments, chlorhexidine digluconate and polyhexanide significantly affected the epithelium. No significant differences were found regarding epidermal barrier. These results may be useful for treatment protocols after implantation of BASS in patients and evaluating them in clinical practice. BASS represent a suitable model to test in vitro the impact of different treatments of other skin wounds.

A. Gledovic, A. Janosevic Lezaic, I. Nikolic, M. Tasic-Kostov, J. Antic-Stankovic, V. Krstonosic, D. Randjelovic, D. Bozic, D. Ili, S. Tamburic, S. Savic, **Polyglycerol Ester-Based Low Energy Nanoemulsions with Red Raspberry Seed Oil and Fruit Extracts: Formulation Development toward Effective In Vitro/In Vivo Bioperformance**, Nanomaterials 2021, 11, 217.

This study focuses on the development of biocompatible oil-in-water (O/W) nanoemulsions based on polyglycerol esters, as promising carriers for natural actives: red raspberry seed oil—RO and hydro-glycolic fruit extracts from red raspberry—RE and French oak—FE. Nanoemulsions were obtained via phase inversion composition (PIC) method at room temperature by dilution of microemulsion phase, confirmed by visual appearance, percentage of transmittance, microscopic, rheological and differential scanning calorimetry (DSC) investigations. The results have shown that the basic RO-loaded formulation could be further enriched with hydro-glycolic fruit extracts from red raspberry or French oak, while keeping a semi-transparent appearance due to the fine droplet size (Z-ave: 50 to 70 nm, PDI value ≤ 0.1). The highest antioxidant activity (~92% inhibition of the DPPH radical) was achieved in the formulation containing both lipophilic (RO) and hydrophilic antioxidants (FE), due to their synergistic effect. The nanoemulsion carrier significantly increased the selective cytotoxic effect

of RO towards malignant melanoma (Fem-X) cells, compared to normal human keratinocytes (HaCaT). In vivo study on human volunteers showed satisfactory safety profiles and significant improvement in skin hydration during 2 h after application for all nanoemulsions. Therefore, polyglycerol ester-based nanoemulsions can be promoted as effective carriers for red raspberry seed oil and/or hydro-glycolic fruit extracts in topical formulations intended for skin protection and hydration.

Y.J. Tak, D.K. Shin, A.H. Kim, J.I. Kim, Y.L. Lee, H.-C. Ko, Y.-W. Kim, S.Y. Lee, **Effect of Collagen Tripeptide and Adjusting for Climate Change on Skin Hydration in Middle-Aged Women: A Randomized, Double-Blind, Placebo-Controlled Trial**, Frontiers in Medicine, January 2021, Volume 7

Introduction: Although collagen is widely used in various forms as a functional ingredient in skin care products, the effect of oral supplementation of collagen tripeptides (CTPs) on human skin is unclear. Moreover, the majority of the positive outcomes of CTP reported so far have not considered the effect of weather conditions. Therefore, we tested the effect of CTP and adjusting for climate change on skin properties in middle-aged women.Materials and Methods: A randomized controlled trial was conducted with 84 women between 40 and 60 years of age. Participants were randomized to receive placebo or 1,000 mg CTP daily for 12 weeks. CTP was prepared from the skin of Nile Tilapia by the digestion method using collagenase from non-pathogenic bacteria of the genus Bacillus. Skin hydration, wrinkling, and elasticity were assessed at baseline and after 6 and 12 weeks with adjustments for temperature, humidity, and ultraviolet A exposure during the evaluation time using weather data from the regional meteorological office. Results: Of the 82 participants, 74 completed the trial without adverse effects. Compared with the control group, trans-epidermal water loss was reduced more in the CTP group after 12 weeks ($P < 0.05$). At 12 weeks, even after adjustment for humidity, temperature, and UVA in the region, the difference of the two groups in TEWL remained statistically significant (adjusted for humidity and temperature, $P = 0.024$; adjusted for UVA, $P = 0.032$; adjusted for temperature, high temperature, and ultraviolet A, $P = 0.031$). In terms of skin hydration, more improvement was evident in the CTP group than in the control group. In the subgroup analysis, subjects under 50 years of age showed a significant improvement in total score and moisture in the subjective skin improvement questionnaire after taking CTP for 12 weeks. Application of CTP was well-tolerated, and no notable adverse effect was reported from both groups. Discussion: Our findings suggest that oral ingestion of CTP from the Skin of Nile Tilapia (Oreochromis niloticus) is well-tolerated and helps reduce water loss in in middle-aged women.

Y. Tezuka, O. Sekine, A. Hirano, Y. Hanada, I. Nakanishi, M. Ariga, C. Azuma, Y. Yamamoto, J. Ito-Kobayashi, M. Washiyama, M. Iwanishi, M. Furuta, M. Kanamori, A. Shimatsu, A. Kashiwagi, **A Prospective, Open-Label Short-Term Pilot Study on Modification of the Skin Hydration Status During Treatment With a Sodium-Glucose Cotransporter-2 Inhibitor**, Diabetes Ther (2021) 12: p. 431–440

Introduction: Various types of skin lesions with pruritus have been reported in participants of Asian clinical trials on sodium-glucose cotransporter-2 (SGLT2) inhibitors. The aim of this study was to determine whether the diuretic effect of a SGLT2 inhibitor could modify skin hydration status in patients with type 2 diabetes mellitus. Methods: A prospective, short-term, open-label, two-parallel-arm, pilot study was conducted. Eligible patients were assigned to either a SGLT2 inhibitor (50 mg ipragliflozin once daily) group or to a dipeptidyl peptidase-4 inhibitor (50 mg sitagliptin once daily) group (control). The biophysical characteristics of the skin were measured and blood chemistry tests were run in all participants 1 day prior to medication initiation (pre-treatment values) and 14 days thereafter (post-treatment values). Results: Fourteen patients were enrolled in the study, of whom eight were in the ipragliflozin group and six in the sitagliptin group. Compared to the pre-treatment values, the glycated hemoglobin (HbA1c) levels were slightly but significantly reduced in the ipragliflozin group ($p = 0.02$), but the changes in HbA1c from the pre-treatment to post-treatment time points did not significantly differ between the two treatment groups. Serum 3-hydroxy butyrate levels were significantly higher in the ipragliflozin group than in the sitagliptin group (p \ 0.02). Neither electrical capacitance nor electrical conductance of the stratum corneum (SC), parameters that reflect skin water content, was reduced by 14 days of ipragliflozin treatment; similarly, no changes in these parameters were found in the sitagliptin control group. There was also no difference in the changes in water barrier function of the SC between the two treatment groups. There was a significant linear correlation (p \ 0.01) in skin water content at pre-treatment and that 14 days after treatment with each drug, respectively. Conclusion: Ipragliflozin treatment for 14 days did not significantly affect the skin hydration status in patients with well-controlled type 2 diabetes mellitus.

J. Kim, H. Yeo, T. Kim, E.-T. Jeong, J.M. Lim, S.-G. Park, **Relationship between lip skin biophysical and biochemical characteristics with corneocyte unevenness ratio as a new parameter to assess the severity of lip scaling**, Int J Cosmet Sci. 2021;43: p. 275–282

Objective: Lip skin dryness and chapping are major concerns related to lip skin care in many populations. The distinctive features of lip skin, such as the low waterholding capacity and weak skin barrier, are strongly associated with these problems; however, few studies have examined lip skin characteristics and the mechanisms underlying these issues. This study was conducted to identify the biophysical properties of dry lip skin and molecular targets affecting lip skin physiology. Methods: Skin hydration, transepidermal water loss and lip skin scaling were evaluated in 40 female subjects. Skin scaling was assessed as a percentage area divided into five categories (G0, G1, G2, G3 and G4) according to the thickness level of tape-stripped corneocytes. The activities and amounts of proteases, cathepsin D and bleomycin hydrolase were measured as markers for the desquamation process and skin hydration, respectively. Results: Skin hydration showed a significantly positive correlation with the percentage area of evenly thin corneocytes (G0) and negative correlations with the percentage areas of slightly thick to severely thick corneocytes (G1-G4). The corneocytes unevenness ratio (CUR) was calculated by dividing the sum of the G1, G2, G3 and G4 values with the G0 value. The CUR was significantly negatively correlated with skin hydration, suggesting that CUR is a new parameter representing the severity of lip scaling. Subjects with lower hydration and higher CUR had higher bleomycin hydrolase activity and lower cathepsin D activity, respectively, than subjects with higher hydration and lower CUR. Conclusion: Our study revealed a correlation between lip skin hydration and severity of lip scaling and verified the association of protease activity with the hydration and chapping state of lip skin. These observations provide a basis for further studies of the persistent problem of lip skin dryness and chapping.

M. Zagórska-Dziok, A. Ziemlewska, T. Bujak, Z. Nizioł -Łukaszewska, Z. Hordyjewicz-Baran, **Cosmetic and Dermatological Properties of Selected Ayurvedic Plant Extracts,** Molecules 2021, 26, 614

Due to the constantly growing interest in ingredients of natural origin, this study attempts to evaluate the possibility of using extracts from three Ayurvedic plants in preparations for the care and treatment of skin diseases. Therefore, studies of antioxidant properties were carried out using DPPH and ABTS radicals, obtaining 76% and 88% of these radical scavenging, respectively. A significant decrease in the intracellular level of free radicals and an increase in the activity of the antioxidant enzyme-superoxide dismutase by almost 60% were also observed. In addition, the extracts were assessed for anti-inflammatory and anti-aging properties, obtaining over 70% inhibition of lipoxygenase activity and almost 40% of collagenase. Additionally, the cytoprotective properties of the obtained extracts on skin cells, keratinocytes and fibroblasts, were demonstrated. To assess the content of biologically active compounds, HPLC-electrospray ionization (ESI)-MS/MS multiple reaction monitoring (MRM) analyses were performed. The obtained results show that all three analyzed plants are a valuable source of biologically active substances with desired properties in the context of skin cell protection. Particularly noteworthy is the extract of *Epilobium angustifolium L.*, for which the most promising results were obtained.

I.B.S. Sitohang, S. Ninditya, **Systemic Glutathione as a Skin-Whitening Agent in Adult**, Hindawi Dermatology Research and Practice Volume 2020

Objectives. To compare the efficacy and safety profiles of systemic glutathione as a skin-whitening agent in adults from several randomized controlled trials (RCTs). Methods. *is study is an evidence-based case report with literature search conducted on Clinical Key, Cochrane, Journal of the American Academy of Dermatology, Taylor and Francis Online, ScienceDirect, and PubMed databases. *ree relevant RCTs were extracted and assessed for validity, importance, and applicability. Results. From 3 included trials, one of the studies opposed glutathione as a skin-whitening agent. However, the other two showed significant results only to some parts of the body or to certain age groups. As a skin-whitening agent, studies showed that glutathione yielded other cosmetic benefits as it may improve skin elasticity and reduce skin wrinkles. Furthermore, glutathione was well tolerated in oral preparations, but not in parenteral preparations. Conclusions. Highestevidence literatures showed that glutathione is not beneficial enough as a skin-whitening agent as it was only effective in some parts of the body and did not elicit long-lasting effects. However, its safety profiles in oral preparations were well tolerated. More researches regarding the time needed for skin color to return to its original state following drug withdrawal need to be conducted as it is yet to be discovered.

A. Skalska Stochaj, D. Hojan Jezierska, L. Kubisz, **Comparing the Efficacy of Monopolar and Bipolar Radiofrequency Treatment on Facial Skin in Women**, JCAD Journal of Clinical and Aesthetic Dermatology, December 2020, Volume 15, Number 12

Objective: The present research compared the effectiveness of the monopolar radiofrequency method with that of bipolar method in the facial skin of women in selected age groups. Methods: The study included 150 women with good general health and healthy skin. The firrst group comprised 75 female participants who received monopolar radiofrequency electromagnetic field treatment (RFM) and 75 women who were treated using the bipolar method (RFB). In both the RFM and RFB groups, five age groups were distinguished: Group I (20–29 years), Group II (30–39 years), Group III (40–49 years), Group IV (50–59 years), and Group V (60–69 years). Transepidermal water loss (TEWL) was measured using tewametry to determine stratum corneum barrier function and corneometry was used to measure epidermal hydration. Tewametric and corneometric measurements of the facial skin were performed to determine its condition following radiofrequency electromagnetic field therapy and to assess the sustainability of the obtained results after four months of therapy. The follow-up measurement was performed prior to the first treatment session and the subsequent ones after one month, and four months following the first measurement. RESULTS: The best results, indicating an improvement in epidermal hydration were observed for bipolar radiofrequency method in the age group 40-49 years and group 50-59 years.

S. Anggraeni, M. Ayu Umborowati, D. Damayanti, A. Endaryanto, C.R. Sigit Prakoeswa, **Role of *Centella asiatica* and ceramide in skin barrier improvement: a double blind clinical trial of Indonesian batik workers**, Journal of Basic and Clinical Physiology and Pharmacology, 2020

Objectives: Batik dyes contain irritant chemicals that increase the risk of skin barrier disruption. This study aims to determine the effect of *Centella asiatica* and ceramide in transepidermal water loss (TEWL), hydration of the stratum corneum and skin acidity (pH). Methods: This was a double blind clinical trial of 30 Indonesian batik workers who suffered from skin dryness, but had no clinical manifestation of contact dermatitis. Subjects were given cream containing *C. asiatica* or ceramide that formulated and randomly labeled by manufacturer (PT Paragon Technology and Innovation). Both subjects and researchers were blinded to the type of the cream. Cream was applied to the hands and arms twice a day. Biological function of the skin (TEWL, stratum corneum hydration level, and skin acidity) was examined by Cutometer dual MP-580. Baseline was recorded in the first examination, followed by second and third examinations at two and four weeks after treatment. Results: After four weeks treatment, there were significant improvement of *C. asiatica* application in evaluation of corneometer palmar (p=0.007; CI 95%), corneometer dorsum (p=0.001; CI 95%), and skin acidity dorsum (p=0.017; CI 95%). Ceramide application also gave significant improvement of corneometer palmar (0.038; CI 95%), skin acidity palmar (p=0.001; CI 95%), TEWL dorsum (p=0.023; CI 95%), corneometer dorsum (p=0.002; CI 95%) and skin acidity dorsum (p=0.011; CI 95%). There were no significant differences of *C. asiatica* effectiveness compared to ceramide in skin barrier improvement. Conclusions: *C. asiatica* and ceramide can improve skin barrier hydration in order to prevent the risk of contact dermatitis in batik workers.

M. Streker, M. S. Thill, M. Kerscher, **Einfluss oraler Kollagen-Peptide auf die Hautqualität am ganzen Körper**, Akt Dermatol 2020; 46: 87–93

Die Hautalterung ist ein komplexer Prozess, der sowohl extrinsischen als auch intrinsischen Einflüssen unterliegt. Neben sichtbaren Zeichen wie Falten und einem Verlust an Elastizität spielen sich insbesondere in der Dermis molekulare Veränderungen ab. Ein wesentlicher Faktor ist die Minderung der Qualität und Quantität von kollagenen Fasern sowie weiteren extrazellulären Matrixbestandteilen. Bereits in früheren In-vivo-Human-Studien wurde eine Verbesserung der Hautqualität im Gesicht durch die orale Supplementierung mit Kollagenpeptiden nachgewiesen. Es konnte mittels objektiver, validierter dermatologischer Mess methoden bestätigt werden, dass die orale Aufnahme von speziellen Kollagen-Peptiden über einen längeren Zeitraum die Hautphysiologie (Lipidgehalt der Hautoberfläche, Stratum-corneum-Hydratation, Hautelastizität, Hautglätte und Hautdichte) positiv beeinflusst. In der vorliegenden 12-wö- chigen Studie wurden die positiven Effekte eines Nutraceuticals mit bioaktiven Kollagen-Peptiden (ELASTEN®) auf die Hautqualität erstmals am gesamten Körper (Gesicht, Dekolleté, Arm und Oberschenkel) untersucht.

D.J. Son, J.C. Jung, Y.M. Choi, H.Y. Ryu, S. Lee, B.A. Davis, **Wheat Extract Oil (WEO) Attenuates UVB-Induced Photoaging via Collagen Synthesis in Human Keratinocytes and Hairless Mice**, Nutrients 2020, 12, 300

The efficacy of wheat extract oil (WEO), standardized to glucosylceramides, for protectingagainst ultraviolet B (UVB)-induced damage of skin barrier function was assessed using the SHK-1 hairless mouse model and two human skin cell lines, namely, CCD-986sk and HeCaT. The ability of repeated oral administration of 30, 60, and 120 mg of WEO/kg/day for 12 weeks to prevent skin damage of SKH-1 hairless mice induced by UVB irradiation was evaluated. The results demonstrated

that UVB-induced water evaporation (transepidermal water loss, TEWL) was significantly decreased by WEO. Similarly, UVB-induced losses in moisture and skin elasticity were improved by WEO supplementation. WEO attenuated the tissue procollagen type I, hyaluronic acid (HA), and ceramide reductions induced by UVB treatment as well. Collagen concentrations in skin tissue were increased in the WEO-treated mice, while UVB-induced epidermal thickening was reduced. In vitro studies using HeCaT human keratinocytes confirmed increased HA and collagen synthesis in response to WEO treatment. This may occur via WEO suppression of matrix metallopeptidase-1 (MMP-1), since its induction by UVB treatment was diminished in treated CCD- 986sk cells. Oral administration of WEO improves skin barrier function in UVB-irradiated mice by attenuating damage typically observed in photoaging. This research further clarifies the clinical benefits previously observed by dietary WEO consumption.

V. Mazzarello, E. Gavini, G. Rassu, M.G. Donadu, D. Usai, G. Piu, V. Pomponi, F. Sucato, S. Zanetti, M.A. Montesu, **Clinical Assessment of New Topical Cream Containing Two Essential Oils Combined with Tretinoin in the Treatment of Acne**, Clinical, Cosmetic and Investigational Dermatology 2020:13, p. 233–239

Background: Acne is a frequent adolescent disease characterized by inflammatory and noninflammatory lesions whose topical treatment very often presents adverse phenomena such as irritation or resistance to antibiotics that reduce the patient's compliance. The purpose of this study is to compare a commercial product (Acnatac gel) based on clindamycin-tretinoin (CTG) with a galenic compound containing 2 essential oils (Myrtus communisL. and Origanum vulgare) and tretinoin (MOTC) to evaluate its anti-acne effectiveness and action on the microclimate of the skin. Methods: Sixty volunteers were randomly divided into an A group using MOTC and a B group, as a positive control, using CTG. The effectiveness was assessed with non-invasive skin analysis (Sebumeter, pH meter, Tewameter and Mexameter) and the counts of the number of lesions, after 15 and 30 days. Results: In both groups, there is a worsening of transepidermal water loss (TEWL) due to tretinoin. MOTC has improved, starting from 15 days of treatment, the papular erythema ($p = 0.0329$ vs CTG) and has reduced at all times even the rashes of retinoids present in the healthy perilesional skin ($p = 0.0329$ and $p = 0.0017$, respectively, at 15 and 30 days). Conclusion: MOTC has shown, compared to Acnatac, to have anti-acne efficacy and to possess an anti-inflammatory activity, due to essential oils, able to reduce in vivo erythematous lesions and those induced by retinoids.

E. Berardesca, A. Bonfgli, B. Cribier, F. Flament, M. Vicic, D. Kerob, J. Tan, **A Split-Face Study Assessing the Clinical Beneft, Tolerability and Subject Satisfaction of a Dermo-cosmetic in Subjects with Rosacea Associated with Erythema and Sensitive Skin**, Clinical, Cosmetic and Investigational Dermatology 2020:13, p. 751–758

Objective: This study assessed the effcacy and tolerability of M89 in patients with rosacea associated with erythema and sensitive skin. Methods: Intra-individual study in a split-face design comparing after 30 days M89 twice daily and usual skin care in 20 adult subjects with rosacea and sensitive skin. M89 contains 89% Vichy volcanic mineralizing water (VVMW) and 0.4% hyaluronic acid. It is hypoallergenic and contains no perfume and this convenes in rosacea. Contained minerals reinforce the natural defences of the skin in restoring the natural skin barrier, stimulating antioxidant activity and reducing inflammation, commonly observed in subjects with rosacea. Clinical evaluations included assessment of erythema, desquamation, papules and pustules, skin tightness, dryness, burning sensation, itching, stinging and stinging test as well as local tolerability. Instrumental evaluations included skin hydration and TEWL. Subject satisfaction was assessed at Days 15 and 30. Demodex density was assessed at Day 30. Results: A signifcant superiority of M89 over the standard skin care was observed for erythema, skin tightness and dryness (all $P \leq 0.05$) as early as Day 15, the skin stinging test was signifcantly in favour of M89 ($P<0.05$ at Day 15 and $P<0.01$ at Day 30) and for skin hydration ($P<0.0001$) at Day 15 and 30 with no difference in mean Demodex density between M89 and usual skin care after 30 days. Tolerance was excellent and subject satisfaction very high. Conclusion: Study results concerning M89 are encouraging for its use either alone or as an adjuvant daily skin care to topical medication in patients with persistent centrofacial erythema of rosacea with no more than 3 papules and pustules.

J. Pavlačková, P. Egner, R. Slavík, P. Mokrejš, R. Gál, **Hydration and Barrier Potential of Cosmetic Matrices with Bee Products**, Molecules 2020, *25*, 2510

Honey, honey extracts, and bee products belong to traditionally used bioactive molecules in many areas. The aim of the study was primarily to evaluate the effect of cosmetic matrices containing honey and bee products on the skin. The study is complemented by a questionnaire survey on the knowledge and awareness of the effects and potential uses of bee products. The effect of bee molecules

at various concentrations was observed by applying 12 formulations to the skin of the volar side of the forearm by non-invasive bioengineering methods on a set of 24 volunteers for 48 h. Very good moisturizing properties have been found in matrices with the glycerin extract of honey. Matricescontaining forest honey had better moisturizing effects than those containing flower honey. Barrier properties were enhanced by gradual absorption, especially in formulations with both glycerin and aqueous honey extract. The observed organoleptic properties of the matrices assessed by sensory analysis through 12 evaluators did not show statistically significant differences except for color and spreadability. There are differences in the ability to hydrate the skin, reduce the loss of epidermal water, and affect the pH of the skin surface, including the organoleptic properties between honey and bee product matrices according to their type and concentration.

M. Law, P. Jarrett, U.M. Nater, N. Skoluda, E. Broadbent, **The efects of environmental enrichment on skin barrier recovery in humans: a randomised trial**, www.nature.com/scientificreports 2020

This study investigated whether environmental enrichment (EE) could reduce stress and improve wound healing in humans. 120 participants underwent a standardised tape-stripping procedure and were then randomised to interact for 30 minutes with one of three EE interventions (comfort blankets as tactile enrichment, music as auditory enrichment or a Paro robot as multi-sensory enrichment) or to a control group. Skin barrier recovery (SBR) was measured using transepidermal water loss at baseline, after tape-stripping and after the intervention. Psychological variables, cortisol and alpha-amylase were measured at the three time-points. SBR did not signifcantly difer between the EE conditions and the control condition. The music condition had higher stimulation levels than the control condition, and the comfort condition had signifcantly lower relaxation levels than the control condition after the intervention. The EE interventions tested were not benefcial for wound healing compared to a control group. Limitations were that the sample were not stressed and an active control condition was used.

C.S. Lee, A. Jamil, **Skin pH and its Relationship with Transepidermal Water Loss and Disease Severity in Children with Atopic Dermatitis: A Cross-Sectional Study,** Journal of Dermatology and Dermatologic Surgery, 2020

Background: pH is increasingly a target in therapeutic strategies for skin barrier repair, but the relationship between pH, transepidermal water loss (TEWL), and atopic dermatitis (AD) severity is not well characterized**.** Purpose: The purpose of the study was to determine the relationship between skin pH with TEWL and their correlations with AD severity. Methods: A cross-sectional study enrolled children aged 4–12 years with AD. Measurements were made using HI 99181 and Tewameter TM 300 at two lesional sites and two nonlesional sites (left cubital fossa, left thigh, and forehead). Disease severity was evaluated using the Eczema Area and Severity Index (EASI) and pruritus score. Results: A total of 14 (58%) girls and 10 (42%) boys aged 7.3 ± 2.6 years with age of AD onset 3.0 ± 2.1 years participated. The mean EASI score was 8.9 ± 8.2, body surface area 13.1% ± 18.5%, pruritus score 5.9 ± 2.7, and Children Dermatology Life Quality Index 5.6 ± 4.9. pH and TEWL were higher at lesional compared to nonlesional skin, pH 5.2 ± 0.7 versus 4.6 ± 0.4, $P < 0.01$ and TEWL 31.1 ± 15.2 versus 16.0 ± 10.2, $P < 0.01$. Lesional pH positively correlated with TEWL ($r = 0.59$, $P = 0.02$ and $r = 0.55$, $P = 0.01$), while nonlesional pH was inversely correlated ($r = -0.42$, $P = 0.04$ and $r = -0.40$, $P = 0.05$). pH showed signifcant positive correlations with EASI and itch at one lesional site. Conclusion: pH and TEWL were higher at lesional skin. pH correlated positively with TEWL at lesional skin but inversely at nonlesional areas. Higher pH was associated with disease severity and itch. pH restoration may have therapeutic potential in AD.

T. Yazdanparast, K. Yazdani, S.A. Nasrollahi, L. Izadi Firouzabadi, P. Humbert, A. Khatami, M. Kassir, A. Firooz, **Biophysical and ultrasonographic changes in early patch/plaque stage of mycosis fungoides, compared with uninvolved skin,** Skin Research & Technology, Volume 26, Issue 6, November 2020, p. 859-866

Background: The goal of this study was evaluation of the skin biophysical properties in early patch/plaque stage of mycosis fungoides (MF) and its comparison with uninvolved skin in order to gain a better understanding of the pathogenesis of diseases. Materials and Methods: The stratum corneum hydration, transepidermal water loss (TEWL), surface friction, pH, sebum, melanin, erythema, temperature, elasticity parameters (R0, R2, R5), thickness, and echo density of epidermis and dermis were measured on lesions of 21 patients and compared with controls (average measures of uninvolved perilesional and symmetrical skins) by paired sample *t* test. Results: Stratum corneum hydration ($P < 0.001$) and echo density of dermis ($P = 0.044$) were significantly lower, whereas pH (P-value = 0.007), erythema ($P < 0.001$), and melanin content ($P = 0.007$) were significantly higher in lesions. There was not any significant difference in TEWL, friction index, sebum, temperature, R0, R2, R5, thickness of epidermis and dermis, and echo density of epidermis between lesions and normal skin. Conclusion:

Parapsoriasis/MF lesions are specified by a set of certain changes in biophysical properties which are mainly correlated with histological changes. These sets of alterations may help in noninvasive, early diagnosis of parapsoriasis/MF.

M. Batory, E. Wołowiec-Korecka, H. Rotsztejn, **The influence of topical 5% tranexamic acid at pH 2.38 withand without corundum microdermabrasion on pigmentation and skin surface lipids**, Dermatol Ther. 2020, Nov;33(6):e14391.

Tranexamic acid (TA) has anti-hemorrhagic effects; however, oral administration has been found to decrease hyperpigmentation. The aim of the work was to compare the effects of treatment with 5% tranexamic acid in combination with corundum microdermabrasion on skin pigmentation, redness, pH, transepidermal water loss (TEWL), sebum level and hydration of back surface and dorsal surface of the hand skin. Six treatments were performed every week on the back surface and both dorsal surfaces of the hands of 12 subjects. The entire back/both hands were treated with 5% tranexamic acid at pH 2.38; left side of the back or left hand were also subjected to corundum microdermabrasion. Skin parameters were measured using the Courage & Khazaka 580 Multi Probe Adapter. Clinical photos were taken using the Fotomedicus system. Significant differences between treatment methods were observed for melanin, erythema and pH. In addition, the two methods differed significantly with regard to the amount of sebum, TEWL and the level of moisture in the skin. Both methods gave similar acidic pH. Summing up tranexamic acid causes a significant reduction in epidermal melanogenesis, has a significant impact on the level of skin hydration, lipids of the epidermis and maintaining the proper TEWL. TA has a significant effect on reducing skin redness.

Y. Pan, X. Ma, J. Zhao, S. Yan, Q. Liu, H. Zhao, **The Interaction of Age and Anatomical Region Influenced Skin Biophysical Characteristics of Chinese Women**, Clinical, Cosmetic and Investigational Dermatology 2020:13, p. 911–926

Background: Ageing is an inevitable physiology process of humans, and skin biophysical parameters change owing to genetic and environmental factors in different ethnic populations. Aim: To gain comprehensive data on the skin biophysical parameters of different anatomical regions and to explore the change trend of the skin characteristics associated with age for the indicated regions by generalized additive model. Methods: We measured various skin biophysical parameters on forehead, cheek, chin and inner forearm of 178 Chinese women aged between 20 and 64 years living in Beijing. These parameters comprised skin hydration, transepidermal water loss (TEWL), sebum content, erythema index (EI), melanin index (MI), L*a*b* values, individual typology angle (ITA) and pH, which were quantifed by non-invasive instruments. Results: Comparing the skin parameters among the four test areas, we observed that the hydration, TEWL, EI and a* values were signifcantly higher for the face than for the forearm, but the L* and ITA values were just the opposite. The cheek was the lightest and brightest region with lowest sebum content, while the chin was much darker and the forehead was yellowish. Considering the change of the skin parameters with age, TEWL, sebum content and melanin and erythema indices had a linear relationship with age, whereas skin hydration, L, a, b, ITA and pH values exhibited a non-monotonic relationship. The turning points of these curves appeared almost at the thirties, showing the lightest and evenest skin color and more hydration, with lower pH values. Conclusion: This study indicates that the skin biophysical characteristics of Chinese women were signifcantly affected by age and body regions.

Y.-J. Kim, H.-J. Ahn, S.-H. Lee, M.-H. Lee, K.S. Kang, **Effects of conditioned media from human umbilical cord blood-derived mesenchymal stem cells in the skin immune response**, Biomedicine & Pharmacotherapy 131 (2020)

Atopic dermatitis (AD) is an inflammatory skin disease in which type 2 allergic inflammation plays a critical role. In this study, the anti-inflammatory effect of conditioned media from human umbilical cord blood-derived mesenchymal stem cells (USC-CM) was investigated in order to apply it as an effective treatment with a low risk of side effects that can overcome the limitations of AD treatment which is currently in use. We found that USC-CM has various growth factors and cytokines associated with anti-inflammatory effect. RT-PCR and ELISA analysis showed that USC-CM inhibited the levels of type 2 cytokine and chemokine Thymus and activationregulated chemokine (TARC), TNF-α and IL-6 in TNF-α/IFN-γ-stimulated HaCaT cells. In addition, USC-CM inhibited IL-4 and IL-13 levels in Th2 cells. Therefore, the results of our study demonstrated that USC-CM has anti-inflammatory effect in TNF-α/IFN-γ-stimulated HaCaT cells which associated with the inhibition of the immunoglobulin (IgE) secretion by activating B cell line. Our *In vivo* results showed that when the USC-CM was applied to lesions of patients with the mild AD for 4 weeks, the skin barrier was strengthened by increasing the level of Corneometer and decreasing the value of transepidermal water loss (TEWL). In conclusion, the results suggest that USC-CM may have therapeutic effect for AD as cosmetics and drug materials.

N. Tomonaga, Y. Manabe, K. Aida, T. Sugawara, **Dietary ceramide 2-aminoethylphosphonate, a marine sphingophosphonolipid, improves skin barrier function in hairless mice**, Scientific Reports (2020) 10:13891

Sphingolipids are one of the major components of cell membranes and are ubiquitous in eukaryotic organisms. Ceramide 2-aminoethylphosphonate (CAEP) of marine origin is a unique and abundant sphingophosphonolipid with a C-P bond. Although molluscs such as squids and bivalves, containing CAEP, are consumed globally, the dietary efficacy of CAEP is not understood. We investigated the efficacy of marine sphingophosphonolipids by studying the efect of dietary CAEP on the improvement of the skin barrier function in hairless mice fed a diet that induces severely dry-skin condition. The disrupted skin barrier functions such as an increase in the transepidermal water loss (TEWL), a decrease in the skin hydration index, and epidermal hyperplasia were restored by CEAP dietary supplementation. Correspondingly, dietary CAEP signifcantly increased the content of covalently bound ω-hydroxyceramide, and the expression of its biosynthesis-related genes in the skin. These effects of dietary CAEP mimic those of dietary plant glucosylceramide. The novel observations from this study show an enhancement in the skin barrier function by dietary CAEP and the effects could be contributed by the upregulation of covalently bound ω-hydroxyceramide synthesis in the skin.

H.-J. Li, N.-L. Wu, C.-M. Pu, C.-Y. Hsiao, D.-C. Chang, C.-F. Hung, **Chrysin alleviates imiquimod-induced psoriasis-like skin infammation and reduces the release of CCL20 and antimicrobial peptides**, Scientific Reports (2020) 10:2932

Psoriasis is a common non-contagious chronic infammatory skin lesion, with frequent recurrence. It mainly occurs due to aberrant regulation of the immune system leading to abnormal proliferation of skin cells. However, the pathogenic mechanisms of psoriasis are not fully understood. Although most of the current therapies are mostly efcient, the side efects can result in therapy stop, which makes the efectiveness of treatment strategies limited. Therefore, it is urgent and necessary to develop novel therapeutics. Here, we investigated the efcacy of chrysin, a plant favonoid, which we previously reported to possess strong antioxidant and anti-infammatory efects, against psoriasis-like infammation. Our results revealed that chrysin signifcantly attenuated imiquimod-induced psoriasislike skin lesions in mice, and improved imiquimod-induced disruption of skin barrier. Moreover, the tnf-α, IL-17A, and IL-22-induced phosphorylation of MAPK and JAK-STAT pathways, and activation of the nf-κB pathway were also attenuated by chrysin pretreatment of epidermal keratinocytes. Most importantly, chrysin reduced tnf-α-, IL-17A-, and IL-22-induced CCL20 and antimicrobial peptide release from epidermal keratinocytes. Thus, our fndings indicate that chrysin may have therapeutic potential against infammatory skin diseases. Our study provides a basis for further investigating chrysin as a novel pharmacologic agent and contributes to the academic advancement in the feld of Chinese herbal medicine.

I. Konya, I. Shishido, Y.M. Ito, R. Yano, **Combination of minimum wiping pressure and number of wipings that can remove pseudo-skin dirt: A digital image color analysis**, Skin Research & Technology, Volume 26, Issue 5, September 2020, p. 639-647

Background: Excessive wiping friction in skin care may lead to skin damage. Bed baths are required to remove skin dirt without affecting the skin barrier function; the wiping pressure and number of wipings that satisfy these two requirements have not been clarified. This study aimed to determine the minimum wiping pressure and number of wipings that can remove skin dirt. Materials and Methods: In this quasi-experimental study, 50 healthy adults received an adhesion of pseudo-oily and aqueous dirt, randomly assigned to the left and right forearms. Each participant was wiped three times with wiping pressure classified into six randomly assigned categories. The dirt removal rate was calculated by coloranalyzing images captured before and after each wiping, and its dependence on the combination of wiping pressure and number of wipings was assessed using a linear mixed model. Results: The combinations achieving oily dirt removal rates of 80% or more were wiping once and pressure ≥50 mmHg, wiping twice and pressure ≥40 mmHg, and wiping thrice and pressure ≥10 mmHg. Aqueous dirt was removed almost completely by wiping once, even with pressure ≥5 mmHg. Conclusion: Wiping with at least 10 mmHg or more three times can sufficiently remove both oily and aqueous dirt. Dirt removal rates with weak pressure can be made about as effective as those achieved with strong pressure by increasing the number of wipings. This result can be applied to daily nursing, home care, and long-term care health facilities.

A. Chodkowska, A. Bieńkowska, Ż. Słyk, J. Giebułtowicz, M. Małecki, **Anticancer activity of topical ointments with histone deacetylase inhibitor, trichostatin A**, Adv Clin Exp Med. 2020;29(9): p. 1039–1049

Background. Trichostatin A (TSA), being a strong specifc histone deacetylase (HDAC) inhibitor, may lead to the inhibition of growth, differentiation and/or apoptosis of cells in a number of tumors. Semisolid drug formulations for topical release of anticancer agents may be an alternative strategy or a supplement of the systemic therapy. Objectives. To prepare semisolid formulations with TSA to be used directly on the skin and to assessthe anticancer effect in vivo on a mouse model with L1 neoplastic tumors.Material and methods. Twenty-four formulations were prepared in the form of semisolid systems containing TSA as the active ingredient. Then, an in vitro study was performed concerning the release of the active substance from the prepared formulations. Four formulations were selected for in vivo studies: oil-in-water cream, hydrogel, w/o emulsion ointment on the absorptive hydrophobic medium, and o/w emulsion gel. The tumor size and mouse body weight were measured during the experiment. The tumors and healthy skin of the mice were assessed regarding the skin barrier function with the Corneometer and Tewameter probes. Results. The semisolid formulation with TSA applied on the skin reduced the growth of neoplastic tumors as compared with the control group. This is especially pronounced in the case of w/o emulsion ointment and o/w emulsion gel. The Corneometer shows that neoplastic tumor growth and formulations on the skin have no effect on the skin condition in comparison with the mouse skin without tumor. The measurement performed with the Tewameter has revealed impaired skin barrier function of neoplastic tumors. Conclusions. Semisolid formulations with TSA ft well in the mainstream of research into topical medicines applied directly on neoplastic tumors, which may support and supplement current oncological treatment.

J. Yang, Y. Tu, M.-Q. Man, Y.-J. Zhang, Y.i Cha, X. Fan, Z. Wang, Z. Zeng, L. He, **Seasonal variations of epidermal biophysical properties in Kunming, China: A self-controlled cohort study,** Skin Research & Technology, Volume 26, Issue 5, September 2020, p. 702-707

Background: Epidermal biophysical properties can be affected by many factors, including body site, age, gender, ethnicity, disease, temperature, humidity, and ultraviolet (UV) radiation. Information about variation of epidermal biophysical properties with seasons is still limited. In the present study, we determined seasonal variation of epidermal biophysical properties of women in Kunming, China. Materials and Methods: A total of 72 women, aged 22.96 ± 2.11 years, were enrolled in this study. Transepidermal water loss rates (TEWL), stratum corneum (SC) hydration, sebum content, melanin index (MI), erythema index (EI), and *L*a** values were measured on the right cheek and the right forearm, using a non-invasive skin physiological instrument in the spring, summer, autumn, and winter in Kunming, China. Results: On the cheek, TEWL, SC hydration, sebum, MI, and *L*a** values varied greatly with seasons ($P < .05$). SC hydration, sebum, MI, and *a**value peaked in the summer, but went lowest in winter. In contrast, TEWL and *L**value went lowest in summer but peaked in winter. Similarly, SC hydration, MI, and *L**value also varied with seasons on the forearm ($P < .05$). In addition, SC hydration, sebum, MI, EI, and *a**value of the cheek were higher than that of the forearm ($P < .001$), but *L**values of the cheek were lower than that of the forearm ($P < .001$). There were no correlations among TEWL and MI, EI, and *L*a**values in any season ($P > .05$). Conclusions: Both epidermal permeability barrier function, sebum, and skin pigment in healthy women vary seasons in Kunming, China.

C. Uhl, G. Wiora, D. Khazaka, **Measuring skin barrier: key for many applications**, PERSONAL CARE EUROPE, September 2020

When the first objective skin measurement systems were developed in the 1980s, the measurement of the Transepidermal Waterloss (TEWL) was among the very first. Until today, it has remained one of the mostimportant measurements for the assessment of skin health. Our skin is a protective barrier against environmental influences. It continuously releases water which is part of its metabolism. This normally imperceptible process is called Transepidermal Water Loss (TEWL). It is based on complex physical diffusion processes taking place in and above the skin. Molecules of water and air move in a chaotic way and transfer energy between each other and to the environment through collisions. The difference in concentration between the skin surface and the surrounding atmosphere is the driving force that turns the random movement of the particles into a directed redistribution.

K. Li, Z. Mu, G. Wen, Y. Zhao, X. Cong, J. Zhang, **Increased regulatory T cells and eosinophils characterize atopic dermatitis-like graft-versus-host disease compared with lichen planus-like graft-versus-host disease**, J Am Acad Dermatol, 2020 Sep;83(3): p. 824-831

Background: Graft-versus-host disease (GVHD) has various cutaneous manifestations. Little is known about the mechanisms of cutaneous GVHD with different clinical features. Objective: To characterize the immunologic features and skin barrier functions of cutaneous GVHD. Methods: The study included 19 patients with atopic dermatitis (AD)-like GVHD, 8 with lichen planus (LP)-like GVHD, 24 with AD, and 15 healthy controls. The subpopulation of T cells in peripheral blood and skin lesions was measured by flow cytometry and immunofluorescence, respectively. Filaggrin expression in skin

lesions was measured by Western blot and immunohistochemistry. Transepidermal water loss was also measured using Tewameter TM 300 (Courage & Khazaka Electronic GmbH, Köln, Germany). Results: The number of peripheral blood eosinophils in AD-like GVHD was significantly higher than that in LP-like GVHD. Type 2 helper T cells in peripheral blood and skin lesions were increased in AD-like GVHD and LP-like GVHD. Regulatory T cells in peripheral blood and skin lesions were increased in AD-like GVHD. Filaggrin expression and transepidermal water loss were increased in skin lesions of AD-like GVHD and LP-like GVHD. Limitations: The number of patients is limited. Conclusion: Although AD-like GVHD and LP-like GVHD both had elevated type 2 helper T cells and impaired skin barrier, increased eosinophils and regulatory T cells were found only in AD-like GVHD.

A. Kovács, D. Péter-Héderi, K. Perei, M. Budai-Szücs, A. Léber, A. Gácsi, E. Csányi, S. Berkó, **Effects of Formulation Excipients on Skin Barrier Function in Creams Used in Pediatric Care**, Pharmaceutics 2020, 12, 729

Semisolid dosage forms are recommended for the dermal care of babies and children. If we look at the ingredients of these preparations, there are still many cases in which there are substances (occlusive agents, preservatives) that no longer meet certain requirements of the modern age, so it is timely to replace them with other substances. The aim of this work was to formulate ascience-based formulation with new components that keep or improve its moisturizing properties, rheological parameters, and microbiological stability. Occlusive oils, like white petrolatum and liquid paraffin and the preservative parabens are traditional ingredients in oil in water creams, were replaced with white beeswax, sunflower oil, and phenoxyethanol, respectively. Cocoa butter, urea, and glycerol were added to improve long-lasting hydration and support the barrier function of the reformulated creams. The rheological properties of the formulations were determined. The effects of the preparations on skin hydration and on the barrier function of the skin were tested. Furthermore, microbiological stability was investigated. The result of the reformulation was an o/w cream that provided a good longer-lasting hydration effect; supported the barrier function of the baby skin without occlusion; and had adequate consistency, easy spreading, a pleasant skin feeling, proper pH, and good microbiological stability.

V.S. Chat, S.K. Uppal, D.G. Kearns, J.J. Wu, **Colloidal Oatmeal in the Treatment of Atopic Dermatitis - Is this plant-based intervention an effective treatment alternative?** Practical Dermatolgy, August 2020

Colloidal oatmeal is a common ingredient in OTC skin products that has been shown to improve skin barrier integrity and reduce pruritus and skin inflammation. Colloidal oatmeal treatments offer symptomatic relief, reduce TCS use, and enhance quality of life in patients with AD.

N. Tangkijngamvong, P. Phaiyarin, S. Wanichwecharungruang, C. Kumtornrut, **The anti-sebum property of chitosan particles**, J Cosm Dermatol, August 2020

Background: Seborrhea is linked to several medical and mental conditions. Although it is common, effective agents and the standardized sebum level for seborrhea are not elucidated. Aims: To determine the efficacy of chitosan particles (CP) formulation on controlling sebum secretion, its extended effects on skin redness and texture after combining with proretinal nanoparticles (CP-PRN), and a correlation of the clinical grading with sebum levels that affect mental health. Patients/methods: A four-week clinical trial with forty subjects was conducted. Subjects applied either CP formulation or CP-PRN during nighttime. Objective measurements including sebum levels, transepidermal water loss (TEWL), skin corneometry, skin redness, and texture were analyzed. Subjects completed a selfassessment clinical grading of skin oiliness at every visit. Results: Both CP and CP-PRN significantly decreased sebum levels ($P \leq .01$) at week 4 compared to baseline. CP also resulted in significant decreases in TEWL ($P \leq .05$) and skin corneometry ($P \leq .05$) throughout the study. A significant improvement in skin redness was observed with CP-PRN ($P \leq .01$). A moderate correlation between the clinical grading and sebum levels was detected (coefficient of 0.5, $P \leq .001$), with a sebum level of 106 μg cm indicating emotional discomfort. One subject experienced local irritation with the CP-PRN. Mild pruritic symptoms were reported in both groups. Conclusions: Chitosan particles exhibited an interesting anti-sebum effect. It could be combined with PRN to extend benefits without losing the sebum controlling effect. The clinical grading may be useful in practice due to a modest correlation with sebum levels.

W. Hua, Y. Zuo, R. Wan, L. Xiong, J. Tnag, L. Zou, X. Shu, L. Li, **Short-term Skin Reactions Following Use of N95 Respirators and Medical Masks**, Contact Dermatitis, 2020 Aug;83(2): p. 115-121

Background: In the context of the COVID-19 pandemic, cases of adverse skin reactions related to masks have been observed. Objective: To analyze the short-term effects of N95 respirators and medical masks, respectively, on skin physiological properties and to report adverse skin reactions caused by the equipment. Methods: This study used a randomized crossover design with repeated

measurements. Twenty healthy Chinese volunteers were recruited. Skin parameters were measured on areas covered by the respective mask and on uncovered skin 2 and 4 hours after donning, 0.5 and 1 hour after doffing, including skin hydration, transepidermal water loss (TEWL), erythema, pH and sebum secretion. Adverse reactions were clinically assessed, and perceived discomfort and incompliance measured. Results: Skin hydration, TEWL and pH increased significantly after donning. Erythema values increased from baseline. Sebum secretion increased both on the covered and uncovered skin with equipment-wearing. There was no significant difference between the physiological values between the two types of equipment. More adverse reactions were reported following N95 mask use that following use of medical mask, and a higher score of discomfort and incompliance. Conclusions: This study demonstrates that skin biophysical characters changes owing to mask and respirator wearing. N95 respirators were associated with more skin reactions than medical masks.

P. Bhargava, S. Nijhawan, H. Singdia, T. Mehta, **Skin Barrier Function Defect - A Marker of Recalcitrant Tinea Infections**, Indian Dermatol Online J 2020;4: p. 566-9

Context: Recently, there has been an increase in the number of chronic, recurrent, and recalcitrant dermatophytosis. Many factors implicated are barrier defects, aberrant host immune response, application of steroids or other irrational combination creams, transmission within family, occlusive clothing, poor hygienic conditions, poor compliance, drug resistance and virulence of the infecting strain. Transepidermal water loss (TEWL) is an important index in accessing the barrier function of skin. Aim: To ascertain the role of TEWL from the lesional skin and its effect on the cure rate and relapse in patients of tinea cruris. Materials and Method: A hospital based prospective comparative study was conducted for 1 year. A total of 200 patients of tinea cruris diagnosed clinically and by KOH examination, were included in the study. TEWL was calculated using Tewameter TM300 open chamber probe of Courage and Khazaka, Cologne, Germany. Patients were classifed according to the TEWL values into Group A (patients with abnormal TEWL) and Group B (normal TEWL). Both groups were given oral itraconazole and antihistamines for 4 weeks. The cure rates and recurrence rates of both the groups were analyzed and compared. Results: In the Group A, i.e., patients of tinea cruris with abnormal TEWL, only 28% of the patients showed clinical improvement at the end of 1 month. Out of those cured, 78.57% of the cases showed recurrence after 2 months of completion of therapy. In Group B, i.e., patients of tinea cruris with normal TEWL, 69% (n = 69) of the patients showed clinical improvement at the end of 1 month. Out of those cured, only 21.74% of the cases (n = 15) showed recurrence. Conclusion: The cases of tinea cruris with abnormal TEWL show signifcant decrease in cure rates and signifcant relapse rates among those initially cured.

A. Mandeau, P. Daigle, E. Loing, M. Shortt, **Hydration Regulation – Hybiscus Sabdariffa Osmolyte for Barrier Moisture Control**, Cosmetics & Toiletries, Vol. 135, No. 7, July/August 2020

Hibiscus sabdariffa L., also know as wild rosella (w. rosella) in Australia, is an annual crop grown in temperate and tropic climate.

F. Elban, E. Hahnel, U. Blume-Peytavi, J. Kottner, **Reliability and agreement of skin barrier measurements in a geriatric care setting**, Journal of Tissue Viability online, July 2020

Background: The non-invasive skin barrier measurements transepidermal water loss, stratum corneum hydration and the skin surface pH are widely used in clinical skin research. Relative and absolute measurement errors of these measurements are unknown in geriatric care settings. Material and methods: Transepidermal water loss, stratum corneum hydration, skin surface pH and temperature were measured on the volar forearm and lower leg twice by trained raters within a cross-sectional study in ten nursing homes. Intrarater reliability was calculated using the ICC (1,1). Intrarater agreement was analyzed using Bland Altman Plots with limits of agreement. Results: Two hundred twenty-three residents were included and mean age was 84.2 years. The highest ICC was found for transepidermal water loss and skin surface temperature of the leg with 0.95 (95% CI 0.93 to 0.96). The ICC of the stratum corneum was 0.91 (95% CI 0.88 to 0.93) for both investigated skin areas. The measurement of the pH at the lower leg had the lowest ICC with 0.73 (95% CI 0.66 to 0.78). Highest limits of agreement of approximately 8 a.u. were calculated for stratum corneum hydration and lowest limits of agreement of approximately 1 ◦C were calculated for skin surface pH. Conclusion: Relative measurement errors of transepidermal water loss and stratum corneum hydration were very low indicating that single measurements provide reliable estimates in this population and setting. However, the absolute measurement errors were high for both of these parameters. To increase reliability of skin surface pH we recommend at least two repeated measurements.

S. Laneri, R. di Lorenzo, A. Bernardi, A. Sacchi, I. Dini, ***Aloe barbadensis*: A Plant of Nutricosmetic Interest**, Natural Product Communications Volume 15(7): 1–6

Aloe barbadensis Miller (Aloe Vera Linne) products have long been employed in health foods and for medical purposes. It has antiinflammatory, antifungal, antioxidant properties, which indicates excellent potential in antiaging cosmetic and skin protection products. The objective of this study is to evaluate the antiaging efficacy of dermocosmetic formulations containing *A. barbadensis* extract on young and mature skin using biophysical and skin imaging techniques. Twenty healthy adult volunteers participated in the study, aged between 20 and 65. The cream formulation, with 10% (w/w) of *A. barbadensis* extract, and placebo, were applied to the face of the volunteers. The effects were evaluated in terms of skin hydration and barrier effect by the measurement of transepidermal water loss (TEWL), derma firmness, and elasticity. The formulation containing *A. barbadensis* extract significantly improves water contained in the stratum corneum, firmness, elasticity of the skin, and decreased TEWL.

C. Hülpüsch, K. Tremmel, G. Hammel, M. Bhattacharyya, A. de Tomassi, T. Nussbaumer, A.U. Neumann, M. Reiger, C. Traidl-Hoffmann, **Skin pH–dependent Staphylococcus aureus abundance as predictor for increasing atopic dermatitis severity**, Allergy. 2020;75: p. 2888–2898

Background: Atopic eczema (atopic dermatitis, AD) is characterized by disrupted skin barrier associated with elevated skin pH and skin microbiome dysbiosis, due to high Staphylococcus aureus loads, especially during flares. Since S aureus shows optimal growth at neutral pH, we investigated the longitudinal interplay between these factors and AD severity in a pilot study. Method: Emollient (with either basic pH 8.5 or pH 5.5) was applied double-blinded twice daily to 6 AD patients and 6 healthy (HE) controls for 8 weeks. Weekly, skin swabs for microbiome analysis (deep sequencing) were taken, AD severity was assessed, and skin physiology (pH, hydration, transepidermal water loss) was measured. Results: Physiological, microbiome, and clinical results were not robustly related to the pH of applied emollient. In contrast to longitudinally stable microbiome in HE, S aureus frequency significantly increased in AD over 8 weeks. High S aureus abundance was associated with skin pH 5.7-6.2. High baseline S aureus frequency predicted both increase in S aureus and in AD severity (EASI and local SCORAD) after 8 weeks. Conclusion: Skin pH is tightly regulated by intrinsic factors and limits the abundance of S aureus. High baseline S aureus abundance in turn predicts an increase in AD severity over the study period. This underlines the importance and potential of sustained intervention regarding the skin pH and urges for larger studies linking skin pH and skin S aureus abundance to understand driving factors of disease progression.

E. Tamaru, M. Watanabe, Y. Nomura, **Dietary immature Citrus unshiu alleviates UVB- induced photoaging by suppressing degradation of basement membrane in hairless mice**, Heliyon 6 (2020)

Ultraviolet (UV) irradiation induces physiological and morphological skin damage, resulting in skin dryness, wrinkle formation, and loss of elasticity. The basement membrane (BM) has been shown to play crucial roles in binding epidermis to dermis tightly, regulating cell differentiation and proliferation, and signaling protein production. Dietary flavonoids have been revealed to improve the damage caused by UV exposure. Immature Citrus unshiu is known to contain high concentrations of flavonoids such as hesperidin and narirutin. In this study, the effects of immature Citrus unshiu powder (ICP) on photoaged skin were demonstrated using UVB irradiated hairless mice. Oral administration of ICP improved loss of skin hydration and increase of transepidermal water loss. The histological analyses of hairless mice dorsal skin revealed that oral administration of ICP improved UVBinduced overgrowth of epidermal cell, suppressed epidermal cell mortality and BM destruction. Therefore, the administration of ICP could improve photoaging by protecting the tissues around BM.

C. Uhl, D. Khazaka, **Measuring skin's "true age"**, PERSONAL CARE June 2020, p. 66-68

The human desire to look young is as old as mankind and our skin plays central role in this craving. Even in ancient civilizations, people developed formulations for creams, tonics and bath additives to keep skin young and beautiful. The physiological process of skin ageing involves structural, biochemical and functional changes. Starting at approximately age 25, the content of collagen and other components of the connective tissue, such as elastin or hyaluronic acid, in the skin continuously decreases. This gradually results in a loss of bound water, leading to a deterioration of the water-protein interaction and an alteration of the overall protein stability.

K.M. Shahunja, A. Tahmeed, I. Hossain, M. Mahfuz, L. Kendall, X. Zhu, K. Singh, J.M. Crowther, S. Singh, R.A Gibson, G.L. Darmstadt, **Topical emollient therapy in the management of severe acute malnutrition in children under two: A randomized controlled clinical trial in Bangladesh**, Journal of Global Health, June 2020, Vol. 10, No. 1

Background Topical emollient therapy can improve neonatal health and growth and potentially provides an additional avenue for augmenting the provision of nutrition to children with severe acute

malnutrition (SAM). We hypothesized that topical treatment of hospitalised children with SAM using sunflower seed oil (SSO), in addition to standard-of-care for SAM, would improve skin barrier function and weight gain, reduce risk of infection, and accelerate clinical recovery. Methods We conducted a randomised, two-arm, controlled, unblinded clinical trial in 212 subjects aged 2 to 24 months who were admitted for care of SAM at the 'Dhaka Hospital' of icddr,b during January 2016 to November 2017. Enrollment was age-stratifed into 2 to <6 months and 6 to 24 months age groups ina 1:2 ratio. All children received SAM standard-of-care, and the SSO group was also treated with 3 g of SSO per kg body weight three times daily for 10 days. Primary outcome was rate of weight gain over the 10-day study period. Secondary endpoints included rate of nosocomial infection, time to recovery from acute illness, skin condition score, rate of transepidermal water loss (TEWL) and C-reactive protein (CRP) level. Results. Rate of weight gain was higher in the SSO than the control group (adjusted mean difference, AMD=0.90 g/kg/d, 95% confidence interval (CI)=-1.22 to 3.03 in the younger age stratum), but did not reach statistical significance. Nosocomial infection rate was significantly lower in the SSO group in the older age stratum (adjusted odds ratio (OR)=0.41, 95% CI=0.19 to 0.85; *P*=0.017), but was comparable in the younger age stratum and overall. Skin condition score improved (AMD=-14.88, 95% CI=-24.12 to -5.65, *P*=0.002) and TEWL was reduced overall (AMD=-2.59, 95% CI=-3.86 to -1.31, *P*<0.001) in the SSO group. Reduction in CRP level was significantly greater in the SSO group (median: -0.28) than the control group (median 0.00) (*P*=0.019) in the younger age stratum. Conclusions Topical therapy with SSO was benefcial for children with SAM when applied as adjunctive therapy. A community-based trial with a longer intervention period is recommended to validate these results.

N. Hazwani Mohd Ariffin, R. Hasham, **Assessment of non-invasive techniques and herbal-based products on dermatological physiology and intercellular lipid properties**, Heliyon 6 (2020)

Skin is the largest external organ of the human body. It acts as a barrier to protect the human body from environmental pollution, mechanical stress, and excessive water loss. The defensive function resides primarily on top of the epidermis layer commonly known as stratum corneum (SC). Human SC consists of three major lipids, namely ceramide, free fatty acid, and cholesterol that comprise approximately 50%, 25%, and 25% of the total lipid mass, respectively. The optimal composition of SC lipids is the vital epidermal barrier function of the skin. On the other hand, skin barrier serves to limit passive water loss from the body, reduces chemical absorption from the environment, and prevents microbial infection. In contrast, epidermal lipids are important to maintain the cell structure, growth and differentiation, cohesion and desquamation as well as formation of a permeability barrier. Multiple non-invasive in vivo approaches were implemented on a regular basis to monitor skin physiological and intercellular lipid properties. The measurement of different parameters such as transepidermal water loss (TEWL), hydration level, skin elasticity, collagen intensity, melanin content, sebum, pH, and tape stripping is essential to evaluate the epidermal barrier function. Novel non-invasive techniques such as tape stripping, ultrasound imaging, and laser confocal microscopy offer higher possibility of accurate and detailed characterisation of skin barrier. To date, these techniques have also been widely used to determine the effects of herbal plants in dermatology. Herbal plants have been traditionally used for ages to treat a variety of skin diseases, as reported by the World Health Organisation (WHO). Their availability, lower cost, and minimal or no side effects have created awareness among society, thus increase the demand for natural sources as the remedy to treat various skin diseases. This paper reviews several non-invasive techniques and evaluations of herbal-based product in dermatology.

T. Quinn, R. Harper, **Evaluation of Barrier Protection Properties of Jojoba Esters**, SOFW Journal 06/20, Volume 146

This research evaluates the ability of jojoba esters and hydrolyzed jojoba esters to protect the skin from insults consumers are exposed to everyday, such as pollution, sensitizers, and commonly used personal care ingredients. Jojoba esters and hydrolyzed jojoba esters are jojoba derived emollients that are commonly included in cosmetic and personal care products for their aesthetically pleasing properties and functionality, which include their ability to moisturize and protect the skin. Consumers encounter a variety of insults to the skin daily, including pollution, allergens, UV rays, as well as various ingredients included within personal care products, such as surfactants, alpha hydroxy acids, and fragrance. A series of in vivo, vehicle-controlled studies were carried out to determine if a combination of jojoba esters and hydrolyzed jojoba esters could protect the skin (i.e. reduce symptoms of irritation) from the following everyday insults: antiperspirant actives, pollution, and known sensitizers (i.e. allergens). The results show that jojoba esters and hydrolyzed jojoba esters provided statistically signifcant benefits for reducing perceived irritation / sensitivity, barrier disfunction (i.e. TEWL), and erythema.

M.A. Nilforoushzadeh, S. Alavi, M. Heidari-Kharaji, A.R. Hanifnia, M. Mahmoudbeyk, Z. Karimi, F. Kahe, **Biometric changes of skin parameters in using of microneedling fractional radiofrequency for skin tightening and rejuvenation facial**, Skin Res Technol., Jun 2020

Background Fractional radiofrequency (RF) has been used for skin rejuvenation and tightening by dermatologists and cosmetic surgeons in recent years. Methods Twenty female patients (mean age of 51.9 years) with Fitzpatrick III to VI skin phototypes who desired to undergo skin lift/tightening received six sessions of fractional microneedle RF treatment and were assessed at baseline and then 3 months after the last session for biometric characteristics using a Colorimeter, Visioface 1000D, Tewameter, Cutometer, Mexameter, and Sebumeter and a skin ultrasound imaging system to evaluate the transepidermal water loss (TEWL), skin pores, color, melanin content, erythema, sebaceous content, and thickness and density of the epidermis and dermis. Patient satisfaction with visual analog scale (VAS) was also measured. Results The results showed that skin pores and spots decreased significantly. TEWL also decreased significantly (by 18.44%). Meanwhile, skin density increased significantly (R7, by 44.41%). The ultrasonographic assessments showed that both the density and thickness of the dermis and epidermis were increased. The changes in the other parameters were not significant. Conclusion FR increases the density and thickness of the dermis and thus also increases the collagen content and decreases skin pores and TEWL.

M. Nagae, M. Nagata, M. Teramo-to, M. Yamakawa, T. Matsuki, K. Ohnuki, K. Shimizu, **Effect of Porcine Placenta Extract Supplement on Skin Condition in Healthy Adult Women: A Randomized, Double-Blind Placebo-Controlled Study**, Nutrients 2020, 12, 1671

Placenta extract has been used as a component of ointments for skin dryness and beautification. However, little is known about the effect of oral intake of placenta extract on skin condition. The current study aimed to clinically explore the effect of oral intake of porcine placenta extract on human skin quality. A randomized controlled double-blind trial was performed on healthy women aged 40–59 years (n = 20), who were randomly assigned to receive either placebo or 200 mg of porcine placenta extract once daily for 4 weeks from 28 January 2019 to 25 February 2019. Skin quality parameters and the Simplified Menopausal Index (SMI) were assessed at baseline and after 4 weeks. After 4 weeks, three parameters of skin quality were significantly improved in the porcine placenta group compared with the placebo group. These results suggest that porcine placenta extract can be used as a health food ingredient to maintain humans' skin condition in the dry winter season.

A. Charpentier, **Clinically supporting 'antiage' and 'pro-age' claims**, Personal Care Europe, June 2020

Claims of personal care evolve following trends and various innovations in the field of the active ingredient development, the finished product formulation and the way both are evaluated, demonstrating their performances. Since 2014, the cosmetics industry is gradually leaving the era of anti-ageing behind. Today, most consumers are more in the mood for a well ageing, slow ageing or pro ageing approach. The philosophy of the 'pro-ageing' movement has sought to remove all 'anti' claims because, according to this concept, women over 50 are not interested in looking younger; they want to look healthy and be honest about their age. Some brands have used the idea of "improves the appearance of skin quality", and "restore the skin comfort", for example. A new vocabulary of renewal, regeneration, plumpness and "glow" now dominates the language of the beauty industry.

S.P. Saunders, A. Floudas, T Moran, C.M. Byrne, M.D. Rooney, C.M.R. Fahy, J.A. Geoghegan, Y. Iwakura, P.G. Fallon, C. Schwartz, **Dysregulated skin barrier function in Tmem79 mutant mice promotes IL-17A-dependent spontaneous skin and lung inflammation**, Allergy, 2020;75: p. 3216–3227

Background: Atopic dermatitis (AD) is associated with a dysregulation of the skin barrier and may predispose to the development of secondary allergic conditions, such as asthma. *Tmem79ma/ma* mice harbor a mutation in the gene encoding Transmembrane Protein 79 (or Mattrin), which has previously been associated with AD. As a result of the *Tmem79* gene mutation, these mice have a defective skin barrier and developspontaneous skin inflammation. In this study, *Tmem79ma/ma* mice were assessed for the underlying immunological response in the development of spontaneous skin and lung inflammation. Methods: Development of spontaneous skin and lung inflammation in *Tmem79ma/ma* mice was analyzed. We further investigated susceptibility to cutaneous *Staphylococcusaureus* infection. *Tmem79ma/ma* were crossed to IL-17A-deficient mice to address the contribution of IL-17A to spontaneous skin and lung disease. Results: *Tmem79ma/ma* mice developed IL-17A-dependent spontaneous AD-like inflammation and were refractory to *S aureus* infection. Mutant mice progressed to airway inflammation subsequent to the occurrence of dermatitis. The progression from skin to lung disease is dependent on adaptive immunity and is facilitated by cutaneous expansion

of Th17 and TCRγδ T cells.

J.-W. Guo, Y.-P. Cheng, C.-Y. Liu, H.-Y. Thong, C.-J. Huang, Y. Lo, C.-Y. Wu, S.-H. Jee, **Salvianolic Acid B in Microemulsion Formulation Provided Sufficient Hydration for Dry Skin and Ameliorated the Severity of Imiquimod-induced Psoriasis-like Dermatitis in Mice**, Pharmaceutics 2020, 12, 457

Psoriasis is a chronic inflammatory skin disorder with a pathogenesis involving the interleukin-23/interleukin-17 axis. Salvianolic acid B exerts several pharmacological effects, such as antioxidation, anti-inflammation, and antitumor effects. The anti-psoriatic effects of salvianolic acid B have not been reported. In this study, we aimed to determine the optimum vehicle for salvianolic acid B, investigate its therapeutic effect on psoriatic-like skin conditions, and explore its underlying mechanisms of action. BALB/c mice were administered topical imiquimod to induce psoriasis-like skin and were then randomly assigned to control, vehicle control, salvianolic acid B in vehicles, and 0.25% desoximetasone ointment treatment groups. Barrier function, cytokine expression, histology assessment, and disease severity were evaluated. The results showed that salvianolic acid B-containing microemulsion alleviated disease severity, reduced acanthosis, and inhibited interleukin-23/interleukin-17 (IL-23/IL-17) cytokines, epidermal proliferation, and increased skin hydration. Our study suggests that salvianolic acid B represents a possible new therapeutic drug for the treatment of psoriasis. In addition, such formulation could obtain high therapeutic efficacy in addition to providing sufficient hydration for dry skin.

D.-B. Myung, J.-H. Lee, H.-S. Han, K.-Y. Lee, H.S. Ahn, Y.-K. Shin, E. Song, B.-H. Kim, K.H. Lee, S.H. Lee, K.-T. Lee, **Oral Intake of *Hydrangea serrata* (Thunb.) Ser. Leaves Extract Improves Wrinkles, Hydration, Elasticity, Texture, and Roughness in Human Skin: A Randomized, Double-Blind, Placebo-Controlled Study**, Nutrients 2020, 12, 1588

Previously, we reported that the hot water extract of Hydrangea serrata leaves (WHS) and its active component, hydrangenol, possess in vitro and in vivo effects on skin wrinkles andmoisturization. We conducted a randomized, double-blind, placebo-controlled trial to clinicallyevaluate the effect of WHS on human skin. Participants (n = 151) were randomly assigned to receive either WHS 300 mg, WHS 600 mg, or placebo, once daily for 12 weeks. Skin wrinkle, hydration, elasticity, texture, and roughness parameters were assessed at baseline and after 4, 8, and 12 weeks. Compared to the placebo, skin wrinkles were significantly reduced in both WHS groups after 8 and 12 weeks. In both WHS groups, five parameters (R1–R5) of skin wrinkles significantly improved and skin hydration was significantly enhanced when compared to the placebo group after 12 weeks. Compared with the placebo, three parameters of skin elasticity, including overall elasticity (R2), net elasticity (R5), and ratio of elastic recovery to total deformation (R7), improved after 12 weeks of oral WHS (600 mg) administration. Changes in skin texture and roughness were significantly reduced in both WHS groups. No WHS-related adverse reactions were reported. Hence, WHS could be used as a health supplement for skin anti-aging.

C. Kaminaka, Y. Yamamoto, M. Sakata, C. Hamamoto, E. Misawa, K. Nabeshima, M. Saito, M. Tanaka, F. Abe, M. Jinnin, **Effects of low-dose Aloe sterol supplementation on skin moisture, collagen score and objective or subjective symptoms: 12-week, double-blind, randomized controlled trial**, Journal of Dermatology 2020; 47: p. 998–1006

Daily oral intake of 40 lg Aloe sterol was shown in a double-blind clinical trial to significantly increase skin barrier function, moisture and elasticity. Ultrasonographic results also suggested that the intake of Aloe sterol increases collagen content in the dermis. Here, we evaluate the effects of a much smaller dose of Aloe sterol, approximately half that used previously, on skin functions in more detail. This is a monocentric, double-blind, randomized, placebo-controlled, supplementation study of the effects of low-dose Aloe sterol on skin transepidermal water loss, hydration, collagen score, evaluation of objective or subjective symptoms, and safety after 12 weeks of daily intake. We randomly administrated either Aloe sterol or placebo to 122 healthy volunteers. Transepidermal water loss was significantly reduced and collagen score was increased in the Aloe sterol group compared with the placebo group at week 12. In the Aloe sterol group, there was significant improvement of objective skin condition (face erythema and pruritus of inner and outer arms) at week 12 compared with week 0, but not in the placebo group. Subjectively, there was significant improvement of visual analog scale of skin acne, fingernail brittleness and constipation in the Aloe sterol group. According to subgroup analysis, although not planned before the study initiation, subjects with dry skin in the Aloe sterol group had significantly increased skin hydration values at week 12 compared with the placebo group. Our results confirmed that even low-dose Aloe sterol ingestion improves skin moisture by promoting skin barrier function and dermal collagen production, which contributes to maintenance of healthy skin.

T. Chu, N.-L. Wu, C.-Y. Hsiao, H.-J. Li, T.-Y. Lin, C.-H. Ku, C.-F. Hung, **An isoflavone extract from soybean cake suppresses 2,4-dinitrochlorobenzene-induced contact dermatitis**, J Ethnopharmacol, May 2020

Ethnopharmacological relevance: Numerous epidemiological and clinical studies have demonstrated the protective role of dietary isoflavones against development of several chronic diseases. ISO-1, one fraction of isoflavone powders derived from soybean cake, is reported to attenuate inflammation and photodamage. Aim of the study: Contact dermatitis is a common inflammatory skin disease, which accounts for most occupational skin disorders. Instead of oral administration, we aimed to explore the effects of topical ISO-1 application on contact dermatitis by using 2,4-dinitrochlorobenzene (DNCB)-stimulated HaCaT keratinocytes and DNCB-induced mouse dermatitis as models. Materials and methods: In the in vitro study, we first evaluated the biologic effects of DNCB on HaCaT keratinocytes. HaCaT keratinocytes were treated with 2,4-dinitrochlorobenzene (DNCB), and cell viability was measured by MTT assay. Then, we detect the prominent induction of IL-8 mRNA expression after DNCB and ISO-1 treatment by reverse transcription polymerase chain reaction (RT-PCR), and release of IL-8 from HaCaT keratinocytes was measured by ELISA assay. HaCaT keratinocytes were pretreated with ISO-1 and then treated with DNCB, phosphorylation of JNK, p38, ERK and IκBα was analyzed by Western blot. In the in vivo study, the hairless mice were used for an induced contact dermatitis model. The surface changes in the dorsal skin after DNCB and ISO-1 treatment were recorded using photography, and TEWL, erythema were measured using an MPA-580 cutometer. Blood was also collected from mice for measurement of white blood cell counts. Results: Results showed ISO-1 inhibited DNCB-induced IL-8 production and also suppressed DNCB-induced phosphorylation of JNK and p38, and IκBα in HaCaT. In the animal model of DNCB-induced contact dermatitis, topical ISO-1 treatment significantly decreased DNCB-induced erythema and transepidermal water loss (TEWL) in mouse skin. ISO-1 also reduced DNCB-induced skin thickening and increase of white blood cell count. Conclusions: ISO-1 is promising for improvement of DNCB-induced inflammation and skin barrier impairment, suggesting the potential application of topical ISO-1 for inflammatory dermatoses.

D. Duscher, Z.N. Maan, M.S. Hu, D. Thor, **A single-center blinded randomized clinical trial to evaluate the antiaging effects of a novel HSF™-based skin care formulation**, J Cosmet Dermatol, 2020 Apr

Background: Similar to chronic wounds, skin aging is characterized by dysfunction of key cellular regulatory pathways. The hypoxia-inducible factor-1 alpha (HIF-1α) pathway was linked to both conditions. Recent evidence suggests that modulating this pathway can rejuvenate aged fibroblasts and improve skin regeneration. Here, we describe the application of a novel HIF stimulating factor (HSF™)-based formulation for skin rejuvenation. Methods: Over a period of 6 weeks using a split-face study design, the effects on skin surface profile, skin moisture, and transepidermal water loss were determined in 32 female subjects (mean age 54, range 32-67 years) by Fast Optical in vivo Topometry of Human Skin (FOITS), Corneometer, and Tewameter measurements. In addition, a photo documentation was performed for assessment by an expert panel and a survey regarding subject satisfaction was conducted. Results: No negative skin reactions of dermatological relevance were documented for the test product. A significant reduction in skin roughness could be demonstrated. The clinical evaluation of the images using a validated method confirmed significant improvement of wrinkles, in particular of fine wrinkles, lip wrinkles, and crow's feet. A significant skin moisturizing effect was detected while skin barrier function was preserved. The HSF™-based skin care formulation resulted in a self-reported 94% satisfaction rate. Conclusion: With no negative skin reactions and highly significant effects on skin roughness, wrinkles, and moisturization, the HSF™-based skin care formulation achieved very satisfying outcomes in this clinical trial. Given the favorable results, this approach represents a promising innovation in aesthetic and regenerative medicine.

K. Yonezawa, M.i Haruna, R. Kojima, **Validity of Infant Face Skin Assessment by Parents at Home**, Asian/Pacific Island Nursing Journal Volume 4(4): p. 159-164, 2020

Parents had better to assess their infant's skin daily to prevent the development of any skin problems. However, there are no standard methods for assessing infant skin at home. This study aimed to validate the assessment of infant face skin conditions by parents as compared to using skin barrier function clinical tests. In addition, we evaluated the degree of agreement between parents and physicians/midwives when assessing an infant's skin. A cross-sectional study involving 184 infants aged 3 months was conducted. To evaluate the parents' infant skin assessment, we used the Neonatal Skin Condition Score (NSCS). On the same day, we evaluated the skin barrier function on the infant's forehead and cheek, including transepidermal water loss (TEWL), stratum corneum hydration, skin pH, and sebum secretion. Skin barrier function values were correlated with infant skin condition assessed

by parents, especially in cases of TEWL of the cheek, for which a moderate positive correlation was found between parental assessment score (ρ = 0.448). In addition, infant with skin problems based on parental assessment had a significantly higher TEWL, lower SCH, and higher skin pH. However, there was weak agreement between parental and physician/midwife assessment. Thus, there was a relationship between parental assessment and skin barrier function; thus, parents can use at-home assessment to assist with infant skin care. In the future, research focused on developing methods of examining infant skin conditions should consider incorporate parental daily skin assessment.

S. Hettwer, E. Besic Gyenge, B. Obermayer, **Influence of cosmetic formulations on the skin's circadian clock**, International Journal of Cosmetic Science, 2020, 42, p. 313–319

Objetive: The circadian rhythm was set into focus by awarding the Nobel Price of Physiology/Medicine to Jeffrey Hall, Michael Rosbash and Michael Young in late 2017. Numerous publications elucidated the molecular mechanisms driving the circadian biorhythms of our body, peripheral organs and each single cell. However, there is minor knowledge on the circadian rhythm of the skin, which has its own peripheral circadian clock in contact with cosmetic formulations. The skin's epidermal clock is excessively influenced by environmental factors like UV radiation or modern lifestyle, which may induce epidermal jetlag. Here, we give an overview on the current knowledge about the epidermal circadian clock and provide a cosmetic solution to protect and preserve the biorhythm of the skin. Methods: Quantitative RT-PCR to analyse the gene expression of circadian clock genes and the downstream DNA repair gene OGG1 in keratinocytes irradiated with UV-B. In vivo study to determine skin parameters dependent on the circadian cycle and interference of cosmetic formulations to them by assessment of morning and evening values at each measurement day after 28, 56 and 84 days of the study. Results: UV-B irradiation leads to a pronounced delay in circadian clock and downstream gene expression which interferes in the proper function of epidermal stem cells and as thus skin function. The use of a cosmetic active ingredient prevents cyclobutene pyrimidine dimer formation, protects epidermal stem cells and resets the circadian gene expression. It preserves the circadian changes in skin hydration, reduces daily fluctuations of skin redness and strengthens the skin barrier. Conclusion: The skin has its own circadian biorhythm to gain full functionality. Interruption of this oscillation will lead to functional impairments. Here we show a cosmetic solution to protect and preserve the skin's circadian rhythm. DNA protection, ROS elimination and stimulation of circadian gene expression seem to be crucial to keep the skin in balance.

T. Jörger, **Hautphysiologische Untersuchungen an dermatologischen Patienten vor, während und nach Therapie in Abhängigkeit körperspezifischer Einflussgrößen, Dissertation** der Medizinischen Fakultät der Ludwig-Maximilians-Universität zu München, April 2020

Die Haut ist nicht nur das größte und schwerste Organ des Menschen, sondern sicherlich auch eines der wichtigsten. Begegnen wir einem Mitmenschen, ist sie eines der ersten Dinge, die wir an ihm wahrnehmen. Nach ihrem Aussehen beurteilen wir, ob er gesund erscheint oder eher blass und kränklich. Ist die Haut glatt und straff, oder schlaff und faltig? Allein dadurch ist es oftmals möglich, das Alter eines Mitmenschen zu schätzen. Ist die Haut stark gebräunt, folgt oft unweigerlich eine Frage wie: „Warst du im Urlaub?". Wirkt die Haut gepflegt oder unrein und fettig? Hat unser Gegenüber einen Ausschlag im Gesicht und wenn ja, ist er vielleicht ansteckend? Sollten wir uns lieber von ihm fernhalten? Solche, teils unbewusste Gedanken und noch viele mehr können bereits ein festes Bild von einem Mitmenschen in uns festlegen, bevor wir überhaupt ein Wort mit ihm gewechselt oder ihm die Hand geschüttelt haben.

S.W. Goh, A. Jamil, N. Safian, N. Nor, N. Muhammad, N.L. Saharudin, **A randomized half-body, double blind, controlled trial on the effects of a pH-modified moisturizer vs. standard moisturizer in mild to moderate atopic dermatitis**, An Bras Dermatol. 2020;95(3): p. 320-325

Background: Higher skin pH in atopic dermatitis contributes to impaired epidermal barrier. A moisturizer compatible with physiological pH could improve atopic dermatitis. Objective: To determine the effect of a physiologically compatible pH moisturizer in atopic dermatitis. Methods: A randomized half body, double blind, controlled trial involving patients with stable atopic dermatitis was performed. pH-modified moisturizer and standard moisturizer wereapplied to half body for 6 weeks. Results: A total of 6 (16.7%) males and 30 (83.3%) females participated. Skin pH reductions from week 0, week 2 and 6 were significant at the forearms (5.315 [0.98] to 4.85 [0.54] to 5.04 [0.78], p = 0.02) and abdomen (5.25 [1.01], 4.82 [0.64], 5.01 [0.59], p = 0.00) but not at the shins (5.01 [0.80], 4.76 [0.49], 4.85 [0.79], p = 0.09) with pH-modified moisturizer. Transepidermal water loss (TEWL) at the forearms decreased (4.60 [2.55] to 3.70 [3.10] to 3.00 [3.55], p = 0.00), abdomen (3.90 [2.90] to 2.40 [3.45] to 2.70 [2.25], p = 0.046). SCORAD improved from 14.1 ± 12.75 to 10.5 ± 13.25 to 7 ± 12.25, p = 0.00. In standard moisturizer group, pH reductions were significant at the forearms (5.29 [0.94] to 4.84 [0.55] to 5.02

[0.70], p = 0.00) and abdomen (5.25 [1.09], 4.91 [0.63], 5.12 [0.66], p = 0.00). TEWL at the forearm were (4.80 [2.95], 4.10 [2.15], 4.60 [3.40], p = 0.67), shins (3.80 [1.40], 3.50 [2.35], 4.00 [2.50], p = 0.91) and abdomen (3.70 [2.45], 4.10 [3.60], 3.40 [2.95], p = 0.80). SCORAD improved from 14.2 ± 9.1 to 10.9 ± 10.65 to 10.5 ± 11, p = 0.00. Reduction in pH was observed with both moisturizers while TEWL significantly improved with pH-modified moisturizer. pH-modified moisturizer resulted in greater pH, TEWL and SCORAD improvements however the differences were not significant from standard moisturizer.

L. Gao, H. Kang, Y. Li, M. Lu, W. Song, Y. Wang, K. Li, L. Wang, G. Wang, **Clinical Efficacy and Safety of 3DEEP Multisource Radiofrequency Therapy Combined with Fractional Skin Resurfacing for Periocular Skin Aging**, J Clin Aesthet Dermatol. 2020;13(3): p. 41–44

Background: The early signs of skin aging usually occur in the periocular region. Objectives: This retrospective analysis evaluated the efficacy and safety profile of a multisource 3DEEP radiofrequency (RF) technology (EndyMed, Caesarea, Israel) in combination with fractional skin resurfacing (FSR) for the treatment of periocular skin aging. Methods: A total of 15 patients with periocular aging underwent monthly treatment sessions of 3DEEP and FSR for three months. Sessions were administered at the Department of Dermatology at Xijing Hospital in Xi'an, China. Indices of skin moisture level, transepidermal water loss (TEWL), skin elasticity, wrinkles, pore size, and skin texture were determined before and after treatment using the Visia® (Canfeld Imaging Systems, New Jersey), Multiprobe Adapter (CK, Cologne, Germany) and Antera3D® (Miravex, Dublin, Ireland) systems. Results: Skin moisture level, elasticity, wrinkles, pore size, and texture improved relative to baseline ($p<0.01$). There was no significant difference in TEWL before and after the treatments ($p>0.05$). Patient satisfaction was 86.67 percent. Patients experienced varying degrees of transient edema, erythema, scabbing, and occasional hyperpigmentation; all adverse effects resolved within 2 to 10 days post-treatment. Conclusion: ENDYMED 3DEEP in combination with FSR appears to be safe and effective in treating periocular skin aging. Randomized controlled trials with a larger patient group are needed to confirm our findings.

J. H. Alfonso, A.K. Afanou, J.-0. Holm, E. Stylianou, **Skin bioengineering in the diagnosis of occupational protein contact dermatitis**, Occupational Medicine 2020;70: p. 282-285

Protein contact dermatitis (PCD) often presents as chronic hand eczema (CHE) with an immediate hypersensitivity to protein proved by a positive skin prick test or by the presence of specific immunoglobulin E.This is frequently induced by occupational exposure to proteins in food workers, farmers, animal breeders, veterinarians and healthcare professionals.While skin barrier impairment is crucial in the pathogenesis of PCD, methods to assess skin barrier function such as trans-epidermal water loss and stratum corneum hydration are not widely used in clinical settings. We describe the diagnostic workup of occupational PCD due to Argentinean shrimps and discuss how the use of skin bioengineering methods including assessment of corneocytes morphology by Scanning Electron Microscopy provides with insightful information on skin barrier function. Diagnosis of PCD is timeconsuming and a multidisciplinary team contributes to early diagnosis and proper occupational rehabilitation.

V.Z. Lim, A.A. Yong, W.P.M. Tan, X. Zhao, M. Vitale, C.L. Goh, **Efficacy and Safety of a New Cosmeceutical Regimen Based on the Combination of Snail Secretion Filtrate and Snail Egg Extract to Improve Signs of Skin Aging**, Journal of Clinical and Aestetic Dermatology, March 2020, Volume 13, Number 3

Background: Two extracts derived from the gastropod Cryptomphalus aspersa have been shown to have dermal regeneration properties: SCA® (secretion fltrate) with fbroblast growth factor-like activity and IFC®-CAF (cellular activating factor), a snail egg extract with skin stem cell activation activity. Objective: The objectives of this study were to evaluate the synergic antiaging activity and tolerability of SCA and IFC-CAF in a combined regimen compared to vehicle as a placebo control. Methods: A three-month, single-center, double-blinded, randomized, vehicle-controlled trial assessed the effects of a daily skincare routine divided into two treatment phases, as follows: intensive (1 month) and maintenance (2 months). Fifty women, aged 45–65 years, with signs of photoaging were randomized to receive either the active ingredients (n=30) or vehicle (n=20). Clinical evaluations included objective measurements of barrier function and skin hydration, elasticity, and color/brightness. Subjective assessments were conducted according to the Rao-Goldman and Glogau scales for wrinkles, the Patient Global Assessment (PGA) scale and Investigator Global Assessment (IGA) scale. Results: Subjects in the active treatment group experienced reductions in transepidermal water loss and significant improvements in skin roughness, frmness, and elasticity. Both groups showed significant improvements in fne lines and wrinkles. PGA and IGA assessments indicated greater improvement in the active

treatment group. Conclusion: The active snail extract treatment appears to be effective in improving signs of skin aging in women 45 to 65 years old. Larger randomized, controlled studies are needed to confrm our results.

C. Karamani, I.T. Antoniadou, A. Dimou, E. Andreou, G. Kostakis, A. Sideri, A. Vitsos, A. Gkavanozi, I. Sfiniadaki, H. Skaltsa, G.T. Papaioannou, H. Maibach, M. Rallis, **Optimization of psoriasis–like mouse models: A comparative study**, bioRxiv, March 2020

Psoriasis, a common chronic, autoimmune, inflammatory, relapsing disease should benefit from reliable and human relevant animal models in order to pre-clinically test drugs and approach their mechanism of action. Due to ease of use, convenience and low cost, imiquimod (IMQ) induced psoriasis-like model is widely utilized; however, are all mouse strains equivalent, is the hairless mouse utilizable and can the imiquimod model be further optimized? Under similar experimental conditions, common mouse strains (BALB/c, C57BL/6J, ApoE) and a new hairless strain (ApoE/SKH-hr2) as well as several inducers (IMQ, IMQ + Acetic Acid (AcOH) topical and IMQ +AcOH systemic) were compared by clinical, histopathological, biophysical and locomotor activity assessment. Results showed that BALB/c mice yielded optimal psoriasislike phenotype with IMQ+AcOH topical treatment, C57BL/6J moderate, ApoE mild, while the ApoE/SKH-hr2 mice due to Munro abscess absence in histopathology analysis left doubts about the psoriasis-like acquisition. The locomotor activity of BALB/c mice treated with IMQ, IMQ+AcOH topically and IMQ+AcOH systemically, showed with all treatments, a decreased covered distance and rearing and an increased immobility. In conclusion, BALB/c appears an optimal psoriasis-like model when utilizing IMQ+AcOH topical application.

S.I. Jang, My. Lee, J. Han, J. Kim, A.R. Kim, J.S. An, J.O. Park, B.J. Kim, E. Kim, **A study of skin characteristics with long-term sleep restriction in Korean women in their 40s**, Skin Res Technol., March 2020, Volume 26, Issue 2, p. 193-199

Background: Previous studies have demonstrated increased pore size and darkening skin color with total sleep deprivation. There are many studies of skin characteristics with short-term sleep restriction, but there are few studies on skin characteristics when sleep is restricted more than three consecutive days. This study evaluated skin changes with sleep limited to 4 hours per night for six nights. Materials and Methods: The study included 32 Korean women in their 40s. Skin hydration, desquamation, barrier recovery, texture, gloss, transparency, elasticity, crow's feet, frown lines, and color were measured. Individual sleep time was monitored by smartwatches. Subjects slept 8 hours per night for six nights in week one and 4 hours per night for six nights in week two. Results: Skin hydration was significantly reduced after 1 day of sleep deprivation, and it continued to decrease. Skin gloss, desquamation, transparency, elasticity, and wrinkles were significantly aggravated after 1day of sleep deprivation. Skin texture was significantly aggravated on the fourth day of sleep restriction. Elasticity was most affected by reduced sleep, with a standardized coefficient of -.320, indicating a significant decrease over time as compared to other characteristics. Conclusion: Skin hydration was gradually decreased with sleep restriction. Skin texture did not change after only1day of sleep restriction. It is a new finding that elasticity decreases more than other skin characteristics with prolonged sleep restriction.

J. Yo, .J.Y. Choi, B.Y. Lee, C.H. Shin, J.-W. Shin, C.H. Huh, J.-I. Na, **Therapeutic Effects of Saline Groundwater Solution Baths on Atopic Dermatitis: A Pilot Study**, Evidence-Based Complementary and Alternative Medicine, Volume 2020

Background: Saline groundwater, collected from the east coast of Korea, has been shown to have protective effects against 2,4- dinitrochlorobenzene- (DNCB-) induced atopic dermatitis-like skin lesions in the murine model. Objectives: To determine the effects of saline groundwater solution baths as a treatment of mild-to-moderate atopic dermatitis. Methods: Twenty-four subjects with mild-to-moderate atopic dermatitis were instructed to take a bath in saline groundwater solution for 20 minutes per day for two weeks. Evaluations were performed at baseline and week 2, including SCORing Atopic Dermatitis (SCORAD) index, corneometry, transepidermal water loss, visual analogue scale for pruritus, and collection of adverse events. Results: Subjects showed significant improvement with respect to the SCORAD index, skin hydration, transepidermal water loss, and pruritus at week 2 when compared with the baseline. Conclusion: Baths in saline groundwater solution may be an alternative therapeutic strategy for treating atopic dermatitis.

D. Maggioni, A. Cimicata, A. Praticò, R. Villa, F.M. Bianchi, S. Busoli Badiale, C. Angelinetta, **A Preliminary Clinical Evaluation of a Topical Product for Reducing Slight Rosacea Imperfections**, Clinical, Cosmetic and Investigational Dermatology 2020:13, p. 299–308

Introduction: Rosacea is a chronic multifactorial skin disorder mainly affecting facial skin with an estimated prevalence of about 5% worldwide. Its main symptoms, occurring early during pathology development, are skin dehydration, redness, erythema, and telangiectasia. Given the lack of a resolutive cure, therapeutic approaches able to relieve the main symptoms are needed. Purpose: The aim of this research article is to evaluate the beneficial effect of a topical product (Serum BK46) on rosacea symptoms. Patients and Methods: A monocentric single-arm, non-blinded study was performed to assess the clinical effect of Serum BK46 in relieving the main symptoms of rosacea: skin dryness, increased trans epidermal water loss (TEWL), redness, and abnormal vascularization. Twenty patients with mild to moderate rosacea were enrolled in the study and asked to apply the product twice per day for 56 days. Skin moisturization, TEWL, and erythema index were instrumentally assessed at baseline and following 24 h and 14, 28 and 56 days of treatment. Clinical parameters, including redness and telangiectasia imperfection visibility, were evaluated on a 5-point scale by a specialized dermatologist at baseline and after 14, 28, and 56 days of treatment. Finally, the visibility of vessel diameter was evaluated at baseline and after 28 and 56 days of treatment. Results: Serum BK46 application restored skin hydration and prevented the loss of water by the skin. Long-term treatment with Serum BK46 significantly reduced skin redness, erythema index, and the visibility of telangiectasia imperfections and superficial vessels. The investigated product's clinical effect was demonstrated by both instrumental and clinical evaluation. Furthermore, Serum BK46 was completely tolerated and no adverse effects were recorded. Conclusion: The moisturizing and skin barrier restoring action of Serum BK46 has been clearly proven in patients displaying mild to moderate rosacea; thus, this product is a good candidate for rosacea treatment.

E. Sofrona, L.-A. Tziveleka, M. Harizani, P. Koroli, I. Sfiniadakis, V. Roussis, M. Rallis, E. Ioannou, **In Vivo Evaluation of the Wound Healing Activity of Extracts and Bioactive Constituents of the Marine Isopod Ceratothoa oestroides**, Mar. Drugs 2020, 18, 219

Wound healing is a fundamental response to tissue injury and a number of natural products has been found to accelerate the healing process. Herein, we report the preparation of a series of different polarity (organic and aqueous) extracts of the marine isopod Ceratothoa oestroides and the in vivo evaluation of their wound healing activity after topical administration of ointments incorporating the various extracts on wounds inflicted on SKH-hr1 hairless mice. The most active extract was fractionated for enrichment in the bioactive constituents and the fractions were further evaluated for their wound healing activity, while their chemical profiles were analyzed. Wound healing was evaluated by clinical assessment, photo-documentation, histopathological analysis and measurement of biophysical skin parameters, such as transepidermal water loss (TEWL), hydration, elasticity, and skin thickness. The highest levels of activity were exerted by treatment of the wounds with a fraction rich in eicosapentaenoic acid (EPA), as well as myristic and palmitoleic acids. Topical application of the bioactive fraction on the wounds of mice resulted in complete wound closure with a skin of almost normal architecture without any inflammatory elements.

M.G. Suh, G. Y. Bae, K. Jo, J.M. Kim, K.-B. Hong, H.J. Suh, **Photoprotective Effect of Dietary Galacto-Oligosaccharide (GOS) in Hairless Mice via Regulation of the MAPK Signaling Pathway**, Molecules 2020, 25, 1679

This study investigated the suppression of photoaging by galacto-oligosaccharide (GOS) ingestion following exposure to ultraviolet (UV) radiation. To investigate its photoprotective effects, GOS along with collagen tripeptide (CTP) as a positive control was orally administered to hairless mice under UVB exposure for 8 weeks. The water holding capacity, transepidermal water loss (TEWL), and wrinkle parameters were measured. Additionally, quantitative reverse-transcription polymerase chain reaction and Western blotting were used to determine mRNA expression and protein levels, respectively. The GOS or CTP orally-administered group showed a decreased water holding capacity and increased TEWL compared to those of the control group, which was exposed to UVB (CON) only. In addition, the wrinkle area and mean wrinkle length in the GOS and CTP groups significantly decreased. Skin aging-related genes, matrix metalloproteinase, had significantly different expression levels in the CTP and GOS groups. Additionally, the tissue inhibitor of metalloproteinases and collagen type I gene expression in the CTP and GOS groups significantly increased. Oral administration of GOS and CTP significantly lowered the tissue cytokine (interleukin-6 and -12, and tumor necrosis factor-α) levels. There was a significant difference in UVB-induced phosphorylation of JNK, p38, and ERK between the GOS group and the CON group. Our findings indicate that GOS intake can suppress skin damage caused by UV light and has a UV photoprotective effect.

H.J. Choi, B.R. Song, J.E. Kim, S.J. Bae, Y.J. Choi, S.J. Lee, J.E. Gong, H.S. Lee, C.Y. Lee, B.-H. Kim, D.Y. Hwang, **Therapeutic Effects of Cold-Pressed Perilla Oil Mainly Consisting of Linolenic acid,**

Oleic Acid and Linoleic Acid on UV-Induced Photoaging in NHDF Cells and SKH-1 Hairless Mice, Molecules 2020, 25, 989

Positive physiological benefits of several plant oils on the UV-induced photoaging have been reported in some cell lines and model mice, but perilla oil collected from the seeds of *Perilla frutescens* L. has not been investigated in this context. To study the therapeutic effects of cold-pressed perilla oil (CPO) on UV-induced photoaging in vitro and in vivo, UV-induced cellular damage and cutaneous photoaging were assessed in normal human dermal fibroblasts (NHDFs) and HR-1 hairless mice. CPO contained five major fatty acids including linolenic acid (64.11%), oleic acid (16.34%), linoleic acid (11.87%), palmitic acid (5.06%), and stearic acid (2.48%). UV-induced reductions in NHDF cell viability, ROS production, SOD activity, and G2/M cell cycle arrest were remarkably improved in UV + CPO treated NHDF cells as compared with UV + Vehicle treated controls. Also, UV-induced increases in MMP-1 protein and galactosidase levels were remarkably suppressed by CPO. In UV-radiated hairless mice, topical application of CPO inhibited an increase in wrinkle formation, transepidermal water loss (TEWL), erythema value, hydration and melanin index on dorsal skin of UVB-irradiated hairless mice. CPO was observed to similarly suppress UV-induced increases in epidermal thickness, mast cell numbers, and galactosidase and MMP-3 mRNA levels. These results suggest CPO has therapeutic potential in terms of protecting against skin photoaging by regulating skin morphology, histopathology and oxidative status.

H. Sekine, Y. Kijima, M. Kobayashi, J. Itami, K. Takahashi, H. Igaki, Y. Nakai, H. Mizutani, Y. Nomoto, K. Kikuchi,·H. Matsushita, K. Nozawa, **Non-invasive quantitative measures of qualitative grading efectiveness as the indices of acute radiation dermatitis in breast cancer patients**, Breast Cancer 2020

Background: Recent improvement of machinery evaluation for the skin changes in various therapies enabled us to evaluate fne changes quantitatively. In this study, we performed evaluation of the changes in radiation dermatitis (RD) using quantitative and qualitative methods, and verifed the validity of the conventional qualitative assessment for clinical use. Methods: Forty-three breast cancer patients received conventional fractionated radiotherapy to whole breast after breastconserving surgery. Erythema, pigmentation and skin dryness were evaluated qualitatively, and biophysical parameters of RD were measured using a Multi-Display Device MDD4 with a Corneometer for capacitance, a Tewameter for transepidermal water loss (TEWL), a Mexameter for erythema index and melanin index. Measurements were performed periodically until 1 year. Results: The quantitative manifestations developed serially from skin erythema followed by dryness and pigmentation. Quantitative measurements detected the efects of irradiation earlier than that of qualitative indices. However, the grades of the domains in RD by qualitative and quantitative assessment showed similar time courses and peak periods. However, no signifcant correlation was observed between the skin dryness grade and skin barrier function. In contrast to serial increase in pigmentation grades, melanin index showed initial decrease followed by marked increase with signifcant correlation with pigmentation grades. Conclusion: Subjectively and objectively measured results of RD were almost similar course and peak points through the study. Therefore, validity of the conventional qualitative scoring for RD is confrmed by the present quantitative assessments. Instrumental evaluations revealed the presence of modest infammatory changes before radiotherapy and long-lasting skin dryness, suggesting indication of intervention for RD.

L. Téot, T.A. Mustoe, E. Middelkoop, G.G. Gauglitz (Editors): **Textbook on Scar-Management - State of the Art Management and Emerging Technologies** (ebook), Springer 2020

The interest in wound healing goes back to the beginning of history and has not diminished throughout the centuries also because practical implications of wound healing studies have remained very relevant for public health. During the last century, much progress has been made in the understanding of basic mechanisms of skin wound healing, and it has been realized that healing processes evolve similarly in various organs. It has been established that fbrotic diseases are regulated by analogous mechanisms, albeit less controlled, compared to those regulating wound healing. Moreover, many advances, such as the use of antiseptics and, later, of antibiotics, as well as the introduction of skin transplants have facilitated the treatment of wounds. It has been shown that wound healing evolution depends on several factors including the type of injury causing the damage, the tissue and/or organ affected, and the genetic or epigenetic background of the patient. This Compendium has the merit of discussing a broad spectrum of topics, including the general biology of wound healing, modern diagnostic approaches, and therapeutic tools, applied to many different clinical situations. It should be of interest to teachers, students, and clinicians working in different aspects of wound healing biology and pathology. I am sure that it will rapidly become an important reference book in these fields.

F. Havas, S. Krispin, N. Borenstein-Auerbach, E. Loing, **Slowing the cellular clock**, Cosmetics & Toiletries, Vol. 135, January 2020, p. 49-57

Skin is the bamer separating the body from the outer environment, protecting against water loss and external aggressions. Skin's condition is the most visible indicator of health and general status, and of age...or youth. Extrinsic and intrinsic factors affect skin aging. Extrinsic factors include exposure to sunlight or pollution, and repetitive muscle movements. Intrinsic aging represents physiological changes over time, occurring at variable, genetically determined rates. The combined effects of aging over the human lifespan lead to a loss of structural integrity and physiological function in the skin. Aged skin is susceptible to dryness, wrinkling, loss of elasticity and hyperpigmentation, among others.

M.G. Almeida Leite, P.M.B.G. Maia Campos, **Correlations between sebaceous glands activity and porphyrins in the oily skin and hair and immediate effects of dermocosmetic formulations**, J Cosmet Dermatol. 2020;00: p. 1–7

Background: Oily skin and hair not only contain a large amount of sebum, but also exhibit other changes that compromise their physiology. The immediate effects of dermocosmetics are very important for adhesion to treatment. Aim: The aim of the present study was to characterize oily skin and scalp, to evaluate the correlation of sebum production with porphyrin counts and the immediate effects of topical formulations for sebum control. Patients/Methods: A total of 100 women aged 18-49 years were recruited. Sebaceous gland activity, sebum amount, stratum corneum water content (SCWC) transepidermal water loss (TEWL), skin gloss, amount of porphyrins and pores were determined in the face and SCWC, sebum amount, porphyrin count, and TEWL were also determined in the scalp. The immediate effects of formulations containing a guarana extract were determined after 2 hours of application. Results: A correlation between sebaceous gland activity and presence of porphyrins in the frontal region of the face was detected. Low gloss values and large amounts of pores in the malar region were related to lower skin uniformity. High sebum values and low SCWC and porphyrin count were also observed in the vertex region. The studied formulations reduced the sebum content of face and scalp after 2 hours of application. Conclusion: Oily skin and hair showed high sebum values, which were correlated with porphyrin count and with the activity of sebaceous glands. Finally, the studied formulations had immediate reducing effects on sebum amounts on the skin and scalp.

K. McIntosh, J. Sarver, K. Mell, D.J. Terrero, C.R. Ashby, Jr., C. Reddy,G. O' Neil, J.B. Ramapuram, A.K. Tiwari, **Oral and dermal toxicity of alkenones extracted from Isochrysis species,** Frontiers in Bioscience, Landmark, 25, p. 817-837, Jan 1, 2020

Isochrysis is commercially available marine algae used for animal feed, human nutrient supplements, and biodiesel. The *Isochrysis species* is one of five genera of haptophytes that produces unique, long-chain lipids known as alkenones that are promising new ingredients for green cosmetics, personal care products and pharmaceutical delivery. However, there is a lack of toxicity data for alkenones in animals, thus limiting their use in humans. In this study, we performed acute oral, acute dermal, and repeated 28-day dermal toxicity studies, using female SAS Sprague Dawley Rats. Our behavioral studies indicated that the specific alkenones had no overt behavioural effects at oral doses up to 4000 mg/kg. In the acute and chronic dermal toxicity studies, the alkenones produced less irritation and did not significantly damage the skin based on the Draize skin reaction scale and trans-epidermal water loss readings compared to the positive control, 1% sodium lauryl sulfate. Overall, our results indicated that alkenones are safe in Sprague Dawley rats, suggesting that they could be used for both oral and dermal formulations, although additional studies will be required.

M.A. Umborowati, D. Nurasrifah, D.M. Indramaya, S. Anggraeni, D. Damayanti, C.R. Sigit Prakoeswa, **The role of ceramide, menthol and polidocanol on pruritus, skin barrier function, and disease severity of mild atopic dermatitis**, Journal of Pakistan Association of Dermatologists, 2020; 30(1): p. 98-105

Background: Atopic Dermatitis (AD) relates with skin barrier defect. Unbearable itch leads to intense scratching, causing skin damage, and perpetuates the disease. The aim of this study is to investigate efficacy of topical ceramide, menthol, and polidocanol to decrease itch and AD severity, also improve skin barrier function. Methods: Total 30 subjects were included in this pre-experimental, before-after observational study. The subjects were children 8-18 years old with mild atopic dermatitis. We evaluated SCORADindex and daily patient-based Patient Eczema Scoring Time (PEST) for AD severity, transepidermal water loss (TEWL) using Tewameter to represent skin barrier function, and also visual analog scale (VAS) to observe itch. The preparation was applied twice daily for 4 weeks. The progression of AD after application, along with side effects, was evaluated on 5 minutes, week 1, 2, and 4. Results: SCORAD index started to decrease after 1-week application. PEST and itch VAS decreased as immediate as 5 minutes after application. Skin barrier function also improved represented by

declining of TEWL values. The differences were statistically significant ($P < 0.05$). Conclusion: Combination of ceramide, menthol, and polidocanol suppress itchy and disease severity, also improve skin barrier function in AD patients.

N. Tangkijngamvong, P. Phaiyarin, S. Wanichwecharungruang, C. Kumtornrut, **The anti-sebum property of chitosan particles**, J Cosmet Dermatol., 2020 January

Background: Seborrhea is linked to several medical and mental conditions. Although it is common, effective agents and the standardized sebum level for seborrhea are not elucidated. Aims: To determine the efficacy of chitosan particles (CP) formulation on controlling sebum secretion, its extended effects on skin redness and texture after combining with proretinal nanoparticles (CP-PRN), and a correlation of the clinical grading with sebum levels that affect mental health. Patients/Methods: A four-week clinical trial with forty subjects was conducted. Subjects applied either CP formulation or CP-PRN during nighttime. Objective measurements including sebum levels, transepidermal water loss (TEWL), skin corneometry, skin redness, and texture were analyzed. Subjects completed a self-assessment clinical grading of skin oiliness at every visit. Results: Both CP and CP-PRN significantly decreased sebum levels ($P \leq .01$) at week 4 compared to baseline. CP also resulted in significant decreases in TEWL ($P \leq .05$) and skin corneometry ($P \leq 05$) throughout the study. A significant improvement in skin redness was observed with CP-PRN ($P \leq .01$). A moderate correlation between the clinical grading and sebum levels was detected (coefficient of 0.5, $P \leq .001$), with a sebum level of 106μg/cm^{-2} indicating emotional discomfort. One subject experienced local irritation with the CP-PRN. Mild pruritic symptoms were reported in both groups. Conclusions: Chitosan particles exhibited an interesting anti-sebum effect. It could be combined with PRN to extend benefits without losing the sebum controlling effect. The clinical grading may be useful in practice due to a modest correlation with sebum levels.

P. Rattanawiwatpong, R. Wanitphakdeedecha, A. Bumrungpert, M. Maiprasert, **Anti-aging and brightening effects of a topical treatment containing vitamin C, vitamin E, and raspberry leaf cell culture extract: A split-face, randomized controlled trial**, J Cosmet Dermatol. 2020 Jan

Background: Skin aging has many manifestations such as wrinkles, uneven skin tone, and dryness. Both intrinsic and extrinsic factors, especially ultraviolet light-induced oxidative radicals, contribute to the etiology of aging. Human skin requires both water- and lipid-soluble nutrient components, including hydrophilic and lipophilic antioxidants. Vitamins C and E have important protective effects in the aging process and require exogenous supply. Raspberry leaf extracts contain botanical actives that have the potential to hydrating and moisturizing skin. Topical products with these ingredients may therefore combine to provide improved anti-aging effects over single ingredients. Objectives: To evaluate the anti-aging and brightening effects of an encapsulated serum containing vitamin C (20% w/w), vitamin E, and European raspberry (Rubus idaeus) leaf cell culture extract. Methods: Fifty female volunteers aged 30-65 years were allocated one capsule of serum for topical application on one side of the face for 2 months, in addition to self-use of facial skin products. Both test (treated) and contralateral (untreated) sides were dermatologically assessed after 4 and 8 weeks. Skin color (melanin index), elasticity, radiance, moisture, and water evaporation were measured by Mexameter MX18®, Cutometer®, Glossymeter GL200®, Corneometer CM825®, and Tewameter TM300® instruments, respectively (Courage + Khazaka Electronic GmbH). Skin microtopography parameters, smoothness (SEsm), roughness (SEr), scaliness (SEsc), and wrinkles (SEw), were measured by Visioscan® VC98 USB (Courage + Khazaka Electronic GmbH), and gross lifting effects were measured by VECTRA® H1 (Canfield Scientific), and adverse reactions and satisfaction were also assessed. Results: Skin color, elasticity, and radiance were significantly improved. The smoothness, scaliness, and wrinkles were also revealed significant improvement. Mild adverse reactions were tingling and tightness. Conclusions: The vitamin C, vitamin E, and raspberry leaf cell culture extract serum has anti-aging and brightening effects of skin.

H. Zainal, A. Jamil, N. Md Nor, M.M. Tang, **Skin pH mapping and its relationship with transepidermal water loss, hydration and disease severity in adult patients with atopic dermatitis**, Skin Research & Technology, Volume 26, Issue 1, January 2020, p. 91-98

Background: Defective skin's acidic mantle is a component of atopic dermatitis (AD) pathophysiology. We mapped the skin pH and determine its relationship with transepidermal water loss (TEWL), hydration and disease severity. Materials and Methods: A cross-sectional study involving patients aged ≥18 years. Eczema Area and Severity Index (EASI) was assessed. Skin pH, TEWL and hydration were measured at 18 pre-determined sites. Results: Forty-eight patients participated, 33(68.8%) females and 15(31.3%) males aged 28.46 ± 12.07 years. The overall skin pH was 5.32 ± 0.68 ranging from 5.16 ± 0.75 to 5.52 ± 0.59. The lowest pH 5.16 ± 0.75 was at anterior leg, popliteal fossae 5.18 ± 0.67, lower back 5.21 ± 0.64, forehead 5.22 ± 0.62, upper back 5.25 ± 0.65 and neck 5.26

± 0.76. Highest pH was at the cheek 5.52 ± 0.59, anterior thigh 5.47 ± 0.68, dorsal arm 5.46 ± 0.68, volar arm 5.43 ± 0.67 and abdomen 5.39 ± 0.67. Lesional areas' pH (5.40 ± 0.13) was higher than nonlesional (5.27 ± 0.14), *P* = .01. pH at AD predilection sites was significantly lower non-predilection sites (5.26 ± 0.59 vs 5.34 ± 0.64). pH did not correlate with TEWL (*r* = .23, *P* = .12), EASI (*r* = .19, *P* = .20) and itch (*r* = .06, *P* = .70) but correlated with hydration *r* = -.33, *P* = .02. Conclusion: Skin pH was lower at AD predilection sites. There was no correlation between pH with AD severity and TEWL, pH correlated with hydration.

H.H. Homann,. T. Ohmann, C. Seelmann, **Abschlussbericht zum Vorhaben „Einfluss perkutaner Kollageninduktion mittels Medical Needling bei Patienten mit Verbrennungsnarben" – Eine prospektive kontrollierte Interventionsstudie (FR-260)**, BG Klinikum Duisburg, 31. Januar 2020

Ziel der Studie war es, zu untersuchen, ob das Verfahren des Medical Needlings bei Verbrennungsnarben zu einer dauerhaften Verbesserung der Narben- und Lebensqualität führen kann. Aktivitäten/Methoden Studiendesign: prospektive kontrollierte Interventionsstudie Studienpopulation: 5 Patienten (3 männlich, 2 weiblich, Ø Alter: 38,8 ± 10,9 Jahre, Ø BMI: 32,1 ± 4,9 kg), insgesamt 15 Hautstellen. Die Verbrennungsnarben mussten seit mindestens 2 Jahren ausgeheilt sein und es durfte zuvor noch kein Medical Needling stattgefunden haben.Die erste Datenerhebung fand einen Monat vor dem Needling statt (t0). Die Hautstellen wurdendaraufhin einen Monat lang mit einem Vitaminöl zur OP-Vorbereitung eingerieben. Die zweite Datenerhebung fand direkt vor der Behandlung statt (t1), die dritte (t2) einen Monat nach dem Needling und die vierte und letzte (t3) sechs Monate nach dem Medical Needling. Das Primärziel der Studie ist die Quantifizierung der subjektiven Verbesserung der Narbenqualität 6 Monate nach der Behandlung anhand des POSAS. Sekundärziel war zum einen die objektive Erfassungder Narbenqualität anhand von Messungen mit dem Cutometer und zum anderen die subjektive Erfassung der Narbenqualität anhand der VSS und die Erfassung der Lebensqualität anhand des BSHS B und des SF36. Die Ergebnisse der Studie lassen darauf schließen, dass das Medical Needling einen kurzfristigen Einfluss auf Hauteigenschaften der Narbenareale zum Zeitpunkt t2 zu haben scheint. Somit könnte tatsächlich eine Kollageninduktion angestoßen worden sein. Anhand der objektiven Messungen mit dem Cutometer und den subjektiven Einschätzungen anhand des POSAS und des VSS können wir diesen Effekt, zumindest zum Zeitpunkt t3, nicht bestätigen. Auch in Bezug auf die Lebensqualität konnte kein signifikanter Unterschied festgestellt werden. Ein möglicher kumulativer Effekt, der durch wiederholtes Medical Needling zustande käme und deutlich messbare Veränderungen der Hauteigenschaften mit sich bringen könnte, wurde in der Studie nicht erfasst. Die geringe Anzahl an longitudinal untersuchten Hautstellen lässt keine zuverlässige Aussage über studienbedingte Veränderungen der Verbrennungsnarben zu. Somit kann anhand der vorliegenden Studienergebnisse kein Einfluss des Medical Needling auf die Narben- und Lebensqualität der Patienten gezeigt werden.

S.-Y. Lee, N.-J. Park, J. Jegal, B.-G. Jo, S. Choi, S.W. Lee, S. Uddin, S.-N. Kim, M.H. Yang, **Suppression of DNCB-Induced Atopic Skin Lesions in Mice by *Wikstroemia indica* Extract**, Nutrients 2020, 12, 173

Wikstroemia indica (L.) C.A. Mey. is used in traditional Chinese medicine to treat inflammatory diseases such as arthritis and bronchitis. In this study, we aimed to investigate the effects of an ethanolic extract of *W. indica* on cutaneous inflammation in mice with 2,4-dinitrochlorobenzene (DNCB)-induced atopic dermatitis (AD). Dermal administration of *W. indica* ethanolic extract toDNCB-sensitized hairless mice with dermatitis, for two weeks, reduced erythema, scaling, and edema.Skin hydration was improved and transepidermal water loss was reduced at a *W. indica* concentrationof 1%. Furthermore, *W. indica* also significantly reduced serum IgE and IL-4 concentrations in our mouse model. These results suggest that *W. indica* has potential as a topical treatment for AD and as an adjunctive agent to control AD.

P. Perugini, M. Bleve, R. Redondi, F. Cortinovis, A. Colpani, **In vivo evaluation of the effectiveness of biocellulose facial masks as active delivery systems to skin**, J Cosmet Dermatol. 2020;19: p. 725–735

Background: In recent years, bacterial cellulose (BC), or biocellulose, a natural polymer synthesized by certain bacteria, has attracted great interest in dermatology and cosmetic applications. Several bioactive ingredients are currently loaded into BC masks. However, only a few studies have reported the effectiveness of such delivery systems. Aim: The aim of this study was to evaluate the effect on skin parameters of three biocellulose masks formulated to have different cosmetic effects (anti-aging, lifting, and cell renewal). In particular, skin moisturizing, skin color, skin viscoelastic properties, skin surface smoothness, wrinkle reduction, dermal homogeneity, and stratum corneum renewal were evaluated. Materials and methods: The study involved 69 healthy Caucasian female volunteers between

25 and 64 years, who were divided into three different studies. Biocellulose facial masks were applied using the split-face method three times a week for 4-8 weeks depending on the study. Results: The results obtained from this work highlight that biocellulose masks are very well tolerated. A significant decrease in skin roughness and wrinkle breadth, and an improvement in dermal homogeneity and firmness, was observed after 2 months of treatment with “anti-aging” masks. A significant improvement in skin firmness and elasticity was observed after 1 month of treatment with “lifting” masks. Furthermore, a 1-month treatment with “cell renewal” masks promoted the production of new skin cells through a mild exfoliating action. Conclusions: This study highlights that biocellulose masks are effective delivery sys tems to successfully release into the skin several types of active compounds exerting many beneficial effects.

A. Tsochataridou, **Hautfunktionsmessung bei Patienten mit atopischer Dermatitis und Psoriasis vulgaris – Gibt es Unterschiede?**, Dissertation Hautklinik und Poliklinik der Universitätsmedizin der Johannes Gutenberg-Universität Mainz, Germany, 2020

Die atopische Dermatitis (aD), welche synonym auch als Neurodermitis, atopisches oder endogenes Ekzem bezeichnet wird, ist eine chronische oder chronischrezidivierende, entzündliche Hauterkrankung, die typischerweise mit ausgeprägtem Juckreiz einhergeht. Das morphologische Bild der in Schüben verlaufenden aD variiert je nach Schweregrad der Erkrankung und Manifestationsalter, sodass leichte, mittelschwere und auch schwere Erscheinungsbilder möglich sind. Schwere Ausprägungen der aD gehen mitunter mit Komplikationen, wie viralen, bakteriellen und mykotischen Superinfektionen der vorgeschädigten Haut einher. Die direkten Auswirkungen der aD, allen voran der Juckreiz, sowie die genannten Komplikationen, können zu einer erheblichen Einschränkung der Lebensqualität und umfangreichen Einschränkungen im Alltag der Betroffenen führen. Ein gezieltes Management ist daher sehr wichtig. Ungefähr 10-20% der Kinder in Europa erkranken an einer aD, bei circa 60% manifestieren sich die ersten Symptome sogar vor Vollendung des 1. Lebensjahres. Epidemiologischen Untersuchungen zufolge ergibt sich immerhin eine ungefähre 1-Jahres-Prävalenz von circa 3% bei Erwachsenen. Die aD ist eine multifaktoriell bedingte Erkrankung, für deren Erstmanifestation sowohl eine genetische Prädisposition als auch verschiedene individuelle Auslösefaktoren von Bedeutung sind. Differentialdiagnostisch sind andere Hauterkrankungen, das allergische, irritative oder toxische Kontaktekzemen, Pyodermien, Mykosen und sehr selten auch sogenannte transiente Formen der Psoriasis vulgaris (Pv) gerade im Kindesalter abzugrenzen. In der Literatur wird der hohe transepidermale Wasserverlust als klinisch messbares Korrelat der komplexen Barrierestörung der aD als für die Erkrankung kennzeichnend hervorgehoben. Die komplexePathophysiologie der aD ist Gegenstand aktueller Forschung. Während genetische Polymorphismen und eine loss-of-function-Mutation des Fillagrin-Gens als fundamentale Ursache der Hautbarrierestörung bei vielen Patienten mit aD bekannt sind, werden pathologische Veränderungen in der Fillagrin-Expression in den letzten Jahren zunehmend auch bei der Pv diskutiert. Trotz den unterschiedlichen klinischen Krankheitsbildern scheinen Überlappungen in der Pathogenese zu bestehen, die zum besseren Verständnis der Erkrankungen zurzeit weiter untersucht werden.

E.N. Goltsova, O.A. Shemonaeva, **Hybrid cooperative complexes of H-HA and L-HA (Profhilo®) and the BAP technique for facial skin bioremodeling: a clinical experience at the NEO-Clinic (Tyumen, Russia)**, Esperienze Dermatologiche 2019 December;21(2-4):47-53

Background: Hyaluronic acid (HA) is increasingly in demand as a dermal agent for the correction of age-related soft tissue defects, such as skin laxity, loss of hydration, wrinkle formation and roughening of skin texture. IBSA Pharmaceuticals’ Profhilo® is the frst BDDE-free injectable formulation of thermally-stabilized, cooperative hybrid HA complexes which effcacy has been proven both *in vitro* and in several independent published clinical studies.This monocentric retrospective observational study tests the effcacy and tolerability of the clinical use of Profhilo according to the specifcally-developed 5-injection point Bio-Aesthetic Points (BAP) technique for facial skin bioremodeling and treatment of laxity of the malar and submalar areas. Methods: Ten female patients with visible signs of facial skin aging were treated with injections of Profhilo® in 3 sittings at 4-week intervals. Photographical evidence, 3D microstructure capture and quantitative data on skin hydration levels and elasticity were collected at the time of treatment and 1 month after its completion. Patients’ and doctors’ subjective evaluations of the treatment’s aesthetic result were recorded according to the GAIS scale. Results: At 1 month after treatment, photographical evidence and 3D Complexion analysis highlighted a clear reduction in wrinkle depth and smoothing of skin texture. Corneometry analysis showed a statistically signifcant 29% improvement in skin hydration, and cutometry analysis recorded a statistically signifcant 25.1% increase in skin compliance (R0) and 47.4% increase in skin elasticity. Both patient and doctor satisfaction levels were high, with average GAIS scores of 2.6 and 2.8, respectively. Conclusions: Overall the treatment was well tolerated, and no notable side effects were recorded.

P. dos Passos Menezes, C. Vilaça Campos Gomes, Y.M. Barbosa Gomes de Carvalho, N. Gomes Lima Santos, V. Matos Andrade, A.M. Santos Oliveira, C. Moreira de Lima, A. Antunes de Souza Araújo, **Evaluation of the Use of Compressive Stockings Impregnated With Hesperetin-Based Nanocapsules in the Healing of Venous Ulcers: A Case Report, Clinical Medicine Insights**: Case Reports, Volume 12, 2019: p. 1–6

Venous ulcers are a more severe complication of chronic venous insufficiency, significantly compromising patient quality of life (QoL). Compressive stockings are still the gold standard treatment method with alternative therapies currently being evaluated. In this perspective, we investigate the influence of compressive stockings impregnated with hesperetin-based nanocapsules in the healing process of venous ulcers. Compressive stockings impregnated with hesperetin-based nanocapsules were applied to a consenting patient for 6 months following all relevant ethical principles for patient studies. The patient was evaluated at baseline (T0), 3 months (T3), and 6 months (T6), using photographic register (healing) probes to measure skin melanin, erythema and hydration parameters, and venous diameters, followed by questionnaires regarding QoL and pain perception. Healing was observed at the 3-month time point and with 91.6% and 93.1% of retraction area in larger ulcers of the right leg and lateral portion of the left leg, respectively. The deepest ulcer in a medial portion of the left leg healed 47.3%. A reduction of all measured skin parameters was observed, indicating a possible hesperetin effect. The scores of QoL and pain were, respectively, in the ranges of 91.6 to 31.2 and 7 to 0. Reduction in venous diameters also indicates healing function. These preliminary findings suggest that compressive stockings impregnated with hesperetin nanocapsules enhance venous ulcer healing. Further clinical trial controlled by placebo, involving a greater number of patients, is required to confirm the findings of this case report.

C. Schrammek-Drusio, **Anamnese & Hautanalyse**, medical skincare, 2019/20

Eine professionelle Hautanalyse ist die Grundlage jeder zielführenden Anti-Aging Behandlung. Denn jeder Hauttyp und –zustand hat verschiedene Anforderungen. Die Kosmetikerin benötigt dafür fundiertes Detailwissen und natürlich Erfahrung. Zur exakten Analyse ist darüber hinaus auch eine auch eine apparative Grundausstattung unverzichtbar.

M. Fahrenhold, **Transepidermaler Wasserverlust bei gesunden Erwachsenen**, hautnah dermatologie, Volume 35 (2019), p. 23

Der transepidermale Wasserverlust, also die Flussdichte von Wasser, das von der Dermis und Epidermis zur Hautoberfläche diffundiert, ist eine der wichtigsten Eigenschaften der Hautbarriere. Ein Dermatologenteam hat sich die Literatur zu diesem Thema von 70 Jahren vorgenommen und die empirische Datenlage überprüft.

N. Braun, S. Binder, H. Grosch, C. Theek, J. Ulker, H. Tronnier, U. Heinrich, **Current Data on Effects of Long-Term Missions on the International Space Station on Skin Physiological Parameters**, Skin Pharmacol Physiol 2019; 32: p. 43-51

Background: Skin reaction to spaceflight has not really been studied yet, although the skin has a very important barrier function to protect the body and can contribute to a more general understanding of physiology. It is proposed here to make a more thorough investigation of the skin during longterm spaceflight, using noninvasive techniques. Aims: The aim of the present Skin-B study is to investigate the kinetics and range of possible skin modifications during long-duration spaceflights and their recovery. Methods: In order to investigate the effect on skin physiological parameters during spaceflight, measurements were carried out on 6 astronauts with respect to skin hydration, transepidermal water loss/n barrier function, and surface evaluation of the living skin in orbit. Additional measured parameters on the ground were skin elasticity, skin density and thickness, as well as microcirculation. Results: Data from the Skin-B subjects (n = 6) contradict the results obtained in the previous pilot study SkinCare (n = 1 subject).In the present study, no deterioration of the skin was found but rather an improvement in skin hydra tion and skin barrier function, and no changes or improvement in the appearance of the skin surface. Furthermore, the skin density and skin thickness as well as skin elasticity values were unchanged from pre-flight values. Conclusion: In conclusion, we found that spaceflight under present conditions has no negative impact on skin physiological parameters.

J. Lee, H. Jang, S. Park, H.-W. Myung, K. Kim, H. Kim, W.-S. Jang, S.-J. Lee, J.K. Myung, S. Shim, **Platelet-rich plasma activates AKT signaling to promote wound healing in a mouse model of radiation-induced skin injury**, J Transl Med (2019) 17:295

Background: The skin is impacted by every form of external radiation therapy. However, efective therapeutic options for severe, acute radiation-induced skin reactions are limited. Although platelet-rich

plasma (PRP) is known to improve cutaneous wound healing, its efects in the context of high-dose irradiation are still poorly understood. Methods: We investigated the regenerative functions of PRP by subjecting the dorsal skin of mice to local irradiation (40 Gy) and exposing HaCaT cells to gamma rays (5 Gy). The cutaneous benefits of PRP were gauged by wound size, histologic features, immunostains, western blot, and transepithelial water loss (TEWL). To assess the molecular effects of PRP on keratinocytes of healing radiation-induced wounds, we evaluated AKT signaling. Results: Heightened expression of keratin 14 (K14) was documented in irradiated HaCaT cells and skin tissue, although the healing capacity of injured HaCaT cells declined. By applying PRP, this capacity was restored via augmented AKT signaling. In our mouse model, PRP use achieved the following: (1) healing of desquamated skin, acutely injured by radiation; (2) activated AKT signaling, improving migration and proliferation of K14 cells; (3) greater expression of involucrin in keratin 10 cells and sebaceous glands; and (4) reduced TEWL, strengthening the cutaneous barrier function. Conclusions: Our fndings indicate that PRP enhances the functions of K14 cells via AKT signaling, accelerating the regeneration of irradiated skin. These wound-healing benefits may have merit in a clinical setting.

J. Snatchfold, D. Targett, **Exploratory study to evaluate two clinical methods for assessing moisturizing effect on skin barrier repair**, Skin Res Technol. 2019;25: p. 251-257

Background: Two clinical methods of assessing a moisturizer's effect on stratum corneum (SC) barrier repair were evaluated in female subjects with dry skin, to identify an assessment method for future studies. Methods: In this single-centre, split-body study, women with dry skin applied moisturizer before (method A) or after (method B) SC barrier perturbation using DSquame® stripping discs. Transepidermal water loss (TEWL) and residual protein on D-Squame discs were assessed over 14 days. Results: Twenty-four subjects were included. For method A, the mean slope values of plots of 1/TEWL vs cumulative protein removed decreased over time for both treated and untreated areas, indicating improved SC barrier quality. There were no significant differences between treated and untreated areas, although a trend to a more negative slope was observed by Day 14 in the treated areas ($P = 0.082$), suggesting treatment improved barrier quality. For method B, using pre- and poststripping as covariates, no statistical differences/trends were observed between treated and untreated areas for change in TEWL from post-stripping to any evaluation from Days 3-14. TEWL values returned towards pre-stripping values for treated and untreated areas by the initial Day 3 evaluation. Conclusion: For method A, there were trends suggesting the moisturizing treatment improved SC barrier quality. For method B, there were no significant differences/ trends between treated and untreated areas. Further assessment with different methodologies is warranted to design appropriate clinical protocols for evaluating accelerated skin barrier repair. These data are insufficient to conclude whether the product or methodology was responsible for the results.

*H. Kim, M. Lee, S.Y. Park, Y.M. Kim, J. Han, E. Kim***, Age-related changes in lip morphological and physiological characteristics in Korean women,** Skin Res Technol. 2019;25: p. 277-282

Objective: Age-related changes in lip morphological and physiological characteristics are key indices for estimating age based on facial features, as reported in many studies. Yet, a majority of studies have focused on Caucasian individuals, with few studies characterizing these changes in Asian female populations. Therefore, the aim of this study was to investigate lip morphological and physiological characteristics in a cohort of Korean women. Methods: A total of 114 volunteers participated in the study. Linear distances (length of philtrum, length of lip, width of lip, and lengths of lower and upper oral commissures), angle of the upper lip, 3D lip heights, and wrinkles were calculated and averaged for each age-group. We also measured lip color, hydration, trans-epidermal water loss (TEWL), and blood flow. Statistical analyses were performed using SPSS version 20.0 (significance level $P < 0.05$). Results: Length of the philtrum and lip width significantly increased with age while upper and lower lip lengths and length of the lower oral commissure significantly decreased with age. The angle of the upper lip tended to decrease with age, but this finding was no significance. Three-dimensional height of the upper lip, wrinkles, and TEWL also decreased with age while hydration increased with age. Finally, redness of the upper and lower lips as well as blood flow significantly decreased with age. Conclusion: Lips tended to shorten in length and widen with age, resulting in a thinner and longer appearance. With regard to physiological parameters, there were important age-related changes in hydration and lip color.

Y. Song, Y. Pan, H. Wang, Q. Liu, H. Zhao, **Mapping the face of young population in China: Influence of anatomical sites and gender on biophysical properties of facial skin,** Skin Res Technol. 2019;25: p. 333-338

Background: Facial skin exhibits unique biophysical properties, which are influenced by anatomical regions and genders. The aim of this study was to comprehensively assess the regional and

gender differences in facial skin biophysical parameters among Chinese population. Materials and Methods: The 12 skin biophysical parameters at four distinct facial skin sites (forehead, cheek, canthus and chin) were measured in a normal population (n = 212) with 42 males and 141 females aged 18-29 years living in Beijing. These parameters consisted of skin hydration, transepidermal water loss, sebum content, erythema/melanin indices, L*a*b* color, skin gloss and elasticity, all quantifying with non-invasive instruments. Results: The results demonstrated that the characteristics of the facial skin were significantly different between the regions and genders. The forehead had weaker skin barrier function but secreted the most sebum content, while the cheek was the driest and brightest region on the face. The canthus was the most hydrated area and the chin displayed higher sebum secretion, darker skin color and less elastic. The females showed more hydrated, less oil, lighter and more elastic facial skin compared with males. Conclusion: This study indicates that the young Chinese facial skin significantly varies with face anatomical regions and differs between genders.

S. Jung, J. Schleusener, F. Knorr, M. Kraft, G. Thiede, H. Richter, M.E. Darvin, S. Schanzer, S. Gallinger, U. Wegener, J. Lademann, **Influence of polyester spacer fabric, cotton, chloroprene rubber, and silicone on microclimatic and morphologic physiologic skin parameters in vivo,** Skin Res Technol. 2019;25: p. 389-398

Background: Skin diseases can develop upon disadvantageous microclimate in relation to skin contact with textiles of supporting devices. Increased temperature, moisture, mechanical fracture, pressure, and inflammatory processes often occur mutually and enhance each other in their adverse effects. Therefore, the early prevention of skin irritations by improvement of microclimatic properties of skin in contact with supporting devices is important. Materials and Methods: In this study, the microclimate under occlusion with polyester, cotton, chloroprene rubber, and silicone textiles, used for supporting devices, was analyzed by determining several characteristic physiologic skin parameters in vivo, including temperature, moisture, and transepidermal water loss (TEWL). This is achieved by comparing a miniaturized in vivo detection device with several established optical and sensory methods in vivo. Results: A highly significant TEWL decrease was found after polyester, chloroprene rubber, and silicone application. The application of all materials showed highly significant decrease in skin surface temperature, with chloroprene rubber showing the lowest. Similarly, all materials showed highly significant increase in relative moisture, where the highest increase was found for chloroprene rubber and silicone and the lowest increase for cotton. The cutaneous carotenoid concentration of chloroprene rubber, silicone, and polyester decreased. A manipulation of the surface structure of the stratum corneum was recognized for all materials except for cotton by laser scanning microscopy. Conclusion: The skin parameters temperature, relative moisture, antioxidant status, and TEWL can effectively characterize the microclimatic environment during occlusion with medical supporting materials. These parameters could potentially be used to develop standardized testing procedures for material evaluation.

H.-C. Lee, S.-Y. Park, **Preliminary Comparison of the Efficacy and Safety of Needle-Embedding Therapy with Acupuncture for Atopic Dermatitis Patients,** Evidence-Based Complementary and Alternative Medicine, Volume 2019

Objectives: Among Traditional Korean Medicine approaches, needle-embedding therapy is used in various felds and consistently studied; however, there have been no clinical studies of the treatment of adult atopic dermatitis (AD) with needle-embedding therapy. Tus, there is a need to investigate the efects of needle-embedding therapy for treatment of AD. Tis study was performed to identify possible efects of needle-embedding therapy at Quchi acupoint (LI11) on AD and to compare these efects with those of acupuncture therapy. Methods: A total of 14 participants were enrolled in this study. Participants received acupuncture or needleembedding treatments for 4 weeks and then were followed for an additional 2 weeks because of safety assessment. The participants were divided into 2 groups: the acupuncture group, receiving treatment at Quchi acupoint (LI11) 3 times per week, and the needleembedding group, receiving treatment at Quchi acupoint (LI11) once per week. Te groups were compared on the basis of the SCORing Atopic Dermatitis (SCORAD) index, Transepidermal Water Loss (TEWL), skin hydration, and Dermatology Life Quality Index (DLQI) at baseline and 1 week afer treatment was completed (5th week). Results: Te SCORAD index, TEWL, Skin hydration, and DLQI at 1 week afer treatment were signifcantly improved in both groups ($p<0.05$). However, there were no significant diferences between the acupuncture and needle-embedding groups in any of the main evaluation indices ($p>0.05$). Te study participants received a total of 84 acupuncture treatments or 28 needle-embedding treatments. No adverse events occurred during the study period. Conclusions: Based on changes in the SCORAD index, TEWL, skin hydration, and DLQI value, we found that both needle-embedding and acupuncture treatments at the Quchi acupoint (LI11) were efective in decreasing the symptoms of AD and exhibited similar therapeutic efects, which suggests that needle-embedding treatment may be more clinically convenient than acupuncture, with longer efects and fewer treatments.

T. Westphal, W. Konschake, H. Haase, M. Vollmer, M. Jünger, H. Riebe, **Medical compression stockings on the skin moisture in patients with chronic venous disease,** Vasa (2019), 48, p. 502–508

Background: Because of side effects like skin dryness and consecutive symptoms like itching the therapy of chronic venous insufficiency (CVI) with medical compression stockings (MCS) can lead to a diminished wear comfort and restricted compliance. Compression stockings with integrated skin care may have a positive influence on the skin hydration and moreover a positive effect on patients compliance. Patients and methods: In this monocentric, randomized prospective, controlled trial a below knee conventional MCS was compared to a medical compression stocking with integrated skin care (MCS-SC), interface pressure range 23–32 mmHg. Participants: 50 patients with CVI. Primary outcome: skin hydration. Secondary outcomes: transepidermal water loss, skin roughness, leg volume, interface pressure and questionnaires about quality of life and wear comfort. Results: In patients wearing MCS the skin moisture decreased ($p = 0.021$) and the skin roughness increased significantly ($p = 0.001$), whereas in patients wearing the MCS-SC skin moisture and skin roughness changed only slightly (n.s.). These protective effects of MCS-SC compared to MCS were most common in patients with CVI at stage 3 ($p = 0.046$), in male patients ($p = 0.013$) and patients with initial dry skin ($p = 0.034$). Both MCS reduced lower leg volume, MCS by 80 ml ($p < 0.001$) and MCS-SC by 60 ml ($p < 0.001$), both MCS improved quality of life: leg complaints ($p = 0.0003$); functional status ($p = 0.010$), well-being and life satisfaction ($p = 0.030$). Wear comfort: In terms of tightness, constriction in bond area and strenuous donning the MCS-SC was assessed significantly more comfortable than MCS ($p < 0.001$). Conclusions: MCS-SC revealed to be superior to MCS with regard to skin moisture, particularly in patients with low skin humidity, in male patients and in patients with C3, varicose veins accompanied by edema.

A.-R. Im, I.W. Park, K.-Y. Ji, J.Y. Lee, K.M. Kim, M.K. Na, S.W. Chae, **Protective effects of Oxya chinensis sinuosa Mishchenko against ultraviolet B-induced photodamage in hairless mice**, BMC Complementary and Alternative Medicine (2019) 19:286

Background: Edible insects, including Oxya chinensis sinuosa Mishchenko (Oc), which is consumed as food in Asia, are considered as a human food shortage alternative, and also as a preventive measure against environmental destruction. Ultraviolet B (UVB) irradiation, which causes skin photodamage, is considered as an extrinsic skin aging factor. It reduces skin hydration, and increases wrinkle formation and reactive oxygen species (ROS) and inflammatory cytokine expression. Thus, the objective of this study was to investigate the anti-aging effects of an ethanol extract of Oc (Oc.Ex). Methods: A UVB-irradiated hairless mouse model was used to examine relevant changes in skin hydration, wrinkle formation, and skin epidermal thickness. Also, antioxidant markers such as superoxide dismutase (SOD) and catalase (CAT) were analyzed, and Oc. Ex skin protective effects against UVB irradiation-induced photoaging were examined by determining the levels of skin hydration factors. Results: Oc.Ex improved epidermal barrier dysfunctions such as increased transepidermal water loss (TEWL) and capacitance reduction in UVB-irradiated mice. It upregulated skin hydration-related markers, including hyaluronic acid (HA), transforming growth factor (TGF)-β, and pro-collagen, in UVB-irradiated mice, compared with the vehicle control group. It also reduced UVB-induced wrinkle formation, collagen degradation, and epidermal thickness. Additionally, it remarkably suppressed the increased expression of matrix metalloproteinases (MMPs), and restored the activity of SOD and CAT in UVB-irradiated mice, compared with the vehicle control group. Furthermore, Oc. Ex treatment downregulated the production of inflammatory cytokines and phosphorylation of the mitogen-activated protein kinases (MAPKs) signaling pathway activated by UVB irradiation. Conclusion: This study revealed that Oc. Ex reduced skin thickness and the degradation of collagen fibers by increasing hydration markers and collagen-regulating factors in the skin of UVB-irradiated mice. It also inhibited UVB-induced antioxidant enzyme activity and inflammatory cytokine expression via MAPK signaling downregulation, suggesting that it prevents UVB-induced skin damage and photoaging, and has potential for clinical development in skin disease treatment.

M. Jung, I. Kim, J.Y. Lee, H.M. Kim, M. Kwon, M. Kim, K.-M. Lim, P.S. Kim, K. Ahn, J. Kim, **Exposure to cold airflow alters skin pH and epidermal filaggrin degradation products in children with atopic dermatitis**, Allergology International, 2019

Background: We aimed to evaluate the influence of cold airflow from the air conditioner on skin barrier function and filaggrin degradation products (FDPs) in children with atopic deramtitis (AD). Methods: In a case-control study, 28 children with AD and 12 normal children without AD were exposed to one of two air conditioner modes (conventional or wind-free) for 2 h. Skin temperature, transepidermal water loss (TEWL), and skin pH were measured on right cheek and forearm at pre- and postexposure time points. We also measured filaggrin and FDPs from the volar surface of the forearm. Results: In AD

patients, skin temperature on the forearm decreased after exposure to the conventional and wind-free modes (P < 0.001 and P ¼ 0.026), and TEWL on the cheek and the forearm decreased in the wind-free mode (P ¼ 0.037 and 0.002). Skin pH on the cheek increased only after exposure to the conventional mode in AD group (P ¼ 0.002). However, no changes in TEWL and skin pH were found after exposure to either the conventional or the wind-free mode in the control group. In AD children, the levels of pyrrolidone carboxylic acid (PCA) and cis-urocanic acid (UCA) were reduced only after exposure to the conventional mode (all P ¼ 0.033). The percent changes of PCA and cis-UCA were higher in the AD group than those in the control group after exposure to conventional mode (P ¼ 0.029 and 0.046). Conclusions: Skin barrier function in children with AD may be altered by the exposure to cold airflow from a conventional air conditioner.

F. Spada, A.H. Lui, T.M. Barnes, **Use of formulations for sensitive skin improves the visible signs of aging, including wrinkle size and elasticity**, Clinical, Cosmetic and Investigational Dermatology 2019:12, p. 415–425

Background: Sensitive skin affects an increasingly large proportion of the population and is less tolerant to frequent and prolonged use of cosmetics. This study investigates the antiaging effects of a skin care system developed for use on sensitive skin. Methods: A total of 30 healthy Caucasian females, aged 32–72, were enrolled in this doubleblind randomized placebo-controlled split-face study. A routine consisting of twice daily topical applications of the test cleanser and test moisturizer or placebo or positive control products was followed for 28 days, with parameters measured at baseline and at 7-day intervals. Objective skin assessments for hydration, transepidermal water loss (TEWL), skin surface topography, elasticity and safety assessment were conducted. Results: Wrinkle surface, length and depth significantly improved by 34.8±4.7% (P<0.001), 19.0±3.2% (P<0.05) and 24.3±3.5% (P<0.05), respectively, after 28 days of skin care treatment with the test cleanser and test moisturizer. R2 (gross elasticity), R5 (net elasticity) and R7 (biological elasticity) significantly increased by 32.8±6.5% (P<0.001), 47.3±8.6% (P<0.001) and 50.6±5.1% (P<0.001), respectively, while R6 (viscoelastic portion) significantly decreased by 33.4±4.6% (P<0.001) after 28 days. Skin hydration was also found to increase significantly after 28 days by 42.2±8.5% (P<0.01), but there was no change in TEWL. No adverse events were reported. Conclusions: A novel skin care routine developed for use on sensitive skin significantlyimproves the signs of aging including hydration, wrinkle size and elasticity without significant adverse effects.

H. Dobrev, **Value of non-invasive bioengineering investigations of the human skin in vivo,** Dissertation in Dermatology and Venerology at the University of Plodiv, 2019, Bulgaria

The skin is the largest organ of the human body. It has a surface area of about 2 m^2 and a weight of about 16% of the body weight. Skin is a great visual field. Most of the changes that occur in it are visible and accessible to dermatologists. For centuries, the dermatologist's eyes and fingers have been his main diagnostic tools. Old physicians are known to describe the rash elements with great love, diligence and methodicality, especially with regard to morphological details. Today, this descriptive phase in the evolution of dermatology has lost its dominance. According to Prof. J. Serup, "*The dermatologist's eyes and hands are already becoming archaic diagnostic tools.*" With the introduction of modern skin bioengineering methods, there has been a transition from the "visible" to the "invisible". From the "visual" field, dermatology is increasingly becoming an "instrumental" field. The advantage of the new research methods created is that they enable the detection of invisible changes in skin functions, as well as their objective and quantitative measurement. This dissertation is devoted to the new methods of skin functional diagnostics. It illustrates the practical application of some of them in the field of dermatology and cosmetic science based on the experience of the sector of "Functional diagnostics of the skin" at the Department of Dermatology and Venereology, University Hospital "St. George", Plovdiv, Bulgaria. The literature review part provides an overview of current bioengineering methods for functional skin diagnostics. The apparatus used to carry out the present work is described in detail. Additionally, two little-known aspects of skin bioengineering research are presented - protocol and research ethics. Data on Bulgarian experience in the field of skin functional diagnostics have also been reported.

M. Mei-Hsia Chan, L. Siyun Tan, Y.-H. Leow, A. Teik-Jin Goon, C.L. Goh, **Comparison of Irritancy Potential of Sodium Lauryl Sulfate-free Aqueous Cream to Other Moisturizers: An Intraindividual Skin Occlusive Study**, J Clin Aesthet Dermatol., 2019;12(7): p. 52–58

Objective: We compared the irritancy potential of sodium lauryl sulfate (SLS)-free aqueous cream to SLS-containing aqueous cream and other moisturizers. Design: This was a double-blind, intraindividual occlusive study. SLS-containing aqueous cream; SLS-free aqueous cream; white soft para n; urea cream; Physiogel® (Stiefel Laboratories, Brentford, United Kingdom); QV cream (Ego

Pharmaceuticals Pty. Ltd., Braeside, Australia); Cetaphil RestoraDerm® (Galderma Laboratories, Fort Worth, Texas); Ceradan® (Hyphens Pharma International Ltd., Singapore); normal saline; and SLS 1% aqueous were applied with Finn chamber occlusion to different sites on each participant's back for 72 hours. Skin assessments were carried out on Day 0 preapplication and Day 3 and Day 7 postapplication. Participants: Twelve healthy adult volunteers were included in this study. Measurements: Study subjects were clinically evaluated by an experienced dermatologist using a four-point severity scale to assess the severity of erythema, dryness, desquamation, stinging or burning, and pruritus. Corneometer® and transepidermal water loss (TEWL) readings were taken to assess skin hydration and skin barrier integrity, respectively. All measurements were performed on Days 0, 3, and 7. Results: Application of the SLS-free aqueous cream resulted in no signi- cant changes in TEWL or Corneometer® readings throughout the study period. The SLS-containing aqueous cream resulted in a signi- cant increase in TEWL from Day 0 to Days 3 and 7. All test moisturizer creams showed no signi- cant changes in their clinical assessment scores. Conclusion: The results of our study indicate that SLS-free aqueous cream has a lower irritancy potential than SLS-containing aqueous cream, with the same level of maintenance of skin barrier integrity and hydration. SLS-free aqueous cream also appears to be less irritating to the skin than other non-SLS generic and commercial moisturizers tested.

M.O. de Melo, P.M.B.G. Maia Campos, **Application of biophysical and skin imaging techniques to evaluate the film-forming effect of cosmetic formulations,** Int J Cosmet Sci. 2019 Dec; 41(6): p. 579-584

Objective: Products with film-forming effect, or 'second skin', which guarantees an immediate protective effect after application, is a highlight, especially when composed of natural ingredients. Thus, the objective of this study was to evaluate the immediate film-forming effect on skin of a gel and emulsion formulations added with Kappaphycus alvarezii and Caesalpinia spinosa extracts through biophysical and skin imaging techniques, especially with the Reflectance Confocal Microscopy (RCM). Methods: The measurements were done in the forearm region before (baseline) and 1 h after of application of the developed formulation and its control. The parameters related to the stratum corneum water content, transepidermal water loss (TEWL), cutaneous microrelief and morphological and structural characteristics of the epidermis were analysed through the following biophysical and skin imaging techniques: Corneometer® CM 825, Tewameter® TM 300, Visioscan® VC98 and Vivascope® 1500, respectively. A sensorial analysis was also performed to study how the formulations were perceived on the skin. Results: The obtained results showed that the active ingredient under study allows the film formation on the skin surface, leading to a reduction of TEWL and skin desquamation. The obtained images from RCM showed a reduction of furrows on the skin surface and a film formation after a single application of the formulations. However, these effects were more pronounced in the emulsion formulation, which suggests a synergistic effect of the active ingredient under study with the emollients of formulation composition. This result was also observed in the sensorial analysis, as both formulations added with the active substance were well evaluated. Conclusion: The presence of Kappaphycus alvarezii and Caesalpinia spinosa extracts in the studied cosmetic formulations, enabled a film formation on a skin surface, bringing benefits as a reduction of transepidermal water loss and skin desquamation, as well as a furrows reduction and an improvement of stratum corneum after 1h of application. Finally, the skin imaging techniques can be suggested as an excellent tool to evaluate a film-forming effect of cosmetic formulations.

M. Milani, B. Hashtroody, M. Piacentini, L. Celleno, **Skin protective effects of an antipollution, antioxidant serum containing Deschampsia antartica extract, ferulic acid and vitamin C: a controlled single-blind, prospective trial in women living in urbanized, high air pollution area,** Clinical, Cosmetic and Investigational Dermatology 2019:12, p. 393–399

Introduction: Air pollution causes skin damage and favors skin aging processes such as dark spots and wrinkles, through oxidative stress. Pollutant substances accelerate skin aging through a specific activation of intracellular receptors called AhR (aryl-hydrocarbon receptors). Deschampsia antartica aqueous extract (DAE) has shown to counteract the pollutantinduced AhR activation. Ferulic acid (FA) and vitamin C (VC) are potent antioxidant substances. A serum containing DAE/FA/VC has been recently developed. So far, no clinical data are available regarding the protective actions of this serum against the detrimental effects of air pollution on the skin. Objective: We conducted a prospective, single-blind, 28-day study to assess efficacy and protective effects against air pollution skin damage of a new serum containing Deschampsia antartica extract. Materials and methods: Twenty, photo type I–III, women (mean age 42 years) with at least three dark spots on the face, living in a homogenous urbanized, high pollution area (Rome) were evaluated. The objectives of the study were to evaluate the effects of treatment on skin barrier function, assessed by transepidermal water loss (TEWL) measurement (Tewameter), the effect on dark spots, evaluated by means of colorimetry (Colorimeter

CL 400), and the effect on squalene peroxide (SQOOH)/squalene (SQ) skin ratio assessed with face swabs. Results: The trial was conducted between November 20 and December 19, 2018. In comparison with baseline, the product induced a significant improvement of skin hydration (-19% of TEWL), a significant improvement of dark spots (+7%) and a significant improvement of SQOOH/SQ ratio (-16%). The product was evaluated very well by >90% of the treated subjects regarding cosmetic acceptability. Discussion: A serum containing DAE/FA/VC has shown to improve skin barrier function, to reduce dark spots and to counteract the skin oxidative stress in women living in high pollution urban area.

E. Kotroni, E. Simirioti, S. Kikionis, I. Sfiniadakis, A. Siamidi, V. Karalis, A. Vitsos, M. Vlachou, E. Ioannou, V. Roussis, M. Rallis, **In Vivo Evaluation of the Anti-Inflammatory Activity of Electrospun Micro/Nanofibrous Patches Loaded with *Pinus halepensis* Bark Extract on Hairless Mice Skin**,* Materials 2019, 12

Abstract: Skin inflammation is the most common symptom in dermatological diseases. It is usually treated by topically applied products, such as creams, gels and lotions. Skin dressings offer a promising alternative as they are endowed with more controlled administration conditions. In this study, the anti-inflammatory activity of electrospun alginate micro/nanofibrous dressings loaded with the aqueous extract of *Pinus halepensis* bark (PHBE) was evaluated in vivo in mice. The upper back skin of SKH-1 female hairless mice was exposed to a single dose of ultraviolet radiation (3 MEDs) and the inflamed area was treated daily by the direct application of a nanofibrous patch. The condition of the skin was evaluated primarily on the basis of clinical observation, photo-documentation and histopathological assessment, while measurements of the erythema, hydration, transepidermal water loss (TEWL) and sebum production were also taken into account. The results showed that the topical application of alginate micro/nanofibrous dressings loaded with PHBE on UV-inflamed skin significantly attenuated inflammation damage, reducing the healing period. Increase of the loading dose of PHBE resulted in a proportional reduction of the extent, the density and the depth of skin inflammation. With the steadily increasing interest of the skin dressing industry towards nanofibrous matrices, electrospun nonwovens could serve as ideal candidates for the development ofmultifunctional anti-inflammatory care systems.

M. Denzinger, J. Rothenberger, M. Held, L. Joss, S. Ehnert, J. Kolbenschlag, A. Daigeler, S. Krauss, **A quantitative study of transepidermal water loss (TEWL) on conventional and microclimate management capable mattresses and hospital beds,** J Tissue Viability. 2019 Nov; 28(4): p. 194-199

Background: Transepidermal water loss (TEWL) is regarded as one of the most important parameters characterizing skin barrier integrity and has found to be higher in impaired skin barrier function. Reduced or low TEWL instead indicates skin barrier integrity or improvement. We evaluated if different mattresses/hospital beds can influence this skin barrier function by measuring TEWL before and after subjects lying in conventional and microclimate management capable mattresses/hospital beds. Methods: We included 25 healthy subjects in our study. Measurements were made using Courage & Khazaka Multi Probe Adapter MPA with Tewameter TM300 to determine TEWL before and after the subjects were lying in conventional (Viskolastic® Plus, Wulff Med Tec GmbH, Fedderingen, Germany and Duo™ 2 mattress, Hill-Rom GmbH Essen, Germany) or microclimate management capable mattresses/hospital beds (ClinActiv + MCM™ and PEARLS AFT, Hill-Rom GmbH Essen, Germany). Results: While there was no statistically significant difference in standard mattresses/hospital beds (22.19 ± 12.99 and 19.80 ± 11.48 g/hm2), the decrease of TEWL was statistically significant in both microclimate management capable mattresses/hospital beds we investigated (16.89 ± 8.586 g/hm2 and 17.41 ± 7.203 g/hm2) compared to baseline values (35.85 ± 24.51 g/hm2). Conclusion: As higher TEWL announces impaired skin barrier function these findings indicate that the choice of the mattress/hospital bed is important for skin barrier function and microclimate management systems improve skin barrier function of the skin.

A.P. Eijkenboom, **Nichtinvasive Untersuchung hautphysiologischer Parameter bei Ekzempatienten im Langzeitverlauf - Eine explorative Analyse**, Dissertation an der Medizinischen Fakultät der Ludwig-Maximilians-Universität zu München, Oktober 2019

Das atopische Ekzem (AE) ist eine verbreitete, chronisch entzündliche Hauterkrankung die in westlichen Ländern gehäuft vorkommt. Nur teilweise verstandene Wechselbeziehungen zwischen genetischen und Umweltfaktoren sind an der Entstehung der Erkrankung beteiligt. Die Erkrankung zeichnet sich durch einen variablen klinischen Phänotyp mit einer heterogenen Pathophysiologie aus. Das atopische Ekzem ist häufig mit Asthma, allergischer Rhinoconjunctivitis und durch Nahrungsmittelallergien ausgelösten, erhöhten Immunoglobulin E (IgE)-Spiegeln assoziiert [1]. Die Prävalenz des AE wird bei Erwachsenen auf 2 – 10 % und bei Kindern auf 15 - 20 % geschätzt [2, 3]. Der Schweregrad ist bei Patienten, welche einen Arzt konsultieren, in 70 % der Fälle mild, in 20 % der

Fälle moderat und in 2 % der Fälle schwer [4]. Davon treten 85 % der Fälle vor dem 5. Lebensjahr auf, wobei bis zu 70 % der Fälle bis zum Erwachsenenalter remittieren. Ein AE, das sich erst im Erwachsenenalter manifestiert, lässt sich oft schwer therapieren [5].

I. Faccini, A. Arnese, C. Gambardella, S. Bettinelli, G. Depta, **Prebiotic make-up: self-preserving natural foundation that boosts the skin microbiota**, presentation at the 25th IFSCC Conference Milan, October 2019

Human skin is a unique and variable ecosystem that is inhabited by a wide range of microorganisms such as bacteria, fungi and viruses. This microbial community, called microbiota, is based on a delicate symbiotic balance between the properties of the microorganisms and the human host. The majority of these bacteria are commensal and create a dense coating that occupies the environmental and nutritional niches avoiding the colonisation of pathogens. Moreover, the commensal microbial population plays an important role in terms of antimicrobial compound synthesis and immunity. Different studies have demonstrated that a disrupted balance in the skin ecosystem could be associated to numerous skin diseases, such as atopic dermatitis, acne vulgaris, psoriasis and chronic wounds. Based on this evidence, maintaining the health of good skin microbes is vital for a healthy skin. A simple way to turn skin into a welcoming and nurturing environment for skin bacteria is the use of prebiotics. Prebiotics are fermented ingredients that act as nutrient sources; they selectively stimulate the growth and activity of beneficial 'normal' skin microbiota [4], at the expense of pathogens. Over the last few years, skincare brands have paid close attention to prebiotic science and severalformulations have been launched on the market, claiming benefit and nourishment for good bacteria on skin. Therefore, the consumer's attention regarding skin's health has increased, and interest is starting to spread also into the make-up field. The lack of make-up products with proven efficacy and scientific support encouraged us to analyze the effect of a coloured cosmetic on the skin microbiota. The challenge of this study was to formulate a natural high performing foundation in which convey a blend of prebiotic ingredients, and to explore with an *in-vitro* and *in-vivo* tests its every-day use in safeguarding the skin microbiota of 20 women with dry and sensitive skin.

V.R. Morares, P.M.B.G. Maia Campos, **Characterization of Nondiabetic and Diabetic Type 2 Skin in the Aging Process Using Biophysical and Skin Imaging Techniques**, presentation at the 25th IFSCC Conference Milan, October 2019

The aging process is a biological, multifactorial and complex phenomenon that includes intrinsic and extrinsic factors. The intrinsic factors are correlated with genetic and metabolism and the extrinsic factors are caused by sun exposition, pollution and other. Both processes results in skin aging, where signs as wrinkles, expression lines, changes in dermal thickness can be observed. Advanced glycation end products – AGEs, are originated from no enzymatic reactions which involves the reduction of sugars and amino groups of proteins and aminoacids. Collagens are essential proteins since they are responsible for the extracellular matrix structure. The AGEs cause modifications on the matrix, once the skin collagen deteriorates by crosslinking process. People with Diabetes have more AGEs in the tissue due to the high glucose concentration, which can cause skin damages. Thus, diabetic patients are more predisposed to signs of early aging than healthy people. In this context, it is very important the better comprehension of the diabetic skin in comparison to the no diabetic one. Thus, the aim of this study was to evaluate the clinical changes in the diabetic type 2 skin by biophysical skin imaging techniques.

C. Klose, J. Fröbel, F. Lauffer, N. Garzorz-Stark, **Skin profiling reveals lipidomic pattern in functional skin parameters for cosmetics**, presentation at the 25th IFSCC Conference Milan, October 2019

Heat, physical activity, abrasive clothes, humidity and disease: external and internal factors stress the *stratum corneum*, the upmost layer of the skin, and affect functional skin parameters such as skin hydration and trans-epidermal water loss. In this study, we align skin lipidome data with functional skin parameters. Using high-resolution shotgun lipidomics analysis applying mass spectrometry (MS) and MSMS, we have discovered lipid profiles mirroring the effects of external and internal factors on functional skin parameters, such as skin hydration or trans-epidermal water loss.

V.T. Ferreira, P.M.B.G. Maia Campos, **Design and development of sunscreen formulations: correlation of physicalmechanical properties and skin biophysical measurements**, presentation at the 25th IFSCC Conference Milan, October 2019

Although UVA radiation accounts for only 9.5% of the solar radiation, it can lead to impairment of dermis and epidermis, even in the case of non-extreme exposures. Long UVA rays are the most significant part of the UVA spectrum as it penetrates the skin most deeply and play a decisive role in many aspects as photoaging, DNA damaging through the production of free radicals, immune system

responses and various photodermatoses. Avobenzone is a consolidated UVA filter, yet its low photo stability is related to undesirable photochemical reactions which may compromise physical and chemical properties of formulations, mostly when associated with inorganic UV filters, which may further increase research and development challenges. Considerable effort is necessary developing photoprotective products with satisfactory UVB/UVA protection ratio, that are visually and sensorially pleasing and match safety and efficacy by forming a stable and homogeneous film over skin surface, both avoiding adverse effects and ensuring the photoprotective activity. Herein, definition of the appropriate vehicle is fundamental where emulsifying agents not only influence efficacy of fatty components but also model surface tension and the cutaneous film formation, compatibility, physical-mechanical properties and distribution on the skin, greatly influencing sunscreens efficacy. In this context, this study aims to systematic develop formulations of satisfactory UVB/UVA protection ratio, with ability to form a stable and homogeneous film on the skin surface, and to evaluate the effect of waxes concentration in the formulations over the rheological behaviour as well their clinical effects by skin biophysical techniques.

S. Hettwer, E. Besic Gyenge, B. Suter, S. Breitenbach, B. Obermayer, **Natural Shin Barrier Supplement to Resist Artificial Radiation,** söfw journal, 145, 10/19

Artificial radiation is all around us. This refers not only to high energy visible light emitted by all kinds of screens but also WiFi radiation of smart devices. As we cannot escape from it and the consequences for our skin are still poorly investigated, protective measures can be taken in advance. Here we describe the use of an alga extract enriched in carotenoids capable of keeping the radiation threats away from our skin. The extract reduces WiFi and blue light-induced ROS generation and preventsoverly carotenoid loss of the skin barrier leading to significant reduction in ageing parameters.

Ò. Expósito, M. Pérez, A. Gallego, T. Ruiz, M. Mas, P. Riera, D. Luna, S. Laplana, **First Generation of Biomimetic Plant Membrane Lipids to Fight Energetic Ageing**, söfw journal, 145, 10/19

During ageing, as well as under stress situations, the cellular energy of the skin, and its vitality, decrease, causing what it is known as energetic ageing. The new active Olea VitaePLF (INCI name: Olea Europaea (Olive) Callus Culture Lysate) made from plant stem cells of wild olive tree sprouts, achieves the activation of the energetic rejuvenation cycles, through a new mechanism of action: the stimulation of Mitochondrial Synapses. This active represents the first generation of biomimetic plant cell membrane lipids: the Phyto-Lipidic Fractions (PLF), with a unique lipidic composition, that stimulates the communication between mitochondria, to boost the energy and vitality levels of the epidermal cells, increasing the production of structural proteins to obtain a clear anti-wrinkle, firming and repairing effect. Several *in vitro* and *in vivo* studies were performed to support these claims.

M. Bimonte, A. Carola, A. Barbulova, C. Zappelli, M. Angelillo, M. Cucchiara, F. Apone, G. Colucci, **Calming the Cascade**, Cosmetics and Toiletries, Vol. 134, No. 9, October 2019

Sensitive skin is a condition of cutaneous hyperreactivity that can result in exaggerated reactions to physical, chemical, hormonal and/or psychological factors. It affects more than 50% of the wortd's population; in fact, one epidemiological study reported a prevalence of 38.4% in the whole of Europe alone. Two primary processes contribute significantly to hypersensitized skin: an acceleration of nerve responses, leading to neurogenic inflammation; and an increase in stratum comeum permeability due to an impaired barrier. The Ttansient Receptors Potential Vanilloid (TRPV) channels play a central role in both of these processes. These cationic receptor channels mediate the influx of monovalent and/or divalent cations into the cells in response to a variety of chemical or physical stimuli.

A. Stork, A. Mehling, P. Schulte, **Gentle Care for Delicate Skin**, SOFW Journal 09/19, Volume 145, Germany, September 11, 2019

When babies set out to explore the world around them, they do not yet have the protection adults count on. Baby skin is thinner and more sensitive, calling for tailored care to defend it from moisture loss, sun and environmental aggressors. *Anja Stork*, *Annette Mehling* and *Petra Schulte* explain how BASF's baby care concept delivers essential and safe care.

*D. Khazaka, C. Uhl***, In-house tests complement CRO final product testing,** PERSONAL CARE EUROPE. September 2019

Before a cosmetic product is offered on the market, final tests are obligatory for the manufacturer to prove its safety and to substantiate the various claims on the products, e.g. reduces wrinkles up to 20%, increases skin hydration for 24 h. There are no limits to modern claims. All over the world, contract research organisations (CROs) varying from small laboratories to vast multinational institutes offer their services to the cosmetic manufacturers to perform all kind of tests and compile the final necessary product documentation.

I. Montaño, **Invisible Yet Indispensable, the Skin Microbiota Needs to be Properly Supported**, SOFW Journal 09/19, Volume 145

Billions of microorganisms colonize the human skin at various sites and constitute the skin microbiota. They form complex com munities that function together with the host immune system to defend against pathogens and to maintain skin health. Sincehaving a well-balanced cutaneous microflora is important for a healthy and beautiful skin, protecting its balance and its recovery represents a winning strategy for skin care products. The active ingredient Black BeeOme™ that results from the fermentation of honey from the rare wild dark bee *Apis mellifera mellifera* with the bacteria Zymomonas mobilis, has been designed to harmonize the skin microflora after stress to ensure a healthy and pure skin. The fermentation eliminates the basic sugars glucose, fructose and sucrose in the honey. As a result, the carbon source for unwanted bacterial growth on the skin is removed. On the other hand, the ferment of Zymomonas mobilis contains factors that may help to control the growth of microorganisms on the skin. Black BeeOme™ has been shown to effciently exert its prebiotic effect to restore the healthy skin's natural microbiota following daily stress.

T.-Y. Kim, N.-J. Park, J. Jegal, S. Choi, S.W. Lee, J. Hang, S.-N. Kim, M.H. Yang, **Chamaejasmine Isolated from *Wikstroemia dolichantha* Diels Suppresses 2,4-Dinitrofluoro-benzene-Induced Atopic Dermatitis in SKH-1 Hairless Mice**, Biomolecules 2019, 9, 697

Plants of the genus *Wikstroemia* have long been used as traditional medicines to treat diseases like pneumonia, rheumatism, and bronchitis. This study was designed to determine the effect of chamaejasmine, a biflavonoid present in *W. dolichantha*, on atopic dermatitis (AD)-like skin lesions in a 2,4-dinitrochlorobenzene (DNCB)-induced murine model of AD. Initially, we examined the anti-allergic activities of ten flavonoids from *W. dolichantha* by measuring β-hexosaminidase release from RBL-2H3 cells. Subsequently, an SKH-1 hairless mouse model of AD was developed based on the topical application of DNCB. Chamaejasmine (0.5%) or pimecrolimus (1%, positive control) were applied to dorsal skins of DNCB-sensitized AD mice for two weeks. Serum IL-4 and IgE levels were determined using enzyme-linked immunosorbent assay kits and transepidermal water loss (TEWL) and skin hydration were measured using a Tewameter TM210 and a SKIN-O-MAT, respectively. Of the ten flavonoids isolated from *W. dolichantha*, chamaejasmine most potently inhibited DNP-specific IgE-induced degranulation in RBL-2H3 cells. Topical administration of chamaejasmine attenuated the clinical symptoms of DNCB-induced dermatitis (i.e., itching, dryness, erythema, and edema). Histological analyses demonstrated that dermal thickness and mast cell infiltration in dermis were significantly reduced by chamaejasmine. In addition, 0.5% chamaejasmine inhibited DNCB-induced increases in total IL-4 and IgE levels in serum, improved skin barrier function, and increased epidermis moisture. Our findings suggest chamaejasmine might be an effective therapeutic agent for the treatment of atopic diseases.

V. Mazzarello, G. Piu, M. Ferrari, G. Piga, **Efficacy of a Topical Formulation of Sodium Bicarbonate in Mild to Moderate Stable Plaque Psoriasis: a Randomized, Blinded, Intrapatient, Controlled Study**, Dermatol Ther (Heidelb) (2019) 9: p. 497–503

Introduction: Psoriasis is a chronic inflammatory disease characterized by the presence of erythematosquamous lesions. A wide variety of topical treatments for therapy of this pathology are available, including sodium bicarbonate (SB). A few papers reported in literature focus on use of SB baths for treatment of psoriasis, but none assess evidence concerning the efficacy of SB topical preparations. This study aimed to determine the effectiveness of a galenic SB in lanette vax formulation compared with lanette vax base in mild to moderate stable plaque psoriasis. Methods: A randomized, double-blind, intrapatient, controlled study was performed in 28 days. Thirty patients of both genders were selected for testing. A blinded investigator evaluated the patients' psoriasis using a modified Psoriasis Area and Severity Index (PASI), body surface area (BSA), and objective parameters using sensors (Multiprobe Adapter MPA5; Courage & Khazaka Electronic GmbH, Cologne, Germany). Results: Data analysis of objective parameters highlighted that use of the SB topical preparation led to no improvement in skin hydration, no reduction in transepidermal water loss, and no decrease of erythema. The modified PASI and BSA did not change from baseline. Conclusions: The results obtained show that use of the studied product did not improve psoriatic lesions.

F. Santoro, N. Lachmann, **An Open-Label, Intra-Individual Study to Evaluate a Regimen of Three Cosmetic Products Combined with Medical Treatment of Rosacea: Cutaneous Tolerability and Effect on Hydration**, Dermatol Ther (Heidelb) (2019) 9: p. 775–784

Introduction: Although rosacea management includes general skincare, previous studies have not evaluated comprehensive skincare regimens as adjuvants to other treatments. Methods: The

primary objective of this openlabel, intra-individual study of subjects with rosacea was to evaluate the cutaneous tolerability of a regimen consisting of Cetaphil PRO Redness Control Day Moisturizing Cream (once daily in the morning), Cetaphil PRO Redness Control Night Repair Cream (once daily in the evening) and Cetaphil PRO Redness Control Facial Wash (foam once in the morning and once in the evening). Secondary objectives were to evaluate the effect on transepidermal water loss (TEWL) and cutaneous hydration and to determine the subjects' evaluation of efficacy, tolerability and future use. A dermatologist examined subjects and measured TEWL and cutaneous hydration on day (D) 0, D7 and D21, when subjects ranked symptoms. Subjects completed a questionnaire on D21. Results: The per-protocol population consisted of 42 subjects receiving treatment for rosacea. Eleven subjects developed adverse events, none of which were considered to be related to the skincare products. Five subjects showed signs or symptoms that were potentially associated with the skincare products that might suggest poor cutaneous tolerability; these were generally mild. TEWL decreased significantly by a mean of 17% on D7 and a mean of 28% on D21 compared with baseline (both P \ 0.001). Skinhydration increased significantly by a mean of 5% on D7 (P = 0.008) and a mean of 10% on D21 (P \ 0.001) compared with baseline. Subjects reported that the regimen was pleasant (98%) and effective (95%) and that it offered various benefits; 90% of subjects reported that they would like to continue to use the regimen and would buy the products. Conclusion: The skincare regimen improved skin hydration and skin barrier function in subjects receiving medical treatment for rosacea and was well tolerated.

K. Li, Z. Mu, G. Wen, Y. Zhao, X. Cong, J. Zhang, **Increased Treg cells and eosinophils characterize atopic dermatitis-like graft-versus-host disease compared to lichen planus-like graft-versus host disease**, J Am Acad Dermatol. 2019 Aug

Background: Graft-versus-host disease (GVHD) has various cutaneous manifestations. Little is known about the mechanisms of cutaneous GVHD with different clinical features. Objective: To characterize the immunological features and skin barrier functions of cutaneous GVHD. Methods: Nineteen patients with atopic dermatitis (AD)-like GVHD, eight patients with lichen planus (LP)-like GVHD, twenty-four patients with AD and fifteen healthy controls were included in this study. T cell subpopulation in peripheral blood and skin lesions were measured by flow cytometry and immunofluorescence respectively. Filaggrin expression in skin lesions was measured by Western blot and immunohistochemistry. Trans-epidermal water loss (TEWL) was also measured using Tewameter® TM 300. Results: The peripheral blood eosinophils in AD-like GVHD were significantly higher than that in LP-like GVHD. Th2 cells in peripheral blood and skin lesions were increased in AD-like GVHD and LP-like GVHD. Treg cells in peripheral blood and skin lesions were increased in AD-like GVHD. Filaggrin expression and TEWL were increased in skin lesions of AD-like GVHD and LP-like GVHD.

P. Tarka , K. Gutkowska, A. Nitsch-Osuch, **Assessment of tolerability and acceptability of an alcohol-based hand rub according to a WHO protocol and using apparatus tests**, Antimicrobial Resistance and Infection Control (2019), 8:191

Background: The effectiveness of alcohol-based hand rubs (ABHRs) depends substantially on their acceptability and tolerability. In this study, we assessed the acceptability and tolerability of a new ABHR (product EU 100.2018.02). Methods: Among physicians, nurses, and cosmetologists who used the ABHR for 30 days, we assessed the product's acceptability and tolerability according to a WHO protocol. Additionally, we used instrumental skin tests. Participants assessed the product's color, smell, texture, irritation, drying effect, ease of use, speed of drying, and application, and they gave an overall evaluation. Moreover, they rated the tolerability, i.e. their skin condition, on the following dimensions: intactness, moisture content, sensation, and integrity of the skin. The tolerability was also assessed by an observer as follows: redness, scaliness, fissures, and overall score for the skin condition. Instrumental skin tests included transepidermal water loss, skin hydration, sebum secretion, and percentage of skin affected by discolorations. All assessments were made at baseline (visit 1), and 3–5 days (visit 2) and 30 days (visit 3) later. Results: We enrolled 126 participants (110 [87%] women) with a mean age of 34.3 ± 11.65 years. Sixty-five participants (52%) were healthcare professionals (physicians, nurses), and 61 (48%) were cosmetologists. During visit 2 and visit 3, about 90% of participants gave responses complying with the WHO's benchmark for acceptability and tolerability. Similarly, the ABHR met the WHO criteria for observer-assessed tolerability: on all visits, in more than 95% of participants, the observer gave scores complying with the WHO benchmark. Transepidermal water loss decreased from baseline to visit 3 ($p < 0.001$), whereas skin hydration, sebum secretion, and the percentage of skin affected by discolorations did not change significantly during the study ($p \geq 130$). Conclusions: The EU 100.2018.02 had both high acceptability and tolerability, meeting the WHO criteria. The WHO protocol proved useful in the analysis of acceptability and tolerability of ABHRs.

P. Suchonwanit, K. Triyangkulsri, M. Ploydaeng, K. Leerunyakul, **Assessing Biophysical and Physiological Profiles of Scalp Seborrheic Dermatitis in the Thai Population**, BioMed Research International, Volume 2019

Background: Scalp seborrheic dermatitis (SD) is a common and chronic inflammatory skin disease which tends to recur over time. By measuring biophysical properties of the stratum corneum, many studies report abnormal biophysical profiles and their association in various dermatologic diseases. The aim of the study is to analyze the biophysical properties and skin barrier defects of scalp SD compared to healthy controls. Materials and Methods: Tis study is a cross-sectional study assessing the correlation of various biophysical and physiological profiles in scalp SD. Forty-two Tai participants with scalp SD were enrolled in the study and 40 healthy participants were also enrolled as the control group. Both SD and control group were subjected to a one-time biophysical and physiological properties' measurement of transepidermal water loss (TEWL), stratum corneum hydration (SCH), skin surface pH, skin surface lipid, and skin roughness. Results: The mean TEWL of lesional skin of SD cases were significantly higher than those of control group ($P<0.05$). Relating to high mean TEWL, the mean SCH was found to be significantly lower in SD cases ($P<0.05$). Skin surface lipid was also found to be significantly higher in SD group ($P<0.05$). However, there were no differences in skin surface pH ($P=0.104$) and roughness ($P=0.308$) between the two groups. Pairwise comparison of each subgroup found that moderate and severe SD demonstrated significantly higher mean skin surface lipid than that of control group ($P<0.05$). Conclusion: Scalp SD may be associated with seborrhea in Tai population. Monitoring of SCH, TEWL, and skin surface lipid could be helpful in assessing severity and evaluating the treatment outcome in patients with scalp SD.

I. Meyer, M. Pesaro, D. Stuhlmann, L. Garbe, G. Schmaus, **Practical Probiotics: Live Microbial Skin Benefits without Limits**, Cosmetics & Toiletries, Vol. 134, No. 8, p. DM14-22

Driven by modem S lifestyle and the eclectic evolution of new technologies, consumers are aware *r* of the potential skin damage environmental stressors can induce. As such, consumers increasingly seek topical products that improve skins endogenous firstline defense mechanisms. In relation, the concept of probiotics to improve gut health is well-established in both the scientific literature and consumer perception.1 In fact, 79% of consumers already believe the use of probiotics is beneficial for skin health and 63% of consumers think probiotics fit well into the beauty care category. Regardless, the benefits of microorganisms applied topically are not widely described.

D.-M. Ding, Y. Tu, M.-Q. Man, W.-J. Wu, F.-Y. Lu, X. Li, Y. Li, J.-T. Yang, Y.-M. Jin, C.-Y. Yang, L. He, **Association between lactic acid sting test scores, self-assessed sensitive skin scores and biophysical properties in Chinese females**, International Journal of Cosmetic Science, 2019, 41, p. 398–404

Background: Lactic acid sting test (LAST) is a classical method to identify sensitive skin. However, some subjects with self-perceived sensitive skin are negative for LAST. Objective: To determine whether LAST scores are associated with specific phenotype of sensitive skin. METHODS: A total of 292 subjects with self-perceived sensitive skin were enrolled in this study. The Sensitive Scale was used to evaluate the severity of burning, stinging, itching, tautness, erythema and scaling based on 0–10 scale scores. In addition to the assessment of LAST scores, epidermal biophysical properties were measured using an MPA system. Results: The Sensitive Scale scores of stinging, itching, tautness and scaling were significantly different between the LAST-positive and -negative groups. However, burning and erythema scores did not differ between the LAST-positive and -negative groups. LAST scores were positively correlated with the Sensitive Scale scores for stinging, itching, tautness and scaling, but not for burning and erythema scores. Moreover, LAST scores negatively correlated with stratum corneum hydration, but positively with transepidermal water loss (TEWL) rates. CONCLUSIONS: Lactic acid sting test scores positively correlated with TEWL rates. LAST scores could be used to identify subjects with sensitive skin characterized mainly by stinging and itching, but not those mainly by burning and erythema.

S. Laneri, R. di Lorenzo, A. Sacchi, I. Dini, **Dosage of Bioactive Molecules in the Nutricosmeceutical *Helix aspersa* Muller Mucus and Formulation of New Cosmetic Cream with Moisturizing Effect**, Natural Product Communications August 2019: p. 1–7

The present study was carried out to provide the allantoin and glycolic acid contents in the *Helix aspersa* Muller mucus of common Campania land (Italy) by using chromatographic method. The study continued with the formulation of a snail mucus cosmetic cream, whose ability to hydrate the skin was evaluated comparing the skin hydration and trans-epidermal water loss (TEWL) effects of a stable cosmetic preparation. The skin TEWL and skin hydration effects were measured by Tewameter and Corneometer probe, respectively, at the beginning, after 1 hour, and 24 hours.

C. Uhl, **Claim support for Microbiome Skin Care**, happi, July 2019

Since the dawn of mankind, humans have struggled to understand why they were struck by disease. Many theories have been established, most of them discarded now. In the first century BC, Roman medical author Cornelius Aulus Celsus mentioned the term"virus,"the Latin term for"poison."He used it to describe the phlegm that transmits rabies. Until the 17th Century, this term was used for all infectious diseases.

T. Sakamoto, Y. Ishio, Y. Ishida, K. Mogi, T. Kikusui, **Low maternal care enhances the skin barrier resistance of offspring in mice**, PLOS ONE, July 2019

Deprivation of maternal care via lack of somatosensory input causes offspring to experience adverse consequences, especially in the central nervous system. However, little is known about the developmental effect of maternal care on peripheral tissues such as the skin, which includes cutaneous sensory neurons. In the present study, we examined the involvement of maternal care in the development of the skin. We investigated offspring reared by early-weaned mother mice who spontaneously showed lower frequency of licking/grooming on nursing. Offspring of early-weaned mothers showed higher resistance against skin barrier disruption than did offspring of normally-weaned mothers, and had normal skin barrier function in the intact trunk skin. In the dorsal root ganglion of early-weaned mother offspring, we also found up-regulation of mRNA levels of the Mas-related G-protein coupled receptor B4 (MrgprB4), which is a marker of sensory neurons that detect gentle stroking. We further found that levels of MrgprB4 mRNA were correlated with the enhancement of skin resistance. The present findings suggest that maternal somatosensory inputs have a developmental impact on the cutaneous sensory neurons of the skin in offspring. Interestingly, the present results suggest that lower maternal care has a benefit on the skin resistance. This provides important information for understanding the development of peripheral tissues in offspring reared under severe conditions such as lower maternal care in the wild.

Z. Khosrowpour , A.S. Nasrollahi, A. Ayatollahi, A. Samadi, A. Firooz, **Effects of four soaps on skin trans-epidermal water loss and erythema index**, J Cosmet Dermatol. 2019 Jun;18(3): p. 857-861

Background: Various tests have been carried out to determine the irritant potential of soaps/cleansers. Objectives: This study was carried out to compare the effects of four different soap formulations on biophysical parameters of the skin, including trans-epidermal water loss (TEWL) and erythema index. Methods: Four different soap formulations (creamy, glycerin containing, syndet, and traditional alkaline soaps) were studied. Twenty healthy volunteers were enrolled and 8% solutions (W/V) of the soaps made with distilled water, 20% sodium dodecyl sulfate (positive control) and water (negative control) were applied to their volar forearms as a single dose patch test. The patches remained on the sites for 4 hours. The skin TEWL and erythema index were measured before applying the patches and 24 and 72 hours after removal of them using TEWAmeter and Mexameter probes, respectively. Results: Alkaline and creamy soaps caused a significant increase in TEWL 24 hours after patch removal. However, 72 hours after patch removal, this increase was significant only in case of alkaline soap (P-value = 0.002). A decreasing trend in skin erythema was observed 24 and 72 hours after application of syndent, glycerin, and creamy soaps. In case of creamy soap, this decrease was significant 72 hours after patch removal (P-value = 0.006). Conclusion: Traditional alkaline soap increased TEWL and skin erythema, which are signs of prolonged damage to the skin barrier. However, the effects of other formulations were transient, and TEWL returned to baseline at 72 hours. Creamy soap even showed a relative protective effect (decrease in erythema index compared to baseline), probably due to the lanolin content of the formulation.

M. Qassem, P. Kyriacou, **Review of Modern Techniques for the Assessment of Skin Hydration**, Cosmetics 2019, 6, 19

Skin hydration is a complex process that influences the physical and mechanical properties of skin. Various technologies have emerged over the years to assess this parameter, with the current standard being electrical probe-based instruments. Nevertheless, their inability to provide detailed information has prompted the use of sophisticated spectroscopic and imaging methodologies, which are capable of in-depth skin analysis that includes structural and composition details. Modern imaging and spectroscopic techniques have transformed skin research in the dermatological and cosmetics disciplines, and are now commonly employed in conjunction with traditional methods for comprehensive assessment of both healthy and pathological skin. This article reviews current techniques employed in measuring skin hydration, and gives an account on their principle of operation and applications in skin-related research.

T. Yazdanparast, K. Yazdani, P. Humbert, A. Khatami, S.A. Nasrollahi, H. Zartab, L. Izadi Firouzabadi, A. Firooz, **Biophysical and ultrasonographic changes in lichen planus compared with uninvolved skin**, International Journal of Women's Dermatology 5 (2019), p. 100–104

Background: Lichen planus (LP) is a chronic inflammatory disease of the skin. Currently, noninvasive techniques are used to evaluate biophysical properties of the skin in vivo. Objective: In this study, we aimed to evaluate skin biophysical properties in patients with LP and make a comparison between involved and uninvolved skin to provide a better understanding of the pathogenesis of LP. Methods: The stratum corneum hydration, transepidermal water loss, pH, erythema, melanin, sebum, friction, temperature, elasticity parameters (R0, R2, R5), and thickness and echo-density of the epidermis, dermis, and subepidermal low echogenic band were measured on lesions of classic LP in 21 patients and compared with the average of perilesional and symmetrical uninvolved skin (as control) with a paired t test. Results: Stratum corneum hydration (p = .002), sebum (p = .04), R0 (p = .005), and echo-density of the dermis (p = .005) were significantly lower, but pH (p = .007), melanin content (p b .001), erythema (p b .001), temperature (p = .01), thickness of dermis (p = .02), and subepidermal low echogenic band (p b .001) were significantly higher in LP lesions. Conclusion: An evaluation of its biophysical, biomechanical, and ultrasonographic characteristics showed that the skin is an objective, noninvasive, and quantitative measuring tool that can be used to provide valuable information about skin changes in classic LP.

H. Zhong, C. Hong, Z. Han, S.J. Hwang, B. Kim, Z. Xu, J. Lee, K.H. Kim, M.H. Jin , C. Zou, **Erjingwan Extracts Exert Antiaging Effects of Skin through Activating Nrf2 and Inhibiting NF-κB**, Hindawi Evidence-Based Complementary and Alternative Medicine Volume 2019

In oriental medicine, mixtures of medical plants are always used as prescriptions for diseases. Natural products extracted from herbs have great potential antiaging effects. Previous studies and clinical trials have shown several critical functions of Erjingwan (EJW), such as nourishing Yin, kidney tonifying and aging-resistance. We assumed that EJW extracts exerted the antiaging effects through nourishing Yin. We examined the antiaging effects of EJW extracts on healthy human skin by noninvasive measurements. Ten we estimated the cell proliferation and DPPH radical scavenging rate. Western blotting analysis was used to determine the expressions of matrix metalloproteinase-1 (MMP-1), type I collagen (COL1A2), p-NF-κB, NF-κB, p-IκBκ, IκBκ, p-Nrf2, and HO-1. EJW extracts did not affect moisture content, TEWL and skin chroma, while it significantly improved skin glossiness and skin elasticity. Moreover, EJW extracts could downregulate the MMP1 expression and upregulate the COL1A2 expression. In addition, it promoted the Nrf2 pathway while it inhibited the NF-κB pathway. With the application of cream containing EJW extracts, the skin aging state was significantly improved. Furthermore, in vitro studies showed that EJW extracts contributed to the repair of skin after injury. Taken together, the antiaging effects of EJW extracts were related to its antioxidant and anti-inflammatory abilities.

M.M.F. Shirata, P.M.B.G.M Campos, **Eficácia clínica de formulações cométicas contendo tetraisopalmitato de ascorbila e peptídeos de arroz na pele jovem com fotoenvelhecimento,** Congresso Colamiqc, São Paulo, May 21-23, 2019

Considerando que a intensidade do fotoenvelhecimento está diretamente relacionada ao grau de exposição a radiação solar, a pele de pessoas ainda jovens pode apresentar alterações decorrentes do mesmo, como hiperpigmentações e redução da elasticidade da pele. Nesse contexto, o desenvolvimento de formulações fotoprotetoras e de formulações cosméticas contendo substâncias ativas com propriedades antioxidantes, hidratantes e com potencial para atuar na derme é fundamental para a prevenção e atenuação de tais alterações cutâneas. Para a comprovação dos beneficios dessas formulações na pele fotoenvelhecida, a avaliação da eficácia clinica por técnicas de biofisica e análise de imagem permite a análise objetiva de várias caracteristicas da pele além da correlação dos resultados obtidos por meio de diterentes parãmetros, o que possibilita a obtenção de resultados mais conclusivos.

C. Uhl, **Efficacy testing of microbiome skin care**, PERSONAL CARE EUROPE, April 2019, p. 41-45, PERSONAL CARE ASIA, May 2019, p. 51-55, косметолог 2 [94] 2019 (in Ukranian), Cosmetics & Toiletries Brasil, Vol. 31, Mai-June, 2019, p. 22-27 (in Portuguese)

For years now, we have accepted the idea that we can nourish our intestinal tract with dedicated bacterial ingredients from food supplements and thereby improve our general health. Books written on this subject have become bestsellers. But why should we focus only on our intestinal tract? There are so many different microbial communities that can be found on and inside our body. Especially the colonization of the skin being our largest organ, tangible to the hands, visible to the eye, and in constant contact with the outside environment has moved to the front of cosmetic research. The idea of being a

complex ecosystem is adding to the existing trend of personalised cosmetics, and will confirm the customer in their feeling of uniqueness.

В течение многих лет мы принимали идею о том, что можем обогащать наш кишечный тракт специальными бактериальными ингредиентами из пищевых добавок и тем самым улучшать общее состояние здоровья. Книги, написанные на эту тему, стали бестселлерами. Но можем ли мы сосредотачиваться только на нашем кишечном тракте?

O microbioma cutâneo é a população de microrganismos que habita a pele. Neste trabalho, o autor apresenta uma breve descrição da importância da atividade do microbioma e dos meios analíticos instrumentais para medir a eficácia de produtos cosméticos de interesse do microbioma cutâneo.

A. Kilic, C. Masur, H. Reich, U. Knie, D. Dähnhardt, S. Dähnhardt-Pfeiffer, C. Abels, **Skin acidification with a water-in-oil emulsion (pH 4) restores disrupted epidermal barrier and improves structure of lipid lamellae in the elderly**, Journal of Dermatology 2019; 46: p. 457–465

The pH of the skin surface increases with age and thus reduces epidermal barrier function. Aged skin needs appropriate skin care to counterbalance age-related pH increase and improve barrier function. This confirmatory randomized study investigated the efficacy of water-in-oil (w/o) emulsions with either pH 4 or pH 5.8 in 20 elderly subjects after 4 weeks of treatment. After the treatment, the skin was challenged with a sodium dodecyl sulphate (SDS) solution in order to analyze barrier protection properties of both formulations. The pH 4 w/o emulsion resulted in a significantly lower skin pH compared with the pH 5.8 w/o emulsion and an improved skin hydration after 4-week treatment. Further, the pH 4 emulsion led to more pronounced improvements in length of intercellular lipid lamellae, lamellar organization as well as lipid levels than the pH 5.8 emulsion. Following SDS-induced barrier damage to the skin, the pH of all test areas increased, but the area treated with the pH 4 emulsion showed the lowest increase compared with baseline. In addition, even after the SDS challenge the skin area treated with the pH 4 emulsion still maintained a significantly increased length of intercellular lipid lamellae compared with the beginning of the study. This study provides evidence that topical application of a w/o emulsion with pH 4 reacidifies the skin in elderly and has beneficial effects on skin moisturization, regeneration of lipid lamellae and lipid content. Application of a pH 4 emulsion can improve the epidermal barrier as well as the stratum corneum organization in aged skin.

M.L. Vazquez-Gonzalez, G. Rodriguez, L. Rubio, J. Nestor, E. Fernandez, L. Barbosa-Barros, O. López, **Intelligent ageing repair with skin superfoods**, PERSONAL CARE EUROPE, April 2019, p. 157-162

The many environmental factors related to modern lifestyle generate a skin imbalance that leads to premature ageing. In this study, we evaluate the capacity of a new skin delivery system based on bicosomes (named bicosome-xanthin) to provide intense detox and revert the signs of ageing. This system was specially designed to incorporate, stabilise and deliver microalgae extract into deep skin layers. Bicosomexanthin proved to be effective in protecting the skin against pollution particles and to prevent 90% of the damage caused by blue light. This extraordinary ingredient also proved *in vivo* to boost the skin's antioxidant capacity and barrier function, to accelerate epidermal cell renewal, improve skin brightness and firmness, and visibly reduce wrinkles.

T. Yazdanparast, H. Hassanzadeh, S.A. Nasrollah, S.M. Seyedmehdi, H. Jamaati, A. Naimian, M. Karimi, R. Roozbahani, A. Firooz, **Cigarettes Smoking and Skin: A Comparison Study of the Biophysical Properties of Skin in Smokers and Non-Smokers**, Tanaffos 2019; 18(2): 163-168

Background: Tobacco smoke is toxic for cells and could be a damaging factor to skin. The purpose of this study was to compare the biophysical properties of skin in smokers and non-smokers. Materials and Methods: The study population consisted of 28 current smokers and 24 non-smokers. The hydration of the stratum corneum, trans epidermal water loss, pH, erythema, melanin content, sebum, friction and elasticity parameters (R0, R2, R5) of skin, epidermis and dermis thickness and echodensity were measured on middle forehead, right cheek and right inner arm of participants. Also volume, surface area and depth of right nasolabial folds were measured. The mean of these values in smokers were compared with nonsmokers by independent sample T- test. Results: Gross elasticity was significantly lower in smokers on forehead (p= 0.048). Thickness of epidermis was higher in smokers in all measured sites but the differences were not statistically significant. Thickness of dermis was higher in smokers in all measured sites too, but only the difference on cheek was statistically significant (p= 0.009). Density of epidermis was lower in smokers in all measured sites, but only the difference on forehead was statistically significant (p= 0.019). Density of dermis was lower in smokers in all measured sites, but only the difference on arm was statistically significant (p= 0.028). Volume and area of nasolabial folds were higher in smokers, but only the difference of area was statistically significant (p =

0.031). Conclusion: Tobacco smoking could affect the biophysical parameters of skin, especially thickness and density of dermis and epidermis and nasolabial folds.

H.-Y. Cheng, L.-F. Li, **Skin Biophysical Parameters and Patch Test Results in People Predisposing to Xiaotong Tiegao Induced Irritant Contact Dermatitis**, Hindawi Evidence-Based Complementary and Alternative Medicine, Volume 2019

Background. Xiaotong Tiegao (XTT) is an ancient topical Tibetan medicine plaster which is widely used in China. Irritant contact dermatitis (ICD) caused by XTT is very common. It is still unclear why some people aremore prone to develop ICD.The aim of this study is to study the baseline skin biophysical parameters and patch test results in individuals predisposing to XTT induced ICD. Methods. During a four-month period, 149 healthy volunteers with ICD and 50 volunteers without ICD after applying XTT were recruited. The skin biophysical parameters were measured, and contact allergy to 20 common allergens was patch tested, at two weeks after the ICD was recovered. Results.There were no significant differences in age and sex between ICD and control groups. It was found that skin median melanin value (176.50 vs 189.50, $P < 0.05$, Mann-Whitney U-test) and erythema value (319.90 ± 70.49 vs 347.93 ± 84.55, $P < 0.05$, Independent-Samples T test) were much lower in ICD than control group. Overall patch test results were not different, but the positivity rate of nickel sulfate (15.44% vs 4.00%, $P < 0.05$, Fisher's exact test) was significantly higher in ICD group. Conclusions. In conclusion, people with nickel allergy, lower values of skin melanin, and erythema are predisposing to develop ICD.

J. Suñer-Carbó, A. Calpena-Campmany, L. Halbaut-Bellowa, B. Clares-Naveros, M.J. Rodriguez-Lagunas, E. Barbolini, J. Zamarbide-Losada, A. Boix-Montañés, **Biopharmaceutical Development of a Bifonazole Multiple Emulsion for Enhanced Epidermal Delivery**, Pharmaceutics 2019, 11, 66

Efficient topical delivery of imidazolic antifungals faces the challenge of overcoming its limited water solubility and its required long-lasting duration of treatments. In this paper, a hydrophilic multiple emulsion (ME) of Bifonazole (BFZ) is shown to maximize its skin retention, minimize its skin permeation, and maintain an acceptable level of being harmless in vivo. The formulations were pharmaceutically characterized and application properties were assessed based on viscosity measurements. Non-Newtonian pseudoplastic shear thinning with apparent thixotropy was observed, facilitating the formulation retention over the skin. The in vitro release profile with vertical diffusion cells showed a predominant square-root release kinetic suggesting an infinite dose depletion from the formulation. Ex vivo human skin permeation and penetration was additionally evaluated. Respective skin permeation was lower than values obtained with a commercial O/W formulation. The combination of amphoteric and non-ionic surfactants increased the bifonazole epidermal accumulation by a factor of twenty. This fact makes the possibility of increasing its current 24 h administration frequency more likely. Eventual alterations of skin integrity caused by the formulations were examined with epidermal histological analysis and in vivo preclinical measurements of skin elasticity and water retrograde permeation. Histological analysis demonstrated that the multiple emulsions were harmless. Additionally, modifications of in vivo skin integrity descriptors were considered as negligible.

J.I. Yablonski, D.R. Winne, **Beginner's Guide to Natural Organic – Product Safety, Claims Support and Preservation**, Cosmetics & Toiletries, Volume 134, No. 2, February 2019, p. 18-31

Browsing a cosmetic counter, searching online or tuning into home shopping networks, one cannot help but notice the ever-increasing number of cosmetic and personal care products purporting to be *green*, *natural* or *organic* that are obviously targeting the rapidly growing environmentally conscious consumer and spa markets. Entire sections of exhibitions and trade shows have been dedicated.

V. Brancato, A. Ratti, K.Tudisco, **Ozosnail Extract® - Evaluation of the hydrating efficacy**, Cosmetic Technology, Jan/Feb 2019, 22 (1), (Article in Italian)

Hydration is a key factor for skin health. Our largest organ, the skin, is composed by two main layers: the dermis, the inner layer, and the epidermis, the inner layer. Epidermal water content has a gradient: 70% in the viable epidermis which decays to 15-30% at the skin surface. In order to prevent any change of skin moisture; skinaging and other kind of alterations, a daily hydrating routine is needed. Choosing the best product is not so simple, skin hydration is Q complex process and different molecules can regulate the water content in several ways. In the present study, we show the in vivo hydrating efficacy (instrumentally assessed) of three emulsions containing different concentration of snail slime against a blank formulation. This secretion contains several components: altantoin, collagene, elastin, mucopolysaccharides, and glycolic add among others, conferring to the slime hydrating, regenerating, nourishing and exfoliating effects when applied onto the skin.

B. Algiert-Zielińska, P. Mucha, H. Rotsztejn, **Effects of lactobionic acid peel, aluminum oxide crystal microdermabrasion, and both procedures on skin hydration, elasticity, and transepidermal water loss**, J Cosmet Dermatol. January 2019

Background: Topical applications of alpha-hydroxy acids and poly hydroxy acids in the form of peels gained popularity. To enhance the effect of these substances, aluminum oxide crystal microdermabrasion can be used in one procedure. Aims: The assessment of skin hydration, elasticity, and TEWL after using lactobionic acid in the form of 20% peel and lactobionic acid in the form of 20% peel combined with aluminum oxide crystal microdermabrasion. Material and Methods: The study involved 20 Caucasian female subjects. Six treatments were performed at weekly intervals, using the Split face method-20% LA was used on the left side of the face and aluminum oxide crystal microdermabrasion followed by 20% LA application on the right side of the face. Results: Corneometric measurement showed statistically significant differences between the hydration level for sessions 1 and 3 and 1 and 6. A higher hydration level was found on the side with the combined procedure. Tewametric measurement showed that the TEWL values were different for sessions 1 and 3 and 1 and 6-they decreased. There were no statistically significant differences between the two procedures. The cutometric measurement indicated statistically significant differences between skin elasticity for pairs in session 1 and 3 and 1 and 6. Conclusions: The results of the study indicate that the combination of LA peel with microdermabrasion increases its moisturizing effect and improves skin elasticity. The use of both procedures also contributed to the decrease in TEWL; however, greater exfoliation of the epidermis in combined procedures resulted in slightly higher TEWL values.

M. Kerscher, A.T. Nurrisyanti, C. Eiben-Nielson, S. Hartmann, J. Lambert-Baumann, **Skin physiology and safety of microfocused ultrasound with visualization for improving skin laxity**, Dove Press, January 2019 Volume 2019:12, p. 71-79

Purpose: The efficacy of microfocused ultrasound with visualization (MFU-V; Ultherapy®) has been demonstrated in clinical studies and daily practice. However, data addressing skin physiology after MFU-V treatment are lacking. This observational evaluation was aimed to assess skin physiology before and after MFU-V treatment using noninvasive biophysical measurements. Patients and methods: Twenty-two female patients with moderate-to-severe skin sagging at the jawline and submental region on the Merz Aesthetics Scale obtained a single MFU-V treatment according to protocol. Skin function measurements focused on short-term effects up to 3 days and long-term effects up to 24 weeks after treatment. Skin temperature, transepidermal water loss, skin hydration, erythema, elasticity, and skin thickness and density were evaluated under standardized conditions. Pain was assessed using a validated numeric visual analog scale. Results: Skin temperature remained in a physiologic range and no significant increase was noted at day 3 after MFU-V treatment. Transepidermal water loss, hydration, and erythema values were fairly stable and showed no significant differences at short- and long-term measurements vs baseline. At week 4 after a single MFU-V treatment, gross and net elasticity values were significantly decreased (P=0.003 and P=0.0001, respectively), followed by significantly increased values at week 12 (P=0.015, P=0.046) and week 24 (P=0.001, P=0.049). Edema due to MFU-V treatment resolved without sequelae. For all patients, pain diminished shortly after treatment. No adverse events occurred during the 24-week follow-up period. Conclusions: MFU-V treatment is well tolerated and it does not alter the epidermal barrier function or physiology of skin. Significant increase in the elasticity of skin was observed at 12 and 24 weeks after a single treatment, which reflects improvement in dermal tissue function. These short- and long-term effects are congruous with the mode of action of MFU-V due to a proven intrinsic tissue remodeling process.

D. Leskur, J. Bukić, A. Petrić, L. Zekan, D. Rušić, A. Šešelja Perišin, I. Petrić, M. Stipić, N. Puizina-Ivić, D. Modun, **Anatomical Site Differences of Sodium Laurylsulphate Induced Irritation: randomised controlled trial,** Br J Dermatol. 2019 January

Background: Sodium laurylsulphate (SLS) induced contact dermatitis is a commonly used model for testing effects of different topical formulations. Volar forearms are preferred testing site by the guidelines, but other anatomical locations were used in previous research, especially upper back, as the clinically used site for testing different antigens. Objectives: Aim of the present study was to investigate existence of anatomical variations of skin response to irritation and its' effects on response to treatment. Methods: Irritation was induced with SLS on symmetrical sites on both forearms and sides of upper back with additional sites exposed to water as controls. Half of the sites were treated with emollient cream while the other half were left untreated. Irritation was assessed using bioengineering methods and clinical scoring. Results: Upper back skin showed higher reactivity to irritants with stronger barrier disruption (measured by Tewameter, 80·2±18·3 vs 48·0±24·2 gm^{-2} h^{-1}), more pronounced erythema (measured by Mexameter, 186·5±88·4 vs 92·1±58·2 AU) and dryness (measured by Corneometer, -28·6±14·5 vs 2·7±16·9 AU). Skin recovery rates were also influenced by anatomical

location with the upper back showing faster recovery (316·7±223·1 vs 156·2±198·5). Treatment didn't lead to improvement in measured parameters, regardless of anatomical location. Conclusion: Skins' reaction to irritant and recovery were dependant on anatomical location. Location where testing was conducted should always be reported as treatments tested across different locations could not be directly compared to each other.

B.-G. Jo, N.-J. Park, S.-N. Kim, J. Jegal, S. Choi, S.W. Lee, L.W. Yi, S.R. Lee, K.H. Kim, M.H. Yang, **Isolation of maltol derivatives from *Stellera chamaejasme* and the anti-atopic properties of maltol on skin lesions in DNCB-stimulated mice**, RSC Adv., 2019, 9, 2125

The aim of this study was to isolate maltol derivatives from S. chamaejasme and to investigate the antiatopic dermatitis (anti-AD) effect of maltol in a 2,4-dinitrochlorobenzene (DNCB)-sensitized mouse model of AD. A novel compound, maltol 3-O-(40-O-cis-p-coumaroyl)-b-D-glucoside (named isosoyamaloside I), and two known maltol derivatives (maltol and soyamaloside I) were isolated from S. chamaejasme using chromatographic methods. Dermal application of maltol to DNCB-sensitized AD mice reduced erythema, pruritus, and lichenification scores. Histopathological examinations revealed significant decline in mast cell infiltration in maltol-treated AD mice. In addition, maltol accelerated skin barrier recovery by reducing TEWL and skin pH and increasing skin hydration. Maltol was also found tosuppress atopy-induced IL-4 and IgE elevations in serum, which are known to be essential for the development of atopy. The results of this study show that maltol is a potential therapeutic candidate for the treatment of AD-related skin diseases.

S.A. Nasrollahi, M.S. Nematzadeh, A. Samadi, A. Ayatollahi, S. Yadangi, C. Abels, A. Firooz, **Evaluation of the safety and efficacy of a triple combination cream (hydroquinone, tretinoin, and fluocinolone) for treatment of melasma in Middle Eastern skin**, Clinical, Cosmetic and Investigational Dermatology 2019:12, p. 437–444

Background: Melasma is the most common pigmentary skin disorder, especially in females and those with darker complexion. The current study evaluated the safety and efficacy of a triple combination cream containing hydroquinone 4%+tretinoin 0.05%+fluocinolone acetonide 0.01% (Januluma® cream produced by Janus Pharmaceutical Co, Tehran, Iran) in the treatment of melasma. Patients and methods: Twenty-two female volunteers (mean±standard deviation of age: 39.20±4.16 years) who fulfilled the eligibility criteria participated in this study after signing the informed consent. They were requested to apply the Januluma® cream every night for 8 weeks. Modified melasma area and severity index (mMASI), skin lightness (L value), and severity of pigmentation (E value) by Visio Face, and skin biophysical parameters including pH, melanin index, erythema index, sebum, hydration, trans epidermal water loss, thickness and density of epidermis, and dermis (using 22 MHz ultrasonography) were measured before and 4 and 8 weeks after treatment. Also patients' satisfaction was assessed 4 and 8 weeks after treatment using visual analog score. Results: mMASI decreased significantly from 3.37 to 2.60 at week 4, and to 2.40 at week 8 (P-values=0.00 and 0.01, respectively). Also, E and L values improved significantly after 8 weeks of treatment (P=0.01 and 0.00, respectively). Skin melanin index decreased from 237.49 AU to 196.30 AU at week 8 (P=0.01). Also echo density of dermis increased significantly after 8 weeks of treatment (P=0.029). Almost all participants experienced some degrees of pruritus, scaling, and erythema, esspecially during the first month of application, which were generally mild and tolerable. The mean satisfaction of patients with the treatment was 6.77. Conclusion: The triple combination formula was reasonably safe and effective for treatment of melasma in Middle Eastern patients.

M. Batory, E. Wołowiec-Korecka, H. Rotsztejn, **The effect of various primers improving adhesiveness of gel polish hybrids on pH, TOWL and overall nail plates condition**, J Cosmet Dermatol. 2019 January

Background: Hybrid manicure is now a popular method of nail care and nail art, which is associated with its durability. Unfortunately, it has an adverse effect on pH, TOWL and overall nail plates condition and has not been investigated in detail so far. Aims: The aim of this study was to compare the pH and TOWL of the hand nails after using different primers. The effect of application time, breaks between applications and the method of curing and removal on those parameters and overall nail plates condition were evaluated. Patients/Methods: An evaluation survey was conducted among 116 women. pH and TOWL measurements of the nail plate in 35 women were taken using the Courage & Khazaka. Clinical photos were made using the Fotomedicus system. Results: The measured pH values of the nail plate in the test group with gel polish hybrid on the nails were from 5.50 to 6.65, while after removal of the gel polish hybrid, the values ranged from 5.63 to 6.68. TOWL of the nail plate covered with gel polish hybrid ranged from 2.9 to 33.2 g/m^2 /h, whereas after removal of hybrids-from 1.9 to 45.7 g/m^2 /h. Conclusion: Different forms of acid-free primers maintain a lower pH of the nail plate covered with a gel

polish hybrid, while the acidic primer maintains higher values of the nail plate pH. The significant decrease in the nail plate TOWL following the application of gel polish hybrid indicates a reduced loss of water from the surface of the nail to the atmosphere.

M. Augustin, D. Wilsmann-Theis, A. Körber, M. Kerscher, G. Itschert, M. Dippel, P. Staubach, **Positionspapier: Diagnostik und Therapie der Xerosis cutis**, Positionspapier JDD 2018

Hintergrund und Rationale: Die Xerosis cutis (Synonym: Xerodermie, trockene Haut, hydrolipidarme Haut) ist mit > 10 Millionen Betroffenen nicht nur eine der häufigsten dermatologischen Diagnosen in Deutschland, sondern auch Leitsymptom vieler dermatologischer, internistischer und neurologischer Erkrankungen. Trotz der medizinischen Relevanz der topischen Basistherapie für die Xerosis cutis gibt es in Deutschland für ihr Management bisher keinen wissenschaftlich belegten Diagnostikund Therapiealgorithmus. Ziel: Dieses Positionspapier vermittelt Ärzten fachübergreifend einen an individuellen Symptomen orientierten, praxisnahen Leitfaden für die Prävention, Diagnostik und Therapie der Xerosis cutis. Methodik: Im Rahmen eines strukturierten Entscheidungsprozesses wurden von erfahrenen dermatologischen Experten zunächst praxisrelevante Fragestellungen definiert und systematisch aufgearbeitet. Auf der Basis von Evidenz und Expertenkonsens wurden daraus diagnostische und therapeutische Algorithmen mit Empfehlungen für die Praxis entwickelt und konsentiert. Ergebnis: Die Xerosis cutis kann grundsätzlich klinisch diagnostiziert werden. Auslöser und/oder Grunderkrankungen müssen abgeklärt und vermieden bzw. spezifisch behandelt werden. Bei der Wahl der geeigneten Basistherapie ist es wichtig, dass nicht nur die Hauthydratation verbessert, sondern auch die Barrierefunktion der Haut wiederhergestellt wird. Sie sollte daher aus einer Kombination von rückfeuchtenden und rückfettenden Inhaltsstoffen bestehen. Je trockener die Haut, desto lipidhaltiger sollte die Hautpflege sein (bevorzugt Wasser-in-Öl-Formulierungen). Die individuelle Auswahl der Inhaltsstoffe orientiert sich nach kausaler Prüfung an den Symptomen Schuppung (v.a. Urea), Fissuren/Rhagaden (v.a. Urea oder Dexpanthenol), Rötung (v.a. Licochalcone A) und Pruritus (v.a. Polidocanol), sowie an der Lokalisation und dem Alter der Patienten. Inhaltsstoffe bzw. Inhaltsstoffkombinationen mit guter Studienevidenz sind zu bevorzugen. Die mit Abstand beste Evidenz bei der Xerosis cutis weist Urea auf, dessen Wirksamkeit in Kombination mit anderen natürlichen Feuchthalte-Komponenten und Ceramiden noch gesteigert werden kann. Zur Arbeitserleichterung am Patienten und zum besseren Erlernen wurde das Xerosimeter entwickelt, das die praktische Umsetzung der Diagnostik und Verlaufskontrolle, eine Klassifikation der Inhaltsstoffe und einen strukturierten Therapiealgorithmus enthält. Schlussfolgerung: Das hier vorgeschlagene strukturierte symptom- und evidenzorientierte Vorgehen mit Diagnostik- und Behandlungspfad soll für die Prävention und frühzeitige Behandlung der Xerosis cutis sensibilisieren. Damit können die Lebensqualität verbessert und Folgeerkrankungen verhindert werden.

M. Ostermeier, M. Kerscher, **Der diurnale Rhythmus der Haut: Mythos oder Realität?: Evaluation mittels biopyhsikalischer Messmethoden,** Aktuelle Dermatologie 44(12): p. 539-546, Dezember 2018

Zusammenfassung Hintergrund Bisher weisen nur wenige Studien auf tageszeitabhängige Rhythmen des transepidermalen Wasserverlustes (TEWL), der Talgproduktion und des pH-Wertes hin. Detailliertere Beschreibungen des Hautbarriere-Rhythmus' könnten für die Wahl des richtigen Zeitpunktes der dermalen Applikation von pharmazeutischen und kosmetischen Wirkstoffen von großer Bedeutung sein. Es ist denkbar, dass eine Optimierung der Wirkung oder Verträglichkeit dermatologischer Behandlungen erreicht werden kann. Somit ist es Ziel dieser Studie, den diurnalen Rhythmus der Hautbarriereparameter Hautrötung, transepidermaler Wasserverlust (TEWL), Stratum corneum-Hydratation, mechanische Eigenschaften, pH-Wert und Sebum zu erfassen. Methoden Insgesamt 24 hautgesunde Probandinnen (21 – 39 Jahre) wurden innerhalb von 12 Stunden in einem 4-Stunden-Rhythmus an den Wangen und an der Stirn anhand biophysikalischer Messverfahren untersucht. Ergebnisse Die Tageszeit wirkt sich auf die Barrierefunktion der Haut aus. Der mittlere Erythem-Wert ist nachmittags signifikant höher als morgens. Anhand der Datenanalyse ist zu erkennen, dass der TEWL-Mittelwert sich abends statistisch sehr signifikant gegenüber dem Mittelwert morgens unterscheidet. Schlussfolgerung Die Erkenntnisse über die tageszeitliche Veränderung der Barrierefunktion können Aufschluss über ideale Zeitfenster verschiedener Kosmetikbehandlungen geben. Somit bietet z. B. ein erhöhter TEWL am Abend aufgrund der Permeabilität eine bessere Absorption von Wirkstoffen mit höherem Molekulargewicht.

J.L. Schiefer, R. Rath, E. Ahrens, D. Grigutsch, I. Gräff, J.-P. Stromps, P.C. Fuchs, A. Schulz, **Evaluation of scar quality after treatment of superficial burns of the hands and face with Dressilk or Biobrane—An intra-individual comparison**, Burns 44 (2018), p. 305 – 317

Introduction: The aesthetic outcome after burn of exposed areas such as the hand and face is of high importance. A number of wound dressings used for the treatment of superficial and partial thickness burns promise rapid wound healing and reduced scarring. Previously, wound healing of hands and faces with superficial burns treated with Dressilk1 compared to Biobrane1 was evaluated intra-individually with similar results. Nevertheless, up to date objective information regarding the scarring after superficial burns treated with Dressilk1 does not exist. Methods: Therefore, 30 patients with superficial burns of the hand and face that were treated with Dressilk1 and Biobrane1 simultaneously were included in the study. An objective scar evaluation was performed analyzing melanin and erythema levels, skin elasticity, transepidermal water loss and scar perfusion three and six and 12 months after injury. Furthermore, a subjective scar evaluation was performed with the patient and observer scar assessment scale (POSAS) and the Vancouver scar scale (VSS). Results: Dressilk1 and Biobrane1 both lead to an aesthetic pleasing outcome after superficial burns of the hands and faces. Regarding the objective scar evaluation only trans-epidermal water loss of burned hands after 6 months showed significant differences between the two dressings. However, these differences were not detected in the 12-month follow up examination. In the subjective scar evaluation no statistical differences could be found between the dressings. All patients stated high satisfaction of scar quality. Conclusion: Dressilk1 is an interesting alternative to Biobrane1 for the treatment of superficial burns of aesthetic and functional important areas.

O. Pelikh, P.-L. Stahra, J. Huanga, M. Gerstc, P. Scholzc, H. Dietrichl, N. Geiset, C.M. Keck, **Nanocrystals for improved dermal drug delivery**, European Journal of Pharmaceutics and Biopharmaceutics 128 (2018), p. 170-178

Nanocrystals are composed of 100% active and possess an increased aqueous solubility and dissolution velocity when compared to larger sized materials. Nanocrystals can be used to improve the bioavailability of poorly soluble actives not only for oral, but also for topical application. In this study nanocrystals of different sizes were produced and the influence of size on dermal penetration was investigated. The influence of different excipients and vehicles on the penetration efficacy upon dermal application was also investigated. Results confirm that dermal penetration of poorly soluble actives increases with decreasing size of the nanocrystals. Unexpectedly, it was observed that many classical penetration enhancers failed to promote the penetration of actives from nanocrystals. Also hydrogels were found to be non-suitable vehicles for the formulation of nanocrystals. As most suitable vehicles for nanocrystals oleogels and creams were identified.

E. Berardesca, M. Loden, J. Serup, P. Masson, L. Monteiro Rodrigues, **The revised EEMCO guidance for the in vivo measurement of water in the skin**, Skin Res Technol. 2018; 24: p. 351-358

Background: Noninvasive quantification of stratum corneum water content is widely used in skin research and topical product development. Methods: The original EEMCO guidelines on measurements of skin hydration by electrical methods and transepidermal water loss (TEWL) by evaporimeter published in 1997 and 2001have been revisited and updated with the incorporation of recently available technologies. Results: Electrical methods and open-chamber evaporimeters for measurement of TEWL are still the preferred techniques to measure the water balance in the stratum corneum. The background technology and biophysics of these instruments remain relevant and valid. However, new methods that can image surface hydration and measure depth profiles of dermal water content now available. Open-chamber measurement of TEWL has been supplemented with semiopen and closed chamber probes, which are more robust to environmental influence and therefore convenient to use and more applicable to field studies. However, closed chamber methods interfere with the evaporation of water, and the methods cannot be used for continuous monitoring. Validation of methods with respect to intra- and inter-instrument variation remains challenging. No validation standard or test phantom is available. Results and Conclusions: The established methods for measurement of epidermal water content and TEWL have been supplemented with important new technologies including methods that allow imaging of epidermal water distribution and water depth profiles. A much more complete and sophisticated characterization of the various aspects of the dermal water barrier has been accomplished by means of today's noninvasive techniques; however, instrument standardization and validation remain a challenge.

M.O. deMelo, P.M.B.G. Maia Campos, **Characterization of oily mature skin by biophysical and skin imaging techniques,** Skin Res Technol. 2018; 24: p. 386-395

Background: The skin is a complex biological system and may suffer change according to the environmental factors, as higher temperatures can increase sebum excretion, presenting oiliness and acne. These alterations can persist during the aging and provoke more changes in aged skin. In this study we evaluated the mature oily skin characteristics using biophysical and skin imaging techniques. Material and methods: Sixty healthy female subjects, aged between 39 and 55 years old were recruited

and separated into 2 groups according to their skin type: normal/ dry and oily skin. The skin was evaluated in terms of stratum corneum water content, transepidermal water loss (TEWL) sebum content, dermis thickness and echogenicity, skin microrelief, and pores content. Results: The mature oily skin presented no significant differences when compared to the normal/dry skin on the stratum corneum water content and TEWL parameters. The sebum content was significantly higher on the oily skin group. The microrelief analysis showed an increase of skin roughness values in the oily skin and increase of scaliness in the normal/dry skin. The oily skin showed lower dermis echogenicity mainly in the frontal region and higher dermis thickness when compared to normal/ dry skin. Conclusion: The mature oily skin showed different characteristics from normal/dry skin in terms of sebum content, microrelief parameters, and dermis thickness. This way, the characterization of mature oily skin in an objective way is very important to development of dermocosmetic products for more effective treatments focused specially on this type of skin.

H. Alexander, S. Brown, S. Danby, C. Flohr, **Research Techniques Made Simple: Transepidermal Water Loss Measurement as a Research Tool**, Journal of Investigative Dermatology (2018) 138, p. 2295-2300

Transepidermal water loss (TEWL) is the most widely used objective measurement for assessing the barrier function of skin in healthy individuals but also patients with skin diseases that are associated with skin barrier dysfunction, such as atopic dermatitis. TEWL is the quantity of condensed water that diffuses across a fixed area of stratum corneum to the skin surface per unit time. The water evaporating from the skin is measured using a probe that is placed in contact with the skin surface and contains sensors that detect changes in water vapor density. TEWL can be measured using an open-chamber, unventilated-chamber, or condenser-chamber device. It is a sensitive measure that is affected by properties of the surrounding microclimate such as environmental humidity, temperature, and airflow and should be measured under controlled conditions. TEWL varies significantly across different anatomical sites and also depends on sweat gland activity, skin temperature, and corneocyte properties. Here we describe how to optimally use TEWL measurements as a skin research tool in vivo and in vitro.

V. Mazzarello, M. Ferrari, P. Ena, **Werner syndrome: quantitative assessment of skin aging**, Clinical, Cosmetic and Investigational Dermatology 2018: 11, p. 397–402

Background: Werner syndrome (WS) is a rare autosomal recessive disorder characterized by premature aging in adults. Although not suffcient to diagnose WS, persistent short stature and alteration of the dentition are among the few early signs that appear at puberty and can lead to a suspected diagnosis. Objective: The study aimed at quantifying the signs of WS skin aging through biophysical parameters to fnd new parameters to be applied together with clinical observations in order to diagnose the disease early. Patients and methods: The skin disorders induced by the disease were studied using noninvasive techniques: Tewameter TM300, Corneometer CM825, Skin-pH-Meter PH900, Mexameter MX16, Visioscan VC98, and Cutometer MPA580. Twenty-four patients divided into young group, WS group, and elderly group were recruited for the study. Results: The WS skin is quite similar to aged skin, with some differences concerning the barrier function and skin elasticity; for instance, a WS patient of 30 years of age has the same skin roughness of a 50/60 years old subject with a more severe skin condition leading to higher dryness, high transepidermal water loss, and less distensibility correlating with skin indurations. Conclusion: In patients with WS, the biophysical parameters can quantify the damage induced on the skin by the disease. In order to stage the degree of the disease, biophysical parameters could be used in the future as a diagnostic procedure in the initial stages of the disease as they may reveal lesions not yet clinically perceptible or in advanced stages.

T. Yadzanparast, S.A. Nasrollah, L.I. Firouzbadi, A. Firooz, **A Phase II Trial to Assess the Safety and Efficacy of a Topical Repair Cream Containing Skin-identical Ceramide Complex in Patients with Contact Dermatitis**, J Clin Aesthet Dermatol. 2018; 11(11): p. 40–44

Background: Contact dermatitis is a common skin condition observed by dermatologists, presenting a burden on healthcare systems. Recently, there has been a trend in producing skin-identical topical preparations for the repair of skin. However, there is a limited number of experimental studies to assess the safety and efficacy of this products. Objective: This study assessed the clinical efficacy and safety of a skin-identical ceramide complex cream (Dermalex Repair Contact Eczema; Omega Pharma, Nazareth, Belgium) in the treatment of contact dermatitis. Design: This was a Phase II, before-after trial. Setting: This study was conducted at the Center for Research and Training in Skin Diseases and Leprosy (CRTSDL) at Tehran University of Medical Sciences in Tehran, Iran. Participants: Fifteen patients with contact dermatitis (8 men and 7 women) between the ages of 25 and 62 years (median age: 36.4 years) were enrolled in this study. Measurements: Changes were assessed using six skin biophysical parameters (transepidermal water loss [TEWL], stratum corneum [SC] hydration, melanin

index, erythema index, skin pH, and skin friction), Physician Global Assessment (PGA) score, and Three-Item Severity (TIS) score at baseline, Week 2, and Week 4 of the study. Results: Skin hydration and TIS showed a statistically significant improvement after treatment with study cream (p=0.023 and p=0.007, respectively). Although the reduction in TEWL was not significant, a slight decrease was observed at Week 4. Conclusions: The skin-identical ceramide complex cream improved contact dermatitis with a decrease in TIS and an increase in skin hydration, implying a repair of the skin barrier.

T. Yazdanparast, K. Yazdani, P. Humbert, A. Khatami, S.A. Nasrollah, H. Hassanzadeh, A.H. Ehsani, L. Izadi Firouzabadi, A. Firooz, **Comparison of biophysical, biomechanical and ultra-sonographic properties of skin in chronic dermatitis, psoriasis and lichen planus**, Med J Islam Repub Iran. 2018(5 Nov);32.108

Background: Skin biometrology is a useful method for evaluation of inflammatory skin disorders such as dermatitis, psoriasis, and lichen planus. The current study tries to compare the biophysical features of skin in dermatitis, psoriasis, and lichen planus. Methods: By a convenient sampling method, 22 mild to moderate chronic dermatitis, 26 psoriasis, and 21 lichen planus patients were recruited in the study. Stratum corneum (S.C.) hydration, Transepidermal water loss (TEWL), pH, erythema, melanin, sebum, friction, elasticity parameters (R0, R2, and R5), skin temperature, skin thickness, and echo-density of epidermis and dermis were measured on the lesional (selected active lesion), uninvolved perilesional, and uninvolved symmetrical skin. The average of perilesional and symmetrical uninvolved parameters was used as control, while the percentage change of each parameter [(lesion – control / control) ×100] was calculated, and compared among three diseases by ANOVA test using SPSS software version 18. The significance level was set at α=0.05. Results: Comparison of percentage changes showed that the changes in TEWL, friction index, sebum content, R2 (gross elasticity), R5 (net elasticity), skin temperature, dermal thickness, and epidermal density are not significantly different among three skin diseases. But there were significant differences in three diseases considering the decrease in S.C. hydration (p<0.001), R0 (opposed to firmness) (p<0.001), and dermal density (p<0.001) compared to control skin. Moreover, the increase in skin pH (p<0.001), melanin content (p=0.048), erythema (p=0.023), and epidermal thickness (p <0.001) significantly differed among these diseases. Conclusion: Dermatitis, psoriasis and lichen planus lesions had specific biophysical changes. It may be helpful in their differential diagnosis.

F. Spada, T.M. Barnes, K.A Greive, **Skin hydration is signifcantly increased by a cream formulated to mimic the skin's own natural moisturizing systems**, Clinical, Cosmetic and Investigational Dermatology 2018:11, p. 491–497

Background: Moisturizers are topical products designed to improve and maintain the skin barrier function and to help prevent dry skin. Materials and methods: A new moisturizer (Ceramide cream) was formulated containing ingredients which mimic the skin's own natural moisturizing systems. Corneometry was performed at baseline, 2, 4, 6 and 24 hours following a single application of Ceramide cream to healthy skin, and compared to three reference moisturizers available over-the-counter, and placebo. Transepidermal water loss (TEWL) was also measured following a single application of Ceramide cream compared to baseline, and its safety was assessed by repeat insult patch test, ophthalmologist and pediatric testing. Results: A single topical application of either the Ceramide cream or the three reference moisturizers resulted in a signifcant increase in skin hydration over time (P<0.001). The placebo cream did not signifcantly increase skin hydration at any time point. At 24 hours post-application, skin hydration measured for Ceramide cream was signifcantly greater (P<0.05) than that measured for all three of the reference moisturizers tested. Ceramide cream was also found to significantly decrease TEWL (P<0.001) over 24 hours, and was shown to be non-sensitizing to the skin of both adults and children and non-irritating to the skin, eyes and related eye area. Conclusion: Ceramide cream increases skin hydration and improves barrier function which may make it suitable for use on dry skin.

M.J. Lis Arias, L. Coderch, M. Martí, C. Alonso, O. García Carmona, C. García Carmona, F. Maesta, **Vehiculation of Active Principles as a Way to Create Smart and Biofunctional Textiles**, Materials 2018, 11, 2152

In some specific fields of application (e.g., cosmetics, pharmacy), textile substrates need to incorporate sensible molecules (active principles) that can be affected if they are sprayed freely on the surface of fabrics. The effect is not controlled and sometimes this application is consequently neglected. Microencapsulation and functionalization using biocompatible vehicles and polymers has recently been demonstrated as an interesting way to avoid these problems. The use of defined structures (polymers) that protect the active principle allows controlled drug delivery and regulation of the dosing in every specific case. Many authors have studied the use of three different methodologies to incorporate active

principles into textile substrates, and assessed their quantitative behavior. Citronella oil, as a natural insect repellent, has been vehicularized with two different protective substances; cyclodextrine (CD), which forms complexes with it, and microcapsules of gelatin-arabic gum. The retention capability of the complexes and microcapsules has been assessed using an in vitro experiment. Structural characteristics have been evaluated using thermogravimetric methods and microscopy. The results show very interesting long-term capability of dosing and promising applications for home use and on clothes in environmental conditions with the need to fight against insects. Ethyl hexyl methoxycinnamate (EHMC) and gallic acid (GA) have both been vehicularized using two liposomic-based structures: Internal wool lipids (IWL) and phosphatidylcholine (PC). They were applied on polyamide and cotton substrates and the delivery assessed. The amount of active principle in the different layers of skin was determined in vitro using a Franz-cell diffusion chamber. The results show many new possibilities for application in skin therapeutics. Biofunctional devices with controlled functionality can be built using textile substrates and vehicles. As has been demonstrated, their behavior can be assessed using in vitro methods that make extrapolation to their final applications possible.

D. Martini, D. Angelino, C. Cortelazzi, I. Zavaroni, G. Bedogni, M. Musci, C. Pruneti, G.Passeri, M. Ventura, D. Galli, P. Mirandola, M. Vitale, A. Dei Cas, R.C. Bonadonna, S. Di Nuzzo, M.B. De Felici, D. Del Rio, **Claimed Effects, Outcome Variables and Methods of Measurement for Health Claims Proposed Under European Community Regulation 1924/2006 in the Framework of Maintenance of Skin Function**, Nutrients 2018, 10, 7

Evidence suggests a protective role for several nutrients and foods in the maintenance of skin function. Nevertheless, all the requests for authorization to use health claims under Article 13(5) in the framework of maintenance of skin function presented to the European Food Safety Authority (EFSA) have received a negative opinion. Reasons for such failures are mainly due to an insufficient substantiation of the claimed effects, including the choice of inappropriate outcome variables (OVs) and methods of measurement (MMs). The present paper reports the results of an investigation aimed at collecting, collating and critically analyzing the information with relation to claimed effects (CEs), OVs and MMs related to skin health compliance with Regulation 1924/2006. CEs, OVs and MMs were collected from both the EFSA Guidance document and from the authorization requests of health claims under Article 13(5). The critical analysis of OVs and MMs was based on a literature review, and was aimed at defining their appropriateness (alone or in combination with others) in the context of a specific CE. The results highlight the importance of an adequate choice of OVs and MMs for an effective substantiation of the claims.

K.-H. Busch, A. Aliu, N. Walezko, M. Aust, **Medical Needling: Effect on Moisture and Transepidermal Water Loss of Mature Hypertrophic Burn Scars,** Cureus, 10(3) 2018

Background: Burn scars remain a serious psychological and physiological problem for affected people. Clinical studies and scientific research have already shown that medical needling improves the scar quality in terms of skin elasticity and erythema. At the same time, patients are confronted with a low-risk therapy and face comparatively less postoperative complications. Objective: The goal of our study was to examine the influence of medical needling on the skin moisture and transepidermal water loss (TEWL) of hypertrophic dry scars. Therefore, 20 patients, of an average age of 34.63 years, with deep second- and third-degree burn scars have been treated. Methods: Medical needling is performed using a roller covered with needles of 3-mm length. The needling device is rolled over the scar in three directions: vertically, horizontally, and diagonally in order to create as many puncture channels as possible. The puncturing leads to multiple micro-wounds and intradermal bleeding, which evokes the post-needling regeneration cascade. The patients were followed up for 12 months postoperatively. The results have been evaluated by means of objective as well as subjective measurement methods. Results: The objective measures show that medical needling influences epidermal thickness and improves the epidermal barrier function at a molecular level. Outcomes are marked by a measurable increase in skin moisture and a reduction in TEWL. Conclusion: Medical needling seems to be a promising approach for the treatment of mature hypertrophic burn scars with a focus on skin moisture and TEWL.

P. Moncayo, F. Paes, S. Arandas Silva, L. Paula, J. Lago, **Sapucainha Extract (Carpotroche brasiliensis) and Polyphenol Cosmetic Combination for Antipollution and Dryness Anti-Stress Effect**, IFSCC Congress, Munich, September 2018

Air pollution and the sun exposure are the main causes of premature skin aging. Exposure to air pollution generates free radicals, activating surface receptors that would otherwise remain deactivated. This may, decrease collagen synthesis as well as oxidize skin components such as proteins, cell membrane lipids, and DNA. The oxidation of these components and increased

inflammation, caused by cytokines intensifying wrinkle and line formation, may degenerate the skin barrier. We propose a cosmetic product to combat the effects of urban environments and varying temperature and humidity. We combine an extract indigenous from Brazil, rich in fatty acids and anti-inflammatory properties, with the antioxidant effect of a widely used ingredient derived from ginger. We performed eight studies using the following methods to assess this product, with non-treated primary human dermal fibroblast as control: Antiprotease (MMP1 and MMP3): To evaluate the inhibition of metalloproteinase, we synthesized MMP1 and MMP3 in a primary culture of human skin fibroblasts, exposed and unexposed, to Ultraviolet radiation. We used commercially available immunoenzymatic assay kits (sandwich ELISA) in the supernatant of the fibroblast cultures treated with the product.- Anti inflammatory IL6: To assess the anti-inflammatory action, we synthesized IL6 in a primary culture of human skin fibroblasts, exposed and unexposed, to E. Coli lipopolysaccharide (LPS). We used the sandwich ELISA kits, in the supernatant of the fibroblast cultures treated with the product. Antioxidant potential (DPPH): The assay is based on the free radical DPPH in an ethanol medium, using the raw materials or substances to be analyzed. Antioxidant potential in a cellular model: This study used L929 fibroblasts. The bioactive sample was directly solubilized in the culture medium while the control group received only the culture medium and bovine fetal serum. Any rise compared to the control group suggests increased endogenous antioxidant capacity. - Protecting target gene in cellular model: The DNA protection was assessed using the Western Blooting method of protein expression. The marker is visible because of the chemiluminescence when peroxidase reacts with the marker's antibody 8-OhdG. - Assessing the reinforcement of skin barrier: The tewameter is used to evaluate the transepidermal water loss in vivo. Assessing skin drying stress: ex vivo stress measurements elucidate how the product impacts the drying stresses of the outermost skin layer, stratum corneum, while subject to low and moderate humidity environments at 22ºC. In vitro Antipollution efficacy: the methodology uses a pollution simulator system to inject ozone and carbon monoxide in substrates impregnated with squalene, with and without the application of the product; exposure to polluting agents; and the quantification post-exposure via HPLC. The in vitro evaluations of the studied ingredients show (i)IL-6 enzyme inhibition of 73%, reducing inflammatory activity; (ii) a 33% and 23% reduction of metalloproteinase MMP-1 and MMP-3 activity; (iii) a 65% decrease in Ki-67 antigen, a cell proliferation marker; and (iv) a 41% reduction of ELOVL3, which helps the elongation of long-chain fatty acids produce precursors for the synthesis of sphingolipids and ceramides, as well as DNA protection. In the anti-pollution test, the product significantly increased squalene protection against peroxidation processes caused by pollution.

G. Boyer, S. Brédif, G. Bellemère, C. De Belilovsky, C. Baudouin, **Investigation of Pediatric Sensitive Skin: Characterization by *in vivo* approach and development of an *in vitro* model**, IFSCC Congress, Munich, September 2018

Skin sensitivity is a self-reported syndrome which affects about 50% of adult population [1]. Recently, a group of expert defined sensitive skin as "A syndrome defined by the occurrence of unpleasant sensations (stinging, burning, pain, pruritus, and tingling sensations) in response to stimuli that normally should not provoke such sensations. These unpleasant sensations cannot be explained by lesions attributable to any skin disease. The skin can appear normal or be accompanied by erythema. Sensitive skin can affect all body locations, especially the face" [2]. There are therefore two kinds of signs that defined sensitive skin, objective signs characterized by erythema and subjective signs characterized by sensations like stinging, burning or tingling. Concerning children, previous work indicates a prevalence of sensitive skin over 30% under 6 years old [3]. The differences between a"normal" immature skin of infant and a "specific" sensitive skin remain unclear. A clinical study was performed to investigate the sensitive skin syndrome in a pediatric population. Based on clinical findings, an *in vitro* skin model mimicking the features of pediatric sensitive skin was developed.

J. Blaak, D. Dähnhardt, S. Bielfeldt, I. Simon, M. Schleißinger, K.-P. Wilhelm3, C. Wagner, S. Dähnhardt-Pfeiffer, P. Staib, **Aged epidermal barrier reveals decreased lipid lamellae density and shows alterations in lipid profile and ratio**, IFSCC Congress, Munich, September 2018

In aged skin, alterations of epidermal barrier function such as reduced stratum corneum (SC) integrity and recovery are described. More precisely, enhanced skin surface pH (ss-pH), impaired epidermal SC lipid synthesis as well as altered composition of the intercellular SC lipids are displayed amongthe elderly. These facts are dermatological challenges as functional and structural changes in SC are accompanied by age-specific clinical signs, such as dryness, roughness and irritation. Although aged skin has previously been examined by biophysical parameters and SC lipid analysis, no investigation has yet been performed regarding the SC lipid lamellae length accompanied by lipid ratio analysis in aged skin. To verify well-known changes in elderly and further to evaluate SC lipids and lamellae, the present work combines baseline data of two consecutive studies on aged epidermal barrier. Additionally, the SC lipid bilayer was evaluated by analyzing the normalized intercellular lipid

lamellae length (nICLL) as well as SC lipid profile and ratio. The present study confirms age-related changes in SC and reveals modifications in SC lipid ratio and structure. The calculated nICLL of aged skin was for the first time shown to be decreased compared to published data of adult skin.

M. Hisama, A. Kishita, N. Yamaguchi, C. Takeuchi, S. Matsuda, K. Yoshio, H. Kanayama, K. Masui, T. Miyazawa, R. Takimi, **Age Related Changes of Human Skin Investigated on Biophysical, Physiological and Histological Characteristics**, IFSCC Congress, Munich, September 2018

Japan's life expectancy has increased steadily over the past century, and currently stands as the highest in the world at almost eighty-four years. As life expectancy increases and with it the proportion of the aged in the population appropriate care of elderly skin becomes a medical concern of increasing importance. The skin is the largest multifunctional organ in the body. It functions as a protective physical barrier by absorbing UV radiation, preventing microorganism invasion and chemical penetration, and controlling the passage of water and electrolytes. The skin has a major role in thermoregulation of body, in addition to immunological, sensory, and autonomic functions. As skin ages, the intrinsic structural changes that are a natural consequence of passing time are inevitably followed by subsequent physiological changes that affect the skin's ability to function as the interface between internal and external environments. As numbers of the elderly increase, cosmetic dermatological interventions will be necessary to optimize the quality of life for this segment of the population. It is important to examine the associations between elderly skin condition and aging for development of anti-aging care products for elderly skin. Understanding the physiological, chemical, and biophysical characteristics of the skin helps us to arrange a proper approach to the management of skin diseases. However, it is critical to consider the influence of genetic and environmental factors on most of the skin characteristics. In this study, we investigated the comparison between the elderly skins in five different age groups on biophysical, physiological and histological characteristics by in *vivo* measurements in order to quantify aging processes on human skin.

N. Braun, S Binder, H Grosch, C Theek, J Ülker, H Tronnier, U. Heinrich, **Effect of microgravity on skin physiology: new findings,** IFSCC Congress, Munich, September 2018

The skin is the largest organ of the human body and has several functions, such as protection, thermal regulation, sensation and endocrine functions. Despite recorded skin problems in space and the fact that the skin is easily accessible and can be continuously examined by means of a large number of non-invasive test methods, investigations of the effects of space flight on skin are underrepresented so far. A first pilot study (SkinCare) was performed by Tronnier et al. on a single astronaut during a 6 month mission. Different skin compartments, namely the surface, epidermis and dermis were analyzed before, during and after the mission. Here, main skin physiological changes observed were a coarsening of the epidermis and a loss of skin elasticity confirmed by changes in the ultrasound picture on the skin. These changes appear to be reversible because after a year, the skin's condition returns to normal [1]. The aim of the present Skin B project was to validate these results on an increased number of astronauts with advanced devices and additional measurements. Therefore, measurements were carried out on 6 astronauts with respect to skin hydration, transepidermal water loss / barrier function and surface evaluation of the living skin in-orbit. Additional measured parameters on ground were skin elasticity, skin density and thickness as well as microcirculation. Thus, the Skin B experiment will complement the SkinCare experiment and aims to confirm the changes observed in the original experiment. However, the skin is not the only or primary focus of the project, but rather serves as a model for all organs covered with epithelial and connective tissue. This study will help the astronauts to prepare for a long stay in space and to set up space travels, e.g. planned exploration of the moon and deeper space.

V.H. Pacagnelli Infante, J. Migliati, P.M.B.G. Maia Campos, **Why should I use sunscreen? The impact of lifestyleon the hydrolipidic, structural and morphological charecteristics of young men skin**, IFSCC Congress, Munich, September 2018

The consumption of cosmetics among men has grown in the last years. However there is some resistance to the use of these products due to the culture, sensory, perception and access for this audience to consume cosmetic products. Considering that the use of sunscreens is a public health issue and directly affects the quality of life, the objective of this study is to show the skin differences between two groups, one that uses sunscreen regularly and one that does not use, using biophysics and skin imaging techniques. Sixty men between 18 and 28 years old, phototypes II, III and IV were randomly selected and questioned about their photoprotection habits. Hydration, integrity of the stratum corneum (TEWL, Corneometer and VisioScan), amount of sebum (Sebumeter) and activity of the sebaceous glands (Sebufix) were made. We analyzed the amount of pores (Visioface), formation of erythema (Mexameter), ultrasound of the dermis (DermaScan C) in the frontal and malar regions and we obtained reflectance confocal microscopy images (RCM) for analysis of the quality of the epidermis

and papillary dermis at the cellular level in the frontal region. Of the 60 participants, 24 regularly uses sunscreens (group A) and 36 were not (group B). When questioned about the reasons for not using sunscreen, group B mentioned that did not obtain family incentive and /or sunscreens was sticky or oily. Changes in the integrity of the stratum corneum were observed, with thickening of this layer of the epidermis and impairment of the barrier function with increase of TEWL and decrease of the hydration for group B. The granular layer of the epidermis is also thicker for this group. There was an increase in microrelief roughness for the same group. Moreover, there is also a higher activity of the sebaceous glands, with consequent greater number of pores for group B. Also, a decrease in the echogenicity ratio of the group B were observed, evidenced by the decrease of the dermoepidermal junction layer (related to the depth of the papillae), increase in pore diameter and worst collagen quality. We observed a disruption of the honeycomb pattern of the epidermis and the presence of polycyclic papillae for group B. This same group showed dilatation in the veins in the basal layer of the epidermis and a significant increase in erythema, evidencing signs of possible inflammation. The presented damages evidences the necessity of UVB photoprotection (more related to the damages in the integrity of the barrier) and UVA, too (damages in the region of the papillary dermis). The lifestyle influences the choices and their consequences, showing that sun exposure can cause damage even early, especially in groups that present a certain cultural resistance to the use of cosmetics such as the male. Furthermore, we have shown that the damages of unprotected sun exposure happen in different layers of the skin, which increases the need to develop suitable sunscreens with UVA and UVB protection and with a good sensorial improving the adhesion of photoprotection among men.

L. Yi-na, Y. Ya-di, X. Zhi-yong, T. Jun, **Promoting Effect of a Gene Expression Related Moisturizer on Shin Hydration and Barrier Function**, söfw journal 1144 109/18

The moisturizing performance of Gmoist® Sea-Gel was evaluated based-upon 14 healthy volunteers. It was found that skin moisture content markedly increased and TEWL effectively decreased after Gmoist® Sea-Gel applied for 7d. Then using real-time fluorescence quantitative PCR technology, HaCaT cells were cultured with Gmoist® Sea-Gel to study six genes expression level related to skin hydration and barrier function. Results showed Gmoist® Sea-Gel significantly promoted the INV, TG-1, FLG and CASP-14 mRNA's expression after 24 hour's treatment. Gmoist® Sea-Gel can upregulate cornified cell envelope related genes expression, promote the degradation of filaggrin into natural moisturizing factors to strengthen skin hydration and barrier function.

A. Erlach, G. Springmann, M. Renner, K.-P. Wilhelm, **Compatibility Testing of Cosmetics and Toiletries for Babies and Children,** söfw journal 1144 109/18

All cosmetic products must be safe, especially those intended for babies and small children. Besides national guidelines and regulations, cosmetic products in the European Union are regulated by the EU Cosmetic Products Regulation. It pays particular attention to protecting the health of vulnerable population groups and recommends a specific assessment for cosmetic products intended for use on children under the age of three years. Nevertheless, standard procedures for the evaluation of the local tolerance are not given. Due to practical and ethical reasons clinical studies on adults should be a first step of compatibility testing. To consider physiological differences notably a not yet fully developed barrier function during the first years of life, barrier function of adult skin can be intentionally compromised by gentle experimental standardized procedures prior product application. As an alternative and depending on the objective target, only pre-screened sensitive subjects are included in the investigation. After extensive pre-examination and testing in adults, tolerance and performance of the final product can also be confirmed with non-incriminating observational studies under normal in-use conditions in children under physician control.

T. Quinn, **Natural emulsifier with texture and skin care benefits**, PERSONAL CARE ASIA PACIFIC, September 2018, p. 65 - 67

Emulsun [INCI: Hydrogenated Sunflower Seed Oil Polyglyceryl-3 Esters (and) Hydrogenated Sunflower Seed Oil Glyceryl Esters (and) Cetearyl Alcohol (and) Sodium Stearoyl Lactylate] is a sunflower-derived o/w emulsifier, in particle form, that can be utilized in skin and hair care applications. This versatile emulsifier helps create stable, aesthetically pleasing emulsions.

H. Alexander, S. Brown, S. Danby, C. Flohr, **Research Techniques Made Simple: Transepidermal Water Loss Measurement as a Research Tool**, Journal of Investigative Dermatology (2018) 138, p. 2295-2300

Transepidermal water loss (TEWL) is the most widely used objective measurement for assessing the barrier function of skin in healthy individuals but also patients with skin diseases that are associated with skin barrier dysfunction, such as atopic dermatitis. TEWL is the quantity of condensed

water that diffuses across a fixed area of stratum corneum to the skin surface per unit time. The water evaporating from the skin is measured using a probe that is placed in contact with the skin surface and contains sensors that detect changes in water vapor density. TEWL can be measured using an open-chamber, unventilated-chamber, or condenser-chamber device. It is a sensitive measure that is affected by properties of the surrounding microclimate such as environmental humidity, temperature, and airflow and should be measured under controlled conditions. TEWL varies significantly across different anatomical sites and also depends on sweat gland activity, skin temperature, and corneocyte properties. Here we describe how to optimally use TEWL measurements as a skin research tool in vivo and in vitro.

N. Braun, M. Herling, C. Theek, H. Tronnier, U. Heinrich, **Wirksamkeit und Verträglichkeit einer Fußcreme bei Typ-2-Diabetikern** (Article in German), Akt Dermatol 2018; 44: p. 144–151

In der vorliegenden Studie wurde eine Fußcreme hinsichtlich ihrer Eignung zur Fußpflege von Typ-2-Diabetikern untersucht. An der Wirksamkeitsstudie nahmen 23 Probanden über einen Zeitraum von 6 Wochen teil, welche die Fußcreme 2-mal täglich applizierten. Die Fußcreme zeichnete sich durch gute feuchtigkeitsspendende Eigenschaften aus und trug zu einer signifikanten Verbesserung der Hautbarriere bei. Gleichzeitig konnte die Durchblutung der Haut und damit die Versorgung der Haut mit Feuchtigkeit deutlich verbessert werden. Messungen der Hauttemperatur zeigten keine Temperaturerhöhung. Es wurde über ein angenehmes Hautgefühl berichtet. Die Keimbesiedlung wurde konstant gehalten. Zusätzlich wurden subjektive Bewertungen in Bezug auf Hautbild, Wirksamkeit und Verträglichkeit mittels Fragebogen erfasst. Hier spiegelte sich die gute Wirksamkeit und Verträglichkeit der Fußcreme durch hohe Akzeptanz bei den Probanden wider.

The present study examined a foot cream regarding its suitability as a foot care product for type 2 diabetes. 23 test subjects participated in the study. The duration of the study was 6 weeks and the foot cream was applied twice daily by the test subjects. The foot cream was characterized by good moisturizing properties and contributed to a significantly improved skin barrier function. At the same time, the blood circulation of the skin and thus the supply of the skin with moisture was significantly improved. Measurements of the skin temperature did not show any increase in temperature. The preparation was described as pleasant for the skin. The colonization of germs on the skin was kept constant. In addition, the skin appearance, the efficacy and skin compatibility was evaluated by the test subjects by means of a questionnaire. Here, the good efficacy and skin compatibility were mirrored in the high acceptance by the test subjects.

I.I. Shuvo, K. Chakma, D. Toutant, **Prospect of 3D Warp Knitted Spacer Fabric and its Effect on Pressure Relieve for Reducing the Prevalence of Pressure Ulcers for Immobile Patients**, Journal of Textile Science & Engineering, Volume 8, Issue 1, 2018

Many hospitals use paper thin bed sheets with high friction coeffcients which are not ideal for patients with pressure ulcers and who are at risk of developing. These patients suffer a great deal of pain, which could have been prevented. Lying on a weak bed sheet with no regards to regulating micro-climate is a clear promoter of pressure ulcers. Another key factor of a hospital bed sheet is they are to be easily washed or disposed of because of all the unknown fluids that could seep onto the sheet. Therefore, the sheet must not only be to comfort those with pressure ulcers but to be easily washable and reusable. Again, in a hospital setting being able to easily wash the sheet and for it to hold its form is signifcant for reducing the cost of throwing away sheets less often. Therefore a theory has been proposed to design a 3D knit spacer bed sheet that will allow patients with pressure ulcers to be comfortable by ensuring a low friction coeffcient between their skin and the material. The friction coeffcient will be reduced by not only the structure but by the 70 percent polyester, 22 percent polypropylene and eight percent spandex blend. The friction coeffcient will stay low due to a high wicking and evaporation capability to ensure the skin stays dry as well as the material. The 3D knit spacer bed sheet also has a higher compressibility which distributes pressure more evenly as well as enabling a care giver to easily rotate an immobile person into a new position. The proposed bed sheet will be easily washable to ensure all bodily fluids such as vomit, blood, and others have been removed. This blanket will be slightly more expensive but is expected to last longer than a typical hospital bed sheet.

H.J. Lee, S.E. Jeong, S. Lee, S. Kim, H. Han, C.O. Jeon, **Effects of cosmetics on the skin microbiome of facial cheeks with different hydration levels,** Microbiology Open. 2018; 7

Basic cosmetics was used by volunteers belonging to high (HHG) and low (LHG) hydration groups for 4 weeks, and bacterial communities and biophysical parameters in facial skin were analyzed. Hydration level increases and transepidermal water loss and roughness decreases were observed in both groups after cosmetic use. Bacterial diversity was greater in LHG than HHG, and increased after cosmetic use in both groups. Bray–Curtis dissimilarities that were higher in LHG than HHG increased in HHG after cosmetic use, whereas they decreased in LHG. The phyla *Actinobacteria*, *Proteobacteria*,

Firmicutes, and *Bacteroidetes* and the genera *Propionibacterium*, *Ralstonia*, *Burkholderia*, *Staphylococcus*, *Corynebacterium*, *Cupriavidus*, and *Pelomonas* were identified as common groups and they were not significantly different between LHG and HHG except for *Propionibacterium* that was more abundant in HHG. After cosmetic use, *Propionibacterium*, *Staphylococcus*, and *Corynebacterium* decreased, whereas *Ralstonia*, not a core genus, increased, as did KEGG categories of lipid metabolism and xenobiotics biodegradation and metabolism, suggesting that *Ralstonia* in skin may have the ability to metabolize cosmetics components. Bacterial communities after cosmetic use were different from those in both LHG and HHG before the cosmetic use, indicating that bacterial communities in LHG were not shifted to resemble those in HHG by cosmetics use.

I. Popa, A.L. Watson, A. Solgadi, C. Butowski, D. Allaway, J. Portoukalian, **Linoleate-enriched diet increases both linoleic acid esterifed to omega hydroxy very long chain fatty acids and free ceramides of canine stratum corneum without effect on protein-bound ceramides and skin barrier function**, Archives of Dermatological Research (2018) 310: p. 579–589

Few studies have investigated the influence of increased amounts of dietary linoleic acid on the epidermal lipid biochemistry and TEWL in healthy subject. The influence of dietary linoleic acid on canine stratum corneum (SC) lipids was studied by feeding two groups of fve dogs differential amounts of linoleic acid (LA) for three months. SC was harvested by tape stripping and lipids were analyzed by thin-layer chromatography and mass spectrometry. The dogs that were fed the higher concentration of LA showed high increases in the contents of both linoleic acid and free ceramides in the SC, whereas the protein-bound ceramide content was unchanged. Acylacids that represent the esterifed form of linoleic acid in omega hydroxyl very long chain fatty acids (ω-OH VLCFA) accounted for most of the elevation of LA, whereas the concentration of the free form was not signifcantly changed. Corroborating the absence of change in the protein-bound ceramides content of healthy dogs SC, TEWL was nearly unaffected by the linoleic acid-enriched diet.

R. Darlenski, E. Hristakieva, U. Aydin, D. Gancheva, T. Gancheva, A. Zheleva, V. Gadjeva, J.W. Fluhr, **Epidermal barrier and oxidative stress parameters improve during in 311 nm narrow band UVB phototherapy of plaque type psoriasis**, J Dermatol Sci, 2018 Jul;91(1): p. 28-34

Background: Psoriasis is a multi-systemic inflammatory disease that results from dysregulation between epidermal keratinocyte homeostasis and both innate and acquired immunity. Epidermal barrier defect has been described in psoriatic lesions. Furthermore an imbalance between pro-oxidative stress and antioxidant defense mechanisms are known in psoriasis patients. Aim: The aim of this study was to address the link between disease activity, epidermal barrier and systemic oxidative stress in the course of 311 nm narrow band ultraviolet B (NB-UVB) therapy of psoriasis. The dynamic of systemic oxidative stress parameters as well as local transepidermal water loss (TEWL) and stratum corneum hydration (SCH) was characterized before and after 311 nm NB-UVB therapy on the plaques of psoriasis vulgaris in comparison to untreated non-affected volar forearm sites of the same patients. Material and Methods: 22 patients with plaque type psoriasis vulgaris and 25 gender- and age-matched healthy controls were enrolled. We assessed the psoriasis area and severity index (PASI) and the dermatology life quality index (DLQI) for monitoring disease activity, severity and self-perceived DLQI impact as patient related outcome parameter. We measured non-invasively TEWL (Tewameter TM 300) and SCH (Corneometer CM 825) and the end product of lipid peroxidation - malondialdehyde (MDA), Reactive oxygen species (ROS), ascorbyl radicals (Asc) and detoxifying activity of catalase (CAT) were measured in the peripheral blood with spectrophotometric and EPR spectroscopy methods. Results: Disease activity improved in all patients compared to baseline witnessed by significant decrease in PASI; (from 14.1 to 10.4; $p < 0.0001$) and DLQI (from 11.7 to 8.1; $p < 0.0001$). At baseline TEWL-values were significantly ($p < 0.0001$) higher on psoriatic plaques (16.8 g/h/m^2) in comparison to uninvolved skin (5.3 g/h/m^2); with a decrease at both sites after NB-UVB phototherapy. SCH was significantly lower at psoriatic plaque s (4.7AU) compared to uninvolved sskin (42.4AU) and increased after treatment (8.6AU) ($p < 0.0001$). Interestingly, SCH decrease slightly during therapy at uninvolved skin (40.6AU). ROS and Asc declined during therapy in parallel to a decrease in MDA. A mild decrease in the antioxidative enzyme CAT activity which did not reach the significance was observed. Conclusion: The presented data is shows that a clinical improvement of psoriatic plaques under NB-UVB therapy, shown in with a decreased PASI and reflected by an increase in quality of life has beneficial effects on epidermal barrier function, SCH and improvement of systemic oxidative stress parameters (ROS, MDA and Asc). We assume that the general improvement in the oxidative stress parameters along with epidermal barrier parameters reflects mainly the improvement of disease activity which overwrites the possible negative pro-oxidative effects of the UV treatment.

J. Matiasek, P. Kienzl, L.W. Unger, C. Grill, R. Koller, B.R. Turk, **An intra-individual surgical wound comparison shows that octenidine-based hydrogel wound dressing ameliorates scar appearance following abdominoplasty**, Int Wound J, 2018 Jun 29

Hypertrophic scar formation because of surgical procedures is associated with higher levels of pain, a lower quality of life, and poor cosmetic outcome and requires more resources in follow-up management. An octenidine-based hydrogel has been shown to modulate immunological function in an in vitro wound model, suggesting an improved scar formation. In this prospective, randomised, observer-blinded, and intra-patient-controlled study, 45 patients who underwent abdominoplasty or mastectomy with transverse rectus abdominis muscle (TRAM) flap reconstruction were given both a standard postoperative wound dressing on one wound side and an octenidine-based hydrogel with transparent film dressing, covered with standard postoperative dressing on the other side. Four instances of hypertrophia were reported in the gel side versus 12 in the standard dressing side. Visual Analogue Scale (VAS) pain scores taken during postoperative dressing changes showed reduced scores on the gel side at all time points. Vancouver Scar Scale (VSS) scores showed improvement in the gel side at 3, 6, and 12 months postoperatively. Skin distensibility measured using a cutometer showed significantly improved measures in gel-treated wounds, similar to measures of healthy skin. Trans-epidermal water loss (TEWL), measured using a tewameter, showed improved values on the gel side soon after surgery, with both the control and the gel side normalising after approximately 6 months. The octenidine-based wound dressing demonstrates improved wound healing associated with a lower incidence of hypertrophic scar formation.

K. Kimori, C. Konya, M. Matsumoto, **Venipuncture-Induced Hematomas Alter Skin Barrier Function in the Elderly Patients**, SAGE Open Nursing, June 2018

We aimed to compare the barrier function of the skin site with the color of hematoma induced by venipuncture and the area surrounding the skin site to help improve skin care for hospitalized elderly patients. There were 50 patients with a median age of 84 years who were included in the analysis. There was no significant difference between the hematoma site-induced venipuncture and the area surrounding the hematoma site in terms of transepidermal water loss and skin sebum level. The status of stratum corneum hydration and skin elasticity on the hematoma sites was significantly lower than that on nonhematoma sites. The median skin pH was significantly higher on hematoma sites than that on nonhematoma sites. The study variables did not reveal any significant correlation with the intensity of skin erythema. These findings showed that hematoma formation in the subcutaneous tissue affected the skin barrier function and that these sites need moisturizing skin care regardless of the intensity of skin erythema.

M. Heldermann, **Tea Wax: a unique wax for hair and skin properties**, PERSONAL CARE EUROPE, June 2018, p. 73-75

Camellia sinensis is a species of evergreen shrub whose leaves and leaf buds are used to produce tea. It is of the genus Camellia of flowering plants in the family Theaceae. *Camellia sinensis* is native to East Asia, the Indian subcontinent, and Southeast Asia, but it is today cultivated across the world in tropical and subtropical regions. Tea plants will grow into a tree if left undisturbed, but cultivated plants are pruned to waist height for ease of plucking. Two principal varieties are used, the smallleaved Chinese variety (C. *sinensis sinensis)* and the large-leaved Assamese plant (C. sinensis assamica), which is mainly grown for black tea production.

O. Qin, Y. Tan, W. Jiang, Q. Fu, Y. Xu, C. Jiang, **Non-invasive assessment of changes and repair dynamics post irritant intervention in skin barrier**, Int J Clin Exp Med 2018;11(5): p. 4490-4499

This study aimed to investigate the changes of skin conditions after interventions of sodium lauryl sulfate (SLS) and tape stripping (TAPE), and explore the correlation of parameters between different non-invasive tools. Twenty-three healthy volunteers were enrolled in this randomized, controlled study, and 4 evaluating skin surfaces on their left forearms were randomly divided into SLS, TAPE, flter, and control groups. Skin surfaces in SLS and TAPE groups were intervened by SLS and tape stripping respectively. Changes of skin conditions were recorded by noninvasive devices. SLS and TAPE both worsened the skin conditions according to the elevated ICD scores. Compared with control, the TAPE group showed increased transepidermal water loss (TEWL) values. Thicker epidermal thickness was observed in the TAPE group, while thinner cuticle thickness by RCM fnally recovered to normal level. Roughness by OCT in TAPE declined frst and then recovered, whereas reduced roughness was observed in VC98 detection. Blood flow volume detected by OCT was unchanged in TAPE, while flux by FLPI was raised. Compared to the flter group, SLS exhibited raised TEWL and decreased thickness data, while reduced epidermal thickness by OCT ultimately elevated. Roughness declined, while roughness by OCT fnally recovered. Flux by FLPI decreased, whereas blood flow volume

by OCT presented an instant reduction followed by a recovery. This study displays the changes of skin conditions post irritation, and discloses a positive correlation of flux parameters between OCT and FLPI as well as a positive correlation of moisture parameters between CM825 and VC98.

E. Berardesca, S. Mortillo, N. Cameli, M. Ardigo, M. Mariano, **Efficacy of a shower cream and a lotion with skin-identical lipids in healthy subjects with atopic dry skin**, Journal of Cosmetic Dermatology, May 2018

Background: Atopic dermatitis is a chronic, pruritic inflammatory skin disease that adversely affects quality of life. Aims: The current study evaluates the efficacy of a shower cream and a lotion, each with skin-identical lipids and emollients, in the treatment of atopic dry skin of subjects with a history of atopic condition. Methods: In all, 40 healthy females with clinically dry skin on the lower legs were enrolled in the study and underwent 4 weeks of daily use of the shower cream and 2 additional weeks of both the shower cream and the body lotion. Subjects were evaluated at day 0, week 4, and week 6. Skin barrier function was assessed by Tewameter®, skin hydration by Corneometer®, smoothness and desquamation by Visioscan®, and stratum corneum architecture by reflectance confocal microscopy (RCM). The investigator assessed the degree of dryness, roughness, redness, cracks, tingling and itch, and subjective self-assessment evaluated the perception of skin soothing, smoothness, and softness. Results: Skin barrier function and skin moisture maintenance were significantly improved using the shower cream. The lotion with physiological lipids, together with the shower cream, also improved skin barrier function and moisture. Both the shower cream and the body lotion reduced clinical dryness, roughness, redness, cracks, tingling and itch, according to the dermatologist, and increased soothing, smoothness, and softness, according to the subjects of the study. Conclusion: The combination of a shower cream and a lotion with physiological lipids efficiently restores skin barrier function and increases skin hydration, becoming an effective skin-care option for patients with atopic dry skin.

D. Khazaka, C. Uhl, **Nails: more than just skin extensions,** PERSONAL CARE ASIA, May 2018, p. 33-35

The horn-like envelopes covering the tips of our fingers and toes are called nails. They are highly specialised epidermal appendages. Finger- and toenails are made out of a tough fibrous protein, the alphakeratine. The nail consists of the nail plate, the nail matrix and the nail bed below it, and the grooves surrounding it. Apart from the aesthetical aspect, a healthy fingernail has the function of protecting the fingertip and the surrounding skin from injuries and preventing the skin at the end of fingers and toes from rolling backwards over the distal phalanx. The nail helps to improve sensitivity and the grip of the fingers and also enables the precise manipulation of small objects through counter-pressure exerted on the pulp of the distal digits (e.g. pulling out a splinter in one's finger), as well as certain cutting or scraping actions.

P. Mokrejš, J. Pavlačková, D. Janáčová, M. Huťťa, **Hydration and Barrier Properties of Emulsions with the Addition of Keratin Hydrolysate**, Cosmetics 2018, 5, 64

Although keratin hydrolysates (KH) are added to skin care agents, detailed studies on the moisturising effects of KH are lacking. The aim of this study is to test whether adding KH into an ointment base (OB) heighten hydration of the skin and diminish transepidermal loss of water (TEWL). Formulations containing 2%, 4%, and 6% of KH (based on OB weight) were prepared. Hydration, TEWL and skin pH were measured; intervals of measurements were as follows: 1, 2, 3, 4, 24 and 48 h. Testing was carried out on 10 men. In terms of hydration, supplementing the OB with 2% KH is optimal, as an 11–19% increase occurs in hydration of stratum corneum (SC). All the formulations with added KH as tested caused TEWL to decline after application. Keratin hydrolysate makes for an excellent occlusive; adding it to OB results in a 30–50% reduction in TEWL after application. KH functions as a humectant as well, as it helps to bind water from the lower layers of the epidermis to the SC. Formulations with additions of 2–6% of KH were stable in structure and did not cause phase separation even after 6 months storage.

J.W. Fluhr, **Atopic Dermatitis and the Barrier,** ISBS Conference San Diego, May 2018

The epidermis is the interface of the human body to the potentially harmful environment with exogenous stressors like chemicals, UV radiation other physical impact. The epidermal barrier is recognized as a central key pathophysiologic element in inflammatory skin diseases such as atopic dermatitis (AD). Some bases of an impaired barrier have been elucidated on the molecular level e.g. mutation in genes encoding for filaggrin and lipid processing defects. Recently, alterations in the microbiome composition and its relation to altered barrier function were reported. Multiple non-invasive biophysical measurement instruments are used to assess skin physiology especially in inflammatory skin diseases associated with an altered epidermal barrier e.g. transepidermal water loss, stratum corneum hydration, surface pH, inflammatory signs and surface parameters. Clinical scores for AD

disease activity are widely used but rely entirely on subjective criteria in assessing both the severity of lesions and the extent of involvement. Noninvasive biophysical instruments are available and introduced into clinical evaluation of chronic diseases and treatment effects. In AD objective scores including biophysical measurements have been published. Quantifying barrier function, stratum corneum hydration, erythema, scaling, and sub-epidermal edema as well as estimates of involved body surface areas are implemented in assessing the severity of AD. Sensitivity and reliability of these severity scores have been published involving computer assisted software and measurement devices. New models are now developed to use standardized approaches in AD in clinical studies. Recently, non- or minimalinvasive methods have been used in different AD research areas. These methods include multidimensional imaging, in vivo multiphoton spectroscopy, optical coherence tomography, atomic force microscopy, near-infrared spectroscopy (NIR), in vivo Raman micro-spectroscopy and in vivo reflectance Raman spectroscopy. The state of the art of established non-invasive novel methods and their value/limitations in in AD research will be discussed. The combintion of established approaches with cutting edge methods will allow to gain a deeper understanding of barrier related inflammatory skin diseases. Eventually biomarkers can be derived from these studies for diagnostic and preventive purposes as well as monitoring of disease activity during specific treatment regiments.

A. Rigal, R. Michael-Jubeli, A. Bigouret, A. Nkengne, A. Baillet-Guffroy1, A. Tfayli, **Lipides**: **Systèmes Analytiques et Biologiques,** ISBS Conference San Diego, May 2018

Introduction: Clinical manifestations of skin aging like xerosis, wrinkles and slackness are related to underlying complex molecular phenomena in the different layers of the skin. The combinations of classical biometric measurements with more complex and informative techniques like *in vivo* Raman spectroscopy can provide interesting information on the organization of lipids in the *Stratum Corneum (SC)*, their barrier function and on water content and mobility, in order to better characterize the skin aging. Methodology: Biometric information (TEWL, corneometry, sebumetry, skin pH, mechanical stress) and Raman spectra and in-depth profiles were collected from the forehead of twenty-two young womens (18- 24 years old) and eighteen elderly womens (70-75 years old). Results and Conclusions: Important modifications on biometric skin parameters, structure of the SC and water mobility can be observed for elderly. Our results show a good association between biometric parameters and *in vivo* Raman descriptors. Interestingly, higher compacity of lipids, higher total water content and lower unbound water content are observed for elderly.

W. van den Eijnde, R. Heus, D. Falcone, M. Peppelman, P. van Erp, **Skin Barrier Impairment Due To Occlusion by Firefighter Clothing**, ISBS Conference San Diego, May 2018

Introduction: At fire scenes, firefighters are exposed to potentially harmful substances. Post firefightingstudies showed increased biomarkers of carcinogenic combustion products in firefighters bodies. Besides inhalation, skin contamination and risk of dermal absorption is getting more attention. In this perspective, skin barrier impairment due to the occlusive effect of firefighter clothes could be a mechanism for enhanced penetration risk of hazardous substances. Methodology: In a paired comparison involving 16 volunteers, the effect of cellophane and a firefighter coat were studied. TEWL, SSWL and skin permittivity were measured at three time intervals;(1) before (2) immediately after 30 minutes of occlusion and (3) 30 minutes after occlusion. Reflectance confocal microscopy was used to study the skin morphology. Results and Conclusions: TEWL values immediately after wearing a firefighter coat were significantly increased. This is an indication of an occlusive effect of the firefighter coat. The skin barrier was fully restored after 30 minutes. In conclusion, wearing a firefighter coat contributes to an increased risk of dermal absorption.

M.O. Melo, L. Kakuda, P.M.B.G Maia Campos, **Clinical Efficacy of a Multifunctional Cosmetic Formulation for Mature Oily Skin**, Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: The skin may change due to factors as high temperatures, increasing sebum excretion and presenting oiliness and acne. These alterations can persist during the aging and provoke more changes that influence the use of cosmetics. The objective of this study was to evaluate the clinical efficacy of a cosmetic product developed for the mature oily skin. Methodology: The clinical efficacy was evaluated on 30 participants aged between 39 to 55 years old with oily skin. The analyzed parameters were: stratum corneum water content, TEWL, sebum content and percentage, microrelief and dermis echogenicity. The analyses were performed on different regions of the face. A placebo formulation was also tested. Results and Conclusions: The developed formulation improved the sebum content and percentage, skin microrelief in terms of skin roughness and desquamation and dermis echogenicity. The biophysical and skin imaging techniques utilized in this study were useful to test the clinical efficacy of an effective formulation for mature oily skin.

M. Mendes Fossa Shirata, P.M. Berardo Gonçalves Maia Campos, **Evaluation of Young Skin Photoaging Using Biophysical and Imaging Techniques**, Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: Photoaging is associated to an intense solar exposure, thus the photoaging signs can be observed also in the young skin, mainly in countries with high UV incidence, like Brazil. The aim of this study was to evaluate the skin changes resulted from photoaging in Brazilian young skin in comparison to photoaged mature skin. Methodology: Thirty participants were divided in two groups: the first between 18 to 35 years old and the second, 40 to 60 years old. Analyzes were performed on the randomized facial malar region. TEWL, stratum corneum water content, sebum content, high resolution imaging, echogenicity and dermis thickness, skin color and elasticity parameters were analyzed. Results and Conclusions: The obtained results showed that sun exposure can cause changes even in the young skin, with the appearance of spots and the reduction of the echogenicity of the dermis, besides there were no significant differences between young skin and mature skin in most parameters. In conclusion, signs of photoaging may be frequent even in young skin.

P.M.B.G. Maia Campos, M.O. Melo, L.O. Guerra, **Application of Reflectance Confocal Microscopy in the Evaluation of Skin Hydration**, Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: The Reflectance Confocal Microscopy (RCM) is an important tool to evaluate skin hydration. However, there is a lack of studies in the literature. This study evaluated the hydrating effects of different active ingredients using RCM. Methodology: A carbomer gel added or not (vehicle) with Hyaluronic Acid (F1), Glycerin (F2), Hydrolyzed Rice Protein (F3) or *Kappaphycus alvarezii*&*Caesalpinia spinosa* Extracts (F4) was used. The anterior leg of 20 participants was utilized and a control was kept. Measures of TEWL, stratum corneum water content and interkeratinocyte reflectance, furrows size, morphology and skin surface irregularity were done before and after 2, 4 and 8 hours. Results and Conclusions: Improvement of TEWL and stratum corneum water content was noted with F2 and F4. Furrows size, morphology and skin surface irregularity improved with F2 and F3. F1 and F2 showed an increase of interkeratinocyte reflectance. RCM is an efficient technique to evaluate morphological changes of skin hydration, showing the modifications of skin structures by alterations reflectance and morphology.

M. Gabarra Almeida Leite, P.M. Berardo Gonçalves Maia Campos, **Evaluation of Oily Hair and Skin: Comparison between Self Perception and Clinical Analysis Using Biophysical and Imaging Techniques**, Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: Excess of oiliness can cause skin changes such as acne and compromise the cutaneous physiology, affecting of both skin and hair. Thus, the aim of this study was to evaluate skin and hair alterations due to excessive amount of sebum using biophysical and imaging techniques. Methodology: 100 participants (18 - 49 years), with oily skin and hair, were recruited. Skin was evaluated in terms of stratum corneum water content, TEWL, activity of the sebaceous glands, amount of porphyrins and pores. Scalp was evaluated in terms of sebum content. Results and Conclusions: Participants were divided 4 groups: 1- Oily skin and hair (45,23%), 2- Oily skin and normal hair (10,71%), 3- Normal skin and oily hair (34,52%) and 4- Normal skin and hair (9,52%). The participants with oily skin presented activity of the sebaceous glands of 9.1 ± 1.1 surface (%), high amount of pores and presence of porphyrins, and scalp amount of sebum of 330,6 ± 9,8 µg/cm². Although all the panelists considered their hair and skin oily, they were classified differently, showing that the tropical weather can influence the self-perception and lead to a wrong treatment without the correct evaluation.

L. Salomão Calixto, C. Picard, G. Savary, P.M. Berardo Gonçalves Maia Campos, **Application of Topical Formulations Containing Natural Origin Actives and UV-Filters in the Prevention of Photoaging in French and Brazilian Skin**, Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: The study of skin from different populations brings an essential knowledge to the development of skin treatments. The aim of this study was to evaluate the immediate effects of topical formulations using biophysical techniques and to compare the skin biology of the participants. Methodology: 36 subjects, 18 French and 18 Brazilians, were enrolled. Transepidermal water loss, stratum corneum water content, skin viscoelasticity and skin brightness were evaluated before and 60 minutes after formulations application. Results and Conclusions: Brazilian skin had a lower TEWL and less gloss on the skin surface when compared with French skin. There was no difference in hydration and viscoelastic profile. After 60 minutes, there was a significant increase in stratum corneum water content and skin brightness, a significant decrease in TEWL and no difference in skin viscoelasticity in both groups. In conclusion, biophysical differences were found on the groups and the formulations were effective in both populations.

A. Manière, A. Trunet, C. Olive, C. Bezivin, E. Loing, **Biomimetic emulsifier with cashmere touch**, PERSONAL CARE EUROPE, April 2018, p. 54-58

Most personal care products are emulsions which can be defined as stabilised fluid systems of liquids that do not normally like to mix, like oil and water. The peacekeeper in such systems is called an emulsifier. Emulsifiers combine a water-loving head holding to the water phase and a fat-loving tail that clings to the oil phase. Oil-in-water (o/w) emulsifiers keep oil drops packed in water, while water-in-oil (w/o) emulsifiers rather retain water drops in oils. Classic emulsifiers are typically synthetic petroleum and hydrocarbon derivatives such as PEG compounds, alkoxylated amides, silicone derivatives, and ethoxylated fatty alcohol.

T.D. Dobbs, T.H. Jovic, Z.M. Jessop, A. Kyle, H.A. Hutchings, I.S. Whitaker, **Objective and Patient-reported Assessments of Skin Grafts and Keystone Flaps—A Pilot Retrospective Cohort Study**, Plast Reconstr Surg Glob Open 2018

Background: The keystone perforator island flap provides a versatile form of reconstruction. Perceived beneftis include better donor-recipient color match, less contour defect, and fewer complications. To date, there has been no high-quality evidence comparing keystone flaps to split-thickness skin grafts (SSG) from both a qualitative and quantitative point of view. Methods: The Objective and Patient Reported Assessments of Skin grafts versus Keystone flap cohort study compares keystone flaps with SSGs for the reconstruction of skin cancer defects. Patient-reported outcome measures were collected using the EuroQol 5 dimension scale and Patient and Observer Scar Assessment Scale (POSAS) questionnaires. Objective assessments of skin quality were assessed with the Courage and Khazaka system. Cost analysis was also performed. Results: Thirty-eight patients were studied: 20 keystone flaps and 18 SSGs. The keystone group had higher EuroQol 5 dimension scale scores (keystone median = 1.0; SSG median = 0.832; P = 0.641) indicating better general quality of life and lower POSAS scores indicating better disease/condition specifc quality of life (keystone mean = 27.7; SSG mean = 35.7; P = 0.323). Observer POSAS scores were signifcantly lower in the keystone group compared with the SSG group (keystone mean = 10.889; SSG mean = 17.313; P < 0.001). Preservation of sensation was signifcantly better in keystone flaps (P = 0.006). There was an average £158/$207 (15%) saving when performing a keystone flap. Conclusion: This pilot study demonstrates a number of possible beneftis of keystone flaps over SSGs. The results demonstrate the need for further research comparing these reconstructive options. We propose a prospective, controlled study using the methods developed in this pilot study.

S. Rahrovan, F. Fanian, P. Mehryan, P. Humbert, A. Firooz, **Male versus female skin: What dermatologists and cosmeticians should know**, International Journal of Women's Dermatology 4 (2018) p. 122–130

Introduction: The skin is important for the perception of health and beauty. Knowledge of the physiological, chemical, and biophysical differences between the skin of male and female patients helps dermatologistsdevelop a proper approach not only for the management of skin diseases but also to properly take care
of cosmetic issues. The influence of genetic and environmental factors on skin characteristics is also critical to consider. Methods: A literature search of PubMed and Google was conducted to compare the biophysical and biomechanical properties of the skin of male and female patients using the keywords "skin", "hydration", "water loss", "sebum", "circulation", "color", "thickness", "elasticity", "pH", "friction", "wrinkle", "sex", "male", and "female". Results: A total of 1070 titles were found. After removing duplications and non-English papers, the number was reduced to 632. Of the 632 titles, 57 were deemed suitable for inclusion in this review. The studies show that the skin parameters of hydration, transepidermal water loss, sebum, microcirculation, pigmentation, and thickness are generally higher in men but skin pH is higher in women. Conclusions: These parameters can be considered as age markers in some cases and are susceptible to change according to environment and life style. Biometrological studies of the skin provide useful information in the selection of active principles and other ingredients of formulations to develop a specific approach for cosmetic treatments.

A. Schulz, I. Rothermund, R. Lefering, P. Christian Fuchs, J. Schiefer, **Long-term Scar Quality after Treatment of Standardized Partial-Thickness Skin Graft Donor Sites**, Advances In Skin & Wound Care, March 2018: 31: p.109-117

Background: The long-term aesthetic appearance of scars is of great importance to patients. Biobrane (Smith and Nephew, Fort Worth, Texas), a biosynthetic skin dressing, is a successfully established dressing for the treatment of superficial wounds. A new silk barrier dressing (Dressilk;

Prevor, Moulin de Verville, France) has also shown good results in wound healing. This study evaluated the long-term scar quality of superficial wounds treated with these dressings. Methods: From February 2012 to May 2013, 11 patients with burns in need of skin grafting received donor site treatment. Study authors dressed 2 adjacent, standardized, partial-thickness skin graft donor sites on each participant with Biobrane or Dressilk. Scar formation on both treated areas was compared 24 months after initial application using subjective and objective assessment methods. Results: Independent of treatment, the majority of the patients described scar quality similar to normal skin using subjective and objective evaluation tools. However, for scar perfusion, significantly lower oxygen saturation was shown in both treated areas compared with untreated skin. Conclusions: Comparatively, the 2 wound dressings showed similar results, making silk dressings an interesting alternative to biosynthetic ones.

A. Aguirre, E. Gil-Quintana, M. La Nuez, **Ovoderm® an effectve treatment to improve skin conditon in patents with altered skin barrier function,** J Skin March 2018;2(1): p. 11-14.

Alterations in the stratum corneum and therefore in the skinbarrier function are produced by diverse causes. The changes in the stratum corneum imply increases in water loss, reduction of the protective effect of the skin and also modifications in its mechanical functions. The aim of the present study was to evaluate the effectiveness of Ovoderm®, a dietary supplement consisting of eggshell membrane, to improve the skin condition of people with an altered barrier function. Sixteen volunteers with a decreased skin barrier function were randomized to daily intake 300mg of Ovoderm® or 300mg of placebo during 60 days. Transepidermal waterloss (Tewameter®), firmness (Cutometer® R0), elasticity (Cutometer® R6) and fatigue (Cutometer® R9) of the skin were measured. At the end of the study there was a significant 43% of decline in the transepidermal waterloss in the volunteers intaking Ovoderm® that was not observed in the placebo group. Participants started the study with normal-affected skin and finished it with healthy-very healthy skin values. A similar tendency was observed in the skin elasticity that was increased by 13% in Ovoderm® group while the control group showed a decrease of 11%. The skin firmness improved significantly by 66% and the fatigue declined by 36% in Ovoderm® group while no significant changes were measured in the placebo group. These results showed that oral supplementation with Ovoderm® restores the skin barrier function in people with cutaneous alterations. Ovoderm® re-establishes the transepidermal waterloss values to those observed in people with healthy skin and it increases the functionality of the skin as evidenced by the improvements in firmness and elasticity and by the decrease in fatigue. Ovoderm® is an effective treatment that could prevent and manage more effectively the alteration of the skin barrier function restoring the skins' health and its biomechanical properties.

F. Spada, T.M. Barnes, K.A. Greive, **Skin hydration is signifcantly increased by a cream formulated to mimic the skin's own natural moisturizing systems**, Clinical, Cosmetic and Investigational Dermatology 2018:11, p. 491–497

Background: Moisturizers are topical products designed to improve and maintain the skin barrier function and to help prevent dry skin. Materials and methods: A new moisturizer (Ceramide cream) was formulated containing ingredients which mimic the skin's own natural moisturizing systems. Corneometry was performed at baseline, 2, 4, 6 and 24 hours following a single application of Ceramide cream to healthy skin, and compared to three reference moisturizers available over-the-counter, and placebo. Transepidermal water loss (TEWL) was also measured following a single application of Ceramide cream compared to baseline, and its safety was assessed by repeat insult patch test, ophthalmologist and pediatric testing. Results: A single topical application of either the Ceramide cream or the three reference moisturizers resulted in a signifcant increase in skin hydration over time (P<0.001). The placebo cream did not signifcantly increase skin hydration at any time point. At 24 hours post-application, skin hydration measured for Ceramide cream was signifcantly greater (P<0.05) than that measured for all three of the reference moisturizers tested. Ceramide cream was also found to significantly decrease TEWL (P<0.001) over 24 hours, and was shown to be non-sensitizing to the skin of both adults and children and non-irritating to the skin, eyes and related eye area. Conclusion: Ceramide cream increases skin hydration and improves barrier function which may make it suitable for use on dry skin.

M.P. Szczepanik, P.M. Wilkołek, Ł.R. Adamek, M. Gołyński, W. Sitkowski, I. Taszkun, **Influence of hair clipping on transepidermal water loss values in horses - a pilot study**, Pol J Vet Sci, 2018 Mar; 21(1): p. 35-38

The measurement of transepidermal water loss (TEWL) is one of the biophysical skin parameters used to assess skin barrier function. Assessment of transepidermal water loss, may depend on such factors as body region, age, sex or breed and the hair coat has been considered as one of the factors that may cause variation of TEWL values. The aim of our research was an examination of the

influence of clipping on the amount of TEWL. The examination was performed with 12 Wielkopolska horses with Courage Khazaka Multi Probe Adapter 5 and a TEWL TM 300 probe. The TEWL values were statistically constant in the clipped site, while the values in the unclipped sites were not. Hair clipping of examined sites is recommended for TEWL measurement in horses.

M. Chapis, **Weak and damaged skin repaired by maracuja**, PERSONAL CARE EUROPE, February 2018, p. 43-48

Passioline is a concentrate of unsaponifiables of virgin maracuja (passion fruit) oil derived from the co-valorisation of the Peruvian maracuja juice industry. When the seeds are left out for the fruit juice production, Expanscience processed them after being dried. They are pressed to obtain virgin maracuja oil. The noblest active molecules of this oil (unsaponifiables), are concentrated by a 100% physical process, fully respectful of the environment: molecular distillation. Passioline is especially rich in tocopherols (>5 mg/100g) and tocotrienols (rare vit E) >40 mg/100g. Passioline promotes skin healing process to repair, regenerate and soothe skin imperfections (chapping, irritations, acne, burns, cuts, and post-surgery lesions).

A. Thibodeau, **Naturally emulsifying with biomimeticclinical benefits**, PERSONAL CARE EUROPE, February 2018, p. 70-74

Choosing the right emulsifier remains a decision formulation chemists face at the onset of each project. The natural origin, global regulatory acceptance, functionality, robustness and compatibility with skin structures are all parameters that need to be carefully analysed when selecting an emulsifier. In addition, the impact of the emulsifier on the sensorial properties of the final formulation remains a key factor. This parameter often determines the acceptance of the cosmetic product by end consumers. Even though oils, emollients and thickeners may influence the emulsion characteristics, emulsifiers remain the cornerstone of a formulations aesthetics and functionality

J.P. Andrade, T.A.L. Wagemaker, D.G. Mercurio, P.M.B.G. Maia Campos, **Beneftis of a dermocosmetic formulation with vitamins B3 and a B6 derivative combined with zinc-PCA for mild inflammatory acne and acne-prone skin**, Biomed Biopharm Res., 2018; (15) 2: p. 214-223

Acne is a chronic inflammatory disorder of the pilosebaceous follicles that affects 80% of the population. As topical agents for acneic skin treatment are often irritants, dermocosmetics, may improve therapy. Thus, we developed cosmetic formulations with nicotinamide (vitamin B3), pyridoxine tris-hexyldecanoate (a vitamin B6 derivative) and zinc- pyrrolidone carboxylic acid (PCA) in association, and evaluated their clinical efcacy, skin compatibility, and sensory properties. The formulation (vehicle) added with vitamin B3, the vitamin B6 derivative and zinc-PCA in combination was applied twice daily for six weeks on the forehead, malar and chin skin regions of sixteen subjects. Before (pre-treatment) and after treatment, these regions were evaluated using biophysical and skin imaging techniques. Inflammatory acne lesions were reduced by 60% after application of the complete formulation. Porphyrine reduction was shown in the majority of volunteers. The results shown an improvement of inflammatory acne lesions based on porphyrine reduction, lesion counts, skin compatibility and comedogenicity testing. The skin barrier function was not impaired by the experimental formulation, which demonstrates its efcacy in acne treatment without undesirable effects. The combination of Zn-PCA and vitamins B3 and B6 vehiculated in an adequate topical formulation can be considered as a safe and effective alternative treatment for mild inflammatory acneic skin.

H.-C. Hung, C.-W. Feng, Y.Y. Lin, C.-H. Chen, K.-H. Tsui4, W.-F. Chen, C.-Y. Pan, J.-H. Sheu, C.-S. Sung, Z.-H. Wen, **Nucleophosmin modulates the alleviation of atopic dermatitis caused by the marine-derived compound dihydroaustrasulfone alcohol**, Experimental & Molecular Medicine (2018) 50

Atopic dermatitis (AD) is a chronic inflammatory skin disease, and its prevalence is increasing. AD usually elicits skin barrier dysfunction, dry skin and itching. As the mechanisms of AD remain unknown, there is an urgent need to find effective therapies. Because of the diversity and complexity of marine environments, the discovery of drugs from marine organisms as novel therapeutic agents for human diseases has seen renewed interest. Dihydroaustrasulfone alcohol (WA-25), the synthetic precursor of austrasulfone, which is a natural product isolated from a Formosan soft coral, has been shown to possess many therapeutic effects in our previous studies. However, the detailed mechanisms and therapeutic effects of WA-25 on AD are incompletely understood. We performed in vitro and in vivo studies to examine the effects of WA-25 on AD. We showed that WA-25 blocks inflammation and oxidative stress. Simultaneously, we also found that WA-25 reduces the AD scores and AD-induced transepidermal water loss (TEWL), scratching behavior, and alloknesis. WA-25 is more effective in cases of AD than are the drugs that are currently used clinically. Importantly, we also found that when

nucleophosmin (NPM) was inhibited or when its expression was reduced, the anti-inflammatory and anti-AD effects of WA-25 were blocked. These data suggest that NPM plays dual roles in inflammation and AD. Overall, these results suggest that WA-25 is a potential anti-inflammatory and AD therapeuticagent that is modulated by NPM.

S. Nisbet, H. Mahalingam, C.F. Gfeller, E. Biggs, S. Lucas, M. Thompson, M.R. Cargill, D. Moore, S. Bielfeldt, **Cosmetic benefit of a biomimetic lamellar cream formulation on barrier function or the appearance of fine lines and wrinkles in randomized proof of concept clinical studies,** InternationalJournal of Cosmetic Science / Volume 41, Issue 1, 2018

Objective: Two studies were designed to evaluate the potential cosmetic benefit of a biomimetic, niacinamide containing moisturizing cream for the first time in humans. Methods: In both studies, healthy women were randomized to use two treatments, one for the left side of the body and one for the right, from three options: the test cream, a positive control or no treatment (use of standard cleanser only). Treatments were applied twice daily for 4 weeks to the face and forearms (Study 1) or the face only (Study 2). Instrumental and clinical skin assessments were performed by trained technicians. Study 1 involved tape stripping and a 5 day no treatment ('regression') period at the end of the 4 weeks. Independent lay graders were asked to grade the skin texture of subjects in Study 2 from high resolution photographs. Results: In Study 1 *(n* = 66), the test cream significantly decreased the transepidermal water loss (TEWL) values on the forearm, and in the cheek area of the face, relative to baseline and compared to no treatment, and increased skin Corneometer values. The improvements were partially retained during a subsequent 5 day period of no treatment. Increases in TEWL values on skin subjected to tape stripping were significantly lower after 4 weeks of using the test cream compared to no treatment. In Study *2 (n = 72* subjects with visible signs of ageing), there was a favourable trend in the change from baseline of a skin roughness parameter, Ra, for the test cream compared to no treatment. There were statistically significant improvements in the Fitzpatrick wrinkle score compared to no treatment, decreases in TEWL and increased Corneometer values and Cutometer values (R5 elasticity parameter). Grading of high resolution images failed to detect the improvements in skin texture (defined as pores, smoothness and unevenness) for the test cream vs. no treatment. No treatment related serious or severe adverse events were reported. Conclusion: Twice daily application of the test cream over 4 weeks had beneficial effects on skin barrier function, ppp moisturization, wrinkle dimensions and elasticity compared to no treatment. These studies provide prc concept evidence and highlight the cosmetic benefit of the biomimetic lamellar cream formulation.

J. István, V. Tünde, **Diagnosztikai lehetőségek és jelentőségük a sebkezelésben** (in Hungarian), XXI. évfolyam, 2018. 1. Szám

A sebkezelő legfontosabb feladata, hogy a sebgyógyulás komplex folyamata menedzselése során a lehető legoptimálisabb feltételeket biztosítsa, azaz a hatékony sebgyógyuláshoz szükséges terápiás döntéseket folyamatosan meghozza. Ehhez megfelelő információra van szüksége, amely a sebkezelésben a diagnosztikus tevékenységünk fontosságára hívja fel a fgyelmet. A seb gyógyítása során akkor dolgozhatunk leghatékonyabban, vagy számíthatunk egyáltalán a seb záródására, ha az általános sebkezelési feladatok mellett megfelelő hangsúlyt fektetünk a változatos etiológiának megfelelő oki kezelésre. Súlyos hibát véthetünk - mely a kezelésünk eredményességét veszélyezteti, ha a sebkezelés diagnózis felállítása nélkül indul el, vagy ha nem megfelelő diagnózis születik.

K. Nomoto, Y. Itaya, K. Watanabe, T. Yamashita, T. Okazaki, Y. Tokudome, **Epidermal permeability barrier function and sphingolipid content in the skin of sphingomyelin synthase 2 deficient mice**, Exp Dermatol, 2018 Jan

Sphingomyelin synthase (SMS) is an enzyme that generates sphingomyelin (SM) from ceramide (CER) and phosphatidylcholine. SM in the epidermis is a precursor of CER, an important lipid for epidermal permeability barrier function. However, the physiological role of SMS in skin is unclear. To uncover the function of SMS in skin, we investigated sphingolipid metabolism enzyme activity in skin, SM content in the epidermis, CER content in the stratum corneum (SC) and transepidermal water loss (TEWL) as an indicator of barrier function in SMS2-knockout (KO) mice. The activities of sphingolipid metabolism enzymes in skin homogenates were measured using a fluorescently labelled substrate. Enzymatic reaction products were detected by high-performance liquid chromatography (HPLC). Lipids in the epidermis or SC were extracted and quantified by high-performance thin layer chromatography (HPTLC). TEWL was measured using a Tewameter TM300. In SMS2-KO mice, SMS activity in skin homogenates, epidermal SM content and SC CER content were significantly decreased relative to wild-type (WT) mice. The TEWL of SMS2-KO mice was significantly increased compared to WT mice. Our data indicate that SMS2 generates SM in the epidermis and contributes to epidermal permeability barrier function and will support understanding of SM-related metabolic disorders.

K. Yonezawa, M. Haruna, M. Matsuzaki, M. Shiraishi, R. Kojima, **Effects of moisturizing skincare on skin barrier function and the prevention of skin problems in 3-month-old infants: A randomized controlled trial,** Journal of Dermatology 2018; 45: p. 24–30

An effective newborn skincare protocol has not been established. We aimed to evaluate the effects of moisturizing skincare, including using lotion and reducing routine bathing. Our hypothesis was that moisturizing skincare would improve skin barrier function. This randomized controlled trial included 227 healthy Asian newborns between 1 week and 3 months old. We compared moisturizing skincare (bathing every 2 days and using lotion daily; intervention, n = 113) to daily bathing without lotion (control, n = 114). We assessed the skin barrier function (transepidermal water loss [TEWL], stratum corneum hydration [SCH], skin pH and sebum secretion) as a primary outcome at 3 months old. We also assessed the incidence of skin problems according to parents' diary reports. Compared with the control, the intervention group had a lower face TEWL (mean standard deviation, 14.69 7.38 vs 17.08 8.26 g/m2 per h, P = 0.033), higher face SCH (60.38 13.66 vs 53.52 14.55, P = 0.001) and higher body SCH (58.89 12.96 vs 53.02 10.08, P < 0.001). Compared with the control, newborns in the intervention group had significantly lower rates of diaper dermatitis between birth and 1 month old (6.3% vs 15.9%, P = 0.022), and tended to have lower rates of body skin problems between 1 and 3 months (42.1% vs 55.2%, P = 0.064). Moisturizing skincare was effective for improving skin barrier function and preventing newborns' diaper dermatitis. The results of our study may help parents make informed decisions about newborn skincare.

A. Ibuki, S. Kuriyama, Y. Toyosaki, M. Aiba, M. Hidaka, Y. Horie, C. Fujimoto, F. Isami, E. Shibata, Y. Terauchi, T. Akase, **Aging-like physiological changes in the skin of Japanese obese diabetic patients**, SAGE Open Medicine, 2018, Volume 6: p. 1–6

Objective: Obesity-associated diabetes causes aging-like changes to skin physiology in animal models, but there have been no clinical studies focusing on human obese diabetic patients. The purpose of this study was to examine the hypothesis that obesity-associated diabetes accelerates aging-like skin changes in Japanese people. Methods: This cross-sectional study enrolled obese-diabetes patients (body mass index≥25kgm−2) and healthy volunteers (body mass index<25kgm−2) as controls. Skin physiology parameters relating to aging (stratum corneum hydration, transepidermal water loss, skin pH, advanced glycation end-products, and dermal collagen density) were evaluated in the two groups. Results: About 37 subjects participated (16 in a control group and 21 in an obese-diabetes group). Age was not significantly different between the groups. The stratum corneum hydration level was significantly lower in the obese-diabetes group. Transepidermal water loss and levels of advanced glycation end-products were significantly higher in this group. Skin pH was not significantly different between groups. Dermal collagen density decreased in the obese-diabetes group. Conclusion: We showed that obese-diabetes patients have decreased stratum corneum hydration, increased transepidermal water loss, higher skin advanced glycation end-products and decreased dermal collagen fiber density compared with normalweight subjects. These results indicate that the ordinary age-related physiological skin changes seen in the elderly can also occur in obese-diabetes patients aged in their 40s.

M. Bimonte, A. Carola, A. Tito, A. Barbulova, A. De Lucia, F. Del Piaz, F. Apone, G. Colucci, **Cold Stress, Banished,** Cosmetics & Toiletries, January 2018

The human skin, as a physical barrier between the body and outside environment, is subjected to seasonal climate changes that significantly affect its protective functions. The hydrolipidic film that coats the epidermis has key roles in the maintenance of the skin barrier integrity - it lubricates and waterproofs the skin surface, thus preserving an appropriate level of hydration, and protects the inner skin layers from micro-lesions due to both dehydration and mechanical insults.

P. Likhitthummaguna, P. Koonngamb, A. Seeremaspun, **Anti-aging effect of oral very high proline complex collagen (DERMOFIX®) on skin properties: a randomized, double-blind, placebo-controlled clinical study**

Taking collagen supplement to rejuvenate skin is now finding public favor due to antiaging trend. Synthesizing collagen, the body needs a specific amino acid group –Proline, Hydroxyproline and Glycine called "Proline complex" to make a core structure of every type of collagen fiber in human body. DERMOFIX®, which is a new very high proline complex containing-collagen supplement, helps promoting collagen synthesis naturally leading to antiaging effects on skin properties as well as other collagen-containing organs. The objective is to study the anti-aging effects of the oral very high proline complex collagen (VHPCC) primarily on skin properties compared to placebo and commercially available collagen (CAV) in Thailand, and secondarily on knee joint. In this randomized, double blind, placebo-controlled clinical trial, 50 women aged 30-45 years old were randomized to receive the VHPCC

10 g, CAV 10 g or placebo 10 g once daily for 8 weeks. Six aging related skin properties, which are skin elasticity, hydration, melanin index, transepidermal water loss, smoothness and wrinkle were objectively measured at 0, 1, 2, 4, 8 weeks. Knee joint assessments, photo-shooting, blood tests for CBC, creatinine and *sirt1* gene expression level were evaluated before and after the study. Results: The VHPCC showed statistically significant improvement and gave faster effects than the CAV and placebo, in skin elasticity, hydration, melanin index, transepidermal water loss, smoothness and wrinkles. Most effects by VHPCC showed significant improvement since the first week while CAV showed improvement mostly at fourth or eighth week. Safety blood tests are normal in all groups. However, the Sirt1 gene expression did not increase in any groups. No adverse effect was reported throughout the study. Conclusion: The study demonstrated that the VHPCC (DERMOFIX®) supplement wasproved safe, gave much faster and more effective effects than CAV in anti-aging of skin properties, knee joints and collagen-containing organs.

M. Cao, Y. Li, Y.-P. Guo, L. Yao, Z. Pan, **Bodymapping - Le mappe del corpo umano ci garantiscono una temperatura ottimale,** Sport Design for All, n° 0, dicembre 2017

L'ergonomia é una scienza che attinge dall fisiolgia, dell'ingegneria e da studi di psicologia, oltre che dall'anatomia.

T. Fujimura, Y. Shimotoyodome, T. Nishijima, K. Sugata, H. Taguchi, S. Moriwaki, **Changes in hydration of the stratum corneum are the most suitable indicator to evaluate the irritation of surfactants on the skin,** Skin Research and Technology 2017; 23: 97-103

Background/Purpose: Irritancy levels of surfactants onhuman skin have not been clarified completely. The relationships between skin damage and changes of skin properties caused by various surfactants were investigated using noninvasive measurements.

E. Hahnel, U. Blume-Peytavi, C. Trojahn, G. Dobos, A. Stroux, N. Garcia Bartels, I. Jahnke, A. Lichterfeld-Kottner, H. Neels-Herzmann, A. Klasen, J. Kottner, **The effectiveness of standardized skin care regimens on skin dryness in nursing home residents: A randomized controlled parallel-group pragmatic trial,** International Journal of Nursing Studies 70 (2017), p. 1–10

Background: Aged residents of institutional long-term care facilities are at high risk for developing skin and tissue diseases. Besides various common skin problems, dry skin (xerosis cutis) is one of the most frequent skin conditions in this setting.

D. G. Mercurio, **Clinical scoring and instrumental analysis to evaluate skin types,** Clinical and Experimental Dermatology, 38, p. 302–309

Background. The biology of the skin is very complex, and there are a number of methods used to classify the different skin types. It is possible to measure or quantify the characteristics of the specific skin types, using a variety of techniques that can objectively evaluate the properties of the skin in a noninvasive manner.

B. Algiert-Zielińska, M. Batory, J. Skubalski, H. Rotsztejn, **Evaluation of the relation between lipid coat, transepidermal water loss, and skin pH,** International Journal of Dermatology, Volume 56, Issue 11, November 2017, p. 1192-1197

Objective: The epidermis is an epidermal barrier which accumulates lipid substances and participates in skin moisturizing. An evaluation of the epidermal barrier efficiency can be made, among others, by the measurement of the following values: the lipid coat, the transepidermal water loss (TEWL) index, and pH. Materials: The study involved 50 Caucasian, healthy women aged 19–35 years (mean 20.56). Methods: Measurements were made using Courage & Khazaka Multi Probe Adapter MPA 580: Tewameter TM 300, pH-Meter PH 905, Sebumeter SM 815. The areas of measurements included forehead, nose, left cheek, right cheek, chin, and thigh. Results: In the T-zone, the lipid coat was in the range between 0 and 270 μg/cm^2 (mean 128 μg/cm^2), TEWL between 1 and 55 g/m^2/h (mean 11.1 g/m^2/h), and pH 4.0–5.6 (mean 5.39). Lower values of the lipid coat up to 100 μg/cm^2 were accompanied by TEWL greater than 30 g/m^2/h and less acidic pH of 5.6–9.0. In the U-zone the range of lipid coat was up to 200 μg/cm^2 (mean 65.2 μg/cm^2), the skin pH remained 4.0–5.6 (mean 5.47), and TEWL was in the range between 1 and 20 g/m^2/h (mean 8.7 g/m^2/h). Lower values of the lipid coat up to 100 μg/cm^2 were accompanied by TEWL between 1 and 20 g/m^2/h and less acidic pH of 5.6–9.0. High values of the lipid coat between 180 and 200 μg/cm^2 were connected with TEWL of 1–15 g/m^2/h. On the skin of the thigh, we observed a very thin lipid coat – 35 μg/cm^2 (mean 5.6 μg/cm^2), pH (mean 5.37), and TEWL (mean 8.5 g/m^2/h) were considered by us to be within regular limits. Conclusions: In the T-zone, a thinner lipid coat resulted in relatively high TEWL and pH levels changing toward alkaline. In the U-zone, thinner lipid coat was accompanied by lower TEWL and pH changing toward alkaline. We also observed that

lower values of lipid coat up to 100 μg/cm^2 were associated with higher pH values ranging toward the basic character pH 5.6–9.0).

M.P. Wakeman, **An open-label forearm-controlled pilot study to assess the effect of a proprietary emollient formulation on objective parameters of skin function of eczema-prone individuals over 14 days,** Clinical, Cosmetic and Investigational Dermatology 2017:10, p. 275–283

Background: This study examines the effcacy of a new plant-based emollient and assesses product acceptability. Methods: Primary effcacy endpoints were improvement in transepidermal water loss, hydration, skin elasticity and frmness, erythema, and skin roughness and smoothness as measured using the versions of Tewameter, Corneometer, Cutometer, Mexameter, and Visioscan VC98, respectively. The cream was applied twice daily by 32 participants to an area of one forearm unaffected by eczema, while the same area of the other forearm was used as a control. Measurements were taken at day 0 and day 14. Secondary endpoints assessed the acceptability of the product. Results: At the end of 2 weeks, transepidermal water loss, hydration, skin elasticity and frmness, erythema, and skin roughness and smoothness improved. All changes were statistically signifcant (p<0.01). The rate of satisfaction with the emollient properties was 82%, and the rate of absorption into the skin was 88%. Results show that the emollient hydrates and repairs eczema-prone skin with high levels of acceptability.

M. Milani, A. Sparavigna, **The 24-hour skin hydration and barrier function effects of a hyaluronic 1%, glycerin 5%, and *Centella asiatica* stem cells extract moisturizing fluid: an intra-subject, randomized, assessor-blinded study,** Clinical, Cosmetic and Investigational Dermatology 2017:10, p. 311–315

Introduction: Moisturizing products are commonly used to improve hydration in skin dryness conditions. However, some topical hydrating products could have negative effects on skin barrier function. In addition, hydrating effects of moisturizers are not commonly evaluated up to 24 hours after a single application. Hyaluronic acid (HA) and glycerin are very well-known substances able to improve skin hydration. *Centella asiatica* extract (CAE) could exert lenitive, anti-inflammatory and reepithelialization actions. Furthermore, CAE could inhibit hyaluronidase enzyme activity, therefore prolonging the effect of HA. A fluid containing HA 1%, glycerin 5% and stem cells CAE has been recently developed (Jaluronius CS [JCS] fluid). Study aim: To evaluate and compare the 24-hour effects of JCS fluid on skin hydration and on transepidermal water loss (TEWL) in healthy subjects in comparison with the control site. Subjects and methods: Twenty healthy women, mean age 40 years, were enrolled in an intra-subject (right vs left), randomized, assessor-blinded, controlled, 1-day trial. The primary end points were the skin hydration and TEWL, evaluated at the volar surface of the forearm and in standardized conditions (temperature- and humidity-controlled room: 23°C and 30% of humidity) using a corneometer and a vapometer device at baseline, 1, 8 and 24 hours after JCS fluid application. Measurements were performed by an operator blinded for the treatments. Results: Skin hydration after 24 hours was signifcantly higher (P=0.001; Mann–Whitney U test) in the JCS-treated area in comparison with the control site. JCS induced a signifcant (P=0.0001) increase in skin hydration at each evaluation time (+59% after 1 hour, +48% after 8 hours and +29% after 24 hours) in comparison with both baseline (P=0.0001) and non-treated control site (P=0.001). TEWL after 24 hours was signifcantly lower (P=0.049; Mann–Whitney U test) in the JCS-treated area in comparison with the control site (13±4 arbitrary units [AU] vs 16±6 AU). JCS fluid signifcantly reduced post-stripping TEWL in comparison with baseline after 1, 8 and 24 hours (–52%, –32% and –48%, respectively). In the control site, TEWL was not reduced in comparison with baseline values at each time point's evaluation. Conclusion:A single application of JCS signifcantly improves skin hydration for up to 24 hours at the same time as improving skin barrier function.

Y. Xu, R. Ma, J. Juliandri, X. Wang, B. Xu, D. Wang, Y. Lu, B. Zhou, D. Luo, **Efficacy of functional microarray of microneedles combined with topical tranexamic acid for melisma - A randomized, self-controlled, split-face study**, Medicine 2017

To evaluate the efficacy of a functional microarray of microneedles (MNs) plus topical tranexamic acid (TA) for melasma in middleaged women in China. Thirty female subjects with melasma were enrolled in this study. The left or right side of the face was chosen randomly to be pretreated with a functional microarray of MNs, followed by topical 0.5% TA solution once per week for 12 weeks. The other half-face was the control, treated with a sham device plus topical 0.5% TA solution. At baseline and at weeks 4, 8, and 12 of treatment, clinical (photographic) evaluations and parameters determined by Visia were recorded. At baseline and week 12, patient satisfaction scores and the biophysical parameters measured by Mexameter were also recorded. Side effects were evaluated at baseline and at the end of the 12 weeks. In total, 28 women (93.3%) completed the study. The brown spots' scores measured by Visia were significantly lower on the combined therapy side than on the control side at 12

weeks after starting treatment; there was no significant difference between sides at 4 or 8 weeks. After 12 weeks, melanin index (MI) decreased significantly in both 2 groups, and the MI was significantly less on the combined side at week 12. Transepidermal water loss, roughness, skin hydration, skin elasticity, and erythema index showed no significant differences between 2 sides at baseline, 4, 8, and 12 weeks after treatment. Physicians' evaluations of photographs showed better results at week 12with combined therapy: >25% improvement was observed in the MNs plus TA side in 25 patients, and in the TA side in only 10 patients. Subjective satisfaction scores on both sides increased significantly. The participants were more satisfied with the results of the combined therapy side than the control side. No obvious adverse reactions were observed throughout the study. Combined therapy with a functional microarray of MNs and topical TA solution is a promising treatment for melasma.

A. Rajabi-Estarabadi, H. Hasanzadeh, A. Taheri, S.R. Feldman, A. Firooz, **The efficacy of short-term clobetasol lotion in the treatment of scalp psoriasis**, Journal of Dermatological Treatment, 2017

Background: Scalp psoriasis can have a considerable impact on patients' quality of life and is considered difficult to treat. Treatment failure may, however, be due to poor adherence, as application of topical treatments to hair bearing areas is difficult and time consuming and also poor communication between physician and patient. Objective: To assess the efficacy of short-term treatment of scalp psoriasis with topical clobetasol lotion. Materials and methods: Twelve patients with mild to severe scalp psoriasis were recruited for this study. Patients applied clobetasol 0.05% lotion twice daily for seven days. They were followed up with phone calls three days after starting the treatment. Skin hydration, transepidermal water loss (TEWL) and skin erythema were assessed noninvasively at baseline and end of study. Results: One week after treatment, median PSI score decreased significantly (p ¼ .002). There was also a significant decrease in median TEWL (p ¼ .012) and increase in skin hydration one week after treatment (p ¼ .010). Eighty three percent of patients were satisfied with treatment result and felt convenient with applying clobetasol lotion. Limitations: Lack of a long-term follow-up. Conclusions: Psoriasis is a long-term disease, and improving adherence in the short time could improve patient's adherence to treatment in long time.

J. Pardeike, R. Müller, **Bestimmung der Hautfeuchtigkeit, Hautelastizität und des Transepidermalen Wasserverlusts (TEWL),** pharmazie-lehrbuch.de

Hintergrund: Zur Bestimmung der Effektivität und Wirksamkeit von dermal zu applizierenden Arzneizubereitungen, kosmetischen Produkten und Rohstoffen sind die Bestimmung der Hautfeuchtigkeit, Hautelastizität und des transepidermalen Wasserverlusts (TEWL) weit verbreitete Methoden.

A. Schulz, P.C. Fuchs, J.P. Stromps, H. Heinel, **Bromelain based enzymatic debridement versus traditional surgical debridement in the treatment of deep dermal facial burn injury,** Oral Presentation, 17th European Burn Association Congress EBA, Barcelona, September 2017

Introduction: Tissue preserving debridement is essential for an optimal long term aesthetic outcome in deep dermal facial burns. Tangential burn eschar excision is still the gold standard. In the recent past promising results were reported for selective and precise eschar removal by NexoBrid, a Bromelain based enzymatic debridement agent. Methods: In a single-centre clinical trial we compared 13 versus 13 patients which received enzymatic and surgical debridement in deep dermal facial burn injury. We assessed time to complete healing, complications in healing process and scar quality after more than 12 months for both groups. Results: 77% of the facial burns that had been debrided enzymatically were found more superficial burned than initially assessed. Enzymatic debridement significantly reduced time to complete wound closure after admission (19.85 days versus 42.23 days, p=0.002), and after enzymatic eschar removal (18.92 days versus 35.62 days, p=0.042). The number of procedures to complete debridement (1.00 versus 1.77, p=0.003) and the need of autografting (15% versus 77%, p=0.002) were significantly reduced in the enzymatic debridement group. Scar quality was superior compared to surgical debridement after 12 months regarding pigmentation (p=0.016), thickness (p=0.16), relief (p=0.10), pliability (p=0.01), surface area (p=0.004), stiffness (p=0.023), thickness (0.011) and scar irregularity (p=0.011). Regarding erythema and melanin, viscoelasticity and pliability, trans - epidermal water loss or laser tissue oxygen saturation, haemoglobin level and microcirculation we found no significant differences for treated and untreated skin in the enzymatic debridement group. Conclusion: Compared to our current SOC we found promising results for enzymatic debridement of deep dermal facial burns with NexoBrid® regarding healing potential, time-efficient treatment and long term caring.

S. Raab, M. Yatskayer, S. Lynch, M. Manco, C. Oresajo, **Clinical Evaluation of a Multi-Modal Facial Serum That Addresses Hyaluronic Acid Levels in Skin**, Journal of Drugs in Dermatology, Volume

16, Issue 9, September 2017, p. 884-890

Background: Hyaluronic acid (HA), the major glycosaminoglycan present in the human skin, is a key contributor to water retention and mechanical support in skin. The level, size, and functionality of cutaneous HA are known to diminish with age. Topical treatments designed to increase the HA content of skin have been met with limited success.The purpose of this study was to evaluate the tolerance and efficacy of a multi-modal facial serum containing HA, Proxylane (C-Xyloside), purple rice extract, and dipotassium glycyrrhizate in addressing HA levels in skin. Methods: A 12-week, single center, clinical study was conducted on 59 women with mild to moderate photodamage. Clinical grading to assess the efficacy and tolerability was conducted on the face at baseline and at weeks 4, 8, and 12. Bioinstrumentation measurements were taken, including corneometer, tewameter, ultrasound, and standardized digital imaging. A randomized subset of 20 subjects from the study population had 3 mm punch biopsies collected for quantitative RT-PCR analysis from 2 sites on the face at baseline and week 12. Additionally, a 4-week, single center, clinical study was conducted on the photodamaged forearms of 12 subjects. At both baseline and week 4, a 4 mm punch biopsy was obtained from the subjects' randomized forearms. Biopsy samples were subjected to immunohistochemical staining and analysis of HA content. Results: Statistically-significant improvements in all facial skin attributes (weeks 4, 8, and 12), stratum corneum hydration (week 12), and transepidermal water loss (week 12) were observed.Tolerability was excellent, with no increases in irritation parameters noted. A significant increase of HA content in skin after 4 weeks of treatment was observed. By PCR analysis, there was a significant increase in hyaluronan synthase 2, as well as a significant increase in collagen type 1a1 after 12 weeks of application. Conclusion: The findings suggest that this novel topical facial serum is capable of stimulating HA and skin extracellular matrix components, as well as improving skin hydration and skin quality in women with mild to moderate photodamage.

H. Aoshima, **Fullerenes improve fine wrinkles around eyes**, PERSONAL CARE ASIA, May 2017, p. 58-61 and PERSONAL CARE EUROPE, September 2017, p. 37-40

Formation of fine wrinkles during the photo-ageing of skin is caused by reactive oxygen species (ROS) generated by exposure of the skin to ultraviolet (UV) light. Therefore, it is very important to quickly scavenge the ROS generated in skin. Applying a radical scavenger such as an antioxidant to skin is effective for the prevention of wrinkles. However, most antioxidants are unstable in the presence of light and heat, and easily deteriorate under exposure to UV light. However, fullerene (C60) is an antioxidant that is stable even in the presence of light and heat. Hence, fullerene was hypothesised to be effective in preventing the formation of fine wrinkles. A clinical trial demonstrated that, compared to a placebo cream, a cream containing fullerene significantly reduced the area of wrinkled skin, without any adverse effects; the wrinkle-improving effect may result from the regulation of gene expression involved in wrinkle formation and skin barrier function via ROS scavenging by fullerene.

U. van Daele, P. Moortgat, R. Clijsen, J. Meirte, M. Anthonissen, K. Maertens, P. Clarys, **Bioavailability of scarred skin during application of a vaso-active substance,** Poster Presentation, 17th European Burn Association Congress EBA, Barcelona, September 2017

Objectives: The skin acts as a mechanical or insulation barrier in physiotherapy interventions. The evidence of topical applications in physiotherapy is poor or lacking in skin and (burn) scar research. In this study, non-invasive skin measurements will be used to evaluate bioavailability of scarred skin during application of a vaso-active substance. Methods: Two groups consisting of 14 scar sites and 8 healthy skin sites are selected based upon predefined inand exclusion criteria. Baseline measurements on a 6cm2 scar/skin site include skin color, trans epidermal water loss, skin hydration and epidermal and dermal thickness. A filter disk saturated with a Methylnicotinate (MN) solution (0.005M) is applied for 30 seconds on the marked scar/skin site. Bioavailability is assessed by quantification of an MN-induced skin redness observed with the Chromameter® over 65 minutes after the MN application by a standardised protocol. Change in skin color is compared using a repeated measures ANOVA. Spearman correlations between skin color and all independent variables are calculated. Between group differences are tested by the Mann-WhitneyU. Spearman correlation coefficients between skin hydration outcome measures are calculated. Results: A significant groupxtime effect for chroma a* values is demonstrated (p=0,044). A significant difference between both groups is found for the sum of total color change (p=0,02) and for dermal thickness (p=0,044). A significant difference between both groups is found for the sum of total color change (p=0,02) and for dermal thickness (p<0,0001). A correlation between the latter parameters is significant (r=,587, p=0,004). Hydration values of the Corneometer correlate significantly with the Grey Index T of the Moisture Map® (r=0,427, p=0,047). Conclusion: The dermal thickness is a determining factor for bioavailability of MN in scars. Epidermal thickness and TEWL were no significant factors of influence on skin color within the current study. The Moisture Map® can be used

as an assessment tool for skin hydration, especially the Grey Index T seems a valuable parameter based upon the current primary study results.

K. Steventon, L.K. Wells, S.K. Greetham, H.S. Jones, **A Great Barrier, Enhanced: A Review of Oral PUFA Supplements for Skin,** C&T online http://www.cosmeticsandtoiletries.com/formulating/category/nutricosmetics, August 217

Skin breakdown is implicated in many areas of health, and transepidermal (TEWL) water loss can indicate the integrity of the skin barrier. This article reviews the literature for evidence of how oral supplementation with polyunsaturated fatty acids (PUFA) could positively impact TEWL, and therefore, skin barrier functioning in healthy individuals.

C. Riethmuller, M.A. McAleer, S.A. Koppes, A. Rawad, J. Franz, M. Haftek, L.E. Campbell, S.F. MacCallum, W.H. Irwin McLean, A.D. Irvine, S. Kezic, **Filaggrin breakdown products determine corneocyte conformation in patients with atopic dermatitis,** in S.A. Koppes: Stratum Corneum Biomarkers for Inflammatory Skin Diseases, Amsterdam 2017

Background: Loss-of-function (LOF) mutations in the filaggrin gene (FLG) are a well-replicated risk factor for atopic dermatitis (AD) and are known to cause an epidermal barrier defect. The nature of this barrier defect is not fully understood. Patients with AD with FLG LOF mutations are known to have more persistent disease, more severe disease, and greater risk of food allergies and eczema herpeticum. Abnormalities in corneocyte morphology have been observed in patients with AD, including prominent villus-like projections (VP); however, these ultrastructural features have not been systematically studied in patients with AD in relation to FLG genotype and acute and convalescent status. Objective: We sought to quantitatively explore the relationship between FLG genotype, filaggrin breakdown products (natural moisturizing factor (NMF)), and corneocyte morphology in patients with AD. Methods: We studied 15 children at first presentation of AD and after 6 weeks of standard therapy. We applied atomic force microscopy to study corneocyte conformation in patients with AD stratified by FLG status and NMF level. By using a new quantitative methodology, the number of VPs per investigated corneocyte area was assessed and expressed as the Dermal Texture Index score. Corneocytes were also labeled with an anti-corneodesmosin antibody and visualized with scanning electron microscopy. Results: We found a strong correlation between NMF levels and Dermal Texture Index scores in both acute and convalescent states (respective $r = -0.80$ and -0.75, $P < .001$ and $P = .002$). Most, but not all, VPs showed the presence of corncodesmosin abundantly all over the cell surface in homozygous/compound heterozygous FLG patients and, to a lesser extent, in heterozygous and wild-type patients. Conclusions: NMF levels are highly correlated with corneocyte morphology in patients with AD. These corneocyte conformational changes shed further insight into the filaggrin-deficient phenotype and help explain the barrier defect in patients with AD with FLG LOF mutations.

S.A. Koppes, F. Charles, L.A. Lammers, M. Frings-Dresen, S. Kezic, T. Rustemeyer, **Efficacy of a cream containing ceramides and magnesium in the treatment of mild to moderate atopic dermatitis: a randomized, double-blind, emollient- and hydrocortisone-controlled trial**, in S.A. Koppes: Stratum Corneum Biomarkers for Inflammatory Skin Diseases, Amsterdam 2017

The aim of this randomized controlled trial was to assess the efficacy of a cream containing ceramides and magnesium (Cer-Mg) in the treatment of mild to moderate atopic dermatitis and to compare it with hydrocortisone and a commonly used emollient (unguentum leniens; cold cream). A total of 100 patients, randomized into 2 groups, were treated for 6 weeks simultaneously (left vs. right side of the body) with either Cer-Mg and hydrocortisone (group I) or Cer-Mg and emollient (group II). The primary outcome was a reduction in severity of lesions as assessed by (local) SCORAD (SCORing Atopic Dermatitis). Levels of trans-epidermal water loss (TEWL), skin hydration, and natural moisturizing factors (NMF) were then measured. After 6 weeks, group I showed comparable significant improvement in SCORAD and TEWL, while in group II, the decrease in SCORAD and TEWL was significantly greater after Cer-Mg compared with emollient. Finally, Cer-Mg cream was more effective in improving skin hydration and maintenance of levels of NMFthan hydrocortisone and emollient.

S.A. Koppes, R. Brans, S. Ljubojevic-Hadzavdic, M. Frings-Dresen, T. Rustemeyer, S. Kezic, **Stratum corneum tape stripping: monitoring of inflammatory mediators in atopic dermatitis patients using topical therapy**, in S.A. Koppes: Stratum Corneum Biomarkers for Inflammatory Skin Diseases, Amsterdam 2017

Objective: The aim of this study was to explore the tape strip sampling technique in the assessment of stratum corneum levels of inflammatory mediators in a clinical trial setting. Methods: Thirty-eight inflammatory mediators were analyzed by a multiplex-assay in the stratum corneum, collected by adhesive tapes before and after 6 weeks of therapy, in mild and moderate atopic dermatitis

(AD) patients (n = 90). Treatment was a ceramide- and magnesium-containing emollient. Results: Twenty-four mediators could quantitatively be determined. The Th2 mediators interleukin (IL)-4, IL-13, CCL2 (monocyte chemotactic protein-1), CCL22 (macrophage-derived chemokine), and CCL17 (thymus and activationregulated chemokine (TARC)) were significantly decreased after therapy as well as IL-ip, IL-2, IL-8 (CXCL8), IL-10, acute-phase protein serum amyloid A, C-reactive protein, and vascular adhesion molecule-1. The decrease of CCL17 and IL-8 was correlated with the decrease in disease severity in a subgroup of moderate AD individuals. Conclusion: Stratum corneum tape stripping offers a minimally invasive approach for studying local levels of immunomodulatory molecules in the skin. CCL17 (TARC) and IL-8 were found to be the most promising biomarkers of AD and might be useful for investigating the course of skin diseases and the effect of local therapy.

K. Ogai, M. Matsumoto, M. Aoki, R. Ota, K. Hashimoto, R. Wada, M. Kobayashi, J. Sugama, **Wash or wipe? A comparative study of skin physiological changes between water washing and wiping after skin cleaning,** Skin Research and Technology 2017; 23: p. 519-524

Background/purpose: Presently, skin-cleaning agents that claim to be removed by water or wiping alone are commercially available and have been used for the purpose of bed baths. However, there is a lack of knowledge on how water washing and wiping differently affect skin physiological functions or ceramide content. The aim of this study was to compare the effects of water washing and wiping on skin physiological functions and ceramide content. Methods: Three kinds of the cleaning agents with different removal techniques (ie, water washing and wiping) were used in this study. Skin physiological functions (ie, transepidermal water loss, skin hydration, and skin pH) and skin ceramide content were measured before and after seven consecutive days of the application of each cleaning agent. Results: No significant differences in skin physiological functions or ceramide content were observed between water washing and wiping. Conclusion: Cleaning agents that claim to be removed by water washing or wiping do not affect skin physiological functions or ceramide content by either removal method.

E. Hahnel, U. Blume-Peytavi, C. Trojahn, J. Kottner, **Associations between skin barrier characteristics, skin conditions and health of aged nursing home residents: a multicenter prevalence and correlational study,** BMC Geriatrics (2017) 17:263

Background: Geriatric patients are affected by a range of skin conditions and dermatological diseases, functional limitations and chronic diseases. Skin problems are highly prevalent in elderly populations. Aim of this study was to investigate possible associations between health, functional and cutaneous variables in aged long-term care residents. Methods: This observational, cross-sectional, descriptive prevalence study was conducted in a random sample of 10 institutional long-term care facilities in Berlin. In total, n = 223 residents were included. Demographic and functional characteristics, xerosis cutis, incontinence associated dermatitis, pressure ulcers and skin tears were assessed. Stratum corneum hydration, transepidermal water loss, skin surface pH and skin temperature were measured. Data analysis was descriptive and explorative. To explore possible bivariate associations, a correlation matrix was created. The correlation matrix was also used to detect possible collinearity in the subsequent regression analyses. Results: Mean age (n = 223) was 83.6 years, 67.7% were female. Most residents were affected by xerosis cutis (99.1%; 95% CI: 97.7% - 100.0%). The prevalence of pressure ulcers was 9.0% (95% CI: 5.0% - 13.0%), of incontinence associated dermatitis 35.4% (95% CI: 29.9% - 42.2%) and of skin tears 6.3% (95% CI: 3.2% - 9.5%). Biophysical skin parameters were not associated with overall care dependency, but with age and skin dryness. In general, skin dryness and measured skin barrier parameters were associated between arms and legs indicating similar overall skin characteristics of the residents. Conclusion: Prevalence of xerosis cutis, pressure ulcers and skin tears were high, indicating the load of these adverse skin conditions in this population. Only few associations of demographic characteristics, skin barrier impairments and the occurrence of dry skin, pressure ulcers, skin tears and incontinence-associated dermatitis have been detected, that might limit the diagnostic value of skin barrier parameters in this population. Overall, the measured skin barrier parameters seem to have limited diagnostic value for the reported skin conditions except xerosis cutis.

M.A. Røpke, C. Alonso, S. Jung, H. Norsgaard, C. Richter, M.E. Darvin, T. Litman, A. Vogt, J. Lademann, U. Blume-Peytavi, J. Kottner, **Effects of glucocorticoids on stratum corneum lipids and function in human skin—A detailed lipidomic analysis,** Journal of Dermatological Sciences (2017)

Background: Topical glucocorticoids (GCs) are known to induce atrophy of human skin including thinning of epidermal and dermal compartments by influencing keratinocyte proliferation and synthesis of extracellular matrix proteins. GCs are also known to reduce skin barrier integrity but little is known about the changes in lipid composition in human skin following topical administration of GCs. Objective: This study investigated the effects of GCs on stratum corneum (SC) function and lipid profile of human skin in vivo. Method: Over a period of 4 weeks, 16 healthy volunteers were treated on the forearms once

daily with topical clobetasol proprionate (CP), betamethasone diproprionate (BDP) or vehicle. One day after last application (Day 29) SC lipids were collected by tape stripping and analysed by a high sensitivity liquid chromatography–mass spectrometry method. Gene expression was analysed in skin biopsies. The full skin, epidermal and SC thickness were assessed by ultrasound, optical coherence tomography and confocal microscopy, respectively, and barrier integrity was assessed by measuring transepidermal water loss (TEWL). Results: Compared to vehicle controls, GCs induced significant alterations in SC lipid profiles. CP caused a reduction in 98 lipids of 226 analysed while BDP treatment only resulted in a significant change of 29 lipids. Most pronounced changes occurred among long chain, ester-linked, ceramide classes while other ceramide classes were much less affected. Almost the complete profile of triacylglycerols (TGs) was significantly decreased by CP while more modest changes were observed in free fatty acids. Topical GCs reduced the thickness of skin layers and increased TEWL. GC treatment also induced changes in expression of genes coding for extracellular markers and enzymes involved in lipid synthesis. Conclusions: This study shows a reduction in specific SC lipid classes following topical GC treatment of human skin and contributes to the characterisation of the barrier disruption in human skin induced bytopical steroids.

E. Hahnel, U. Blume-Peytavi, C. Trojahn, G. Dobos, A. Stroux, N. Garcia Bartels, I. Jahnke, A. Lichterfeld-Kottner, H. Neels-Herzmann, A. Klasen, J. Kottner, **The effectiveness of standardized skin care regimens on skin dryness in nursing home residents: A randomized controlled parallel-group pragmatic trial,** International Journal of Nursing Studies 70 (2017) 1–10

Background: Aged residents of institutional long-term care facilities are at high risk for developing skin and tissue diseases. Besides various common skin problems, dry skin (xerosis cutis) is one of the most frequent skin conditions in this setting. Objectives: To investigate the effectiveness of two structured skin care regimens in comparison to routine skin care on xerosis cutis in nursing home residents. Design: A multi-center, pragmatic, randomized, controlled, investigator blinded study with three parallel groups. Settings: The study was conducted in a random sample of ten out of 291 institutional long-term care facilities of the federal state of Berlin, Germany. Participants: Long-term care residents being 65+ years affected by dry skin were included. Methods: The residents were allocated into one of three study groups. Two interventional groups used standardized skin care regimens, consisting of a body wash and twice daily applications of leave-on products for eight weeks. The third control group performed skin care as usual. All participating residents were examined at baseline and after 4 and 8 weeks. Xerosis cutis was measured with the Overall Dry Skin score. Instrumental skin barrier measurements were performed at baseline and after 8 weeks. Diaries were used to document washing and skin care frequencies. Results: In total, 133 residents were included and allocated to one of the three groups. Mean age was 83.8 (SD 8.3) years, 65.4% were female and most residents had care levels I (42.9%) or II (42.9%) according to the German Social Code Book XI. Mean Barthel score was 46.8 (SD 24.2) and mean Braden score was 17.6 (SD 3.7). Leg skin areas were drier compared to arms and trunk areas. At the end of the study the Overall Dry Skin scores in the intervention groups were lower compared to the control group. There were statistically significant improvements of skin dryness in both intervention groups compared to the control group over time. Conclusions: The results of this pragmatic trial indicate that structured skin care regimens are effective in reducing skin dryness in aged nursing home residents within eight weeks.

T. Tomova-Simitchieva, A. Lichterfeld-Kottner, U. Blume-Peytavi, J. Kottner, **Comparing the effects of 3 different pressure ulcer prevention support surfaces on the structure and function of heel and sacral skin: An exploratory cross-over trial,** International Wound Journal, 2017; p. 1–9

Special support surfaces are key in pressure ulcer prevention. The aim of this study was to measure the effects of 3 different types of mattresses (reactive gel, active alternating air, basic foam) on skin properties of the sacral and heel skin after 2 hours loading. Fifteen healthy females (median age 66 years) were included. Transepidermal water loss, skin surface temperature, erythema, stratum corneum hydration, epidermal hydration, skin extensibility, elastic function, and recovery as well as skin roughness parameters were measured under controlled room conditions before loading, immediately after loading, and 20 minutes postloading in the supine position on the different mattresses. The highest increases in transepidermal water loss, skin temperature, and erythema were observed for the foam mattress after loading, indicating higher deformation and occlusion. Cutaneous stiffness decreased in all 3 groups, indicating structural changes during loading. There was a substantial decrease of mean roughness at the heel skin in the foam group, leading to a flattening of the skin surface. Study results indicate that the type of support surface influences skin structure and function during loading. The gel and air mattress appeared to be more protective compared with the foam mattress, but the differences between the gel and air were minor.

J. Kottner, V. Kanti, G. Dobos, E. Hahnel, A. Lichterfeld-Kottner, C. Richter, K. Hillmann, A. Vogt, U. Blume-Peytavi, **The effectiveness of using a bath oil to reduce signs of dry skin: A randomized controlled pragmatic study,** International Journal of Nursing Studies 65 (2017), p. 17–24

Background: Dry skin (xerosis cutis) is increasingly recognized as a relevant health problem in daily life and in health and nursing care. The use of bath additives such as oils is common to reduce dry skin, but empirical evidence supporting this practice is limited. Objectives: The aim of this study was to investigate the effectiveness of using a bath oil additive in improving skin barrier function and ameliorating dry skin in comparison to non-oil containing skin cleansers for bathing or showering. Design: Single centre randomized observer blind pragmatic parallel group trial. Settings: Outpatient/community care. Participants: Volunteers showing clinically mild to moderate dry skin recruited from the city of Berlin. Methods: Healthy children and adults were randomly assigned to use either a commercially available bath oil or to continue using their regular non-oil containing skin cleansers every other day over a study period of 28 days. Skin barrier parameters and the severity of dry skin were assessed at baseline and at two follow-up visits at the study centre. Transepidermal water loss was the primary outcome. Results: All sixty participants randomized completed the trial. Median age was 32.5 (IQR 8.3 to 69) years. At the end of study the mean transepidermal water loss in the intervention group was statistically significant lower compared to the control group (mean difference 1.9 (95% CI 3.1 to 0.8) g/m2/h). Stratum corneum hydration was statistically significantly higher in the intervention group at the end of the study. Skin surface pH and roughness were comparable in both groups and remained unchanged, while both groups showed a trend to improvement in dry skin symptoms Conclusions: This pragmatic trial provides empirical evidence that the regular use of the investigated bath oil is effective in improving the skin barrier function in children and adults with mild dry skin when used in routine skin care and supports its use as a basic element for the management of a broad spectrum of dry skin conditions.

M. Schario, T. Tomova-Simitchieva, A. Lichterfeld, H. Herfert, G. Dobos, N. Lahmann, U. Blume-Peytavi, J. Kottner, **Effects of two different fabrics on skin barrier function under real pressure conditions**, Journal of Tissue Viability 26 (2017), p. 150 -155

Background: Pressure Ulcers (PUs) are a severe form of skin and soft tissue lesions, caused by sustained deformation. PU development is complex and depends on different factors. Skin structure and function change during prolonged loading on PU predilection sites and surfaces being in direct contact with skin are likely to have an impact as well. Little is known about the influence of fabrics on skin function under pressure conditions. Objectives: To investigate skin responses to sustained loading in a sitting position and possible differences between two fabrics. Methods: Under controlled conditions 6 healthy females (median age 65.0 (61.0e67.8) years) followed a standardized immobilization protocol of a sitting position for 45 min on a spacer and on a cotton fabric. Before and after the loading period skin surface temperature, stratum corneum hydration, transepidermal water loss (TEWL), erythema, skin elasticity and 'relative elastic recovery' were measured at the gluteal areas. Results: A 45 min sitting period caused increases of skin surface temperature and erythema independent of the fabric. Loading on spacer fabric showed a two times higher increase of TEWL compared to cotton. Stratum corneum hydration showed slight changes after loading, skin elasticity and 'relative elastic recovery' remained stable. Conclusions: Sitting on a hard surface causes skin barrier changes at the gluteal skin in terms of stratum corneum hydration and TEWL. These changes are influenced by the fabric which is in direct contact to the skin. There seems to be a dynamic interaction between skin and fabric properties especially in terms of temperature and humidity accumulation and transport.

K.C. Bernhöft, M. Streker, M. Kerscher, **Evaluation einer kosmetischen Maske bestehend aus einem Puder (27% Vitamin C, 4% Emblica Extrakt) und einer Lösung (40% Glykolsäure, 10% Zitronensäure) in Kombination mit einem Produkte-Set zur Reduktion fazialer Hyperpigmentierung**

Fragestellung: Wie effektiv ist die Anwendung einer kosmetischen Peelingmaske in Kombination mit einem Produkte Set für zuhause bei der Reduzierung von Hyperpigmentierung bei Frauen? Methodik: In dieser Pilotstudie wurden 2×12 Probandinnen, insgesamt 24, zwischen 25 und 60Jahren in je einem Zeitraum von 12Wochen untersucht. Die Peelingmaske wurde 6x mit je einem Abstand von 10–14Tagen auf dem gesamten Gesicht nach einem speziellen Behandlungsablauf angewendet. Während des gesamten Studienzeitraums wurden die Probandinnen dazu angehalten das ausgegebene Produkte Set zuhause anzuwenden. Zur Evaluation der direkten Hautreaktion wurde eine Probanden Befragung, als auch eine Experten Einschätzung, zu jeder Visite eingeholt. Zusätzlich wurde zur Effekt Feststellung die standardisierte Fotographie (Visia, complexing analysis), Mexametrie und Probanden Befragungen vor Beginn der Studie, an Tag 42 und an Tag 84 angewendet. Die Verträglichkeit der Behandlung, die Corneometrie, der transepidermale Wasserverlust, als auch der pH

Wert wurden mittels biophysikalischer Messungen festgehalten. Ergebnis: Die Probanden stellten in den Befragungen eine Verbesserung der Hauttextur, Ebenmäßigkeit und des gesamt Erscheinungsbildes der Haut fest. Größtenteils sind die Hyperpigmentierungen nach Anwendung der Peelingmaske und des Produkte Sets zurückgegangen. Die Hautfarbe, gemessen an Melanin und Hämoglobin (Erytheme) ist schwächer geworden, verglichen zu den Vorab-Messungen. Die Hautverträglichkeit gemessen an den biophysikalischen Werten ist gegeben gewesen. Schlussfolgerung: Die Anwendung der Peelingmaske, wie auch der Heimpflege-Produkte war verträglich und konnte eine Verbesserung der Haut erreichen. Dies lässt darauf schließen, dass ein oberflächliches, kosmetisches Fruchtsäurepeeling, in diesem Fall in Form einer Peelingmaske, mit einem ergänzendem Produkte Set für zuhause, eine zufriedenstellende und verträgliche Alternative zu aufhellenden Produkten auf dem Markt darstellt.

H.S. Scheer, **Untersuchung zur Hautbarriere bei Atopischem Ekzem und Filaggrinmutation,** Dissertation, Klinik und Poliklinik für Dermatologie und Allergologie am Biederstein, TU München, Germany, August 2017

Der Begriff Atopie leitet sich von dem griechischen Wort *atopos* ab und bedeutet „nicht am richtigen Platz“ oder „seltsam“. Er wurde 1923 eigens für die Beobachtungen von Coca und Cooke kreiert, die damit eine abnorme Hypersensitivitätsreaktion gegen ursprünglich harmlose Umweltsubstanzen beschreiben wollten. Wichtig war ihnen dabei die Abgrenzung zur Anaphylaxie und Allergie im Sinne einer Serumkrankheit (Coca & Cooke, 1923). Seitdem variierte die Begriffsdefiniton stark und ist Gegenstand andauernder Kontroversen.

N.R. Ngatu, M Tanaka, M. Ikeda, M. Inoue, S. Kanbara, S. Nojima, **Sujiaonori-Derived Algal Biomaterials Inhibit Allergic Reaction in Allergen-Sensitized RBL-2H3 Cell Line and Improve Skin Health in Humans**, J. Funct. Biomater, 2017, 8, 37

Sujiaonori, a river alga growing in the Kochi prefecture, Japan, contains several bioactive compounds such as sulfated polysaccharides (ulvans), !-3 fatty acids, and vitamins. Dietary intake of this alga-based supplement has been reported to increase circulatory adiponectin, a salutary hormone that is reported to be associated with healthy longevity and prevents a number of cardiovascular and metabolic disorders. This report highlights the anti-allergic and skin health enhancing effects of Sujiaonori-derived ulvan (Tosalvan) and supplement, respectively. RBL-2H3 cell line was used to investigate the anti-allergic effect of algal SP through the evaluation of β-hexosaminidase activity. Algal sulfated polysaccharides or SP (Tosalvan, Yoshino SP) were extracted from powders of dried alga samples provided by local food manufacturers. Report on the effect of daily dietary intake of Sujiaonori-based supplement on skin health is part of a four-week clinical investigation that, in comparison with a supplement made of 70% corn starch powder and 30% spinach powder mixture (twice 3 g daily), explore the beneficial effects of Sujiaonori algal biomaterial (SBM; 3 g taken twice daily) on cardiovascular, gastrointestinal and skin health in a sample of Japanese women. Transepidermal water loss (TEWL) was the skin health marker used in this study and was measured with the use of a corneometer. Significant reduction of β-hexosaminidase activity was observed in Tosalvan and Yoshino SP-treated cells (vs. control; $p < 0.05$), whereas dietary intake of SBM markedly reduced TEWL level after four weeks of supplementation, as compared to baseline TEWL ($p < 0.001$). Additionally, SBM improved TEWL better than the control product ($p < 0.001$). Findings contained in this report suggest that Sujiaonori-derived Tosalvan and Yoshino SP have anti-allergic potential and that the dietary intake of SBM has a beneficial effect on skin health.

C. Korponya, E. Szél, Z. Behány, E. Varga, G. Mohos, Á. Dura, S. Dikstein, L. Kemény, G. Erös, **Effects of Locally Applied Glycerol and Xylitol on the Hydration, Barrier Function and Morphological Parameters of the Skin**, Acta Derm Venereol. 2017

Glycerol and xylitol hydrate the skin and improve its barrier function over a short period. We studied the effects of glycerol and xylitol on the physiological properties and morphology of the skin after longer-term application. Twelve volunteers with dry skin were examined. Three areas on the arms were determined. Area 1 served as untreated control. The vehicle was applied to area 2, while area 3 was treated twice daily with a formulation containing glycerol (5%) and xylitol (5%) for 14 days. Transepidermal water loss (TEWL), hydration and biomechanical properties of the skin were monitored. Biopsies were taken for routine histology and immunohistochemistry for flaggrin and matrix metalloproteinase-1 (MMP-1). The polyols increased the skin hydration and protein quantity of flaggrin, elevated the interdigitation index, decreased the TEWL and improved the biomechanical properties of the skin, but did not change the protein expression of MMP-1. A combination of glycerol and xylitol can be useful additional therapy for dry skin.

J. Liu, Y. Xu, T.-K. Lin, C. Lv, P.M. Elias, M.Q. Man, **Topical Histamine Stimulates Repigmentation of Nonsegmental Vitiligo by a Receptor-Dependent Mechanism**, Skin Pharmacol Physiol, 2017;30: p. 139–145

Background: Though vitiligo is a common depigmentary disorder, it still represents a substantial therapeutic challenge. Therapeutic options are limited in part due to its uncertain etiology. Objective: Because recent studies suggest that histamine stimulates melanogenesis in vitro, we determined here whether topical histamine stimulates repigmentation in patients with stable, nonsegmental vitiligo. Methods: A total of 23 otherwise normal volunteers with vitiligo, including 14 males and 9 females aged 6–59 years (mean age 29.2 ± 2.8), were enrolled in this study. 1% histamine in distilled water was applied to the lesions twice daily for 5 weeks, while comparable lesions, treated with distilled water alone, served as the controls. The melanin index was measured on the uninvolved and lesional skin sites before and after 5 weeks of treatments using the melanin/erythema probe connected to a Courage-Khazaka MPA5 (Cologne, Germany). Changes in epidermal permeability barrier were also assessed at the same time point. To determine whether histamine-induced repigmentation is receptor-dependent, both ears of C57BL/6J mice were treated topically with 5% cimetidine, a histamine type 2 receptor (H2r) antagonist, twice daily for 10 days. One hour after each cimetidine application, the right ear was treated topically with 10% histamine, while vehicle alone was applied to the left ear. Changes in melanin index were measured 24 h after the last application of histamine and vehicle as described in the human study. Results: In patients with vitiligo treated with vehicle alone for 5 weeks, the melanin index remained unchanged, while topical histamine treatment increased the melanin index by 38% ($p < 0.001$ vs. both vehicle and pretreatment), which was paralleled by a >60% reduction in lesion surface area. Moreover, topical histamine accelerated permeability barrier recovery. No adverse events were observed following histamine applications. In mice, topical histamine significantly increased the melanin index, while topical co-applications of the H2r antagonist (cimetidine) prevented the expected histamineinduced increase in melanin index. Conclusions: These studies indicate that topical histamine or an H2r agonist could be useful for treating nonsegmental vitiligo, but further clinical studies in large populations will be required to validate the efficacy and safety of this approach.

S.H. Han, J.W. Park, **Diabetic and sympathetic influences on the water permeability barrier function of human skin as measured using transepidermal water loss - A case-control study**, Medicine (2017) 96:45

The presence of long-standing hyperglycemic conditions has been suggested to lead to many skin problems associated with an impaired skin barrier function. However, the relationship between impaired skin barrier status and altered peripheral nervous system function has not yet been determined. The purpose of this study was to investigate the water evaporation rate as a measure of the permeability barrier function of diabetic skin and its relationship to diabetic sensorimotor polyneuropathy (DSPN) and peripheral autonomic neuropathy (PAN) using well-controlled confounding variables. This case-control study included 42 participants with chronic diabetes and 43 matched healthy controls. The diabetic group underwent a nerve conduction study and sympathetic skin response (SSR) test to confirm the presence of DSPN and PAN, respectively. Different skin regions were analyzed using the noninvasive Tewameter instrument (Courage+Khazaka Electronic GmbH, Cologne, Germany). The impacts of PAN, DSPN, age, and diabetes duration on the values of transepidermal water loss (TEWL) were each analyzed and compared between the groups. Regardless of the presence of DSPN or PAN, the TEWL values as measured on the distal extremities were significantly lower in thediabetic group than in the control group. In the diabetic group, participants with abnormal SSR test results showed decreased TEWL values in the finger, sole, and first toe, as compared with participants with normal SSR test results. In the control group, age showed a negative correlation with the TEWL values with respect to some measured regions. However, in the diabetic group, there was no significant correlation between either patient age or diabetes duration and TEWL values. The presence of a long-term hyperglycemic state can reduce the permeability barrier function of the skin, a phenomenon that might be related to the presence of an impaired peripheral sympathetic nervous system, rather than peripheral sensorimotor denervation.

Xi Li, C. Yuan, L. Xing, P. Humbert, **Topographical diversity of common skin microflora and its association with skin environment type: An observational study in Chinese women**, Scientific Reports, (2017) 7:18046

This study evaluated cutaneous microbial distribution, and microbial co-occurrence at different body sites and skin environments in Chinese women (39.6 ± 11.9 years, N= 100) during the winter season. Microbial distribution (*Propionibacterium acnes*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Lactobacillus*, Pseudomonadaceae, and *Malassezia furfur*), association with biomarkers (antimicrobial peptides: LL-37, β-defiensins [HBD-2, HBD-3]), and claudin-1) and skin biophysical

parameters (transepidermal water loss, pH, skin scaliness and roughness, sebum and hydration levels) were also determined. Skin sites (glabella [GL], hand-back [HB], interdigital web-space [IS], antecubital fossa [AF], volar forearm [VF], back [BA]) were classified as normal, oily or dry based on two-step cluster analysis and exposed or unexposed (uncovered or covered by clothes, respectively) based on seasonal apparel. Pseudomonadaceae and *Staphylococcus aureus* had the highest and lowest detection rate respectively at all sites. Cluster analysis identified skin sites as 'normal' (HB, BA, AF, VF), 'dry' (IS) and 'oily' (GL). Bacterial alpha diversity was higher in exposed (HB, IS, and GL) compared with unexposed sites (BA, AF and VF). Co-occurrence of *Staphylococcus aureus* with any of the other five microorganisms was lower in dry and oily skin versus normal skin. Skin exposure, biophysical/barrier profile and biomarkers were found to be associated with bacterial distribution and co-occurrence.

T.A. Petukhova, L.A. Hassoun, N. Foolad, M. Barath, R.K. Sivamani, **Effect of Expedited Microneedle-Assisted Photodynamic Therapy for Field Treatment of Actinic Keratoses - A Randomized Clinical Trial**, JAMA Dermatol. 2017; 153(7): p. 637-643

Importance: Photodynamic therapy (PDT) is an effective and cosmetically favorable treatment modality for actinic keratoses (AKs). However, prolonged incubation times and pain associated with treatment are burdensome to the patient and a hindrance to widespread use of PDT as standard field therapy for AK. Objective: To evaluate efficacy and pain associated with microneedle expedited PDT. Design, Setting, and Participants: The Microneedle Photodynamic Therapy II (MNPDT-II) study was a randomized, single-blinded, split-face controlled, 2-arm clinical trial. Thirty-three participants with AK on the face were recruited in a university dermatology outpatient clinic from 2015 to 2016, and 32 participants completed the study. Interventions: Participants were randomized into 2 incubations arms, either 10-minute or 20-minute aminolevulinic acid (ALA) incubation times, after pretreatment with a microneedle roller (200 um) vs a sham roller. They were blinded to the laterality of microneedle and sham roller assignments. After incubation, they were exposed to blue light (Blu-U, Dusa Pharmaceuticals) for 1000 seconds for a total fluence of 10 J/cm^2. Main Outcomes and Measures: The primary outcome was to quantitatively measure AK resolution, and the secondary outcome was to assess pain associated with microneedle pretreatment. Results: Thirty-three individuals were recruited and randomized to either the 20-minute or the 10-minute incubation arm. Thirty-two participants completed the study with a mean follow-up time of 34.5 days in the 20-minute group, and 30.2 days in the 10-minute group. For the 20-minute incubation arm, average AK clearance was 76% vs 58% on the sham side ($P < .01$), including 3 patients with complete clearance, although not statistically significant ($P = .25$). Pain assessment on the visual analog scale (VAS) during blue light illumination was not significantly different between the microneedle and sham sides (0.7 and 0.4; $P = .28$), respectively. For the 10-minute incubation arm AK clearance for the microneedle pretreated side was 43% compared with 38% on the sham side ($P = .66$). Pain during the blue light exposure was not significantly different between the microneedle and sham sides, 4.5 mm and 3.4 mm ($P = .21$), respectively. Conclusions and Relevance: Photodynamic therapy with microneedle pretreatment at a 20-minute ALA incubation time significantly improved AK clearance with efficacy similar to that of a conventional 1-hour ALA incubation time. The additional advantage to expedited treatment was that the procedure was virtually painless. However, expedited exposure of a 10-minute ALA incubation time did not reach significantly different AK clearance from the sham control.

F. Chandra, D. Sandiono, U. Sugiri, **Cutaneous Side Effects and Transepidermal Water Loss To Gefitinib: A Study of 11 Patients,** Dermatol Ther (Heidelb) (2017) 7: p. 133–141

Introduction: Cutaneous side effects caused by epidermal growth factor receptor (EGFR) inhibitors occurred in 45–100% of patients which may lead to therapy modification or interruption. This study aimed to evaluate cutaneous side effects and transepidermal water loss (TEWL) values in non-small cell lung carcinoma (NSCLC) patients who received gefitinib EGFR inhibitor. Methods: A descriptive observational study with cross-sectional design and a consecutive sampling method was conducted from 1 February to 4 March 2016. Eleven NSCLC patients with EGFR mutation who visited the Hemato-Oncology Clinic/Internal Medicine Department, Dr. Hasan Sadikin General Hospital, Bandung, Indonesia, were assessed through history taking, physical examination, and TEWL examination using Tewameter. Results: Ten of the eleven patients experienced cutaneous side effects. The most frequently observed was xerosis cutis (8/10 patients), followed by acneiform eruptions (7/10 patients), and paronychia (3/10 patients). None of these patients experienced hair changes, mucositis, or drug hypersensitivity. Mean TEWL value of these patients was higher than normal (11.205 ± 1.881 g/m2/h). Conclusions: Patients who received gefitinib EGFR inhibitor experienced cutaneous side effects including xerosis cutis, acneiform eruptions, and paronychia, and have mean TEWL values higher than normal. Therefore, it might affect the skin barrier function.

L. Lünnemann, **Klinische Studie zur Untersuchung verschiedener Hautpflegeregime in der Windelregion bei Säuglingen im Alter von 7 bis 11 Lebensmonaten**, Dissertation, Dissertation an der Charité Universität, Medizinische Fakultät, Juni 2017

Hintergrund: Die Windeldermatitis (WD) gehört mit 20% der pädiatrischen Konsultationen zu den häufigsten Hauterkrankungen in der Kindheit. Eine adäquate Pflege in der Windelregion gehört zu den Basismaßnahmen im Rahmen der Prävention einer WD bzw. möglichen Exazerbation. Bisher gibt es jedoch kein einheitliches nationales oder internationales Konzept zur Pflege der Haut speziell in der Windelregion von Säuglingen. Methodik: In einer monozentrisch, prospektiven Studie wurden 89 gesunde Säuglinge im Alter von 9 Monaten (+/- 8 Wochen) über 8 Wochen drei verschiedenen Pflegeregimen zugeordnet: in Gruppew wurde die Windelregion mit Baumwollwaschlappen und Wasser (n=30) gereinigt, Gruppew+c erhielt zusätzlich zu der Reinigung mit Baumwollwaschlappen eine zweimal tägliche Applikation einer Wundschutzcreme im Windelbereich (n=28), GruppeF+C erhielt eine Reinigung mit Feuchttüchern und eine Applikation mit Wundschutzcreme (n=31). Der Transepidermale Wasserverlust (TEWL), die Stratum corneum Hydratation (SCH), der Hautoberflächen pH-Wert (pH), Interleukin-1α und die mikrobielle Besiedelung wurden in der Windelregion (oberer äußerer Glutealbereich), in Haut außerhalb der Windelregion (Oberschenkel) und in von Windeldermatitis betroffenen Hautarealen an Tag 1, Woche 4 und Woche 8 gemessen. Der Hautzustand wurde mittels Neonatal Skin Condition Score und Diaper Rash Grade bewertet. Ergebnisse: Auf gesunder Haut in der Windelregion kam es zu einem Absinken der SCH in GruppeW+C und GruppeF+C, während es nur in GruppeW+C zu einem Absinken des TEWL kam. Der pH-Wert stieg in GruppeW+C und GruppeF+C an. Insgesamt zeigten sich SCH, pH-Wert und Interleukin-1α in gesunder Haut in der Windelregion im Vergleich zu gesunder Haut außerhalb der Windelregion erhöht. Das Auftreten von WD war in allen drei Gruppen vergleichbar. In von WD betroffener Haut zeigten sich erhöhte TEWL und pH-Werte im Vergleich zu gesunder Haut in und außerhalb der Windelregion. Schlussfolgerung: Säuglinge, die eine Pflege mit Wundschutzcreme erhielten, wiesen niedrigere SCH-Werte und höhere pH-Werte in der Windelregion im Vergleich zur Haut außerhalb der Windelregion auf. Es wurde keine Korrelation zu dem Auftreten von WD in den einzelnen Pflegegruppen festgestellt.

K. Li, Z.-. Mu, X. Chen, G.-. Wen, Y. Zhao, J.-Z. Zhang, **Atopic Dermatitis-like Graft-versus-host Disease and Lichen Planus-like Graft-versus-host Disease: Alterations in Skin Barrier Function and Related Molecules,** Chinese Medical Journal, June 20, 2017, Volume 130, Issue 12

Allogeneic hematopoietic stem cell transplantation (HSCT) is a therapeutic option for various hematological malignancies, solid tumors, and severe immunodeficiency disorders. Graft-versus-host disease (GVHD) is a common complication of HSCT. GVHD has been classifed into acute GVHD and chronic GVHD (cGVHD) based on clinical presentation and time of disease onset. cGVHD is a delayed complication in patients undergoing HSCT, which commonly affects the skin, eyes, gastrointestinal tract, liver, and lungs. The incidence of cGVHD ranges from 6% to 80%. Skin is the most common organ affected in cGVHD (75%). Cutaneous cGVHD has various manifestations, mimicking a wide variety of autoimmune and inflammatory skin diseases, especially lichen planus (LP)-like GVHD and scleroderma (sclerodermoid GVHD). Poikiloderma-like, psoriasis-like, and dermatomyositis-like GVHD have also been reported.

V. Raikou, A. Varvaresou, I. Panderi, E. Papageorgiou, **The efficacy study of the combination of tripeptide-10-citrulline and acetyl hexapeptide-3. A prospective, randomized controlled study,** J Cosmet Dermatol, 2017 Jun;16(2): p. 271-278

Background: Bioactive peptides have beneficial effects on the skin. Objective: We investigated to evaluate the effect of acetyl hexapeptide-3 and tripeptide-10 citrulline and the possible synergism between these two peptides. Methods: Twenty-four healthy volunteers were randomized to receive combination of acetyl hexapeptide-3 with tripeptide-10 citrulline (Group G1), tripeptide-10 citrulline (Group, G2), acetyl hexapeptide-3 (Group G3), or neither peptide (Group G4) for 60 days. Skin properties evaluated included skin microtopography, parameters cR2 and cR3, and transepidermal water loss (TEWL) using a skin visioscan and a tewameter, respectively. Results: After 20 days, the measurements between G1 and G2 groups (cR2 P=.045, cR3 P=.044), G2 and G3 groups (cR2 P=.017, cR3 P=.017), G3 and G4 groups (CR2 P=.022), and G2 and G4 groups (cR3 P=.028) from baseline were significant. After 60 days, measurements between groups G1 and G3 (cR2 P=.016, cR3 P=.025), groups G2 and G3 (cR2 P=.044, cR3= P=.044), and groups G1 and G4 (cR2 P=.025) were significant. After 20 days, changes in TEWL between groups G1 and G3 (P=.03), groups G2 and G3 (P=.045), and groups G3 and G4 (P=.025) were significant. After 40 days, changes between groups G2 and G3 (P=.028) and groups G3 and G4 (P=.01) from baseline were significant. Conclusion: Our results confirm the antiwrinkle activity of acetyl hexapeptide-3. A significant decrease in TEWL with acetyl hexapeptide-3 treatment is observed. We provided clinical evidence for the antiwrinkle efficacy of tripeptide-10

citrulline and possibly TEWL. The underlying mechanism by which these two peptides can act synergistically was not clear in this study.

S. Mac-Mary, J.-M. Sainthillier, P. Humbert, **Mesure instrumentale de l'hydratation cutanée**, EMC - Cosmétologie et Dermatologie esthétique, June 2017

L'eau joue un rôle fondamental dans les propriétés physiques de la peau en permettant d'assurer sa solidité, sa flexibilité et une perméabilité minimale pour que l'eau endogène puisse jusqu'à la surface cutanée activer les enzymes responsables de la desquamation. Dans la couche cornée, elle est fixée sur des substances hydrosolubles et hygroscopiques intracellulaires appelées *natural moisturizing factors*. Cette eau représente l'aspect statique de l'hydratation cutanée.

C. Uhl, D. Khazaka, **Test equipment supports anti-pollution claims,** PERSONAL CARE ASIA PACIFIC, May 2017, p. 27-29 and PERSONAL CARE EUROPE, September 2017, p. 74-76

Pollution and its impact on the skin have recently become the main topic at all important cosmetic events, and products claiming to protect the skin from pollution effects are a major trend in the cosmetic and personal care industry.

C. Sermsilp, **Efficacy of Topical Botulinum Toxin Type A Cream for Treatment of Primary Axillary Hyperhydrosis: A Randomized, Doubleblinded, Split Site, Vehicle Control Study,** Dissertation at Chulabhorn International College of Medicine, Thammasat university, Thailand, May 2017

The treatment of Primary Axillary Hyperhidrosis (PAH) with traditional needle-based botulinum toxin delivery has been proven to be effective with Botulinum Toxin Type A (BTX-A). However, it is mainly associated with more pains and costs, as well as a number of adverse events following the injections, such as pains, redness at injection site, and possible muscle weakness. In a recent study, the effectiveness of topical BTX-A was significantly shown in PAH treatment with a decreased risk of side effects, resulting in no systemic and very few local adverse events. Therefore, this research is created for the purpose of testing the efficacy of low dose topical liposomal based BTX-A cream as a novel and cost-effective modality for treatment of PAH. Ultimately, this non-invasive topical method could yield treatment efficacy for PAH with minimally effective concentration of BTX-A. Objective: This research has been created in order to test the efficacy and safety of BTX-A in multilamellar liposomal beaded capsule cream for treatment of PAH compared to vehicle cream. Methods: A prospective, randomized, double blinded, split site study was conducted in participants, aged > 18 years, having symmetrical sweating with hyperhidrosis severity scale (HDSS) of 2-4. The amount of sweat reduction was assessed using a Tewameter. BTX-A (30U), combined with multilamellar liposomal based cream to bind the toxin, was applied to one axilla and the vehicle without BTXA to the other axilla once daily before bedtime with a total duration of seven days. Clinical improvement was evaluated using Tewameter, Minor's Iodine Starch Test, HDSS, and Dermatology Life Quality Index (DLQI) every 2-week visit until 8 weeks. The data from questionnaires of patients' satisfaction and adverse reactions were recorded at every follow- up visit. Results: Twenty participants, with mean (SD) age of 37.55 (9.41), were recruited into the study. Of these, 80% and 20% were female and male, respectively. At the 2nd, 4th, 6th and 8th week of follow-up, the topical BTX-A treated side demonstrated sweat reduction of 8.06, 6.47, 7.15 and 3.94, respectively with mean difference from Tewameter measurement relative to the same-patients in the vehiclecontrol treated axillae, with statistical significance ($p<0.001$). Also, clinical grading by panel assessment of IST photography showed statistically significant ($p<0.001$) improvement with mean difference of 1.50, 1.50, 1.10 and 0.75 at the 2nd, 4th, 6th, and 8th weeks of follow-up, respectively. According to the statistic result, HDSS score shows a great difference between the BTX-A treated and the vehicle treated groups ($p<0.001$). As well, DLQI score showed the improvement in 8 from 10 choices, with statistical significance ($p<0.05$). Nonetheless, no side effects were present in this study. Conclusion: The results of the 30U of BTX-A inversion with multilamellar liposomal beaded capsule cream could provide effective treatment outcomes of PAH compared to the vehicle control treated side, evaluated by Tewameter. The clinical grading of improvement was noted by Minor's Iodine Starch Test (IST), HDSS, and DLQI. Tewameter demonstrated the statistically significant improvement of the BTXA treated side compared with the vehicle control treated side. Meanwhile, HDSS score showed improvement in the BTX-A treated group compared to the control treated group, with statistical significance ($p<0.001$). Moreover, DLQI illustrated the significantly improved quality of life and greater patient's satisfaction outcomes with serious side effects. Hence, the topical BTX-A could be an innovative painless and cost effective treatment of PAH.

G. Nicoletti, P. Perugini, S. Bellino, P. Capra, A. Malovini, O. Jaber, M. Tresoldi, A. Faga, **Scar Remodeling with the Association of Monopolar Capacitive Radiofrequency, Electric Stimulation, and Negative Pressure,** Photomedicine and Laser Surgery, Volume 35, Number 5, 2017

Objective: A study was established to objectively assess the effects of low-intensity electromagnetic and electric stimulation plus negative pressure on mature scars. Background: Radiofrequency plus negative pressure therapy demonstrated a favorable reorganization and regeneration of the collagen and elastic fibers and was proposed for the treatment of cellulitis and skin stretch marks. Methods: Twenty-six mature scars in 20 Caucasian patients (15 females and 5 males) were enrolled in the study. The treatments were carried out with a Class I, BF-type electromedical device equipped with a radiofrequency generator, an electric pulse generator, and a vacuum pump twice a week for 3 months. Corneometry, transepidermal water loss, elastometry, colorimetry, and three-dimensional skin surface pattern were objectively assessed with Multi Probe Adapter System MPA and PRIMOS pico. A subjective assessment was carried out with the VAS and PSAS scales. Each scar was compared before and after the treatment and with the skin in the corresponding healthy contralateral anatomical area at the same times. Results: Reduction of the scar surface wrinkling and overall scar flattening were demonstrated after the treatment. The scar slightly tended to approach the color and elasticity of healthy skin too. Conclusions: The combined local treatment of mature scars with low-intensity electromagnetic and electric stimulation in association with negative pressure might suggest a favorable synergic effect on the scar collagen and elastic fiber remodeling.

S.A. Nasrollahi, H. Hassanzade, A. Moradi, M. Sabouri, A. Samadi, M.N. Kashani, A. Firooz, **Safety Assessment of Tretinoin Loaded Nano Emulsion and Nanostructured Lipid Carriers: A Non-invasive Trial on Human Volunteers,** Curr Drug Deliv. 2017;14(4): p. 575-580

Background and Aim: Topical application of tretinoin (TRE) is followed by a high incidence of side effects. One method to overcome the problem is loading TRE into lipid nanoparticles. The potential safety of the nanoparticle materials has been always considered as a major concern. In this in vivo study, changes in human skin biophysical parameters including hydration, TEWL, erythema, and pH have been used to determine the safety of tretinoin loaded nano emulsion (NE) and nanostructured lipid carriers (NLC). Method: TRE loaded NE and NLC were prepared using a high pressure homogenizer. Skin biophysical parameters were measured on the volar forearms of twenty healthy volunteers, before and after applying TRE-NE and TRE-NLC lotions. All the measurements were done using respective probes of MPA 580 Cutometer®. Results: We obtained particles of nanometric size (<130 nm) with narrow distribution and optimal physical stability. None of the formulations made any statistically significant change in any of the measured skin properties. P-values were 0.646, 0.139, 0.386, 0.169 after applying TRE-NE and 0.508, 0.051, 0.139, 0.333 after applying TRE-NLC, respectively. Conclusion: Both formulations are reasonably safe to apply on human skin and topicalapplication of TRE-NE and TRE-NLC had almost similar effects on skin biophysical parameters.

Y. Borzykh, T. Momot, **Restauration of the skin epidermal barrier after alkaline peeling procedure (article in Ukrainian),** Les Nouvelles Esthetiques (Ukraine), 4 (104)/2017

A damaged epidermal barrier is like an open gate for various microorganisms, allergens etc. Therefore, its protection and recovery should be an integral part of skin treatment procedures – in particular, after peeling. In this article, the authors provide insight into the results of a clinical study, the purpose of which was to study the recovery rate of the epidermal barrier after alkaline peeling application, and also give their recommendations.

Y.H. Hong, U.J. Chang, Y.S. Kim, E.Y. Jung, H.J. Suh, **Dietary galacto-oligosaccharides improve skin health: a randomized double blind clinical trial,** Asia Pac J Clin Nutr 2017;26(4): p. 613-618

Background and Objectives: To study the effects of galacto-oligosaccharides (GOS) on the skin, we investigated skin-related parameters in healthy adults who received GOS for 12 weeks. Methods and Study Design: This double-blind, randomized, placebo-controlled study included subjects divided into two groups (control and GOS) by stratified block randomization. The GOS group received 1.0 g of GOS twice a day, whereas the control group received only vehicle. Results: The results showed that the increase in corneometer values from baseline to week 12 was significantly greater in the GOS group than in the control group (6.91 vs 2.88 arbitrary units, $p<0.05$). The transepidermal water loss (TEWL) in the GOS group was reduced significantly after 12 weeks of GOS treatment (20.1 g/h/m2 at baseline vs 17.5 g/h/m2 at week 12, $p<0.05$). The differences in total and percentage of wrinkle areas between the two groups were statistically significant after 12 weeks of GOS treatment ($p<0.05$). Conclusion: Our findings support that oral treatment with GOS is beneficial to the skin and present the possibility of new nutritional strategies for skin care.

H.-J. Rösch, **Proving Efficacy**, C0SSMA 4 2017, p. 48-49

Cosmetic products are subl ject to Cosmetic Regulation 1223/2009/EC in the European Union. This regulation defines fundamental safety standards and protects consumers from misleading

information. Article 20 states that " in the labelling, making available on the market and advertising of cosmetic products, text, names (and) pictures shall not be used to imply that these products have characteristics or functions which they do not have."

J. Daybell, C. Maunsell, **Comprehensive skin barrier protection: colloidal oatmeal,** PERSONAL CARE EUROPE, April 2017, p. 85 - 90

Oatmeal has been used for many centuries as a soothing agent to relieve itch and irritation associated with various dry skin conditions. In 1945, a ready to use colloidal oatmeal, produced by finely grinding the oat and boiling it to extract the colloidal material, became commercially available.1 Today, colloidal oatmeal is available in various dosage forms from powders for bathing to shampoos, shaving gels, and moisturising creams. The clinical properties of colloidal oatmeal derive from its chemical composition diversity. The high concentration in starches and (3-glucan is responsible for the protective and water-holding functions of oat. The presence of different types of polyphenols confers antioxidant and anti-inflammatory activity. The cleansing activity of oat is mostly due to saponins. Its many functional properties make colloidal oatmeal a cleanser, moisturiser, buffer, as well as a soothing and protective anti-inflammatory agent. This present article profiles the key attributes of colloidal oatmeal and presents data on a new advanced colloidal oatmeal (Oat COM). Oat COM colloidal oatmeal is an advanced colloidal oatmeal due to its structural and chemical composition with marked improvements in oil and water binding capacities.

L. von Oppen-Bezalel, F. Havas, M. Shevach, A. Shtevi, O. Ben-Chitrit, **Sun-activated naturals for instant and long-term beauty,** PERSONAL CARE EUROPE, April 2017, p. 121 - 124

Fluorescent materials absorb light energy, and re-emit it at a longer wavelength. Fluorescence is used in a range of industries, including cosmetics. Usually, synthetic substances are employed. In this article, we present the use of natural, UV activated, fluorescent active ingredients to deliver instant skin lightening and anti-redness; and overall skin brightening effects. In one study, we used the natural green fluorescence of phytoene and phytofluene in the form of IBR-TCLC (tomato colorless carotenoids), to deliver instant skin lightening and redness reduction. This was demonstrated in a placebo-controlled study using UV and full spectrum light photography and quantitative measures (colorimeter). named In a second IBR-Dragon study, we deliver used the immediate natural blue and long fluorescence -term overall of dragon skin brightening fruit extract effects using both photographic demonstration and quantitative instrumental measurements. In the studies reported above, we make use of the materials' natural UV induced fluorescence, leveraging colour opponency theory to deliver real, measurable, and consumer-perceptible beauty benefits- using natural and safe compounds.

N. Pouillaute, **A secret weapon against effects of pollution**, PERSONAL CARE EUROPE, April 2017, p. 146 - 148

Half of the world's population lives in cities and consequently pollution is now a major concern for a large number of consumers. It is not only a concern regarding the pollution's impact on the Earth, but also on people's health in general and in particular on the skin.

E. Bochietto, S. Todeschi, **Skin moisturizing: How to choose the best assay,** Household and Personal Care Today , vol. 12(2) March/April 2017, p. 52-53

To keep skin healthier and younger, the very first thing we need to do is maintain a good level of hydration. It may seem obvious, but the importance of this simple fact is often underestimated.

P. Mokrejš, M. Huťťa, J. Pavlačková, P. Egner, **Preparation of Keratin Hydrolysate from Chicken Feathers and Its Application in Cosmetics**, Cosmetics, J. Vis. Exp. (129), 2017

Keratin hydrolysates (KHs) are established standard components in hair cosmetics. Understanding the moisturizing effects of KH is advantageous for skin-care cosmetics. The goals of the protocol are: (1) to process chicken feathers into KH by alkaline-enzymatic hydrolysis and purify it by dialysis, and (2) to test if adding KH into an ointment base (OB) increases hydration of the skin and improves skin barrier function by diminishing transepidermal water loss (TEWL). During alkaline-enzymatic hydrolysis feathers are first incubated at a higher temperature in an alkaline environment and then, under mild conditions, hydrolyzed with proteolytic enzyme. The solution of KH is dialyzed, vacuum dried, and milled to a fine powder. Cosmetic formulations comprising from oil in water emulsion (O/W) containing 2, 4, and 6 weight% of KH (based on the weight of the OB) are prepared. Testing the moisturizing properties of KH is carried out on 10 men and 10 women at time intervals of 1, 2, 3, 4, 24, and 48 h. Tested formulations are spread at degreased volar forearm sites. The skin hydration of stratum corneum (SC) is assessed by measuring capacitance of the skin, which is one of the most world-wide used and simple methods. TEWL is based on measuring the quantity of water transported per a defined

area and period of time from the skin. Both methods are fully non-invasive. KH makes for an excellent occlusive; depending on the addition of KH into OB, it brings about a 30% reduction in TEWL after application. KH also functions as a humectant, as it binds water from the lower layers of the epidermis to the SC; at the optimum KH addition in the OB, up to 19% rise in hydration in men and 22% rise in women occurs.

M. Inamoto, W. Nishida, N. Okahata, **Control and Evaluation of Glass Tactile-feeling,** Res. Reports Asahi Glass Co., Ltd., 67 (2017) (article in Japanese)

By imparting visually imperceptible structure to the glass surface, it is possible to control the touch feeling of the glass while keeping its exterior appearance. In addition to sensory methods such as questionnaires, quantitative evaluation methods were examined. In the present study, based on the hypothesis that the main factor of touch feeling is finger slipperiness, we succeeded in quantitative evaluation by measuring the dynamic friction coefficient when actually touching the glass. Furthermore, we found that there is a correlation between surface texture and finger slipperiness.

K. Agrawal, L.A. Hassoun, N. Foolad, T.L. Pedersen, R.K. Sivamani, J.W. Newman, **Sweat lipid mediator profling: a noninvasive approach for cutaneous research**, J. Lipid Res., 2017, 58: p. 188–195

Recent advances in analytical and sweat collection techniques provide new opportunities to identify noninvasive biomarkers for the study of skin inflammation and repair. This study aims to characterize the lipid mediator profle including oxygenated lipids, endocannabinoids, and ceramides/ sphingoid bases in sweat and identify differences in these profles between sweat collected from nonlesional sites on the unflared volar forearm of subjects with and without atopic dermatitis (AD). Adapting routine procedures developed for plasma analysis, over 100 lipid mediators were profled using LC-MS/MS and 58 lipid mediators were detected in sweat. Lipid mediator concentrations were not affected by sampling or storage conditions. Increases in concentrations of C30–C40 [NS] and [NdS] ceramides, and C18:1 sphingosine, were observed in the sweat of study participants with AD despite no differences being observed in transepidermal water loss between study groups, and this effect was strongest in men ($P < 0.05$, one-way ANOVA with Tukey's post hoc HSD). No differences in oxylipins and endocannabinoids were observed between study groups. Sweat mediator profling may therefore provide a noninvasive diagnostic for AD prior to the presentation of clinical signs.

D. Antonov, S. Schliemann, P. Elsner, **Methods for the Assessment of Barrier Function**, in T. Agner (Edt.): Skin Barrier Function, Curr Probl Dermatol. Basel, Karger, 2016, Vol 49, p. 61–70

S. Miyawaki, K. Kohara, T. Kido, Y. Tabara, M. Igase, T. Miki, K. Sayama, **Facial pigmentation as a biomarker of carotid atherosclerosis in middle-aged to elderly healthy Japanese subjects,** Skin Research and Technology 2016; 22: 20-24

Background/purpose: Perceived age may be a better predictor of mortality rate than chronological age. We have demonstrated that perceived age was a significant biomarker for carotid atherosclerosis in Japanese. However, it remains to be determined which skin parameter is associated with atherosclerosis. The purpose of this study is to analyze the relationship between 10 facial skin-aging parameters and atherosclerosis in 169 middle-aged to elderly Japanese women who participated. Methods: Facial photographs were taken under a shadowless lamp from three directions using a high-resolution digital camera. The digital images of each subject were analyzed using computer software and various parameters of skin aging such as pigmentation, wrinkles, and skin color were quantified. Carotid intima-media thickness (IMT) and brachial-ankle pulse wave velocity (baPWV) were measured as indices for atherosclerosis.

J. Eo, Y.-K. Seo, J.-H. Baek, A.-R. Choi, M.-K. Shin, J.-S. Koh, **Facial skin physiology recovery kinetics during 180 min post-washing with a cleanser**, Skin Research and Technology 2016; 22: 148-151

Background/Purpose: Facial cleansing is important to clean and exfoliate the skin while maintaining optimal physiologicfunction. However, there is insufficient data on the very early stage of skin change after applying soap or cleansing foam. We investigated the recovery kinetics of facial skin physiologyduring 180 min after exposure to the cleanser.

A. Firooz, H. Zartab, B. Sadr, L. Naraghi Bagherpour, A. Masoudi, F. Fanian, Y. Dowlati, A. Hooshang Ehsani, A. Samadi, **Daytime Changes of Skin Biophysical Characteristics: A Study of Hydration, Transepidermal Water Loss, pH, Sebum, Elasticity, Erythema, and Color Index on Middle Eastern Skin,** Iranian Journal of Dermatology, Dec. 2016

Background: The exposure of skin to ultraviolet radiation and temperature differs signifcantly during the day. It is reasonable that biophysical parameters of human skin have periodic daily fluctuation. The objective of this study was to study the fluctuations of various biophysical characteristics of Middle Eastern skin in standardized experimental conditions. Materials and Methods: Seven biophysical parameters of skin including stratum corneum hydration, transepidermal water loss, pH, sebum, elasticity, skin color, and erythema index were measured at three time points (8 a.m., 12 p.m. and 4 p.m.) on the forearm of 12 healthy participants (mean age of 28.4 years) without any ongoing skin disease using the CK MPA 580 device in standard temperature and humidity conditions. Results: A significant difference was observed between means of skin color index at 8 a.m. (175.42 ± 13.92) and 4 p.m. (164.44 ± 13.72, $P = 0.025$), between the pH at 8 a.m. (5.72 ± 0.48) and 4 p.m. (5.33 ± 0.55, $P = 0.001$) and pH at 12 p.m. (5.60 ± 0.48) and 4 p.m. (5.33 ± 0.55, $P = 0.001$). Other comparisons between the means of these parameters at different time points resulted in nonsignifcant *P* values. Conclusion: There are daytime changes in skin color index and pH. Skin color index might be higher and cutaneous pH more basic in the early morning compared to later of the day.

F. Chandra, D. Sandiono, U. Suairi, Q. Suwarsa, H. Gunawan, **Cutaneous Side Effects and Transepidermal Water Loss To Gefitinib: A Study of 11 Patients,** Dermatol Ther HeidelbL 2016 Dec 21

Introduction: Cutaneous side effects caused by epidermal growth factor receptor (EGFR) inhibitors occurred in 45-100% of patients which may lead to therapy modification or interruption. This study aimed to evaluate cutaneous side effects and transepidermal water loss (TEWL) values in non-small cell lung carcinoma (NSCLC) patients who received gefitinib EGFR inhibitor. Methods: A descriptive observational study with cross-sectional design and a consecutive sampling method was conducted from 1 February to 4 March 2016. Eleven NSCLC patients with EGFR mutation who visited the Hemato-Oncology Clinic/Internal Medicine Department, Dr. Hasan Sadikin General Hospital, Bandung Indonesia, were assessed through history taking, physical examination, and TEWL examination using Tewameter. Results: Ten of the eleven patients experienced cutaneous side effects. The most frequently observed was xerosis cutis (8/10 patients), followed by acneiform eruptions (7/10 patients), and paronychia (3/10 patients). None of these patients experienced hair changes, mucositis, or drug hypersensitivity. Mean TEWL value of these patients was higher than normal (11.205 ± 1.881 g/m2/h). Conclusions: Patients who received gefitinib EGFR inhibitor experienced cutaneous side effects including xerosis cutis, acneiform eruptions, and paronychia, and have mean TEWL values higher than normal. Therefore, it might affect the skin barrier function.

T. Marichal, N. Gaudenzio, S. El Abbas, R. Sibilano, O. Zurek, Philipp Starkl, L.L. Reber, D. Pirottin, J. Kim, P. Chambon, A. Roers, N. Antoine, Y. Kawakami, T. Kawakami, F. Bureau, S.-Y. Tam, M. Tsai, S.J. Galli, **Guanine nucleotide exchange factor RABGEF1 regulates keratinocyte-intrinsic signaling to maintain skin homeostasis,** J Clin Invest. 2016;126(12): p. 4497-4515

Epidermal keratinocytes form a structural and immune barrier that is essential for skin homeostasis. However, the mechanisms that regulate epidermal barrier function are incompletely understood. Here we have found that keratinocytespecific deletion of the gene encoding RAB guanine nucleotide exchange factor 1 (RABGEF1, also known as RABEX-5) severely impairs epidermal barrier function in mice and induces an allergic cutaneous and systemic phenotype. RABGEF1-deficient keratinocytes exhibited aberrant activation of the intrinsic IL-1R/MYD88/NF-κB signaling pathway and MYD88-dependent abnormalities in expression of structural proteins that contribute to skin barrier function. Moreover, ablation of MYD88 signaling in RABGEF1-deficient keratinocytes or deletion of *Il1r1* restored skin homeostasis and prevented development of skin inflammation. We further demonstrated that epidermal RABGEF1 expression is reduced in skin lesions of humans diagnosed with either atopic dermatitis or allergic contact dermatitis as well as in an inducible mouse model of allergic dermatitis. Our findings reveal a key role for RABGEF1 in dampening keratinocyte-intrinsic MYD88 signaling and sustaining epidermal barrier function in mice, and suggest that dysregulation of RABGEF1 expression may contribute to epidermal barrier dysfunction in allergic skin disorders in mice and humans. Thus, RABGEF1-mediated regulation of IL-1R/MYD88 signaling might represent a potential therapeutic target.

A. Noguchi, M. Tominaga, N. Takahashi, H. Matsuda, Y. Kamata, Y. Umehara, C.K. Ko, Y. Suga, H. Qaawa, K. Takamori, **Differences in therapeutic effects of topically applied corticosteroid and tacrolimus on atopic dermatitis-like symptoms in NC/Nga mice,** J Dermatol Sci. 2016 Dec 24

Background: Topical corticosteroid and calcineurin inhibitor have similar therapeutic benefits in atopic dermatitis (AD), but the differences in therapeutic mechanisms of action of these agents against AD symptoms are not fully understood. Objective: This study was performed to examine the different effects of topical betamethasone valerate (BMV), clobetasol propionate (CBP), and tacrolimus (TAC) on

itch-related behavior and dermatitis in NC/Nga mice with AD-like symptoms. Methods: AD-like dermatitis was induced in the dorsal skin of NC/Nga mice by repeated topical application of Dermatophagoides farinae body (Dfb) ointment twice weekly for three weeks. Mice with dermatitis scores over 5 were divided into five groups with equal dermatitis scores and treated with BMV, CBP, TAC, or Vaseline (Vas) once daily for two consecutive days, or were not treated (NT). Scratching behavior was analyzed using a SCLABA -Real system. Transepidermal water loss (TEWL) before and after treatment was measured using a Tewameter TM210. Skin collected from each group was analyzed histologically. Results: After the second treatment, dermatitis showed significantly greater improvement in the CBP and TAC-treated groups than in the Vas-treated and NT groups. The numbers of scratching bouts were significantly lower in CBP and TAC-treated mice than in Vas-treated mice. TEWL was significantly lower in TAC-, but not in CBP-, treated mice than in Vas-treated mice. Immunohistochemical examination showed that BMV, CBP and TAC did not reduce the increased densities of epidermal protein gene product 9.5- and substance Pimmunoreactive fibers. The numbers of dermal CD4-immunoreactive T cells were significantly lower in BMV and CBP-treated mice than in Vas-treated and NT mice. The numbers of dermal eosinophils were significantly lower in BMV, CBP and TAC-treated mice than in Vas-treated and NT mice, with CBP showing the strongest effect. CBP significantly reduced epidermal thickness compared with Vas and NT. There were no significant differences in the numbers of interleukin-31-immunoreactive cells and mast cells, or in expression of epidermal thymic stromal lymphopoietin among all five groups. Conclusions: The therapeutic potency of TAC against AD-like symptoms, including pruritus, is equal to that of the corticosteroid CBP. Epidermal innervation of sensory nerves itself might not be related to the therapeutic effects of topical tacrolimus and corticosteroids in its early phase.

M.N. Busche, A. Roettaer, C. Herold, P.M. Voat, H.O. Rennekampff, **Evaporative Water Loss in Superficial to Full Thickness Burns,** Ann Plast Surg. 2016 Oct;77(4): p. 401~5

Introduction: Increased evaporative water loss (EWL) in burn patients leads to dehydration and hypothermia. Early clinical studies performed with outdated hygrometers suggested a 17 to 75 times increased EWL in burns with contradicting results for the different burn depths. Our study proposals were: (1) obtain reliable data of the EWL of all burn depths, (2) compare these results with findings from earlier studies, (3) evaluate the usefulness of the EWL in differentiating between superficial and deep partial thickness burns, (4) determine the effect of Biobrane on the EWL of superficial partial thickness burns in vivo, and (5) evaluate the effect of the sterile incision foil Opraflex on the EWL in split skin graft donor sites. Methods: We measured the EWL of all burn depths in 28 patients under stable and recorded conditions regarding room temperature and humidity with a modern digital evaporimeter (Tewameter TM 300). For the first time in vivo, we also determined the effect of Biobrane on the EWL of burns and evaluated the EWL in split skin graft donor sites covered with Opraflex. Results: The EWL in all burn depths was significantly increased ($P < 0.001$) compared with unburned skin. There was no significant difference ($P > 0.05$) in the EWL of superficial compared with deep partial thickness burns, whereas full thickness burns had a significantly lower EWL ($P < 0.05$) compared with superficial and deep partial thickness burns. Biobrane significantly reduced the EWL ($P < 0.05$) of superficial partial thickness burns. The EWL of Opraflex covered skin graft donor sites was significantly reduced compared with uncovered donor sites ($P < 0.05$). Conclusions: Our data suggest that the actual EWL in burns is approximately 3 times higher in full thickness burns and approximately 4 times higher in superficial and deep partial thickness burns compared with normal skin and therefore much lower than suggested previously. Because there was no significant difference in the EWL of superficial compared with deep partial thickness burns, the EWL cannot be used to differentiate between these burn depths. Biosynthetic wound dressings can significantly reduce the EWL of superficial partial thickness burns and sterile incision foil protects split skin graft donor sites from an increased EWL.

H*. Jeon, D.H. Kim, Y.-H. Nho, J.-E. Park, S.-N. Kim, E.H. Choi,* **A Mixture of Extracts of Kochia scoparia and Rosa multiflora with PPAR α/γ Dual Agonistic Effects Prevents Photoaging in Hairless Mice**, Int. J. Mol. Sci. 2016, 17

Activation of peroxisome proliferator-activated receptors (PPAR) α/γ is known to inhibit the increases in matrix metalloproteinase (MMP) and reactive oxygen species (ROS) induced by ultraviolet light (UV). Extracts of natural herbs, such as *Kochia scoparia* and *Rosa multiflora*, have a PPAR α/γ dual agonistic effect. Therefore, we investigated whether and how they have an antiaging effect on photoaging skin. Eighteen-week-old hairless mice were irradiated with UVA 14 J/cm2 and UVB 40 mJ/cm2 three times a week for 8 weeks. A mixture of extracts of *Kochia scoparia* and *Rosa multiflora* (KR) was topically applied on the dorsal skin of photoaging mice twice a day for 8 weeks. Tesaglitazar, a known PPAR α/γ agonist, and vehicle (propylene glycol:ethanol = 7:3, *v*/*v*) were applied as positive and negative controls, respectively. Dermal effects (including dermal thickness, collagen density, dermal expression of procollagen 1 and collagenase 13) and epidermal effects (including skin barrier function,

epidermal proliferation, epidermal differentiation, and epidermal cytokines) were measured and compared. In photoaging murine skin, KR resulted in a significant recovery of dermal thickness as well as dermal fibroblasts, although it did not change dermal collagen density. KR increased the expression of dermal transforming growth factor (TGF)-β. The dermal effects of KR were explained by an increase in procollagen 1 expression, induced by TGF-β, and a decrease in MMP-13 expression. KR did not affect basal transepidermal water loss (TEWL) or stratum corneum (SC) integrity, but diddecrease SC hydration. It also did not affect epidermal proliferation or epidermal differentiation. KR decreased the expression of epidermal interleukin (IL)-1α. Collectively, KR showed possible utility as a therapeutic agent for photoaging skin, with few epidermal side effects such as epidermal hyperplasia or poor differentiation.

L. Agren, E. Nilsson, **The effect of Nordicseed oilon dry, irritated scalp,** PERSONAL CARE EUROPE, September 2016, p. 32-34

Many experience difficulty finding something that helps to reduce scalp problems even though there is a wide range of products available on the market - shampoos, creams, gels and liniment. The unique combination of valuable nutrients and fatty acid composition make blackcurrant seed oil and sea buckthorn oil interesting for an irritated scalp. We aimed to investigate whether Q for Skin's concept based on blackcurrant seed oil and sea buckthorn pulp/seed oil can help people with a dry, irritated scalp.

H.-S. Jeon, S.-W. Youn, H.-E. Jeon, J.-H. Kim, J.-Y Hyon, **Assessment of Transepidermal Water Loss From the Ocular Area in Dry Eye Disease,** IOVS September 2016 Vol. 57 No. 11; 4835

Purpose: To investigate transepidermal water loss (TEWL) from the ocular area in dry eye disease (DED) and evaluate the correlation between ocular TEWL and other DED parameters. Methods: Transepidermal water loss from the ocular area in 56 eyes with DED and 38 healthy eyes was me sured using a Tewameter TM300 that was equipped with custom made goggles (measuring temperature 248C–268C and relative humidity 35%–45%). The DED group was classified into two subgroups, aqueous deficient dry eye (ADDE) and evaporative dry eye (EDE). Correlations between ocular TEWL and other DED parameters, such as tear osmolarity, tear break-up time (TBUT), corneal staining, conjunctival staining, Schirmer I test, Ocular Surface Disease Index (OSDI), and Visual Analogue Scale score were evaluated.

H.-J. Kim, D. Kim, H.-J. Kim, H. Kim, J.-S. Kim, H.-S. Chae, A. Jang, **Anti-Wrinkle Effect of Leg Bone Hydrolysates and Oil from Jesu Crossbred Horses**, 62nd International Congress of Meat Science and Technology, 14-19th August 2016, Bangkok, Thailand

This study investigated the antiwrinkle activity of horse leg bone hydrolysates less than 3 kDa (HL) and horse oil (HO) on ultraviolet-induced photoaging in hairless mice (Skh-1). Skin wrinkles were induced by UVB-irradiation for 10 weeks on the back of Skh-1 hairless mice three times a week. Total 70 mice were divided into 7 groups: –NC (normal group), +UC (UV control), +HLL (dietary HL, 500 mg/kg/d BW), +HLH (dietary HL, 1000 mg/kg/d BW), +HO (spreading HO), +HOHLL (spreading HO and dietary HL, 500 mg/kg/d BW), +HOHLH (spreading HO and dietary HL, 1000 mg/kg/d BW). Wrinkle formation, skin moisture, transepidermal water loss (TEWL), wrinkle depth and epidermal thickness were analyzed. +UC induced epidermal barrier dysfunction including a decrease in skin moisture, an increase in TEWL, skin wrinkle depth and epidermal thickness. The skin moisture of +HOHLH (63.32%) was higher than in +UC (52.26%). TEWL was decreased in HL and HO. In +HLH (17.52 μm), the wrinkle depth significantly lower than in +UC (24.74 μm). The epidermis thickness in +UC was higher than that in +HLL, +HLH, +HO, +HOHLL and +HOHLH. These results indicate that HL and HO exerts anti-photoaging activities by improving wrinkle formation and dryness.

M. Saito, M. Tanaka, E. Misawa, R. Yao, K. Nabeshima, K. Yamauchi, F. Abe, Y. Yamamoto, F. Furukawa, **Oral administration of Aloe vera gel powder prevents UVB-induced decrease in skin elasticity via suppression of overexpression of MMPs in hairless mice**, Bioscience, Biotechnology and Biochemistry, 2016 Vol. 80 No. 7, 1416-1424

This study reports the effects of oral Aloe vera gel powder (AVGP) containing Aloe sterols on skin elasticity and the extracellular matrix in ultraviolet B (UVB)-irradiated hairless mice. Ten-week-old hairless mice were fed diets containing 0.3% AVGP for 8 weeks and irradiated UVB for 6 weeks. Mice treated with AVGP showed significant prevention of the UVB-induced decrease in skin elasticity. To investigate the mechanism underlying this suppression of skin elasticity loss, we measured the expression of matrix metalloproteinase (MMP)-2, -9, and -13. AVGP prevented both the UVB-induced increases in MMPs expressions. Moreover, we investigated hyaluronic acid (HA) content of mice dorsal skin and gene expression of HA synthase-2 (Has2). In the results, AVGP oral administration prevented

UVB-induced decreasing in skin HA content and Has2 expression and attenuates the UVB-induced decrease in serum adiponectin, which promotes Has2 expression. These results suggested that AVGP has the ability to prevent the skin photoaging.

M.Q. Man, R. Sun, G. Man, D. Lee, Z. Hill, P.M. Elias, **Commonly Employed African Neonatal Skin Care Products Compromise Epidermal Function in Mice,** Pediatr Dermatol., 2016 Jul 11

Background: Neonatal mortality is much higher in the developing world than in developed countries. Infections are a major cause of neonatal death, particularly in preterm infants, in whom defective epidermal permeability barrier function facilitates transcutaneous pathogen invasion. The objective was to determine whether neonatal skin care products commonly used in Africa benefit or compromise epidermal functions in murine skin. Methods: After twice-daily treatment of 6- to 8-week-old hairless mice with each skin care product for 3 days, epidermal permeability barrier function, skin surface pH, stratum corneum hydration, and barrier recovery were measured using a multiprobe adapter system physiology monitor. For products showing some benefits in these initial tests, the epidermal permeability barrier homeostasis was assessed 1 and 5 hours after a single application to acutely disrupted skin. Results: All of the skin care products compromised basal permeability barrier function and barrier repair kinetics. Moreover, after 3 days of treatment, most of the products also reduced stratum corneum hydration while elevating skin surface pH to abnormal levels. Conclusion: Some neonatal skin care products that are widely used in Africa perturb important epidermal functions, including permeability barrier homeostasis in mice. Should these products have similar effects on newborn human skin, they could cause a defective epidermal permeability barrier, which can increase body fluid loss, impair thermoregulation, and contribute to the high rates of neonatal morbidity and mortality seen in Africa. Accordingly, alternative products that enhance permeability barrier function should be identified, particularly for use in preterm infants.

M.M. Kelleher, A. Dunn-Galvin, C. Gray, D.M. Murray, M. Kiely, L. Kenny, H. Irwin McLean, A.D. Irvine, J. O'B. Hourihane, **Skin barrier impairment at birth predicts foodallergy at 2 years of age,** J Allergy Clin Immunol 2016; 137: p. 1111-1116.

Background: Transcutaneous exposure to food allergens can lead to food sensitization (FS)/food allergy (FA). We measured skin barrier function in early infancy and related it to the later development of FS/FA at age 2 years. Objective: We sought to examine the relationship between early life skin barrier function and FA in infancy. Methods: Infants in the Babies After Scope: Evaluating the Longitudinal Impact Using Neurological and Nutritional Endpoints (BASELINE) birth cohort had transepidermal water loss (TEWL) measured in the early newborn period and at 2 and 6 months of age. At age 2 years, infants had FS/FA screening with skin prick tests and oral food challenges. Results: One thousand nine hundred three infants were enrolled. One thousand three hundred fifty-five were retained to age 2 years, and 1260 underwent FS screening. FS was present in 6.27% (79/1260; 95% CI, 4.93% to 7.61%), and FA prevalence was 4.45% (56/1258; 95% CI, 3.38% to 5.74%). Egg was the most prevalent allergen (2.94%), followed by peanut (1.75%) and cow's milk (0.74%). Day 2 upper-quartile TEWL (>9 gwater/m2/h) was a significant predictor of FA at age 2 years (odds ratio [OR], 4.1; 95% CI, 1.5-4.8). Seventy-five percent of children with FA at 2 years of age had day 2 TEWL in the upper quartile. Even in those without atopic dermatitis (AD), infants with upper-quartile day 2 TEWL were 3.5 times more likely to have FA at 2 years than infants in the lowest quartile (95% CI, 1.3-11.1; P 5 .04). Conclusion: Neonatal skin barrier dysfunction predicts FA at 2 years of age, supporting the concept of transcutaneous allergen sensitization, even in infants who do not have AD. TEWL could be used for stratifying infants in the first few days of life before development of AD or FA for targeted intervention studies to potentially alter the atopic march.

S. Xin, L. Ye, G. Man, C.Lv, P.M. Elias, M.-Q. Man, **Heavy Cigarette Smokers in a Chinese Population Display a Compromised Permeability Barrier,** BioMed Research International, Volume 2016

Cigarette smoking is associated with various cutaneous disorders with defective permeability. Yet, whether cigarette smoking influences epidermal permeability barrier function is largely unknown. Here, we measured skin biophysical properties, including permeability barrier homeostasis, stratum corneum (SC) integrity, SC hydration, skin surface pH, and skin melanin/erythema index, in cigarette smokers. A total of 99 male volunteers were enrolled in this study. Smokers were categorized as light-tomoderate (<20 cigarettes/day) or heavy smokers (≥20 cigarettes/day). An MPA5 was used to measure SC hydration and skin melanin/erythema index on the dorsal hand, forehead, and cheek. Basal transepidermal water loss (TEWL) and barrier recovery rates were assessed on the forearm. A Skin-pH-Meter pH900 was used to measure skin surface pH. Our results showed that heavy cigarette smokers exhibited delayed barrier recovery afer acute abrogation (1.02% ± 13.06 versus 16.48% ±

6.07), and barrier recovery rates correlated negatively with the number of daily cigarettes consumption (p = 0.0087). Changes in biophysical parameters in cigarette smokers varied with body sites. In conclusion, heavy cigarette smokers display compromised permeability barrier homeostasis, which could contribute, in part, to the increased prevalence of certain cutaneous disorders characterized by defective permeability. Thus, improving epidermal permeability barrier should be considered for heavy cigarette smokers.

S. Jung, H. Richter, M. Darvin, S. Schanzer, A. Kramer, A. Patzelt, M.C. Meinke, J. Lademann, **Changes of the skin barrier and bacterial colonization after hair removal by clipper and by razor**, J of Biomedical Photonics & Eng 2(2), June 2016

Background: Inappropriate hair removal increases the risk of surgical site infections which are associated with a higher morbidity and mortality of surgical patients. Here, the effects of a clipping device and a disposable razor on the skin barrier, microbial burden and surface structure were compared. Methods: Changes in bacterial colonization, transepidermal water loss, antioxidant status and the skin surface structure were investigated on the calves of 12 healthy volunteers. Measurement time points were at baseline (tbase) and 24 hours after hair removal (t24). Results: Both, the disposable razor and the clipper showed a decrease in log colony-forming units count from tbase (mean(tbase) ± standard deviation = 2.6 ± 1.27, median ± standard error = 2.6 ± 0.37) to t24 at prazo r= 0.05 and pclipper = 0.06 respectively. At t24 clipping resulted in a higher reduction of log colony-forming units (mean(t24) = 1.76 ± 0.8, median = 1.69 ± 0.23) compared to the use of the disposable razor (mean(t24) = 1.84 ± 0.85, median = 1.91 ± 0.24). Furthermore, the razor-treated group showed an increase in colony-forming units from t0 to t24, whereas clipping lead to a continuous decrease in colony-forming units from t0 to t24. An enhanced appearance of microlesions and a significant increase of transepidermal water loss after shaving using the disposable razor (p = 0.005) were found indicating skin barrier disruptions. Clipping showed no significant effect on transepidermal water loss. Conclusion: Hair removal using the clipping device results in less disruption of the skin barrier compared to the razor, avoiding the development of microlesions. This could be favorable for the prevention of surgical side infections and postoperative wound management.

N.R. Lee, H.-J. Lee, N.Y. Yoon, D. Kim, M. Jung, E.H. Choi, **Application of Topical Acids Improves Atopic Dermatitis in Murine Model by Enhancement of Skin Barrier Functions Regardless of the Origin of Acids,** Ann Dermatol Vol. 28, No. 6, 2016, p. 690-696

Background: The acidic pH of the stratum corneum (SC) is important for epidermal permeability barrier homeostasis. Acidification of the skin surface has been suggested as a therapeutic strategy for skin disorders such as atopic dermatitis (AD). Objective: We performed an animal study to evaluate the usefulness of acidification of SC for inhibition of AD lesions and to find out if the therapeutic effect of vinegar is attributable to its herbal contents, rather than its acidity. Methods: Five groups of six oxazolone-treated (Ox)-AD mice were treated for three weeks with creams of different acidity: vehicle cream alone (pH 5.5), neutralized vinegar cream (pH 7.4), pH 5.0 vinegar cream, pH 3.5 vinegar cream, and pH 3.5 hydrogen chloride (HCl) cream. Also, we have compared two groups of Ox-AD mice treated with pH 5.5 vehicle cream or pH 5.5 vinegar cream. Results: Ox-AD mice treated with acidic creams exhibited fewer AD-like lesions, had significantly lower eczema scores, decreased basal by transepidermal water loss (TEWL), and increased SC hydration compared to the groups given only vehicle and neutral cream. There was no significant difference between the acidic vinegar and HCl groups. Between the groups treated with vehicle and pH 5.5 vinegar cream, there was no difference in eczema score, basal TEWL and SC hydration. Conclusion: Application of topical acids, regardless of their source materials, inhibits the development of AD lesions by maintenance of skin surface pH and skin barrier function in murine model.

M. Zhou, H. Xie, L. Cheng, J. Li, **Clinical characteristics and epidermal barrier function of papulopustular rosacea: A comparison study with acne vulgaris,** Pak J Med Sci 2016 Vol. 32 No. 6

Objective: To evaluate the clinical characteristics and epidermal barrier function of papulopustular rosacea by comparing with acne vulgaris. Methods: Four hundred and sixty-three papulopustular rosacea patients and four hundred and twelve acne vulgaris patients were selected for the study in Xiangya Hospital of Central South University from March 2015 to May 2016. They were analyzed for major facial lesions, self-conscious symptoms and epidermal barrier function. Results: Erythema**,** burning, dryness and itching presented in papulopustular rosacea patients were signifcantly higher than that in acne vulgaris patients (P<0.001). The clinical scores of erythema, burning, dryness and itching in papulopustular rosacea patients were signifcantly higher than those in acne vulgaris patients (P<0.001). The water content of the stratum cornuem and skin surface lipid level were both

signifcantly lower in papulopustular rosacea patients than that of the acne vulgaris patients (P<0.001) and healthy subjects (P<0.001); Water content of the stratum cornuem and skin surface lipid level were higher in acne vulgaris patients in comparison with that of healthy subjects (P>0.05, P<0.001; respectively). Transepidermal water loss was signifcantly higher in papulopustular rosacea patients than that of acne vulgaris patients and healthy subjects (P<0.001); transepidermal water loss was lower in skin of acne vulgaris patients than that of healthy subjects (P<0.001). Conclusion: Erythema, burning, dryness and itching are the characteristics of papulopustular rosacea, which makes it different from acne vulgaris. The epidermal barrier function was damaged in papulopustular rosacea patients while not impaired in that of acne vulgaris patients.

C.W. Bradley, D.O. Morris, S.C. Rankin, C.L. Cain, A.M. Misic, T. Houser, E.A. Mauldin, E.A. Grice, **Longitudinal evaluation of the skin microbiome and association with microenvironment and treatment in canine atopic dermatitis,** J Invest Dermatol, 2016 June ; 136(6): p. 1182–1190

Host-microbe interactions may play a fundamental role in the pathogenesis of atopic dermatitis (AD), a chronic relapsing inflammatory skin disorder characterized by universal colonization with Staphylococcus. To examine the relationship between epidermal barrier function and the cutaneous microbiota in AD, this study employed a spontaneous model of canine AD (cAD). In a cohort of 14 dogs with cAD, the skin microbiota was longitudinally evaluated with parallel assessment of skin barrier function at disease flare, during antimicrobial therapy and posttherapy. Sequencing of the bacterial 16S ribosomal RNA gene revealed decreased bacterial diversity and increased proportions of Staphylococcus (S. pseudintermedius in particular) and Corynebacterium in comparison to a cohort of healthy control dogs (n=16). Treatment restored bacterial diversity with decreased Staphylococcus proportions, concurrent with decreased cAD severity. Skin barrier function, as measured by corneometry, pH, and transepidermal water loss (TEWL) also normalized with treatment. Bacterial diversity correlated with TEWL and pH, but not corneometry. These findings provide insights into the relationship between the cutaneous microbiome and skin barrier function in AD, the impact of antimicrobial therapy on the skin microbiome, and highlight the utility of cAD as a spontaneous non-rodent model of AD.

S. Shefer, **Targeted Delivery of Natural Skin Components to Restore Barrier Integrity: Achieving Anti-Aging Health Benefits,** EURO COSMETICS 5-2016, p. 28-30

A topic getting increasingly more frequent, and significant, attention in the fields of dermatology and cosmetics is skin barrier health and restoration. While the attention is well deserved, like other skin care topics, it is fundamental to understand the science behind the marketing. We will work here to first understand the issues related to skin barrier integrity, review the effects consumers want these products to achieve, and finally review the scientific approach and natural ingredient-based technology that is able to bring about a dramatic improvement in skin barrier health.

H. Sundaram, N. Mackiewicz, E. Burton, L. Peno-Mazzarino, E. Lati, S. Meunier, **Pilot Comparative Study of the Topical Action of a Novel, Crosslinked Resilient Hyaluronic Acid on Skin Hydration and Barrier Function in a Dynamic**, Three-Dimensional Human Explant Model, J Drugs Dermatol, 2016 Apr;15(4): p. 434-41

Background: Hyaluronic acid (HA) is a popular ingredient in topical formulations for cosmetic improvement of the skin. Most formulations contain linear, non-crosslinked HA oligomers, low molecular weight (LMW) HA, and/or high molecular weight (HMW) HA. Crosslinking of HA enhances its clinical longevity and mechanical characteristics. The objective of this study was to characterize the topical effects of a new, crosslinked resilient HA (RHA) that is also available as a cohesive, tissue-integrating injectable filler, compared with non-crosslinked HMW HA and LMW HA. Living human skin explants that preserve the 3-dimensional structure of in vivo skin were used to maximize clinical relevance. Methods: Standardized doses of each HA product were applied daily for 9 days to human skin explant surfaces. Untreated explants served as controls. Water content of the stratum corneum and entire epidermis was analyzed by Raman spectroscopy. Transepidermal water loss (TEWL) was measured to assess skin barrier function. Explant morphology and microrelief were evaluated by optical and scanning electron microscopy. Results: Crosslinked RHA achieved a significant increase in epidermal water content (7.6%) over the control. Spectral cartography confirmed a higher epidermal water content with RHA than with HMW HA or LMW HA. TEWL was reduced by 27.8% with RHA, and by 15.6% with HMW HA, but increased by 55.5% with LMW HA. Cutaneous microrelief improved with RHA. Corneocyte cohesion improved with RHA and HMW HA. Conclusions: This comparative, multimodal study demonstrated greater benefits of topical crosslinked RHA over linear HMW HA or LMW HA in reducing TEWL, retaining and redistributing water within the epidermis, maintaining skin integrity, and improving skin barrier structure and function. RHA was a more efficacious humectant than LMW HA, and a more efficacious

occlusive moisturizer than HMW HA. These integrative epidermal repair activities are of significant value for addressing primary deficits of aging skin, improving tolerance to retinoids and other topical agents, and optimizing procedural outcomes. A combination of topical and injectable HA provides an elegant model of synergistic, multi-level skin restoration.

T.J. Stephens, M.L. Sigler, P.D. Hino, A. Le Moigne, L. Dispensa, **A Randomized, Double-blind, Placebo-controlled Clinical Trial Evaluating an Oral Anti-aging Skin Care Supplement for Treating Photodamaged Skin**, J Clin Aesthet Dermatol. 2016;9(4): p. 25–32

Objective: Evaluate an anti-aging skin care supplement on the appearance of photodamaged skin. Design: Randomized, double-blind, placebo-controlled clinical trial. Following a one-month washout period, subjects received two anti-aging skin care formula tablets (total daily dose: marine complex 210mg, vitamin C 54mg, zinc 4mg) or placebo daily for 16 weeks. Subjects were restricted from products/procedures that may affect the condition/appearance of skin, including direct facial sun or tanning bed exposure. Participants utilized a standardized facial cleanser and SPF15 moisturizer. Setting: Single study center (Texas, United States; June–November 2007). Participants: Healthy women aged 35 to 60 years (mean, 50 years), Fitzpatrick skin type I–IV, modified Glogau type II–III. Measurements: Subjects were assessed at Weeks 6, 12, and 16 on clinical grading (0–10 VAS), bioinstrumentation, digital photography, and selfassessments. Analysis of variance with treatment in the model was used for between-group comparisons (alpha P≤0.05). Results: Eighty-two anti-aging skin care formula subjects and 70 placebo subjects completed the study. Significant differences in change from baseline to Week 16 scores were observed for clinical grading of overall facial appearance (0.26; P<0.0001), radiant complexion (0.59; P<0.0001), periocular wrinkles (0.08; P<0.05), visual (0.56; P<0.0001) and tactile (0.48; P<0.0001) roughness, and mottled hyperpigmentation (0.15; P<0.001) favoring the subjects in the anti-aging skin care supplement group. Ultrasound skin density (Week 16) was significantly reduced for placebo versus anti-aging skin care supplement group (-1.4% vs. 0%; P<0.01). Other outcomes were not significant. Mild gastrointestinal symptoms possibly related to the anti-aging skin care supplement (n=1) and placebo (n=2) were observed. Conclusion: Women with photodamaged skin receiving anti-aging skin care supplement showed significant improvements in the appearance of facial photodamage.

K.C. Lee, J. Dretzke, L. Grover, A. Logan, N. Moiemen, **A systematic review of objective burn scar measurements,** Lee et al. Burns & Trauma (2016) 4:14

Abstract: Background: Problematic scarring remains a challenging aspect to address in the treatment of burns and can significantly affect the quality of life of the burn survivor. At present, there are few treatments available in the clinic to control adverse scarring, but experimental pharmacological anti-scarring strategies are now beginning to emerge. Their comparative success must be based on objective measurements of scarring, yet currently the clinical assessment of scars is not carried out systematically and is mostly based on subjective review of patients. However, several techniques and devices are being introduced that allow objective analysis of the burn scar. The aim of this article is to evaluate various objective measurement tools currently available and recommend a useful panel that is suitable for use in clinical trials of anti-scarring therapies.

S. Bänziger, B. Suter, B. Obermayer, **Fixing age with lipids: improvement of the epidermal lipid synthesis in mature skin,** HPC Vol. 11 (2) March/April 2016

Abstract: Epidermal lipids constitute the seal for the outermost skin layers and the glue for the corneocytes. Epidermal lipids, however, are reduced in mature skin and may represent the underlying cause of increased susceptibility, diminished capacity to recover, and chronic dryness of mature skin. Hence reactivating epidermal lipid synthesis represents a promising anti-ageing strategy for mature skin. Earlier *in-vitro* experiments implied that *Gynostemma pentaphyllum* extract reactivates lipid synthesis via the Liver X receptor (LXR). Here we show that the cosmetic active REFORCYL®, which is based on a *Gynostemma pentaphyllum* extract, positively impacts mature skin *in-vivo*, and that the reactivation of lipid synthesis translates into improved barrier integrity and repair.

A.I. Arshad, S.H. Khan, N. Akhtar, **Formulation Development of Topical Cream loaded withAnanas Comomus Extract: in vivo Evaluation for Changes in Skin barrier Function using Biophysical Techniques**, Acta Pol Pharm. 2016 Mar-Apr;73(2): p. 485-94

The prime objective of current investigation was to develop a topical skin care cream (w/o) loaded with Ananas comosus extract versus placebo control, and evaluated non-invasively for changes in skin barrier function i.e., epidermal hydration levels and transepidermal water loss (TEWL), on healthy human volunteers. Active cream carrying 2% extract of Ananas comosus in the internal phase of w/o emulsion was prepared while placebo contained no extract. Stability assessment of both creams was

performed at various storage conditions 8, 25, 40 degrees C, 40 degrees C + 75% RH (relative humidity) and 50 degrees C. Effects on epidermal hydration and TEWL were observed by applying active cream at one side and placebo on the other side of face by 11 healthy human volunteers during 12 weeks period using Corneometer MPA5 and Tewameter MPA5. Results indicated that both creams (active and placebo) remained stable at all storage conditions. All samples manifested non-Newtonian, shear thinning behavior with increasing shear rate, whereas statistical interpretation indicated that effects of active cream were superior than placebo, as it significantly ($p = 0.05$) improves the epidermal hydration levels up to 56.74% and reduces TEWL up to -73.19% at the end of study period compared to baseline value. The surface evaluation of living skin (SELS) parameters SEr, SEsc, SEsm, SEw were also assessed and indicated a significant ($p = 0.05$) reduction. Conclusively, creams loaded with Ananas comosus extract exhibit better physicochemical stability and represent a propitious improvement in skinbarrier function, used as a functional moisturizing and anti-aging ingredient in topical skincare products.

M. Fell, J. Meirte, M. Anthonissen, K. Maertens, J. Pleat, P. Moortgat, **The Scarbase Duo®: Intra-rater and interrater reliability and validity of a compact dual scar assessment tool**, Burns, Volume 42, Issue 2, March 2016, p. 336-344

Objective scar assessment tools were designed to help identify problematic scars and direct clinical management. Their use has been restricted by their measurement of a single scar property and the bulky size of equipment. The Scarbase Duo® was designed to assess both trans-epidermal water loss (TEWL) and colour of a burn scar whilst being compact and easy to use. Twenty patients with a burn scar were recruited and measurements taken using the Scarbase Duo by two observers. The Scarbase Duo measures TEWL via an openchamber system and undertakes colorimetry via narrow-band spectrophotometry, producing values for relative erythema and melanin pigmentation. Validity was assessed by comparing the Scarbase Duo® against the Dermalab and the Minolta Chromameter respectively for TEWL and colorimetry measurements. The intra-class correlation coefficient (ICC) was used to assess reliability with standard error of measurement (SEM) used to assess reproducibility of measurements. The Pearson correlation coefficient (r) was used to assess the convergent validity. The Scarbase Duo® TEWL mode had excellent reliability when used on scars for both intra- (ICC=0.95) and inter-rater (ICC=0.96) measurements with moderate SEM values. The erythema component of the colorimetry mode showed good reliability for use on scars for both intra-(ICC=0.81) and inter-rater (ICC=0.83) measurements with low SEM values. Pigmentation values showed excellent reliability on scar tissue for both intra- (ICC=0.97) and inter-rater (ICC=0.97) with moderate SEM values. The Scarbase Duo TEWL function had excellent correlation with the Dermalab (r=0.93) whilst the colorimetry erythema value had moderate correlation with the Minolta Chromameter (r=0.72). The Scarbase Duo® is a reliable and objective scar assessment tool, which is specifically designed for burn scars. However, for clinical use, standardised measurement conditions are recommended.

H. J. Fitton, T. Oddie, D. Stringer, S. Karpiniec, **Marine plant extracts offer superior dermal protection,** Personal Care, March 2016

Two specialty macroalgae-derived extracts have been developed by leading Australian biotechnology company Marinova, for use in cosmetic formulations. Wild-grown Undaria pinnatifida and Fucus vesiculosus macroalgae were sourced to extract two well characterised, certified organic fucoidan compounds: Maritech Reverse and Maritech Bright. Maritech Reverse is a highly sulfated, high purity fucoidan, while Maritech Bright is a high purity compound comprised of both fucoidan and marine polyphenols. Extensive clinical and in vitro testing showed both extracts offer superior cosmeceutical benefits, particularly through anti-glycation, immune boosting and enzyme inhibitory mechanisms and UV protecting and soothing activity. Maritech Reverse was particularly effective at increasing the expression of wound-healing genes, while Maritech Bright was shown to clinically reduce age spot and wrinkle appearance. The demonstrated bioactivity of the extracts at low concentrations, in addition to their certified organic and environmentally sustainable status, position Maritech Bright and Maritech Reverse as two highly valuable ingredients for cosmetic formulation.

M. Mendes Fossa Shirata, P.M. Berardo Gonçalves Maia Campos, **Importance of texture and sensorial profle in cosmetic formulations development,** Surg Cosmet Dermatol 2016;8(3): p. 223-30

Introduction: The evaluation of the clinical effcacy of cosmetic formulations in real conditions of use is indispensable and the correlation of these results with texture and sensory profle analyses is necessary because impacts directly in the continuity of cosmetic treatment. Objective: The evaluation and correlation of the texture and sensorial profle, and clinical effcacy of cosmetic formulations containing alfafa oligosaccharides, cassava polysaccharides and sunscreens. Methods: It was

evaluated the texture and sensorial profle, and clinical effcacy of formulations through biophysical and imaging analysis techniques. Results: The methods presented a good correlation, because formulation added with suncreens and active ingredients provided better spreadability and sensorial properties. The assessment of clinical effcacy was coherent with the sensory analysis once the "skin smoothness" parameter could be proven with the increase of hydration and improvement of skin microrelief. Conclusions: The application and correlation of the used techniques enabled the defnition and obtainment of a formulation with sensory acceptance and proven clinical effcacy in the improvement of texture and skin hydration. Thus, this study provides contribution in dermatological area, once an appropriate sensory favors the adhesion to the use of the product and the consequent treatment success.

V. Mengeaud, **Évaluation de l'effet hydratant,** in: A.-M. Pénse-Lhéritier (Editor): Évaluation des produits cosmétiques, Lavoisier Paris, Tec & Doc, chapter 3, p. 32-57, 2016

La peau constitute Einterface principale entre l'environnement extérieur et notre organisme, qui est équipe à son extrême surface d'une très fine couche tissulaire appelée *stratum corneum* (SC) dont la fonction spécifique de «barrière» est indispensable à notre survie terrestre, Elle est non seulement protectrice vis-à-vis des agressions extérieures qu'elles soient physiques, chimiques ou microbiologiques, mais aussi capable de limiter les pertes hydriques corporelles. Ainsi, Tune des fonctions majeures de la peau est d'assurer son rôle de barrière entre l'organisme et le milieu extérieur tout en préservant des échanges avec celui-ci. La fonctionnalité de cette barrière depend donc d'un équilibre dynamique. En effet, au niveau de cette interface, sont mis en jeu des mécanismes régulés de manière dynamique et réactive, qui concourent au maintien d'un milieu interne stable alors que l'environnement extérieur subit des variations: ces mécanismes garantissent l'homéostasie cutanée.

A.-M. Pensé-Lhéritier, A. Sirvent, **Objectivation des produits antitranspirants et déodorants**, in: A.-M. Pénse-Lhéritier (Editor): Évaluation des produits cosmétiques, Lavoisier Paris, Tec & Doc, chapter 9, p. 144-157, 2016

Longtemps délaisse, le produit affichant une activité déodorante et antitranspirante fait actuellement l'objet de nombreuses innovations et de communication de la part des entreprises. En effet, ce produit s'est vendu en 2015 à 4 milliard d'unites soit le troisième dans la catégorie hygiène après le gel douche et le dentifrice. Au-delè des nouvelles propositions d'emballage compressé, les marques ont fixe leur innovation: - sur la substitution des ingrédients pour le marché féminin: matières premières naturelles et minérales moins agressives; - sur des produits techniques pour les hommes: capteurs d'odeurs par exemples. Afin de ne pas decévoir ces populations quant à l'efficacité des produits, ce qui entrainerait automatiquement l'absence de ré-achat, il est très important de pouvoir offrir des méthodes d'evaluations efficientes pour tester ces produits s'affichant comme déodorants et/ou antitranspirant. Sous ces noms se cachent en fait deux modes d'action bien différents. Le déodorant ne perturbe pas la sudation et se contente de masquer l'odeur. Quant à l'antitranspirant (ou antiperspirant), son rôle premier est avant tout de bloquer l'écoulement du flux sudoral et il revendique des effets absorbants, antihumidité et neutralisants.

A.C. da Silva Marques, **Biometrologic Evaluation of Cosmetic Products**, Dissertation in pharmaceutical sciences at the University of Coimbra, 2016

Given the growing importance that cosmetic products have on human's health and in our daily life, it is important to increase the control of these products, both in terms of safety and effectiveness. Taking into account that conducting animal tests for the production and validation of cosmetic products is prohibited by law, producers of these products have to resort to alternative methods. Biophysical methods have gained an important highlight in the scientific community, in particular the non-invasive methods. They allow a safe and faster evaluation of cosmetics. The purpose of this work is to describe some methods and equipments used at national and European level to test the effectiveness of cosmetic products and correlate the parameters evaluated with the alleged properties in the products. The methods include evaluation tests of the following skin properties: hydration, elasticity, coloring, sebum production and perspiration.

A. Ratz-Łyko, J. Arct, K. Pvtkowska, **Moisturizing and Antiinflammatory Properties of Cosmetic Formulations Containing *Centella asiatica* Extract**, Indian J Pharm Sci. 2016 Jan-Feb, 78(1): p. 27-33

Centella asiatica extract is a rich source of natural bioactive substances, triterpenoid saponins, flavonoids, phenolic acids, triterpenic steroids, amino acids and sugars. Thus, many scavenging free radicals, exhibit antiinflammatory activity and affect on the *stratum corneum* hydration and epidermal barrier function. The aim of the present study was to evaluate the *in vivo* moisturizing and

antiinflammatory properties of cosmetic formulations (oil-in-water emulsion cream and hydrogel) containing different concentrations of *Centella asiatica* extract. The study was conducted over four weeks on a group of 25 volunteers after twice a day application of cosmetic formulations with *Centella asiatica* extract (2.5 and 5%, w/w) on their forearms. The measurement of basic skin parameters *{stratum corneum* hydration and epidermal barrier function) was performed once a week. The *in vivo* antiinflammatory activity based on the methyl nicotinate model of microinflammation in human skin was evaluated after four weeks application of tested formulations. *In vivo* tests formulations containing 5% of *Centella asiatica* extract showed the best efficacy in improving skin moisture by increase of skin surface hydration state and decrease in transepidermal water loss as well as exhibited antiinflammatory properties based on the methyl nicotinate model of microinflammation in human skin. Comparative tests conducted by comeometer, tewameter and chromameter showed that cosmetic formulations containing *Centella asiatica* extract have the moisturizing and antiinflammatory properties.

M. Zając, M.P. Szczepanik, P.M. Wilkołek, Ł.R. Adamek, Z.J.H. Pomorski, W. Sitkowski, M. Gołyński, **Assessment of a correlation between Canine Atopic Dermatitis Extent and Severity Index (CADESI-03) and selected biophysical skin measures (skin hydration, pH, and erythema intensity) in dogs with naturally occurring atopic dermatitis**, The Canadian Journal of Veterinary Research, 2015

Atopic dermatitis is a common allergic skin disease in dogs. The aim of this study was to examine the possibility of a correlation between biophysical skin variables: skin hydration (SH), skin pH, and erythema intensity measured in 10 different body regions and both total Canine Atopic Dermatitis Extent and Severity Index (CADESI-03) and CADESI measured in a given region (CADESI L). The study was conducted using 33 dogs with atopic dermatitis. The assessment of the biophysical variables was done in 10 body regions: the lumbar region, right axillary fossa, right inguinal region, ventral abdominal region, right lateral thorax region, internal surface of the auricle, interdigital region of right forelimb, cheek, bridge of nose, and lateral site of antebrachum. Positive correlations were found between SH and CADESI L for the following regions: the inguinal region (r = 0.73) and the interdigital region (r = 0.82), as well as between total CADESI and SH on digital region (r = 0.52). Also, positive correlations were reported for skin pH and CADESI L in the lumbar region (r = 0.57), the right lateral thorax region (r = 0.40), and the lateral antebrachum (r = 0.35). Positive correlations were found in the interdigital region between erythema intensity and the total CADESI-03 (r = 0.60) as well as the CADESI L (r = 0.7). The results obtained suggest that it may be possible to use skin hydration, pH, and erythema intensity to assess the severity of skin lesion but positive correlation was only found in < 13.3% of possible correlations and usage of these measures in dogs is limited.

H. Dabboue, N. Builles, É. Frouin, D. Scott, J. Ramos, G. Marti-Mestres, **Assessing the Impact of Mechanical Damage on Full-Thickness Porcine and Human Skin Using an *In Vitro* Approach,** BioMed Research International, Volume 2015

For most xenobiotics, the rates of percutaneous absorption are limited by diffusion through the horny layer of skin. However, percutaneous absorption of chemicals may seriously increase when the skin is damaged. Te aim of this work was to develop an *in vitro* representative model of mechanically damaged skins. Te epidermal barrier was examined following exposure to a razor, a rotating brush, and a microneedle system in comparison to tape-stripping which acted as a reference. Excised full-thickness skins were mounted on a diffusion chamber in order to evaluate the effect of injuries and to mimic physiological conditions. The transepidermal water loss (TEWL) was greatly increased when the barrier function was compromised. Measurements were made for all the damaged biopsies and observed histologically by microscopy. On human and porcine skins, the tape-stripping application (0 to 40 times) showed a proportional increase in TEWL which highlights the destruction of the stratum corneum. Similar results were obtained for all cosmetic instruments. Tis is reflected in our study by the nonsignifcant difference of the mean TEWL scores between 30 strips and mechanical damage. For a specifc appreciation, damaged skins were then selected to qualitatively evaluate the absorption of a chlorogenic acid solution using fluorescence microscopy.

J.C. Bernengo, H. Adhoute, D. Mougin, **Measurement of the time off light of photons into the skin: influence of site, age and gender, correlation with other skin parameters,** Skin Research and Technology 2015; 21: 25-34

Background/purpose: The speed of light (time of flight) into the skin is obviously relied to ist structure, and might appear as a tool for non-invasive investigation of skin physico-chemical properties, among them aging is of primary importance. Though already piblished, such time of flight measurements have never been extensively correlated with other well-documented skin parameters such as

localization, the influence of gender and age, the elasticity and roughness, and the water trans-epidermal diffusion (TEWL).

W. Silny, A. Polanska, D. Jenerowicz, K. Kniola, M. Molinska-Glura, A. Danczak-Pazdrowska, **Monitoring of therapy in atopic dermatitis - observations with the use of high-frequency ultrasonography,** Skin Research and Technology 2015; 21:35-40

Background: In reactive and proactive therapy of atopic dermatitis a well-established agent is tacrolimus, a member of calcineurin inhibitors' family. The clinical safety and efficacy of this drug were evaluated previously in randomized multicenter trials. However, so far in clinical studies the assessment of its action on the skin has been made only on basis of different scores and scales. We present the 6-month observations of tacrolimus therapy in atopic dermatitis patients monitored with the use of noninvasive techniques like high-frequency ultrasonography and evaporimetry.

N. Aghazadeh, A. Firooz, A. Rajabi Estarabadi, P. Hejazi, **The effects of water exposure on biophysical properties of normal skin,** Skin Research and Technology 2015; 21: 131-136

Background: Water exposure is an influential factor in some common dermatoses. It has also been shown that water has an effect on barrier function and biophysical properties of skin. The aim of this study was to evaluate the effect of water immersion on biophysical properties of normal skin.

G.N. Stamatas, A. Lopes-DaCunha, A. Nkengne, C. Bertin, **Biophysical properties of striae distensae evaluated in vivo using non-invasive assays,** Skin Research and Technology 2015; 21:254-258

Background: Striae Distensae (SD) or stretch marks are manifestations of epidermal atrophy that occurs after tissure tearing due to rapid growth or over-stretching and are characterized by distinct microstructural features. The objective of this in vivo studay was to investigate the biophysical properties of SD lesions, including skin barrier function, skin surface hydration, mechanical properties, and chromophore concentrations, compared to normal adjacent skin.

J-F. Nicolay, E. Coste, M. Fréchet, **Dermal-epidermal junction: a key target for anti-ageing,** Personal Care, November 2015

The dermal epidermal junction (DEJ) is a complex structure (Fig. 1) primarily responsible for epidermis to dermis attachment. The DEJ thus warrants cohesion and mechanical resistance of the skin. It also behaves as a selective permeability barrier controlling cell migration (immune cells, for example) and molecular exchanges (growth factors and nutrients, stress signals). Epidermal cells' interaction with the DEJ regulates their proliferation, differentiation and migration, which is critical for epidermal renewal, barrier function setup, and wound healing.

H. van der Hoeven, Dr. H. Prade, **Epidermal anti-ageing with a probiotic skin care approach,** Personal Care November 2015

While most anti-ageing products promise to fight signs of ageing and turn back time, older skin care users are reported to be perfectly comfortable with their age. As they do not feel old, they are not compellingly interested in looking younger but in looking the best way they can. And that means above all as healthy as possible. Healthy-looking skin is closely related to the actual main purpose of our skin, to function as a physical barrier between our body and the harmful outside world. Being our skin's top layer, the epidermis is responsible for maintaining this function.

K. von Oppen-Bezalel, **Shielding against pollution for pristine clear skin,** Personal Care November 2015

A major unmet need the cosmetic industry is the effective, natural and safe means to protect and detoxify the skin against environmental pollution to which it is exposed daily. Pollution in general and air pollution specifically have detrimental effects on skin health and apprearance. Constant exposure to environmental toxins leads to accumulated damage in two main ways: DNA damage and chronic imflammation, which over time produces premature signs of ageing.

K. Krull, **Untersuchung von Hautrötung und Helligkeit mittels verschiedener Farbmessverfahren *in vitro* und *in vivo*,** Dissertation an der Medizinische Fakultät der Universität zu Jena, 2015

Zusammenfassung: Die Haut ist das größte Organ unseres Körpers und bildet aufgrund ihres spezifischen Aufbaus eine wichtige Barriere des Organismus gegenüber der Umwelt. Diese Barriere kann jedoch durch verschiedene Reize geschädigt werden, was zu Veränderungen im Aufbau, z. B. durch Abtragung oberster Zellschichten, sowie Änderungen von hautphysiologischen Parametern führt. Diese Parameter sind unter anderem der transepidermale Wasserverlust (TEWL), der Wassergehalt im

Stratum Corneum, die Hautdurchblutung und die Pigmentierung der Haut. In der vorliegenden Dissertation wurden die Veränderungen der eben genannten Parameter nach Einfluss exogener Reize mit Hilfe verschiedener Messgeräte untersucht. Ziel war es, die Haut mechanisch mittels Tapestripping, sowie chemisch durch Einwirkung von Natriumlaurylsulfat (engl. Sodium Lauryl Sulfate, SLS) und Wasser unter Okklusion zu reizen, um anschließend herauszufinden, ob eine erfolgte milde Irritation in einer Veränderung der Hautrötung und – pigmentierung resultiert und mit welcher Sensitivität diese Farbveränderungen durch die einzelnen Farbmessgeräte erfasst wurden. Zum Einsatz kamen das Mexameter MX18 (Fa. Courage & Khazaka), die Chromameter 200 und 300 (Fa. Minolta), der DermaSpectropen (Fa. Lange GmbH) und das Colorimeter (Fa. Courage & Khazaka).

J. Polaskova, J. Pavlackova, P. Egner, **Effect of vehicle on the performance of active moisturizing substances,** Skin Res Technol, 2015 Nov; 21(4): p. 403-412

Purpose: The work is aimed at the description and study of the hydration effect of different active substances (hyaluronic acid, sericin, glycerol, and urea) incorporated in two different vehicles commonly used for compounding pharmaceutical ingredients, gel, and emulsion. Methods: The effects of the formulations were investigated by instrumental methods in vivo after their administration to the skin of volar forearms in a group of 20 healthy volunteers (women, mean age of 28 years). Hydration effect was observed by corneometry and barrier properties (TEWL) by tewameter at regular time intervals (1-26 h) after application of the prepared samples. Results: The results indicate that the active substances incorporated in the emulsion moisturize the skin better compared to the same substances contained in the gel. Furthermore, it was found that these ingredients, whether they are present in the emulsion or in the gel, prevent TEWL in a similar manner. Conclusion: The study showed that differences exist among the tested active ingredients in their ability to moisturize the skin. These differences are dependent not only on the type and concentration of the active substance used but also on the type of vehicle in which they are applied. It was also found that the active substances influence the viscosity of the prepared formulations.

K.L. Hon, Y.C. Tsang, N.H. Pong, V.W.Y Lee, N.M. Luk, C.M. Chow, T.F. Leung, **Patient acceptability, efficacy, and skin biophysiology of a cream and cleanser containing lipid complex with shea butter extract versus a ceramide product for eczema**, Hong Kong Med J, Volume 21 Number 5, October 2015

Objectives: To investigate patient acceptability, efcacy, and skin biophysiological effects of a cream/cleanser combination for childhood atopic dermatitis. Design: Case series. Setting: Paediatric dermatology clinic at a university teaching hospital in Hong Kong. Patients: Consecutive paediatric patients with atopic dermatitis who were interested in trying a new moisturiser were recruited between 1 April 2013 and 31 March 2014. Swabs and cultures from the right antecubital fossa and the worst eczematous area, disease severity (SCORing Atopic Dermatitis index), skin hydration, and transepidermal water loss were obtained prior to and following 4-week usage of a cream/cleanser containing lipid complex with shea butter extract (Ezerra cream; Hoe Pharma, Petaling Jaya, Malaysia). Global or general acceptability of treatment was documented as 'very good', 'good', 'fair', or 'poor'. Results: A total of 34 patients with atopic dermatitis were recruited; 74% reported 'very good' or 'good', whereas 26% reported 'fair' or 'poor' general acceptability of treatment of the Ezerra cream; and 76% reported 'very good' or 'good', whereas 24% reported 'fair' or 'poor' general acceptability of treatment of the Ezerra cleanser. Tere were no intergroup differences in pre-usage clinical parameters of age, objective SCORing Atopic Dermatitis index, pruritus, sleep loss, skin hydration, transepidermal water loss, topical corticosteroid usage, oral antihistamine usage, or general acceptability of treatment of the prior emollient. Following use of the Ezerra cream, mean pruritus score decreased from 6.7 to 6.0 (P=0.036) and mean Children's Dermatology Life Quality Index improved from 10.0 to 8.0 (P=0.021) in the 'very good'/'good' group. Tere were no statistically significant differences in the acceptability of wash (P=0.526) and emollients (P=0.537) with pre-trial products. When compared with the data of another ceramideprecursor moisturiser in a previous study, there was no statistical difference in efcacy and acceptability between the two products. Conclusions: Te trial cream was acceptable in three quarters of patients with atopic dermatitis. Patients who accepted the cream had less pruritus and improved quality of life than the non-accepting patients following its usage. Te cream containing shea butter extract did not differ in acceptability or efcacy from a ceramide-precursor product. Patient acceptability is an important factor for treatment efcacy. Tere is a general lack of published clinical trials to document the efcacy and skin biophysiological effects of many of the proprietary moisturisers.

A. Patatian, T. Bader, A. Afchain, L. Peno,G. Percoco, S. Scalvino, D. Reby, E. Lati, P. Benech, **Gene expression profiling performed on tape stripping or explants identifies common transcriptional**

signatures: an "open access" to decipher molecular factors accounting for individual skin physiology, IFSCC 2015 Zurich

Introduction: Skin is the largest organ of the body and performs many functions that support is protective role and survival. It helps us sense our surroundings and provides a barrier to environmental insults. The Stratum corneum (SC) is the outer layer of the skin (non-viable epidermis), and forms the rate-controlling barrier for diffusion for almost all compounds. It is composed of dead flattened, keratin-rich cells, the corneocytes. These dense cells are surrounded by a complex mixture of intercellular lipids, namely, ceramides, free fatty acids, cholesterol, and cholesterol sulphate. Their most important feature is that they are structured as ordered bilayer arrays [1-2]. The other layers are: the remaining layers of the epidermis (viable epidermis), the dermis, and the subcutaneous tissues. There are also several associated appendages: hair follicles sweat ducts, apocrine glands and nails.

C. Barba, C. Alonso, I. Sánchez, E. Suñer, L.C. Sáez, L. Coderch, **Third generation of proteoglycans against skin aging,** IFSCC 2015 Zurich

Summary: Aging produces a functional deficit in the skin due to its structural and molecular alterations. The majority of age-dependent changes that occur in our skin happen in the dermis. This is the result of changes in the skin collagen, principal dermis component, and in the proteoglycans, being decorin and versican the most important proteoglycans on skin cells. Furthermore, sun exposure is the primary environmental stressor leading to damaged skin. The main aim of this work is to study the efficacy of a Proteum serum, containing third generation of proteoglycans, against skin aging. *In vitro* tests were performed to evaluate the Proteum serum ability on activating the production of collagen and proteoglycans on skin cells. An *in vivo* study was performed to determine the efficacy of the Proteum serum when applied on skin during 30 days with the use of non-invasive biophysics techniques. The *invitro* tests demonstrated that the Proteum serum was able to elevate the production of molecules which are essential on supporting the dermal extracellular matrix organization. These results were correlated by the *in vivo* measurements. A beneficial effect of the applied Proteum serum was demonstrated with an improvement of the skin roughness, a reinforcement of the skin barrier function and a protector effect on human stratum corneum against LPO.

C.S.C. Pereira, A. R. Baby, MV R. Velasco, M.T. Scotti, **Correlação Instrumental e Sensorial de Composição Aromática no Ciclo Menstrual,** Cosmetics & Tolietries (Brasil) Vol 27, set-out 2015

In order to know the variables that may influence the fragrance-substrate interface and consumer perception in the menstrual cycle, and contribute to the development of fragrances, there was a study correlating the sensory analysis and instrumental (biochemical and chromatographic measurements) as a function of the cycle menstrual. *(Article in Protuguese)*

M. Schultz, **Charakterisierung der Hautbarrierefunktion von Früh- und Reifgeborenen innerhalb der ersten Lebensjahre unter Berücksichtigung angewandter Pflegekonzepte in der Neonatalperiode,** Dissertation Charité - Universitätsmedizin Berlin, Germany, September 2015

Die Reifungsprozesse der Hautbarriere dauern vermutlich bis ins Kleinkindalter hinein an und führen zu einer erhöhten Vulnerabilität der Hautbarriere gegenüber externen Einflüssen. Deshalb ist es wichtig, den Einfluss von Hautpflege auf die kindliche Hautbarriere wissenschaftlich zu untersuchen. Ziel dieser Studie war die Charakterisierung der kindlichen Hautbarriere in ihrer postnatalen Entwicklung unter Berücksichtigung standardisierter postnataler Pflegekonzepte und weiterer Faktoren.

K. Gardien, D. Baas, E. Middelkoop, **Reliability of the Tewameter TM300 for the measurement of Transepidermal Waterloss in burn scars**, Annals of Burns and Fire Disasters - vol. XXVIII – Supplement EBA - September 2015

Introduction: Different measurement parameters and devices are available for clinical research to evaluate scar quality. Transepidermal water loss (TEWL) is a physiological characteristic to measure the efficiency of the skin barrier function and can be measured with the Tewameter TM300. The aim of this study is to investigate the reliability of the Tewameter TM300 for the assessment of TEWL (in grams per square meter per hour (g/h/m²)) in burn scars at 3, 6 and 12 months post-burn. Also the relation between TEWL scar values and scar quality parameters was investigated. Methods: A cross-sectional study was performed in 40 adult patients with burn scars. Three different study areas (scar, healthy adjacent and contralateral skin) were assessed with the Tewameter TM300 by two observers. The inter-observer reliability was tested using the average and single measures intra-class correlation coefficient (ICC) and the standard error of measurement (SEM). Agreement between observers was assessed using Bland-Altman plots with 95% limits of agreement (LoA). Correlations between mean TEWL scar values and scar quality parameters were investigated by Pearson's correlation coefficient. Results: The inter-observer reliability for the three areas was excellent with ICC values between 0.88 and 0.98. SEM

values were between 0.77-1.99. Bland-Altman plots showed relatively wide LoA values -8.6 to 6.9 g/h/m² for scar and -4.5 to 3.9 g/h/m² for healthy skin. Mean TEWL scar values were significantly higher compared to healthy skin (p = 0.000, Wilcoxon). Significant correlations were found between TEWL scar values and the erythema index measured with the DSMII ColorMeter (p= 0.001), POSAS Observer Overall opinion score (p=0.040) and a negative correlation for the number of weeks post-burn (p=0.050). Conclusion: The Tewameter TM300 is a reliable device for the measurement of TEWL in burn scars. However, SEM values were high and relatively wide LoA values were observed. This indicates that the Tewameter TM300 is more appropriate for use in research settings than for the follow-up of individual patients or scars. Minor to moderate fluctuations in TEWL in individual patients may not be distinguished from measurement error using this current measurement setup.

J. Kottner, G. Dobos, A. Andruck, C. Trojahn, J. Apelt, H. Wehrmeyer, C. Richter, U. Blume-Peytavi, **Skin response to sustained loading: A clinical explorative study,** Journal of Tissue Viability (2015) 24, p. 114 – 122

Abstract Background: Severe illness, disability and immobility increase the risk of pressure ulcer development. Pressure ulcers are localized injuries to the skin and/or underlying tissue as a result of long enduring pressure and shear. Little is known about the role of the stratum corneum and the upper skin layers in superficial pressure ulcer development. Objectives: To investigate possible effects of long enduring loading on the skin barrier function under clinical conditions at two pressure ulcer predilection sites. Methods: Under controlled conditions 20 healthy females (mean age 69.9 (3.4) years) followed a standardized immobilization protocol of 90 and 150 min in supine position wearing hospital nightshirts on a standard hospital mattress. Before and immediately after the loading periods skin surface temperature, stratum corneum hydration, transepidermal water loss and erythema were measured at the sacral and heel skin. Results: Prolonged loading caused increases of skin surface temperature and erythema at the sacral and heel skin. Stratum corneum hydration remained stable. Transepidermal water loss increased substantially after loading at the heel but not at the sacral skin. Conclusions: Skin functions change during prolonged loading at the sacral and heel skin in aged individuals. Accumulation of heat and hyperaemia seem to be primarily responsible for increasing skin temperature and erythema which are associated with pressure ulcer development. Increased transepidermal water loss at the heels indicate subclinical damages of the stratum corneum at the heel but not at the sacral skin during loading indicating distinct pathways of pressure ulcer development at both skin areas.

V. Küppers, M. Kemper, C. Abels, **Clinical evaluation of a water-in-oil emulsion with protective and regenerative properties for the anogenital area**, Clinical, Cosmetic and Investigational Dermatology 2015:8, p. 555–562

Abstract: Inadequate hygiene, aggressive cleansing, and chafng skin folds, as well as urine, feces, and sweat may trigger irritative contact dermatitis in the anogenital area. Serious recommendations for protection of the skin toward irritants include hygienic aspects and the use of appropriate skin care. Furthermore, preventing an accumulation of irritants on unprotected skin is mandatory. An intraindividual comparison study with 30 participants (17 female, 13 male; age: 44.2±8.3 years) was performed to evaluate the properties of a newly developed water-inoil (W/O) balm on artifcial sodium dodecyl sulfate-damaged epidermal barrier. The balm was applied 14 days twice daily, and transepidermal water loss and erythema were investigated. A signifcant improvement of both parameters after 12 days and even after 21 days could be confrmed. Two major clinical trials were performed to evaluate the safety and effcacy regarding protective and regenerative properties of the W/O balm on irritated skin in the anogenital area. Therefore, 29 children were enrolled (14 male, 15 female, age: 15.5±7.8 months) in an openlabeled 4-week clinical study. The balm was used in the area under disposable diapers at least after diaper change or if required. Furthermore, in a second open, multicenter study, 43 women (mean age: 46.2±16.9) with predisposition to skin irritation in the outer anogenital region were included. The product was applied for 4 weeks 1–2 times daily. In both studies, skin tolerability, applicability, scent, spreadability, and removability of the balm were evaluated by participants and practitioners predominantly as good or even very good, also skin hydration, protection, and regeneration were judged positively. The studies confrmed that the newly developed W/O balm exhibits excellent tolerability and is easy to remove. At the same time, excellent properties with respect to effcacy regarding regeneration and protection could be observed, without any undesired effects at any time.

I. Waller, B. Suter, S. Hettwer, B. Obermayer, S. Bänziger, **In-Vitro Corneometry and Tewametry – Setting up skin substitute modelst o evaluate cosmetic moisturising materials,** H&PC, Vol. 10 (4) – July/August 2015

Abstract: Moisturisers improve skin hydration by using humectants and/or occlusive agents. Their efficacy is investigated by monitoring skin hydration or transepidermal water loss. In-vivo measurements, however, are costly and we therefore aimed to provide equivalent skin substitute in-vitro models. Two major models were established: collagen or synthetic membranes placed on agar-agar 'subsurface' gels. Their suitability for in-vitro hydration testing was evaluated by assessing their ability to accurately differentiate well-established moisturising ingredients. Second, the models were used for proof-of-concept investigations, e.g. assessing a novel active ingredient's moisturising efficacy. Indeed, the models successfully discriminated between occlusive and emollient, as well as between formulations with different moisturising characteristics. Taken together, each model had its strengths and weaknesses. In combination, however, such models may facilitate preliminary efficacy testing and thereby prove supportive for product development.

S. Higurashi, Y. Haruta-Ono, H. Urazono, T. Kobayashi, Y. Kadooka, **Improvement of skin condition by oral supplementation with sphingomyelin-containing milk phospholipids in a double-blind, placebo-controlled, randomized trial,** J. Dairy Sci. 98, 2015: p. 6706–6712

Sphingomyelin (SM), an essential phospholipid for the skin, is contained largely in the milk fat globule membrane surrounding milk fat, concentrated fractions of which are also generated concurrently during the manufacture of dairy products. Such an SM-containing milk phospholipid concentrate (SM-MPC) is useful for investigating the benefits of dietary SM. Here, we examined the effect of consuming SM-MPC on the condition of skin in a double-blind, placebo-controlled, randomized trial. Ninety-six healthy subjects aged 20 to 39 yr with low skin hydration were randomly assigned to 3 groups: a high-SM group supplemented with SM-MPC at a dose equivalent to 10 mg/d of SM, a low-SM group supplemented with SM-MPC equivalent to 5 mg/d of SM, and a placebo group fed a vehicle composed of olive oil and beeswax. During daily supplementation for 12 wk, parameters related to the condition of skin were evaluated at baseline and every 3 wk. Skin hydration at the heel was significantly increased at wk 9 and 12 in the low-SM group compared with the placebo group. Skin elasticity in the region below the eye was significantly increased at wk 9 in the high-SM group versus placebo. Questionnaire-based subjective perceptions of skin conditions were significantly improved for facial skin moisture at wk 3 and 12, and in the wrinkle around the eyes at wk 9 and 12 in the high-SM group versus placebo. Our results indicate that constant and long-term supplementation with SM-MPC is capable of improving the general condition of skin.

M. Kelleher, A. Dunn-Galvin, J.O'B. Hourihane, D. Murray, L. E. Campbell, I. McLean, A. D. Irvine, **Skin barrier dysfunction measured by transepidermal water loss at 2 days and 2 months predates and predicts atopic dermatitis at 1 year,** J Allergy Clin Immunol., April 2015 :135(4):930-5

Background: Loss-of-function mutations in the skin barrier protein filaggrin (FLG) are a major risk for atopic dermatitis (AD). The pathogenic sequence of disturbances in skin barrier function before or during the early development of AD is not fully understood. A more detailed understanding of these events is needed to develop a clearer picture of disease pathogenesis. A robust, noninvasive test to identify babies at high risk of AD would be important in planning early intervention and/or prevention studies. Objectives: To ascertain whether a noninvasive measurement of skin barrier function at day 2 after birth and at 2 months predicts the development of AD at 1 year. Furthermore, to determine whether increases in transepidermal water loss (TEWL) predate the development of clinical AD. Methods: A total of 1903 infants were enrolled in the Cork Babies After Scope: Evaluating the Longitudinal Impact Using Neurological and Nutritional Endpoints Birth Cohort study from July 2009 to October 2011. Measurements of TEWL were made at birth (day 2) and at 2 and 6 months. The presence of AD was ascertained at 6 and 12 months, and disease severity was assessed by using the SCORing Atopic Dermatitis clinical tool at 6 months and by using both the SCORing Atopic Dermatitis clinical tool and Nottingham Severity Score at 12 months. A total of 1300 infants were genotyped for FLG mutations.

A. Ratz-Łyko, J. Arct, K. Pytkowska, S. Majewski, **In vivo and ex vivo evaluation of cosmetic properties of seedcakes,** J Cosmet Laser Ther. 2015 Apr;17(2): p. 109-15

The seedcakes are a potential source of natural bioactive substances: antioxidants, protein, and carbohydrates. Thus, they may scavenge free radicals and have an effect on the stratum corneum hydration and epidermal barrier function. The aim of the study was to evaluate the in vivo and ex vivo properties of emulsions with the seedcake extracts using the pH meter, corneometer, tewameter, methyl nicotinate model of micro-inflammation in human skin, and tape stripping of the stratum corneum. The in vivo and ex vivo studies showed that the emulsions with Oenothera biennis, Borago officinalis, and Nigella sativa seedcake extracts have anti-inflammatory and antioxidant activity. The 6-week topical application of the emulsions with the B. officinalis and N. sativa seedcakes significantly reduced skin irritation and influenced the improvement of the skin hydration and epidermal barrier function compared

with placebo. The seedcakes due to their antioxidant and anti-inflammatory activities have potential application in anti-aging, moisturizing, mitigating, and protective cosmetics.

Y. Fukushima, Y. Takahashi, Y. Hori, Y. Kishimoto, K. Shiga, Y. Tanaka, E. Masunaga, M.Tani, M. Yokoyama, K. Kondo, **Skin photoprotection and consumption of coffee and polyphenols in healthy middle-aged Japanese females**, Int J Dermatol. 2015 Apr;54(4): p. 410-8

Background: Reactive oxygen species are known to mediate skin photoaging, which results in the formation of pigmented spots and wrinkles. Coffee is the largest source of polyphenols, which supplies a large number of antioxidants in one's daily life. However, little is known about how much coffee and polyphenol consumption influences skin health. Materials and Methods: In this study, a cross-sectional survey of the diet, environmental factors, and skin conditions was conducted in healthy Japanese females to explore the influence of coffee and polyphenol consumption on skin conditions. Non-smoking, healthy female subjects with moderate sun exposure in their daily lives were recruited for this study (n = 131, age range: 30-60 years old) and recorded their food and beverage intake and life circumstances using questionnaires. The skin water content, transepidermal water loss, and elasticity were measured on the cheek of each subject using noninvasive methods: Corneometer, a Tewameter, and a Cutometer, respectively. Wrinkles and pigmented spots were evaluated using digital photograph images. Results: Consumption of coffee and total polyphenols from all sources and from coffee showed a statistically significant correlation towards a decrease in pigmented spot scores ($P < 0.05$). Subjects with high total polyphenol consumption from coffee or chlorogenic acids (the third tertile group) showed the lowest score of ultraviolet pigmented spots ($P < 0.05$). Conclusion: Coffee and polyphenol consumption was associated with low facial pigmented spots in Japanese middle-aged females. We speculated that coffee helps protect human skin from photoaging, and polyphenols, including chlorogenic acids, may contribute to the decreased hyperpigmentation of pigmented spots.

E.D. Son, Y. Kim, K.M. Joo, H.J. Kim, E. Lee, G.W. Nam, E.G. Cho, M. Noh, J.H. Chung, S.Y. Byun, T.R. Lee, **Skin dryness in apparently healthy human skin is associated with decreased expression of bleomycin hydrolase in the stratum corneum**, Clin Exp Dermatol. 2015 Apr; 40(3): p. 247-53

Background: Maintenance of water balance in the stratum corneum (SC) is determined by the content of intercellular lipids and natural moisturizing factors (NMFs) in corneocytes. Aim: To investigate the association between the NMFs and (pro)filaggrin and the proteases responsible for the processing of (pro)filaggrin to NMFs in the SC of hydrated and dry skin areas of healthy human subjects. Methods: The SC hydration state and the transepidermal water loss (TEWL) were measured using a Corneometer and a Tewameter, respectively. Proteases, (pro)filaggrin and NMFs were extracted from SC samples obtained by tape-stripping of the tested skin. Expression levels of (pro)filaggrin were determined by dot blotting and western blotting, and total NMFs by ultra-high performance liquid chromatography. Expression of the proteases caspase-14, calpain-1 and bleomycin hydrolase was measured by western blotting. Results: The levels of (pro)filaggrin were not significantly different between hydrated and dry skin, whereas the level of total NMFs was significantly reduced in dry skin. A negative correlation between (pro)filaggrin and NMFs was found in dry skin (Pearson correlation coefficient $r = - 0.57$, $^*P < 0.05$). Bleomycin hydrolase expression was significantly decreased in the SC of dry skin. Conclusions: These results suggest that the low hydration state of dry skin may be due to the reduction in (pro)filaggrin degradation caused by decreased bleomycin hydrolase expression.

H. Fitton, E. Davis, S. Karpiniec, D. Stringer, **Bioactive fucoidan fractions as cosmetic ingredients,** Personal Care, April 2015

Abstract: Marinova, an Australian biotechnology company, developed two speciality cosmetic ingredients from marine algae. Maritech Bright is a Fucus vesiculosus derived extract (pictured) comprising both fucoidan and polyphloroglucinol, and Maritech Reserve is a high purity fucoidan from Undaria pinnatifida. Fucoidan is a sulphated, fucose rich polysaccharide with multiple bioactivities. Polyphloroglucinols are unique marine algal derived polyphenols with profound antioxidant activity.

G. Nicoletti, F. Brenta, M. Bleve, T. Pellegatta, A. Malovini, A. Faga, P. Perugini, **Long-term in vivo assessment of bioengineered skin substitutes: a clinical study,** J Tissue Eng Regen Med, 2015 Apr;9(4): p. 460-468

The aim of the study was an objective in vivo assessment of skin properties after reconstruction with two artificial dermal substitutes, Integra® and Hyalomatrix®. Twenty-seven patients underwent reconstruction of 36 skin-loss sites with full-thickness skin graft, split-thickness skin graft, Hyalomatrix® bioengineered skin substitute and sequential split-thickness skin graft and Integra® bioengineered skin substitute and sequential split-thickness skin graft. Objective assessments were carried out using three

instrumental devices: Multi Probe Adapter System MPA; 22 MHz ultrasound skin scan; and Primos Pico for a three-dimensional (3D) skin scan. The skin parameters under study in our sample were: corneometry, transepidermal water loss, elastometry, colorimetry, skin thickness and 3D skin surface pattern. A skin reconstruction with Hyalomatrix seemed to most closely approach the hydration, transepidermal water loss and skin surface 3D pattern of normal skin. A skin reconstruction with Integra seemed to demonstrate the best skin colour feature and elastic properties. Although no statistically significant differences were observed, the descriptive analysis of the outcomes might suggest a better cell regulation, regenerated extracellular matrix and neoangiogenesis with the use of Hyalomatrix, and the formation of a more elastic regenerated dermis, with overall better physical, mechanical and optical properties, with the use of Integra.

W. Weistenhöfer, M. Wacker, F. Bernet, W. Uter, H. Drexler, **Occlusive gloves and skin conditions: is there a problem? Results of a cross-sectional study in a semiconductor company**, Br J Dermatol, 2015 Apr;172(4): p. 1058-1065

Background: Although there is poor scientific evidence that working with occlusive gloves is as damaging as wet work, prolonged glove occlusion is considered to be a risk factor for developing hand eczema similar to wet work. Objective: To assess the effects of wearing occlusive gloves during the whole working day, without exposure to any additional hazardous substances, on skin condition and skin barrier function. Methods: We investigated 323 employees of a semiconductor production company in Germany: 177 clean-room workers wearing occlusive gloves during the whole shift (exposed group) and 146 employees working in administration (control group). A standardized interview was performed, the skin condition of both hands was studied using the quantitative skin score HEROS, and transepidermal water loss (TEWL) and stratum corneum hydration were measured. Results: There was no significant difference in skin condition between the two subgroups. Values for TEWL and corneometry were significantly higher in exposed participants ($P<0{\cdot}05$). However, the TEWL values were similar to control values if participants took off the occlusive gloves at least 30 min before the measurement. Hence, the effect of occlusion on skin barrier function seems to be transient. Conclusion: Prolonged wearing of occlusive gloves with clean hands and without exposure to additional hazardous substances does not seem to affect the skin negatively.

A. Thibodeau, **Global skin action of a luminaria extract,** Personal Care, April 2015

Skin is a large and complex tissue where the orchestrated actions of resident cells are necessary to support its structural and metabolic integrity. Cells of the epidermis (mainly keratinocytes) play a role in protecting from environmental stress such as UV exposure, mechanical damage and pro-oxidative attacks. Perhaps more importantly, top layers of the epidermis along with a lipid-rich intercellular matrix from the skin barrier. It is no secret that the skin barrier is fundamental in preventing excessive water evaporation thereby supporting normal skin hydration levels.

Y. Takagi, N. Tanaka, M. Miyaki, K. Takeuchi, K. Matsuo, **An effective novel facial cleanser for mild acne: Cleanser formulated with Sodium Laureth Sulfate and Alkyl Ether Carboxylates,** H&PC Vol. 10 (2) March/April 2015

Abstract: Many people suffer from acne. Washing the face with cleansers is generally recommended for acne care and cleansers containing salicylic acid are frequently used in the United States. However, salicylic acid has many side effects such as inducing dryness and irritation. Here we demonstrate that a facial cleanser based on alkyl ether carboxylates (AEC) and sodium laureth sulfate (SLES), which does not contain and anti-acne ingredients including salicylic acid, improved the acne more quickly than general cleansers containing salicylic acid (≈ 1.5%). No side effects were observed and a favorability rating was obtained from the subjects in a questionnaire. These results suggest that the skin cleanser formulated with AEC and SLES is an effective cleanser for the care of mild acne.

S. Manzoni, S. Ferrigato, D. Calamiello, **Moisturizers: what they are and how improve formulation with a novel emulsifier,** H&PC Vol. 10 (2) March/April 2015

Abstract: Moisturizers are widely used products that are important in several dermatologic and cosmetic skin therapies. They contain varyious combinations of emollients, occlusive, and humectants to achieve their beneficial effects, and there is an overwhelming number of formulations available. To develop a rational approach in chosing moisturizers, they should be categorized on the basis of application site.

L. Agren, E. Nilsson, **Effect of blackcurrant seed oil on atopic eczema,** Personal Care March 2015

There are many reasons why eczema develops, both hereditary and from environmental exposure. Biochemists have found that atopic eczema can develop a result of a deficiency, imbalance

or an inability to covert essential fatty acids. These fatty acids are necessary for the body to be able to make use of other fatty acids and play a vital role in regulating inflammation and the immune system. The aim of the study was to investigate the following questions: What is the effect of Q for Skin's concept based on blackcurrant seed oil on atopic eczema? Is there a link between the occurrence of atopic eczema and diet? Is it possible for people diagnosed with atopic eczema to reduce the usage to topical corticosteroids?

A.D. Permatasari, N. Trisnowati, **Correlation between Transepidermal Water loss (TEWL) on non-lesional skin area and clinical severity of atopic dermatitis,** University Ghadja Mada, Indonesia, 2015

Background: Atopic dermatitis usually develops in patients with an individual or family history of allergic diseases, and is characterized by chronic relapsing inflammation seen especially in childhood, associated with IgE hyperproduction and precipitation by environmental factors. However, the exact etiology has been unclear, and so far there is no research done in Yogyakarta to know whether transepidermal water loss on non-lesional skin area will affect the severity of atopic dermatitis or not. Objective: The objective of the study is to know whether transepidermal water loss on non-lesional skin area will affect the severity of atopic dermatitis or not (measured by Objective SCORAD index in the non lesion area). Methodology: The measurement of Transepidermal Water Loss (TEWL) on the non-lesional skin area was done by using TEWAmeter, while the severity of atopic dermatitis was measured by objective SCORAD. And then, the correlation between these two parameters were analyzed by Spearman's rho Correlation Test. The subjects are atopic dermatitis patients at Dermatovenerology Clinic Dr. Sardjito Hospital, Yogyakarta, Indonesia from April-September 2012. Result: Statistic test using Spearman's rho Correlation Test shows that there is no correlation between transepidermal water loss on non-lesional skin area with the clinical severity of atopic dermatitis. Summary: Transepidermal water loss on non-lesional skin area is not correlated with clinical severity of atopic dermatitis.

C. Uhl, D. Khazaka, **Claims and measurement methods for hair and scalp,** Personal Care, March 2015

Hair diversity (style, shape, growth pattern or colour) is one of the most important features to define us physically. Therefore it is no surprise that the market of hair care products with a value of US$39 billion is one of the most important sectors in the complete area of cosmetic products. Hair care products for women are the most frequently bought and used cosmetic products of all. Shampoos and conditioners are leading in the field. For men, hair care is the most important and favoured sector of all cosmetics.

C. Trojahn, G. Dobos, A. Lichterfeld, U. Blume-Peytavi, .J. Kottner, **Characterizing Facial Skin Ageing in Humans: Disentangling Extrinsic from Intrinsic Biological Phenomena,** BioMed Research International, Volume 2015

Facial skin ageing is caused by intrinsic and extrinsic mechanisms. Intrinsic ageing is highly related to chronological age. Age related skin changes can be measured using clinical and biophysical methods. Te aim of this study was to evaluate whether and how clinical characteristics and biophysical parameters are associated with each other with and without adjustment for chronological age. Twenty-four female subjects of three age groups were enrolled. Clinical assessments (global facial skin ageing, wrinkling, and sagging), and biophysical measurements (roughness, colour, skin elasticity, and barrier function) were conducted at both upper cheeks. Pearson's correlations and linear regression models adjusted for age were calculated.

M. Zając, M. Szczepanik, P. Wilkołek, ł. Adamek, Z. Pomorski, **The influence of non-specific anti-pruritus treatment with cyclosporine A on transepidermal water loss (TEWL) in natural atopic dermatitis in dogs,** Polish Journal of Veterinary Sciences Vol. 18, No. 2 (2015), p. 415–424

Atopic dermatitis is a common allergic skin disease in dogs. Monitoring the progress of treatment and the assessment of the severity of disease symptoms are crucial elements of the treatment procedure. One of the common means of assessing the severity of the clinical signs of the disease is the CADESI 03. Research studies have pointed to a possibility of assessing the severity of skin lesions by means of measuring biophysical skin parameters such as TEWL, skin hydration and erythema intensity. The aim of the study was the assessment of changes in TEWL and CADESI values measured in ten different body regions during non-specific anti-pruritus treatment. The examination was performed on ten dogs with atopic dermatitis (age from 2.5 years to 7 years, mean age 3.8 years). The measurements were performed in the following body regions: the lumbar region, the right axillary fossa, the right inguinal region, the ventral abdominal region, the right lateral thorax region, the internal surface of the auricle, interdigital region of the right forelimb, cheek, bridge of nose and the lateral site of antebrachum. A statistically significant decrease in CADESI values was reported starting from the

second week of treatment. In the case of the mean TEWL values, a fall was observed after one week of treatment in the ventral abdominal region and the interdigital region, after two weeks of treatment in the axillary fossa and the inguinal region, and after three weeks in the cheek and the lateral thorax region. There was no statistically significant decrease in TEWL values in the course of treatment in four other regions.

S. Rösler, **Hautphysiologie im Säuglingsalter: Einfluss von Babyschwimmen mit und ohne anschließender Anwendung einer Pflegelotion auf die Hautbarriere von Säuglingen im Alter von 3 bis 6 Lebensmonaten**, Dissertation zur Erlangung der Doktorwürde der Charité Universitätsklinik Berlin, 2014

T. Sakai, Y. Hatano, W.i Zhang, S. Fujiwara, **Defective maintenance of pH of stratum corneum is correlated with preferential emergence and exacerbation of atopic-dermatitis-like dermatitis in flaky-tail mice**, Journal of Dermatological Science 74 (2014), p. 222–228

Background: Neutralization of stratum corneum (SC) pH, which is induced by a variety of stimuli, such as scratching, use of soap and inflammation, can stimulate activity of serine protease (SPase). Activation ofSPase induces production of thymic stromal lymphopoietin (TSLP) through protease-activated receptor- 2. Both reduced expression of natural moisturizing factors, which are required for maintenance of SC pH, and the preferential development of atopic dermatitis (AD)-like dermatitis are found in flaky-tail mice (FTM) with a loss-of-function mutation in filaggrin. Objective: We examined possible correlations between disturbance of responses to an exogenous stimulus of SC neutralization and the preferential emergence of AD-like dermatitis in FTM. Methods: FTM and wild-type mice (C57BL/6) were subjected to an SC-neutralization stimulus via application of 1,1,3,3-tetramethylguanidine (TMG). TMG was applied to young mice at a time when FTM had not yet developed significant dermatitis, and we examined their ability to maintain SC acidity and several parameters associated with AD-like dermatitis. Results: The recovery of SC pH after the application of TMG was delayed in FTM, presumably because of unchanged expression of Na+/H+ antiporter 1, which is involved in maintenance of SC acidity. Cutaneous inflammation with elevated SPase activity and serum levels of TSLP, thymus and activation-regulated chemokine and IgE were induced only in TMG-treated FTM. Conclusion: Our results suggest that defective maintenance of pH of SC is correlated with emergence and exacerbation of AD-like dermatitis in FTM.

J. Kottner, L. Ludriksone, N.G. Bartels, U. Blume-Peytavi, **Do Repeated Skin Barrier Measurements Influece Each Other's Results? An Explorative Study,** Skin Pharmacology and Physiology 2014; 27:90-96

Abstract: Background: Biophysical skin measurement techniques are widely used to quantify the skin barrier function. In clinical research usually several parameters are subsequently measured in the same skin areas. In this study, possible interfering effects of subsequent measurement procedures on transepidermal water loss (TEWL), stratum corneum hydration (SCH) and skin surface pH were investigated. Methods: An exploratory study was conducted. Twelve young (mean age 32.9 ± 7.2 years) and 12 elderly (mean age 68.3 ± 2.5 years) subjects without any skin diseases were enrolled. The parameters TEWL, skin surface pH, SCH, sebum content, and surface evaluation of living skin were obtained successively in pairs from 4 contralateral volar forearm skin areas.

C. Soica, C. Oprean, F. Borcan, C. Danciu, C. Trandafirescu, D. Coricovac, Z. Crăiniceanu, C.A. Dehelean, M. Munteanu, **The Synergistic Biologic Activity of Oleanolic and Ursolic Acids in Complex with Hydroxypropyl-γ-Cyclodextrin,** Molecules 2014, 19, 4924-4940

Abstract: Oleanolic and ursolic acids are natural triterpenic compounds with pentacyclic cholesterol-like structures which gives them very low water solubility, a significant disadvantage in terms of bioavailability. We previously reported the synthesis of inclusion complexes between these acids and cyclodextrins, as well as their in vivo evaluation on chemically induced skin cancer experimental models. In this study the synergistic activity of the acid mixture included inside hydroxypropyl-gamma-cyclodextrin (HPGCD) was monitored using in vitro tests and in vivo skin cancer models. The coefficient of drug interaction (CDI) was used to characterize the interactions as synergism, additivity or antagonism. Our results revealed an increased antitumor activity for the mixture of the two triterpenic acids, both single and in complex with cyclodextrin, thus proving their complementary biologic activities.

J.W. Fluhr, R. Darlenski, **Transepidermal Water Loss (TEWL),** Non Invasive Diagnostic Techniques in Clinical Dermatology; Springer Berlin Heidelberg 2014; ISBN 978-3-642-32108-5

Introduction: The skin separates the inner part of our body against the potentially harmful environment. The skin barrier protects the human body against many external stressors, namely,

physical stress (e.g., mechanical, thermal, UV radiation), chemical stress (e.g., tensides, prolonged water exposure, solvents), and environmental conditions [1]. Furthermore the skin as a barrier prevents the organism from loss of essential components such as ions, water, and serum proteins. The skin as a barrier also reflects internal processes, diseases, disease activity, and some of the lifestyle, manifested in intrinsic and extrinsic aging. The skin has also sociocultural functions and plays an important role in communication and self-expression.

K. Heinrich, U. Heinrich, H. Tronnier, **Influence of Different Cosmetic - Formulations on the Human Skin Barrier,** Skin Pharmacology and Physiology 2014; 27: p. 141-147

Abstract: The human skin barrier is an important part of the skin's intactness and its functionality is a precondition for healthy skin. Ingredients in cosmetic formulations, especially penetration enhancers, can influence this barrier function as they transport active agents into deeper skin layers. In this study different cosmetic formulations were tested by 60 healthy female volunteers over a period of 4 weeks. The skin hydration and barrier function before and during the application were measured. Significant changes in both parameters were determined. A negative influence on the barrier function by penetration enhancers could be observed, but it was also found that lamellar lipid structures (Derma-MembranSysteme ® , DMS ®) are able to enhance the skin barrier. Both penetration enhancers as well as DMS can increase skin hydration.

X. Li, C. Galzote, X. Yan, L. Li, X. Wang, **Characterization of Chinese body skin through in vivo instrument assessments, visual evaluations, and questionnaire: influences of body area, inter-generation, season, sex, and skin care habits,** Skin Research and Technology 2014; 20: 14-22

Background/Purpose: The varying influence of mutiple factors (e.g., aging, sex, season, skin care habits) on skin structure and function necessitates study within ethnic groups to fully characterize their skin. Methods: Men and women aged 40-50 years (n=43) and their consanguineous same sex-children, aged 18-25 years (n=43), living in Chengdu, China were enrolled in this single center, non-interventional study. Volunteers attended two study visits (summer, 2010 and winter, 2011) at which dermatologists measured transepidermal water loss (TEWL), skin hydration, sebum secretion, fine lines/roughness, melanin/erythema, termperature, and color, and clinically graded participants' skin.

R. Nachat-Kappes, A. Gardarin, L. Rios, E. Ranouille, M. Favre-Mercuret, V. Jay-Debaut, J.Y. Berthon, **Probiotische Fraktionen – eine neue Lösung, die Hautgesundheit durch Stärkung der Barrierefunktion zu verbessern, indem die Hauthydrataion erhöht und Entzündungen vorgebeugt wird,** SOFW-Journal, 140/12-2014

Abstract: Unsere Haut sorgt für eine lebenswichtige Barriere zwischen Körper und Umwelt. Sie verhindert Austrocknung, begrenzt das Eindringen von körperfremden Stoffen und schützt vor mechanischer Belastung. Es ist dargelegt worden, dass Probiotika, hauptsächlich Laktobazillen und Bifidobakterien, die Barrierefunktion des Darms wiederherstellen und Entzündungen lindern. Daher haben wir einen neuen Wirkstoff aus Lactobacillus pentosus (LPCE) entwickelt, der durch Fermentation erzeugt wird. Die Wirkungen von LPCE auf Expression und Sekretion von Interleukin-8 (IL-8) wurden in rekonstruierter Epidermis, die mit Phorbol-12-myristat-13-acetat (PMA) aktiviert wurde, untersucht.

M. Schario, L. Lünnemann; A. Stroux, A. Reisshauer, T. Zuberbier, U. Blume-Peytavi, N.G. Bartels, **Children with dry skin and atopic predisposition: daily use of emollients in a participant-blinded randomized, prospective trial**, Skin Pharmacology and Physiology 2014; 27; p. 208-216

Abstract: Background: Dry skin reflects a skin barrier defect which can lead to atopic dermatitis. Little is known about the distinct effects of emollient use in children with dry skin and atopic predisposition. Objectives: We investigated the effects of daily application of pressed ice plant juice (PIPJ)- based emollients and petrolatum-based emollients. Methods: Children aged 2-6 years with dry skin and atopic predisposition were randomized into 2 groups: group 1 received emollients containing PIPJ and natural lipids, while group 2 received petrolatum-based emollients. Skin condition and biophysical properties of the skin barrier were assessed at inclusion and weeks 4, 12 and 16.

S. Luebberding, N. Krueger, M. Kerscher, **Age-Related Changes in Male Skin: Quantitative Evaluation of One Hundred and Fifty Male Subjects,** Skin Pharmacol Physiol 2014; 27: p. 9–17

Background/Purpose: Modern men have changed their beauty and grooming habits, which has resulted in an increasing demand for cosmetics for men. However, very little information is available about the dermatological needs of male skin. Therefore, the aim of this present clinical study was to conduct the first systematic assessment of the skin physiology of men with special attention to lifetime changes. Methods: A total of 150 healthy male subjects (aged 20– 70 years) were selected following strict criteria, including age, sun behavior and smoking habits. Transepidermal water loss (TEWL),

hydration level, sebum production and pH values were measured with worldwide-acknowledged biophysical measuring methods at the forehead, cheek, neck, volar forearm and dorsum of hand. Results: TEWL and sebum production vary by localization, but generally not with increasing age, whereas stratum corneum (SC) hydration decreases significantly at the face and neck. The greatest decrease was assessed at the f rehead. Skin surface pH significantly increases with aging in the face.

Y.S. Cho, J.H. Jeon, A. Hong, H.T. Yang, H. Yim, Y.S. Cho, D.H. Kim, J. Hur, J.H. Kim, W. Chun, B.C. Lee, C.H. Seo, **The effect of burn rehabilitation massage therapy on hypertrophic scar after burn: a randomized controlled trial**, Burns. 2014 Dec;40(8): p. 1513-20

Background: To evaluate the effect of burn rehabilitation massage therapy on hypertrophic scar after burn. Method: One hundred and forty-six burn patients with hypertrophic scar(s) were randomly divided into an experimental group and a control group. All patients received standard rehabilitation therapy for hypertrophic scars and 76 patients (massage group) additionally received burn scar rehabilitation massage therapy. Both before and after the treatment, we determined the scores of visual analog scale (VAS) and itching scale and assessed the scar characteristics of thickness, melanin, erythema, transepidermal water loss (TEWL), sebum, and elasticity by using ultrasonography, Mexameter(®), Tewameter(®), Sebumeter(®), and Cutometer(®), respectively. Results: The scores of both VAS and itching scale decreased significantly in both groups, indicating a significant intragroup difference. With regard to the scar characteristics, the massage group showed a significant decrease after treatment in scar thickness, melanin, erythema, TEWL and a significant intergroup difference. In terms of scar elasticity, a significant intergroup difference was noted in immediate distension and gross skin elasticity, while the massage group significant improvement in skin distensibility, immediate distension, immediate retraction, and delayed distension. Conclusion: Our results suggest that burn rehabilitation massage therapy is effective in improving pain, pruritus, and scar characteristics in hypertrophic scars after burn.

J. Smits, M. Weibel, N. Herbst, **Plant-derived system boosts hydration and lipid barrier,** Personal Care November 2014

Abstract: In the field of corneobiology, the skin barrier has been pointed out to play a crucial role in skin homeostasis. In the treatment of dry skin, it is important to repair and augment the skin barrier in order to achieve positive and long-lasting results. To adequately describe the hydration state of the human skin, a number of complementary measuring techniques are often employed. Therefore, besides the classic methods of corneometry and determination of the transepidermal water loss, we tested our moisturizing active Hydro-Gain and the two industry standards, glycerol and hyaluronic acid, in a PCR-array and in a study using confocal Raman spectroscopy. In the comparison to glycerol and hyaluronic acid, Hydro-Gain gave the best results regarding skin moisturisation and we also found evidence that Hydro-Gain stimulates strengthening of the skin barrier.

H. Khan, N. Akhtar, A. Ali, **Effects of Cream Containing Ficus carica L. Fruit Extract on Skin Parameters: In vivo Evaluation**, Indian Journal of Pharmaceutical Sciences, November - December 2014

This study was aimed to investigate the effects of cream containing Ficus carica L. fruit (Fig) extract on various skin parameters such as skin melanin, erythema, moisture content, trans-epidermal water loss and sebum. For this purpose, formulation with 4% concentrated extract of F. carica fruit and base without extract were developed. Base served as a control. Both base and formulation were applied to the cheeks of human volunteers for 8 weeks to investigate the effects on different skin parameters using non-invasive bioengineering instruments. Formulation decreased the skin melanin, trans-epidermal water loss and skin sebum significantly. Formulation increased the skin hydration significantly and insignificant effects on skin erythema. We concluded that a stable topical cream (w/o emulsion) containing F. carica fruit extract have effects on skin melanin, trans-epidermal loss, hydration values and sebum content and possibly could be used against for hyper pigmentation, acne, freckles and wrinkle.

B. Tyszczuk, B. Szczepanik, R.K. Mlosek, S. Malinowska, R. Debowska, K. Rogiewicz, I. Eris, **The high frequency ultrasound as a tool for the assessment of anti-cellulite treatments efficacy,** IFSCC 2014 Paris

Cellulite is nowadays a common aesthetical defect, wich affects most of women worldwide. Taking into consideration the size of this phenomenon cosmetic industry is searching a new ways of fighting against it and new diagnostic tools and methods to measure anti-cellulite therpy's efficacy. Unfortunatelly reliable monitoring of anti-cellulite treatment still remains a problem. However, new

diagnostic techniques such as high frequency ultrasound (HFultrasound) imaging can be usefull tool for the assesment of cellulite-reducing efficacy of cosmetics therapy.

K. Shingaki, S. Kawaguchiya, Y. Hasegawa, M. Sumitani, Y. Yamamoto, K. Torii, **Analysis of environmental factors and related molecular mechanisms that reduce cutaneous sensation and the development of cosmetics to prevent and improve functional decline of cutaneous sensation**, IFSCC 2014 Paris

Summary: The beneficial effects of touch have been well investigated in infant psychological and physiological development and adult homeostasis. Cutaneous sensation, which facilitates the beneficial effects of touch, alters under the influence of disease and aging. However, the environmental factors that affect cutaneous sensation, their related molecular mechanisms, and the possibility of cosmetics against decline have not been well studied. In this study, we showed a significant positive correlation between age and the perception threshold of a 2000-Hz current which stimulates Aβ-fibres and a significant negative correlation between a 2000-Hz current perception threshold (CPT) and the skin's physiological parameters. In addition, ultraviolet (UV) radiation significantly increased the 2000-Hz CPT in the skin, decreased the expression of neuroprotective growth factors, and altered the expression of matrix components which are the scaffoldings of nerve fibres in the normal human dermal fibroblasts. Furthermore, we showed a significant 2000-Hz CPT decrease 1 month after treatment with cosmetics that included moisturizing ingredients and vitamins. From these results, it is suggested that chronic UV exposure induces the functional decline of cutaneous sensation by decreasing the neuroprotective functional components of the skin and that cosmetics are useful for preventing and improving the decline of cutaneous sensation.

J. Wada, L. Paula, M. Spina, T. Takeda, **Elixir of oils from the Amazonian biodiversity for application in cosmetics for hands and nails,** IFSCC 2014 Paris

Summary: The Amazon region has numerous oleaginous vegetable species which features promising potential in Cosmetic Industry as Murumuru butter, Ucuuba butter and Brazil nut oil. The fatty acid composition of these ingredients is really unique: murumuru butter, Astroc ryum murumuru, has lauric acid as the main fatty acid; ucuuba butter, Virola surinamensis, is composed predominantly by myristic acid; and Brazil nut oil, Bertholletia excelsa seed oil, is rich in acids as oleic and linoleic. The combination of these 3 renewable resources (Elixir) demonstrated benefits of treatment for skin and nails as skin film formation, fortification of cutaneous barrier, skin moisturization and strengthening for nails. It was possible to add technological resources which were quite valuable for these renewable raw materials through the Elixir by its effectiveness in cosmetics and environment preservation.

W. Henschel, **Prospektive Pilotstudie zum dermatologischen Nutzen der Einführung von Hautschutz- und Hautpflegecreme in ein chirurgisches Team**, Dissertation der Universitätsmedizin der Ernst-Moritz-Arndt Universität Greifswald, Germany, Oktober 2014

Das Wort Chirurgie setzt sich aus dem altgriechischen Wort χείρ (kheir) für „Hand" und ἔργον (ergon) für „Arbeit", „Werk", „Tat" zusammen. Das bedeutet, dass ein Chirurg im wörtlichen Sinn ein Handarbeiter ist. Diese Übersetzung aus dem Altgriechischen rückt die Tatsache in den Mittelpunkt, dass der Chirurg täglich mit seinen Händen arbeitet. Ein altes Sprichwort - „Der Mann, der zu beschäftigt ist, sich um seine Gesundheit zu kümmern, ist wie ein Handwerker, der keine Zeit hat, seine Werkzeuge zu pflegen." - nimmt Bezug darauf, dass man sowohl für seine Gesundheit als auch für sein Werkzeug Sorge tragen sollte. Dieses Sprichwort ist für Chirurgen von besonderer Bedeutung, da ihre Hände einerseits im Rahmen ihrer allgemeinen Gesundheit gepflegt werden müssen und ihnen ihre Hände andererseits als Werkzeug dienen. Die besondere Gewichtung, die dem Hautschutz und der Hautpflege zukommen sollte, spiegelt sich jedoch nicht nur in Volksweisheiten wider.

J.H. Min, I.S. Yun, D.H. Lew, T.S. Roh, W.J. Lee, **The Use of Matriderm and Autologous Skin Graft in the Treatment of Full Thickness Skin Defects**, Arch Plast Surg 2014;41: p. 330-336

Background: For patients with full thickness skin defects, autologous Split-thickness skin grafts (STSG) are generally regarded as the mainstay of treatment. However, skin grafts have some limitations, including undesirable outcomes resulting from scars, poor elasticity, and limitations in joint movement due to contractures. In this study, we present outcomes of Matriderm grafts used for various skin tissue defects whether it improves on these drawbacks. Methods: From January 2010 to March 2012, a retrospective review of patients who had undergone autologous STSG with Matriderm was performed. We assessed graft survival to evaluate the effectiveness of Matriderm. We also evaluated skin quality using a Cutometer, Corneometer, Tewameter, or Mexameter, approximately 12 months after surgery. Results: A total of 31 patients underwent STSG with Matriderm during the study period. The success rate of skin grafting was 96.7%. The elasticity value of the portion on which Matriderm was

applied was 0.765 (range, 0.635–0.800), the value of the trans-epidermal water loss (TEWL) was 10.0 (range, 8.15–11.00) g/hr/m2, and the humidification value was 24.0 (range, 15.5– 30.0). The levels of erythema and melanin were 352.0 arbitrary unit (AU) (range, 299.25– 402.75 AU) and 211.0 AU (range, 158.25–297.00 AU), respectively. When comparing the values of elasticity and TEWL of the skin treated with Matriderm to the values of the surrounding skin, there was no statistically significant difference between the groups. Conclusions: The results of this study demonstrate that a dermal substitute (Matriderm) with STSG was adopted stably and with minimal complications. Furthermore, comparing Matriderm grafted skin to normal skin using Cutometer, Matriderm proved valuable in restoring skin elasticity and the skin barrier.

H. Takahashi, H. Tsuji, M. MinamiI-Hori, Y. Miyauchi, H. Iizuka, **Defective barrier function accompanied by structural changes of psoriatic stratum corneum,** Journal of Dermatology 2014; 41: p. 144–148

Although barrier function of psoriatic skin is shown to be decreased by measuring transepidermal water loss (TEWL), few reports exist examining other physical skin properties and components including stratum corneum hydration, natural moisturizing factor (NMF), free fatty acids (FFA), b-sheet and a-helix ratio of structural protein(s), and sebum content. We compared the skin properties and components of normal, involved and uninvolved skin of psoriasis. Using a corneometer and attenuated total reflection-infrared spectrometer, we measured TEWL, stratum corneum hydration, NMF, FFA, b/a ratio and sebum in psoriasis vulgaris patients and healthy controls. TEWL and b/ a ratio of involved psoriatic skin were significantly increased compared with uninvolved skin and normal control skin. In contrast, stratum corneum hydration, NMF and FFA, but not sebum, are significantly decreased in the involved skin compared with uninvolved skin and normal skin. TEWL and stratum corneum hydration returned to the normal levels following clinical improvement of the lesion. Barrier function and hydration of psoriatic skin are defective and secondary structure in stratum corneum protein is altered in the involved psoriatic skin.

M. Zając, M.P. Szczepanik, P.M. Wilkołek, Ł.R. Adamek, Z.J.H. Pomorski, W. Sitkowski, M. Gołyński, **Assessment of the relationship between transepidermal water loss (TEWL) and severity of clinical signs (CADESI-03) in atopic dogs**, Vet Dermatol 2014; 25: p. 503–583

Background: Atopic dermatitis (AD) is a common allergic skin disease of dogs. Objective documentation of disease severity is important for the assessment of responses to therapeutic interventions. One common means of assessing the severity of clinical signs is the Canine Atopic Dermatitis Extent and Severity Index (CADESI)-03. In addition, studies of the biophysical parameters of the skin suggest that assessment of transepidermal water loss (TEWL) may also have value for estimation of disease severity. Hypothesis/Objectives: The aim of the present study was to verify the correlation between TEWL and CADESI-03 measured at 10 different body sites. Animals: Twenty-six dogs with AD (age range 1–7 years, median age 3 years). Methods – The assessment was performed at the following 10 body sites: the lumbar, inguinal, ventral abdominal, interdigital regions, axillary fossa, lateral thorax, lateral aspect of the antebrachium, concave surface of the auricle, cheek and bridge of the nose. Results: Positive correlations were found between TEWL and the total CADESI-03 for the auricle (r = 0.59), bridge of nose (r = 0.62) and interdigital skin (r = 0.47). Positive correlations were also observed between TEWL and local CADESI-03 scores for the axillary fossa (r = 0.73), inguinal region (r = 0.55) and interdigital skin (r = 0.77). Conclusions and clinical importance: The results indicate that it may be possible to use measurement of TEWL to assess the severity of skin lesions, but a positive correlation was found in only five of 10 body regions examined.

M. Gołyński, M. Szczepanik, K. Lutnicki, ł. Adamek, M. Gołyńska, P. Wilkołek, W. Sitkowski, Ł. Kurek, P. Dębiak, **Biophysical parameters of rats' skin after the administration of methimazole**, Bull Vet Inst Pulawy 58, p. 315-319, 2014

The paper describes the influence of oral administration of methimazole on biophysical skin parameters. Wistar rats of different sex (220–260 g) were used in the experiment. Biophysical skin parameters, such as transepidermal water loss (TEWL), corneometry, and pH were examined at seven-day intervals. Significant changes in the parameters were observed on the 7th d of methimazole administration. The changes were observed in both sex but males appeared to be less sensitive in that respect. Changes in the parameters in the females showed rapid mechanisms, which normalised transepidermal water loss and skin hydration, as well as restored skin barrier functions. TEWL, skin hydration, and skin pH measurements allow an early assessment of skin barrier dysfunction after administration of this drug.

D. McCamile, **Infant skin conditions-treatments and products,** Personal Care September 2014

An infant's skin varies greatly from adult skin, the barrier it provides from the outside world continues to develop over the early years, during which time it is much more prone to developing conditions rarer in adults. Young skin is typically around 30% thinner, with a far greater tendency to irritation and dryness. Moisturisation measurements using a Corneometer instrument show a far higher absorption rates of water in babies and toddlers compared to adults but also a faster return to baseline values. Tewameter assessments also show higher values in infants, dempnstrating that the skin barrier functionality is not fully developed in infants, trans-epidermal water loss being a key indicator of barrier functionality.

N. Belhaj, M. Borel, C. Bezivin, **Phospholipid-based emulsifiers give much more,** Personal Care September 2014

The base formula of a cosmetic product contributes greatly to its success, not only in terms of the pleasure it provides upon application but also in terms of efficacy. The base must not be considered only as the sensorial part of a formula but als as a key element to improve the clinical results. Used first in the cosmetic industry for their emulsifying properties and sophisticated skin feel, phospholipid-based emulsifiers offer much more than that. Thanks to the different chemical and biological properties of phospholipids, phospholipid-based formulas can also be considered to provide active properties due to their moisturising action, and act as bioavailability enhancer due to their ability to improve the skin penetration of the active ingredients they contain.

J. Polásková, J. Pavlacková, V. Tlasková, **Moisturizing effect of cosmetic emulsions with sericin,** Stratum Corneum VIII Meeting, 2014 Cardiff

Aim of study: The aim of the work was to measure and compare the hydration effect of both traditional (glycerol) and non-traditional (sericin) moisturizing agents contained in topically applied cosmetic emulsions.

E. Rubio, B. Martinez-Teipel, R. Armengol, **From in silico PredIction to a Real Cosmetic Active for an Improved Skin Barrier Function,** SOFW Journal 8-2014

Abstract: We were interested in developing a novel natural PPAR ɣ agonist intended to improve epidermal moisturization and skin barrier function. By means of an in silico energetic binding study, we predicted the capacity of rhaponticin to acta s a PPAR ɣ full agonist, and we later confirmed this by several in vitro tests. First, the active showed ist binding affinity to PPAR ɣ. In cell cultures, rhaponticin demonstrated its capacity to enhance keratinocyte differentiation, increasing the production of involucrin, filaggrin and stratum corneum barrier lipids. In agreement with this activity profile, rhaponticin also improved cell cohesion.

M.V. Velasco, R.P. Vieira, A.R. Fernandes, M.F. Dario, C.A. Pinto, C.A. Pedriali, T.M. Kaneko, A.R. Baby, **Short-term clinical of peel-off facial mask moisturizers**, Int J Cosmet Sci. 2014 Aug;36(4): p. 355-60

Objective: This study aimed to compare the efficacy of a peel-off facial mask based on polyvinyl alcohol (PVA) with an oil-in-water (o/w) emulsion and the effect of a soybean extract fermented by Bifidobacterium animale incorporated in those formulations (5% w/w). Methods: The formulations were submitted to randomized clinical studies in volunteers to evaluate the measurement effects as (a) tensor by Cutometer®, (b) moisturizing by Corneometer® and transepidermal water loss (TEWL) by Tewameter®. These effects were determined in a short-term study (3 h) in a controlled-temperature room. Results: The tensor effect and TEWL values indicated no significant difference between the use of facial mask and emulsion. On the other hand, the moisturizing effect of the facial mask on the stratum corneum was more significant than that of the emulsion according to Corneometer® measurements. Conclusions: Biometric cutaneous evaluation of peel-off facial masks (short-term study) showed that the masks promoted moisturizing effect of the stratum corneum more effectively than the oil-in-water emulsions. Thus, the facial masks were more efficient than emulsions in relation to moisturizing effects, but this efficiency is not related to the presence of fermented soybean extract. The results indicated that peel-off facial masks increase skin hydration in a process related to the occlusive effect.

Y.-M. Ye, B.E. Kim, Y.-S. Shin, H.-S. Park, D.Y.M. Leung, **Increased Epidermal Filaggrin in Chronic Idiopathic Urticaria is Associated with Severity of Urticaria**, Ann Allergy Asthma Immunol. 2014 June; 112(6): p. 533–538

Chronic idiopathic urticaria (CIU) is defined as the repeated occurrence of transient (≤ 24 hours) wheals and/or angioedema lasting for more than 6 weeks without an eliciting cause (1). Similar to atopic dermatitis (AD), CIU is characterized by immune aberrations, severe pruritus and unpredictable aggravations which lead to a substantial impact on quality of life (2-5). As the prevalence of CIU has

been reported to reach 1.0% in the general population, the socioeconomic burden of this disease is remarkable (5). Recent guidelines (6) recommend to identify and to avoid underlying causes of CIU as the main goal for treatment. However, it is very difficult to find and eliminate the causes of CIU. Further understanding of the pathophysiology in CIU patients with severe and refractory to conventional treatments is still required.

J.K. Plichta, S. Droho, B.J. Curtis, P. Patel, R.L. Gamelli, K.A. Radek, **Local Burn Injury Impairs Epithelial Permeability and Antimicrobial Peptide Barrier Function in Distal Unburned Skin**, Crit Care Med. 2014 June; 42(6): e420–e431

Objectives: Our objective was to characterize the mechanisms by which local burn injury compromises epithelial barrier function in burn margin, containing the elements necessary for healing of the burn site, and in distal unburned skin, which serves as potential donor tissue. Design: Experimental mouse scald burn injury. Setting: University Research Laboratory. Subjects: C57/Bl6 Male mice, 8–12 weeks old. Interventions: To confirm that dehydration was not contributing to our observed barrier defects, in some experiments mice received 1 mL of saline fluid immediately after burn, while a subgroup received an additional 0.5 mL at 4 hours and 1 mL at 24 hours following burn. We then assessed skin pH and transepidermal water loss every 12 hours on the burn wounds for 72 hourspostburn. Measurements and Main Results: Burn margin exhibited increased epidermal barrier permeability indicated by higher pH, greater transepidermal water loss, and reduced lipidsynthesis enzyme expression and structural protein production up to 96 hours postburn. By contrast, antimicrobial peptide production and protease activity were elevated in burn margin. Skin extracts from burn margin did not exhibit changes in the ability to inhibit bacterial growth. However, distal unburned skin from burned mice also demonstrated an impaired response to barrier disruption, indicated by elevated transepidermal water loss and reduced lipid synthesis enzyme and structural protein expression up to 96 hours postburn. Furthermore, skin extracts from distal unburned skin exhibited greater protease activity and a reduced capacity to inhibit bacterial growth of several skin pathogens. Finally, we established that antimicrobial peptide levels were also altered in the lung and bladder, which are common sites of secondary infection in burninjured patients. Conclusions: These findings reveal several undefined deficiencies in epithelial barrier function at the burn margin, potential donor skin sites, and organs susceptible to secondary infection. These functional and biochemical data provide novel insights into the mechanisms for graft failure and secondary infection after burn injury.

A. McDougall, **Skin barrier function study highlights oatmeal efficacy,** Cosmetics Design Europe, Juni 2014

Newly published results of an in-vivo clinical trial for Oat Cosmetics' multifunctional ingredient Oat COM have highlighted its skin repair properties are 'significant'. The ingredient is extruded colloidal oatmeal, and the independent investigation carried out aimed to assess the skin barrier damage repair properties of Oat COM with an occlusive skin patch. As such, the study showed that the UK firm's ingredient supported the increased repair rate of the skin.

W. Almeida Ciancaglio Garbossa, D. Garcia Mercurio, P.M.B.G. Maia Campos, **Shikimic acid: a potential active principle for skin exfoliation**, Surg Cosmet Dermatol 2014;6(3): p. 239-47

Introduction: Organic acids are widely used in cosmeceutic-based skincare due to their exfoliation and cell renewal related effects. A star anise derivative known as shikimic acid is an example. Objectives: To evaluate the antioxidant activity of shikimic acid and the clinical efficacy of dermocosmetic preparations containing 3% of this active principle. Methods: The antioxidant activity was assessed through an in vitro method. Formulations of gel, gel cream, and a 3% solution of the acid were sequentially dispensed and preliminarily subjected to stability and sensory analysis. The clinical study was performed through non-invasive biophysical and skin imaging techniques. Results: The shikimic acid showed antioxidant potential. All formulations were found to be stable and the addition of shikimic acid improved the sensory analysis of the gel and gel cream. In the clinical assessment, the gel and the solution showed significant alterations in microrelief and in the parameters linked to skin exfoliation. However, the gel cream formulation did not show such an effect, suggesting the importance of the vehicle for the effectiveness of the cosmeceutics. Conclusions: Shikimic acid can be considered an active principle with good potential for application in dermocosmetic formulations aimed at exfoliation and improvement of the skin's microrelief.

M. Kieć-Świcrczyńska, D. Chomiczewska-Skóra, D. Świerczyńska-Machura, B. Kręcisz, **Impact of wet work on epidermal barrier (tewl and stratum corneum hydration) and skin viscoelasticity in nurses** (Abstract – Full article in Polish), Med Pr. 2014;65(5): p. 609-19

Background: Nurses are prone to develop hand eczema due to occupational exposure to irritants, including wet work. The aim of the study was to evaluate the impact of wet work on selected skin properties, reflecting epidermal barrier function--transepidermal water loss (TEWL) and stratum corneum hydration--and additionally skin viscoelasticity, in nurses. Materials and Methods: Study subjects included 90 nurses employed in hospital wards. Measurements were carried out within the dorsal aspect of the dominant hand, using a Cutometer MPA 580 equipped with Tewameter TM 300 and Corneometer CM 825 (Courage & Khazaka, Germany) probes. Examinations took place on hospital premises. Similar measurements were performed in the control group of females non-exposed to irritants. Results: In the examined group of nurses, mean TEWL was 15.5 g/h/m2 and was higher than in the control group (12.99 g/h/m2). After rejecting the extreme results, the difference between the groups proved to be statistically significant ($p < 0.05$). The mean value of stratum corneum hydration was lower in the examined group (37.915) compared with the control group (40.05), but the difference was not sta tistically significant. Also results of viscoelasticity assessment showed no significant differences between studied groups. Conclusions: The results of the assessment of skin biophysical properties show that wet work exerts a moderately adverse impact on skin condition. A higher TEWL value and a lower stratum corneum hydration in workers exposed to irritants reflect an adverse impact of these factors on the epidermal barrier function.

B. Eberlein, J. Huss-Marp, F. Pfab, R. Fischer, R. Franz, M. Schlich, M. Leibl, V. Allertseder, J. Liptak, M. Kriegisch, R. Hennico, J. Latotski, C. Ebner von Eschenbach, U. Darsow, J. Buters, H. Behrendt, R. Huber, J. Ring, **Influence of alpine mountain climate of Bavaria on patients with atopic diseases: studies at the Environmental Research Station Schneefernerhaus (UFS - Zugspitze) – a pilot study**, Clinical and Translational Allergy 2014, 4:17

Mountain and maritime climate therapy takes advantage of specific climatic conditions to treat chronic allergic diseases. It was the aim of the study to investigate effects of a 5 day sojourn on atopic diseases at the highest German mountain. In this pilot study 18 patients with grass pollen-induced rhinoconjunctivitis, atopic ezcema or asthma and 11 non-allergic controls were included. Skin physiology parameters, changes of the respiratory and nasal functions, subjective symptoms and blood parameters were measured during a 5-day observation period in the Environmental Research Station Schneefernerhaus (UFS) at the moderate altitude mountain region (Zugspitze; 2650 m alt.) compared to a low altitude area (Munich; 519 m alt.). Several of the skin physiology parameters changed significantly during the observation period (decrease of skin hydration, increase of skin smoothness, skin roughness, skin scaliness and pH-value). In patients with atopic eczema, the SCORAD (Severity Scoring of Atopic Dermatitis) and the scores of the DIELH (Deutsches Instrument zur Erfassung der Lebensqualität bei Hauterkrankungen) did not change significantly. Histamine induced itch decreased significantly. Parameters of nasal function did not change significantly. Several lung parameters showed a slight, but statistically significant improvement (forced expiratory volume in one second/volume capacity [FEV1/VC], peak expiratory flow [PEF], maximum expiratory flow at 50% of vital capacity [MEF 50], maximal mid-expiratory flow between 25% and 75% of vital capacity [MMFEF 25/75]), whereas the vital capacity (VC) decreased significantly. ECP (eosinophil cationic protein) in the serum and parameters of blood count changed significantly. These results show that the benefit of a moderate altitude mountain climate sojourn over a period of 5 days differs in depending on the atopic disease. Especially asthma parameters and itching of the skin improved. It would be interesting to assess the parameters during longer observation periods in alpine climate.

D. Khazaka, C. Uhl, **Measurement and understanding of TEWL,** Personal Care March 2014

The outer layers of the skin, especially the stratum corneum, play a vital role in protecting the body against many external stressors of chemical, physical and environmental nature, at the same time preventing the organism from losing water, ions and serum proteins to keep the skin flexible and elastic. Through this barrier water constantly evaporates from the skin surface, which is reflected in the transepidermal water loss (TEWL).

J.Y. Park, T.G. Lee, J.Y. Kim, M.C. Lee, Y.K. Chung, W.J. Lee, **Acellular Dermal Matrix to Treat Full Thickness Skin Defects: Follow-Up Subjective and Objective Skin Quality Assessments**, Arch Craniofac Surg Vol.15 No.1, 2014, p. 14-21

Background: There are several options for replacement of the dermal layer in fullthickness skin defects. In this study, we present the surgical outcomes of reconstruction using acellular dermal substitutes by means of objective and subjective scar assessment tools. Methods: We retrospectively reviewed the medical records of 78 patients who had undergone autologous split-thickness skin graft with or without concomitant acellular dermal matrix (CGDerm or AlloDerm) graft. We examined graft survival rate and evaluated postoperative functional skin values. Individual comparisons were performed

between the area of skin graft and the surrounding normal skin. Nine months after surgery, we compared the skin qualities of CGDerm graft group (n=25), AlloDerm graft group (n=8) with skin graft only group (n=23) each other using the objective and subjective measurements. Results: The average of graft survival rate was 93% for CGDerm group, 92% for AlloDerm group and 86% for skin graft only group. Comparing CGDerm grafted skin to the surrounding normal skin, mean elasticity, hydration, and skin barrier values were 87%, 86%, and 82%, respectively. AlloDerm grafted skin values were 84%, 85%, and 84%, respectively. There were no statistical differences between the CGDerm and AlloDerm groups with regard to graft survival rate and skin functional analysis values. However, both groups showed more improvement of skin quality than skin graft only group. Conclusion: The new dermal substitute (CGDerm) demonstrated comparable results with regard to elasticity, humidification, and skin barrier effect when compared with conventional dermal substitute (AlloDerm).

M. Farwicka, T. Köhlera, J. Schilda, M. Mentela, U. Maczkiewitza, V. Paganic, A. Bonfiglic, L. Riganoc, D. Bureikb, G.G. Gauglitz, **Pentacyclic Triterpenes from *Terminalia arjuna* Show Multiple Benefits on Aged and Dry Skin**, Skin Pharmacol Physiol 2014;27: p. 71–81

Background: Pentacyclic triterpenoids improve epidermal barrier function and induce collagen production. Here, their effects on cutaneous aging by means of objective instrumental measurements were elucidated. Methods: Reconstituted human epidermis, cultivated keratinocytes and fibroblasts were incubated with *Terminalia arjuna triterpenes* (*T. arjuna* bark extract), and mRNA and protein expression of various genes was determined using microarray analysis, qRT-PCR and ELISA techniques. Clinical efficacy of *T. arjuna* bark extract versus vehicle control cream was elucidated in 30 patients and transepidermal water loss (TEWL), skin hydration and elasticity were measured. Another 30 female patients in their postmenopausal phase were treated with a similar regime, and skin sebum content, cutaneous blood microcirculation and skin density/echogenicity were assessed. Results: Incubation with T. arjuna triterpenes increased FGF-2, TSP-1, TGF-β and CTGF expression, and VEGF secretion in vitro. Elevated lactate dehydrogenase release upon sodium dodecyl sulphate challenge was reversed by the application of *T. arjuna* bark extract. *T. arjuna* bark extract decreased TEWL, improved skin moisturization, reduced scaliness and led to significantly improved skin elasticity. Also, increases in blood microflow and skin sebum contentas well as improved skin thickness/echogenicity were noted on postmenopausal skin, resulting in visible reduction of sagging skin on the jowls as demonstrated by digital photography. Conclusion: *T. arjuna* bark extract appears as an innovative active ingredient that exerts versatile antiaging properties in vitro and in vivo.

Hand- und Hautschutz, Publikation der Berufsgenossenschaft Rohstoffe und Chemische Industrie, Januar 2014

M.S.B Kriegisch, **Einflüsse des alpinen Hochgebirgsklimas auf Parameter allergischer Erkrankungen: Untersuchungen an der Umweltforschungsstation Schneefernerhaus (UFS - Zugspitze),** Dissertation am ZAUM – Zentrum Allergie und Umwelt der Technischen Universität München, Germany, 2013

Definitionsgemäß wird die Atopie als familiär auftretende Überempfindlichkeit von Haut und Schleimhaut gegenüber Umweltstoffen beschrieben, die mit einer erhöhten Immunglobulin E-Bildung und/oder einer veränderten unspezifischen Reaktivität assoziiert ist. Sie stellt ein heterogenes Syndrom dar und manifestiert sich in unterschiedlichsten Organen, wobei die allergische Rhinokonjunktivitis, das atopische Ekzem und das Bronchialasthma die häufigsten Manifestationen darstellen. Diese drei Erkrankungen, die auch als atopische Trias bezeichnet werden, treten sowohl gleichzeitig als auch nach einander auf, wobei das atopische Ekzem als Erstmanifestation im Kindesalter überwiegt. Im Rahmen des „Etagenwechsels“ kann sich aus dem atopischen Ekzem sowohl ein Bronchialasthma als auch eine allergische Rhinokonjunktivitis entwickeln.

M.M. Kelleher, M. O'Carroll, A. Gallagher, D.M. Murray, A.D. Galvin, A.D. Irvine, J. O'B Hourihane, **Newborn Transepidermal Water Loss Values: A Reference Dataset**, Pediatric Dermatology, p. 1–5, 2013

Transepidermal water loss (TEWL) is a simple noninvasive measurement of inside-out skin barrier function. The goal of this research was to establish normal values for TEWL in early life using data gathered from the Cork BASELINE Birth Cohort Study. TEWL was recorded in a standardized fashion using a well-validated open-chamber system. A mean of three readings was recorded from 1,036 neonates (37–42 weeks gestational age) and 18 late preterm infants (34–37 weeks gestational age) within 96 hours of birth in an environmentally controlled room. Full-term neonatal TEWL measurements have a normal distribution (mean 7.06 ± 3.41 g of water/m2 per hour) and mean preterm neonatal TEWL measurements were 7.76 ± 2.85 g of water/m2 per hour. This is the largest evaluation

to date of TEWL in a normal-term neonatal population. It therefore constitutes a reference dataset for this measurement using an open-chamber system.

K. Mizukoshi, H. Akamatsu, **The investigation of the skin characteristics of males focusing on gender differences, skin perception, and skin care habits,** Skin Research and Technology 2013; 19: 91-99

Background/purpose: Various studies have examined the properties of male skin. However, because these studies mostly involved simple measurement with non-invasive devices, a lack of understanding of the properties of male skin remains. Methods: In this study, we focused and investigated not only on simple instrumental measurements but also on gender differences and men's subjective perceptions of skin and daily skin care habits.

Y. Gao, X. Wang, S. Chen, S. Li, X. Liu, **Acute skin barrier disruption with repeated tape stripping: an in vivo model for damage skin barrier,** Skin Research and Technology 2013; 19: p. 162-168

Purpose: To establish a model of standardized acute barrier disruption, investigate the response of normal human to repeated tape stripping, and analyze the change of damaged skin with non-invasive examination techniques for skin, such as TEWL and squamometry. Methods: Repeated tape stripping with corneofix was applied on three different anatomical sites, the measurement of TEWL was performed on the baseline and after every 5 strips. Then the samples of corneofix were analyzed using Visioscan VC98 and squamometry.

R.K. Mlosek, S. Malinowksa, M. Sikora, R. Debowska, A. Stepien, K. Czekaj, A. Dabrowska, **The use of high frequency ultrasound imaging in skin moisturization measurement,** Skin Research and Technology 2013; 19: p. 169-175

Introduction: The appropriate skin hydration level enables its normal function and healthy apperarance. Purpose: The purpose of present research was to assess the applicability of high frequency ultrasound (HFU) to the monitoring of skin moisturization treatments. Material and Methods: The study sample encompassed 27 women, aged 20-67 y.o. (mean age of 45.48 y.o.) with dry skin. All women applied a strong moisturizing cream on their facial skin for 14 days. The course of treatment was monitored using the HFU. The following parameters were subjected to the ultrasound evaluation: epidermal echo thickness, dermis thickness, and separately the thickness of the superior and inferior layer of dermis. The measurements were taken on the participants' chins and cheeks. In addition, skin hydration and transepidermal water loss (TEWL) were determined.

H. Hoeksema, M. de Vos, J. Verbelen, A. Pirayesh, S. Monstrey, **Scar management by means of occlusion and hydration: A comparative study of silicones versus a hydrating gel-cream,** Burns 2013

Abstract: Despite the worldwide use of silicones in scar management, its exact working mechanism based on a balanced occlusion and hydration, is still not completely elucidated. Moreover, it seems peculiar that silicones with completely different occlusive and hydrating properties still could provide a similar therapeutic effect. The objective of the first part of this study was to compare the occlusive and hydrating properties of three fluid silicone gels and a hydrating gel-cream. In a second part of the study these results were compared with those of silicone gel sheets. Tape stripped skin was used as a standardized scar like model on both forearms of 40 healthy volunteers. At specific times, trans epidermal water loss (TEWL) and the hydration state of the stratum corneum were measured and compared with intact skin and a scar-like control over a 3–4 h period. Our study clearly demonstrated that fluid silicone gels and a hydrating gel-cream have comparable occlusive and hydrating properties while silicone gel sheets are much more occlusive, reducing TEWL values far below those of normal skin. A well-balanced, hydrating gel-cream can provide the same occlusive and hydrating properties as fluid silicone gels, suggesting that it could eventually replace silicones in scar treatment.

M. Brock, P. Padtorelli, **Cosmacol ELI – A Multifunctional Additive for Rinse-off Products**, Cosmetic Science Technology 2013

This article illustarates the multi functionality of the latic acid carrier named Cosmacol ELI (INCI-name: C12-13 Alkyl Lactate) in rinse-off products. This material is mild to the skin, exhibits superior skin re-fatting action and thickens Sodium Alkylethersulphate based formulations. Furthermore, if affects neither foaming ability nor foam stability and enables the creation of transparent rinse-off products with very low clear melting points.

B. Singh, H. Maibach, **Climate and skin function: An Overview**, Skin Research and Rechnology 2013; 19, p. 207-212

Background: Climates of the world are diverse and produce changes in skin integrity and functioning. Evidence on skin and its response to severe climates is limited, but information can be inferred from data chracterizing skin under controlled climate conditions using noninvasive bioengineering techniques. Methods: A literature search was conducted on the effects on major climate conditions on skin integrity and function. Results: Exposure of murine skin to low humidity promotes a hyperproliferactive and proinlammatory response, which can be prevented with topical agents or occlusion. Transepidermal water loss (TEWL) and average skin temperature (Tsk) is highly sensitive to climate or ambient temperature (Tambient). High altitudes leave skin more susceptible to UV radiation and even brief exposures cause surface changes. Pollution can result external skin aging and may be a risk factor for exacerbation of dermatoses.

J. du Plessis, A. Stefaniak, F. Eloff; S. John, T. Agner, T.-C. Chou, R. Nixon, M. Steiner, A. Franken, I. Kudla, L. Holmes, **International guidelines for the in vivo assessment of skin properties in non-clinical settings: Part 2. Transepidermal water loss and skin hydration,** Skin Research and Technology 2013; 19, p. 265-278

Background: There is an emerging perspective that is not sufficient to just assess skin exposure to physical and chemical stressors in workplaces, but that it is also important to assess the condition, i.e. skin barrier function oft he exposed skin at the time of exposure. The workplace environment, representing a non-clinical enviroment, can be highly variable and difficult to control, thereby presenting unique measurement challenges not typically encountered in clinical settings. Methods: An expert working group convened a workshop a spart of the 5th International Conference on Occupational and Environmental Exposure of Skin Chemicals (OEESC) to develop basic guidelines and best practices (based on existing clinical guidelines, published data, an down experiences) for the in-vivo measurement of transepidermal water loss (TEWL) and skin hydration in non-clinical settings with specific reference to the workplace as a worst-case scenario.

N. Mohd Noor, S.H. Hussein, **Transepidermal water loss in erythrodermic patients of various aetiologies**, Skin Research and Technology 2013; 19, p. 320-323

Background/purpose: Despite its severity not much work has been done to explore the barrier function in patients with erythroderma. This study compares TEWL between skin of healthy subjects and erythrodermic patients of various aetiologies and at different sites. We also assess TEWL between patients with acute and chronic erythroderma. Methods: Twenty-five erythrodermic patients and 26 age, race and sex-matched healthy controls were performed at five sites; right cheek, left volar forearm, abdomen, upper back and right calf using Tewameter TM210. Results: TEWL in erythrodermic patients were significantly higher than healthy individuals at all the sites ($P < 0.001$). There were significant differences in TEWL between anatomical sites in controls ($P < 0.001$) but not in patients. The highest TEWL for the patient and control groups were that of the abdomen and the right cheek respectively.

J.W. Jung, Y.W. Lee, Y.B. Choe, K.J. Ahn, **An 8-week face-split study to evaluate the efficacy of cosmeceuticals using non-invasive bioengineering devices**, Skin Research and Technology 2013; 19, p. 324-329

Background/aims: Even with the increasing demand for functional cosmeceuticals in the recent years, objective standard criteria for assessing their efficacy are currently incomplete at best. In this 8-week face-split study, in which we topically applied high-priced cosmeceuticals on one side and more affordable cosmeceuticals on the other side of face, we compared the efficacy of these two products using non-invasive bioengineering technology. Methods: We assessed the efficacy of a skin-whitening and an anti-wrinkle cosmeceutical product on 25 and 19 healthy female volunteers, respectively. In a single blind split setting, each participant received an 8-week topical application of high-priced cosmeceuticals to the left side of face, and cheaper cosmeceuticals to the right side. Then, the subjects' biophysical parameters were measured for an objective evaluation of the results. This was followed by a questionnaire to obtain a subjective assessment.

K.Q. Boucetta, Z. Charrouf, H. Aguenaou, A. Derouiche, Y. Bensouda, **Does Argan oil have a moisturizing effect on the skin of postmenopausal women?,** Skin Research and Technology 2013; 19; 356-357

During menopause, the decrease in endogenous estrogen level affects negatively the homeostasis of the estrogen target organs including the skin, which becomes more predisposed to develop the skin dryness (1), characterized by increase in the transepidermal water loss (TEWL) and a decrease in the water content of the epidermis (WCE).

M. Bayer, G. Schlippe, W. Voss, **Tests on Cosmetics: Requirements and Successful**

Implementations, Cosmetic Science Technology 2013

Abstract: Dermatological tests in accordance with scientific criteria are of decisive value for the safety and efficacy of cosmetics. The latest alterations to European legislation emphasise this fact. Whether a cosmetic product is well tolerated or causes irritations or allergic reactions must be proven by dermatological tests. The range of test methods starts with simple questionnaires and ends with complex physiological measurements. The quality of dermatological reports directly depends on the seriousness of the commissioned dermatologists. Pitfalls occur whenever non qualified scientific results are generously used for advertising campaigns such as 'dermatologically tested', 'allergy tested', 'hypo-allergenic' etc. Additionally many reports on cosmetics therefore must be valid in scientific methods and practical execution.

Z. Kurgyis, G. Eros, I.B. Nemeth, E. Csizmazia, S. Berkó, P. Szabò-Révész, L. Kemény, E. Csányi, **The irritant effects of pharmaceutical excipients used in topical formulations,** Poster University of Szeged, Dermatology, Allergology

The dermal and transdermal application of drugs rises all over the world which, partly due to the high expecations toward these formulations, leads to the development of several new pharmaceutical excipients. Meanwhile active agents undergo thorough examinations during their development, little is known about the safety profile of pharmaceutical excipients. Surfactants, for instance, while acting as penetration enhancers may damage skin barrier, leading to irritant contact dermatitis.

M. Schweitzer, K. Stang, **A Physiological Experiment for Skin Research on ISS**, Kayser-Threde GmbH 2013 & DLR

SKIN-B is an experiment set for non-invasive investigation of changes of skin hydration, skin barrier function and skin surface structure of astronauts before, after, and during space flight. Professor Dr. Heinrich and Dr. Nicole Gerlach from Derma Tronnier, Institute for Experimental Dermatology at Witten-Herdecke University, hope to derive conclusions from the data on the effects of weightlessness on the astronaut's skin, inner organs, and on physiological changes to the skin to be expected during long-term missions. In comparison to the precursor experiment SkinCare (2006) the experiment set has been substantially improved by Kayser-Threde: An enhanced ultra-violet camera was chosen to obtain sharper images. Operation was made easier since the experiment can now be operated from a space station laptop via USB ports and with a software adapted for this specific purpose. Use of the ISS board laptop also allows experiment data to be transferred to Earth directly.

R.S. Teixeira, L.A. Araújo, D.G. Mercúrio, P.M.B.G. Maia Campos, **Application of biophysical techniques to evaluate the efficacy of a gel with zinc pca,** University of Sao Paulo, 2013

The biophysical and skin imaging techniques are effective tools to help characterize the skin type and to evaluate the'clinical efficacy of products cosmetics because they are non-invasive methods and enable to evaluate die products directly in human skin.

M. Wagh, **Skin Deep: Exploring the Hidden World of Dogs (and Humans),** Bellwether Magazine, Volume 1, Number 80, Fall 2013

By current estimates, the human body contains 10 times more microbial cells than human cells. Acting in ways both beneficial and harmful, the microorganisms living on the surface of the skin, as well as in the gut and other organs, constitute a complex ecosystem known to influence digestion, allergies, and a variety of diseases.

D.G. Mercurio, T.A.L. Wagemaker, P.M:B.G Maia Campos, **Effects of sun exposure habits on skin aging: a multivariate analysis**, ISBS, Milan 15-16.10.2013

Summary: Skin exposure to ultraviolet (UV) radiation is related with molecular, morphological, structural and clinical changes on the skin, which characterizes photoaging. However, there are few studies that correlate sun exposure habits and objective measurements using biophysical and skin image techniques. Thus, the aim of this study was to evaluate the influence of the sun exposure habits on the biophysical and morphological characteristics of aged skin using multivariate analysis. For this, 40 healthy female volunteers (aged between 18- 30 or 40-65 years) filled a questionnaire concerning their sun exposure and protection habits during different periods of their lives. The characterization of the skin of dorsal and volar forearms was performed using objective measurements by biophysical and skin image techniques in terms of transepidermal water loss, direct measurement of the skin topography, viscoelasticity, dermis thickness and echogenicity, and structure and morphology of the epidermis by in vivo Reflectance Confocal Microscopy. Principal Component Analysis (PCA) of the values of each parameter was used to visualize the relationship between variables and groups. According to the PCA

analysis, the sun exposure habits are directly related to increased dermis thickness, reduced echogenicity and elasticity.

U. Griesbach, M. Hloucha, A. Mehling, D. Prinz, **Ein Pflegeadditiv mit Öldeposition für ein gutes Hautgefühl und hohe Pflegeansprüche**, SOFW Journal; 139; 10-2013

Was kann man heute von Hautreinigungsprodukten erwarten? Wie können Hautreinigungsprodukte attraktiver, besser, wertvoller werden? Welche Technologien helfen dem Entwickler? Hautreinigung ist ein wichtiges Segment in der Kosmetikindustrie. In 2012 wurden in Europa z.B. in den Segmenten Duschgele/Flüssigseifen/Intimpflege und Badezusätze 967.000 Tonnen für rund 6,67 Mrd. € verkauft (Datenrecherche aus Euromonitor). Während der Aufbau eines tensidischen Kosmetikproduktes in den Anfängen der Kosmetikentwicklung recht einfach war und als Alternative zum Seifenstück galt, können Produkte heute aufgrund einer Vielzahl von Basis- und Zusatzstoffen anders komponiert und mit zusätzlichen Vorteilen ausgestattet werden. Unter dem Preisdruck vieler Händler und Handelsketten hat sich allerdings die Zusammensetzung der Formulierungen von Duschen und Badezusätzen verändert. Zwei Trends sind dabei zu beobachten: Kostendruck führt zu reduzierten Rezepturen, z.B. im Gehalt an waschaktiven Substanzen, Verzicht auf hochwertige, milde Tenside und auf Wirkstoffe. Auf der anderen Seite gibt es einen Trend zu cremigen Systemen, die entweder Ölkomponenten und/oder Polymere enthalten und sehr pflegend sein können, oft auch einen Hauch Luxus vermitteln.

C. Galzote, R. Estanislao, M.O. Suero, A. Khaiat, M.I. Mangubat, R. Moideen, H. Tagami, X. Wang, **Characterization of facial skin of various Asian populations through visual and non-invasive instrumental evaluations: influence of age and skincare habits,** Skin Research and Technology 2013;19; 454-465

Background/purpose: We aimed to evaluate the impact of age and skincare habits on facila skin of different Asian ethnicities by comparing skin properties and skincare habits among various Asian populations of varying age groups. Methods: We evaluated approximately 100 female subjects each from a total of eight Asian cities in China, Indian, South Korea, Japan and the Philippines grouped according to age ranging from 14 to 75 years during a summer season. Facial skin was characterized using dermatological examinations of the cheek. Information regarding personal skincare habits was collected using a questionnaire.

S. Luebberding, N. Krueger, M. Kerscher, **Age-related changes in skin barrier function – Quantitative evaluation of 150 female subjects,** International Journal of Cosmetic Science, 2013, 35, p. 183–190

Synopsis: The protection against water loss and the prevention of substances and bacteria penetrating into the body rank as the most important functions of the skin. This so-called ‘skin barrier function’ is the natural frontier between the inner organism and the environment, and is primarily formed by the epidermis. An impairment of the skin barrier function is often found in diseased and damaged skin. An influence of ageing on skin barrier function is widely accepted, but has not been conclusively evaluated yet. Therefore, the aim of this clinical study was to assess the potential influence of ageing on skin barrier function, including transepidermal water loss (TEWL), stratum corneum hydration, sebum content and pH value. One hundred and fifty healthy women aged 18–80, divided into five age groups with 30 subjects each, were evaluated in this study. TEWL, hydration level, sebum secretion and pH value of hydro-lipid acid film were measured with worldwide acknowledged biophysical measuring methods at cheek, neck, d_ecollet_e, volar forearm and dorsum of hand. Whereas TEWL and stratum corneum hydration showed only very low correlation with subject’s age, the sebum production decreased significantly with age, resulting in the lowest skin surface lipids levels measured in subjects older than 70 years. The highest skin surface pH was measured in subjects between 50 and 60 years, whereas the eldest age group had the lowest mean pH. The dorsum of the hand was the location with the highest TEWL and lowest stratum corneum hydration in all age groups. The results show that only some parameters related to skin barrier function are influenced by ageing. Whereas sebum production decreases significantly over lifetime and skin surface pH is significantly increased in menopausal woman, TEWL and stratum corneum hydration show only minor variations with ageing.

C. Adomat, W. Gehring, **Protektiver Effekt von Betulin-Emulsionen/Protective Effect of Betulin-Emulsions,** Aktuelle Dermatologie 2013; 39, p. 499-503

Zusammenfassung: In zwei voneinander unabhängigen Studien wurde die protektive Wirkung von Betulin-Emulsionen allein (Imlan®-Creme Pur und Imlan®-Creme Plus, Birken AG, Niefern-Öschelbronn, Deutschland) und im Vergleich zu dem Hautschutz-Produkt Excipial Protect® (Spirig Pharma AG, Egerkingen, Schweiz) im repetitiven Waschtest mit Natriumlaurylsulfat (SLS) untersucht.

Dabei konnte für alle Präparate eine vergleichbare Schutzwirkung gegenüber SLS nachgewiesen werden.

Abstract: In two independent studies the protective effect of two betulin-emulsions (Imlan® Creme Pur und Imlan® Creme Plus, Birken AG, Niefern-Öschelbronn, Germany) and of a betulin-emulsion in comparison to the skin protection creme Excipial Protect® was tested in a repetitive washing test with sodium dodecylsulfate (SLS). The effect concerning protection against SLS was found to be comparable for all three products.

J. du Plessis, A. Stefaniak, F. Eloff, S. John, T. Agner, T.-C. Chou, R. Nixon, M. Steiner, A. Franken, I. Kudla, L. Holness, **International guidelines for the in vivo assessment of skin properties in non-clinical settings: Part 2. transepidermal water loss and skin hydration**, Skin Research and Technology 2013; 0: p. 1-10

Background: There is an emerging perspective that it is not sufficient to just assess skin exposure to physical and chemical stressors in workplaces, but that it is also important to assess the condition, i.e. skin barrier function of the exposed skin at the time of exposure. The workplace environment, representing a non-clinical environment, can be highly variable and difficult to control, thereby presenting unique measurement challenges not typically encountered in clinical settings. Methods: An expert working group convened a workshop as part of the 5th International Conference on Occupational and Environmental Exposure of Skin to Chemicals (OEESC) to develop basic guidelines and best practices (based on existing clinical guidelines, published data, and own experiences) for the in vivo measurement of transepidermal water loss (TEWL) and skin hydration in non-clinical settings with specific reference to the workplace as a worst-case scenario.

J. Polaskova, J. Pavlackova, P. Vltavska, P. Mokrejs, J. Rahula, **Moisturizing effect of topical cosmetic products applied to dry skin**, J. Cosmet. Sci., 64, p. 1–12 (September/October 2013)

One of the complications of “diabetes mellitus” is termed diabetic foot syndrome, the fi rst symptoms of which include changes in the skin’s condition and properties. The skin becomes dehydrated, dry, and prone to excessive formation of the horny layer, its barrier function becoming weakened. This function can be restored by applying suitable cosmetic excipients containing active substances. The aim of this study was to evaluate and compare the effects of commercially available cosmetic products (CPs) designed for the care of diabetic foot, through a group of selected volunteers using noninvasive bioengineering methods. Statistical surveys ($p < 0.05$) evaluated these CPs as regards to their hydration effect and barrier properties. Special attention was devoted to CPs with the declared content of 10% urea, and that the infl uence of this preparation’s ability to hydrate and maintain epidermal water in the epidermis was confirmed.

L. von Oppen-Bezalel, O. Ramot, O.B. Chitrit, F. Havas, **Jojoba leaf extract enhances skin performance from inside**, Personal Care September 2013

Jojoba is a shrub native to the Sonoran and Mojave deserts of Arizona, California, and Mexico. It is the sole species of the family Simmondsiaceae, placed in the order Caryophyllales. Jojoba is commonly for its oil, a liquid wax ester, present in seeds. Unlike jojoba oil, IBR-Gapture is an aqueous extract of the jojoba leaf. Sourced from this well adapted desert plant, able to maintain itself effectively in extremely warm and dry environments, IBR-Gapture (now referred to as ‘the jojoba leaf extract‘) captures these unique abilities via delicate and natural extraction. Jojoba plants reserve the scarce water supply of the harsh desert, acting as a drop of vitality in the arid scenery. IBR’s jojoba leaf extract is a natural heir to the jojoba plant’s ability to moisturise, protect and beautify.

A. Heghes, C.M. Soica, S. Ardelean, R. Ambrus, D. Muntean, A. Galuscan, D. Dragos, D. Ionescu, F. Borcan, **Influence of emulsifiers on the characteristics of polyurethane structures used as drug carrier**, Chemistry Central Journal 2013, 7:66

Background: Emulsifiers have a significant role in the emulsion polymerization by reducing the interfacial tension thus increasing the stability of colloidal dispersions of polymer nanostructures. This study evaluates the impact of four emulsifiers on the characteristics of polyurethane hollow structures used as drug delivery system. Results: Polyurethane (PU) structures with high stability and sizes ranging from nano- to micro-scale were obtained by interfacial polyaddition combined with spontaneous emulsification. The pH of PU aqueous solutions (0.1% w/w) was slightly acidic, which is acceptable for products intended to be used on human skin. Agglomerated structures with irregular shapes were observed by scanning electron microscopy. The synthesized structures have melting points between 245-265°C and reveal promising results in different evaluations (TEWL, mexametry) on murine skin. Conclusions: In this study hollow PU structures of reduced noxiousness were synthesized, their size

and stability being influenced by emulsifiers. Such structures could be used in the pharmaceutical field as future drug delivery systems.

M.L. Kmieć, A. Pajor, G. Broniarczyk-Dyła, **Evaluation of biophysical skin parameters and assessment of hair growth in patients with acne treated with isotretinoin**, Postep Derm Alergol 2013; XXX, 6: p. 343–349

Introduction: Treatment of the severe forms of acne vulgaris remains a challenge. Isotretinoin is a drug often used in these cases. Retinoids affect the mechanisms that play a role in the pathogenesis of acne, reduce the production of sebum and sizes of the sebaceous glands. However, isotretinoin appears to have undesirable side effects in the skin, mucous membranes and hair. Aim: The aim of this study was to assess the effect of acne vulgaris treatment with isotretinoin on biophysical skin parameters: skin sebum and stratum corneum hydration levels, transepidermal water loss values, pH, erythema and hair growth parameters: total number, density and proportion of anagen hair. Material and methods: The study included thirty patients with acne types: papulopustular, conglobata and phlegmonosa. Patients were treated with isotretinoin at a dose of 0.5–1.0 mg/kg/day for a period of 4–7 months. The measurements of skin biophysical parameters were performed before and after the treatment using Sebumeter SM815, Corneometer CM825, Tewameter TM300, MX Mexameter MX18 and Skin-pH-Meter PH908. Hair growth parameters were evaluated with FotoFinder Dermoscope using the TrichoScan Professional V3.0.8.76 software. Results: The results of biophysical skin parameter measurements after the treatment showed a reduction in the severity of seborrhea. However, the skin was dry, which confrmed a lowered degree of stratum corneum hydration and an increase in transepidermal water loss values. Moreover, severity of erythema, an increase in pH value, and variations in selected hair growth parameters: decrease in total count, density and proportion of anagen hair were demonstrated. Conclusions: The reduction in the skin sebum levels was observed after the treatment. There was dryness of the skin, which was confrmed by biophysical skin parameter measurements. Changes in the hair growth parameters showed telogen efuvium hair loss.

Wirksamkeit und Verträglichkeit von Nasenbalsam bei Hautirritationen, Birken AG, Ästhetische Dermatologie 5, 2013

In einer im April und Mai 2012 vom proDerm Institut für Angewandte Dermatologische Forschung durchgeführten Anwendungsstudie verwendeten 52 freiwillige Probanden über einen Zeitraum von 4 Wochen den Nasenbalsam (Imlan Nasenbalsam Plus, Birken AG) mindestens einmal täglich. Alle Probanden hatten laut eigenen Angaben eine Pollenallergie auf Frühblüher und im Testzeitraum daher Symptome von Heuschnupfen mit Begleiterscheinungen wie trockener und geröteter Haut im Nasenumfeld. Vor und nach der Anwendungsphase wurde der Status der Haut im relevanten Areal durch einen Dermatologen sowie durch die Probanden selbst beurteilt.

M.P. Szczepanik, P.M. Wilkołek, M. Pluta, ł.R. Adamek1, M. Gołyński, Z.J.H. Pomorski, W. Sitkowski, **The examination of biophysical skin parameters (transepidermal water loss, skin hydration and pH value) in different body regions in Polish ponies**, Polish Journal of Veterinary Sciences Vol. 16, No. 4 (2013), p. 741–747

The purpose of this study was to evaluate transepidermal water loss, skin hydration and skin pH in normal polish ponies. Twelve ponies of both sexes were examined in the study. Measurements were taken from seven different sites: the neck region, the shoulder, thorax, lumbar, inguinal, lip region and the pinna. In each of the regions transepidermal water loss (TEWL), skin hydration and skin pH were measured. For transepidermal water loss, the lowest values were observed in the pinna (10.54 g/hm2), while the highest values were observed in the lip region (30.98 g/hm2). In the case of skin hydration the lowest values were observed for the thorax region (1.96 CU), and the highest for the lip region (48.28 CU). For skin pH, the lowest results were obtained in the pinna (7.03), and the highest in the lumbar region (8.05).

S. Luebberding, N. Krueger, M. Kerscher, **Skin physiology in men and women: in vivo evaluation of 300 people including TEWL, SC hydration, sebum content and skin surface pH,** IFSCC Magazine Volume 16, Number 4 2013

Objectives: Evidence is given that differences in skin physiological properties exist between men and women. However, despite an assessable number of available publications, the results are still inconsistent. Therefore, the aim of this clinical study is the first systematic assessment of gender-related differences in skin physiology in men and women, with a special focus on changed over lifetime.

Improved skin barrier recovery with L22 in a lotion, Poster Floratech, In-Cosmetics, Paris 2013

L22 improves the recovery of skin barrier function better than Olive Oil or Caprylic/Capric Triglyceride Oil, common emollients with skin-lipid like components. L22 is a botanically derived system which delivers the skin lipid profile of a healthy 22 year old. TEWL (transepidermal water loss) was measured using a Tewameter TM300 on normal, untreated forearm skin. The forearms were then exposed to acetone in order to partially extract the natural skin lipids. TEWL measurements were again taken 30 minutes after acetone extraction, followed by one application of each lotion or water (negative control).

Skin barrier recovery with Floraesters 60, Poster Floratech, In-Cosmetics, Paris 2013

2% Floraesters 60 performed statistically significantly ($p<0.05$) better than the vehicle when compared to the baseline values and demonstrated no statistical significant difference from petrolatum three hours after application. TEWL (transepidermal water loss) was determined using a Tewameter TM300 on normal, untreated forearm skin (baseline), followed by exposure to a 0.3% solution (w/w) of SLS (sodium lauryl sulfate) for appoximately 18 hours under occlusion using 19mm Hill Top Chambers (to break down the barrier of the skin). TEWL measurements were again taken 30 minutes following chamber removal and percent increase from baseline was determined.

Improved skin barrier function with Floraesters 60, Poster Floratech, In-Cosmetics, Paris 2013

1% Floraesters 60 performed statistically significantly ($p<0.01$) better than the vehicle, and equivalent to 5% petrolatum. TEWL (transepidermal water loss) was determined using a Tewameter TM300 on normal, water-treated forearm skin (see image above). The forearms were then treated with one application of various test articles, followed by exposure to a 0.3% solution (%w/w) of SLS (sodium lauryl sulfate) approximately 12 hours under occlusion using 19mm Hill Top Chambers.

Increased skin barrier function with Floraesters 20, 30, and 60, Poster Floratech, In-Cosmetics, Paris 2013

2% Floraesters 20, 2%Floraesters 30, and 2% Floraesters 60 performed statistically significantly ($p<0.001$) better than the vehicle when compared to the untreated skin at the time of evaluation and statistically equivalent to 5% petrolatum at the time of evaluation. TEWL (transepidermal water loss) was determined using a Tewameter TM300 on normal, untreated forearm skin (see image above). The forearms were then treated with one application of various test articles, followed by exposure to a 0.3% solution (w/w) of SLS (sodium lauryl sulfate) for approximately 12 hours under occlusion using 19mm Hill Top Chambers.

C. Uhl, D. Khazaka, **Techniques for globally approved skin testing,** Personal Care April 2013

In efficacy testing and claim support for cosmetic products, objective measurement systems became indispensable long ago, especially since subjective clinical assessments are often prone to bias and inter-observer variation. Without suitable instrumentation it is close to impossible to determine what a product is really doing for the skin. Those objective measurement methods and subjective evaluations are mutually dependent. No measurement can be performed without the subjective evaluation of the results by the user of such instrumentation. However, a pure subjective evaluation of the skin without appropriate measurement techniques is not able to achieve accurate results either. This relationship becomes clearer when looking for example at skin colour measurements. Subjectively, the human brain cannot process slight changes in colour, especially when the colours are not viewed side by side, but at different points in time. Instrumental measurement however will clearly detect such slight changes. The achieved result must then be interpreted in context with the expected outcome or the hypothesis. For this, you will always need a knowledgeable and experienced person because 'a fool with a tool is still a fool', as the late Albert Kligman used to say. This relationship between objective measurement and subjective evaluation is not only true for the determination of differences in skin colour, but also for all other skin measurement parameters important for the cosmetic industry.

G. Neudahl, **Rating of butters on TEWL, moisturisation and elasticity;** Personal Care February 2013

Butyrospermum Parkii (Shea) Butter (shea butter) is widely used in personal care and cosmetics as a moisturiser and emollient. While shea butter has grown in importance within the industry, there is little in the way of clinical studies showing its efficacy in skin care. Much of the information is based upon its composition or anecdotal in nature. Nonetheless, most cosmetic chemists are convinced that shea butter works, and works very well, as a moisturiser, improving the lipid barrier function. We believe that many other naturally occurring butters, such as Garcinia Indica Seed Butter (kokum butter), Mangifera Indica (Mango) Seed Butter (mango butter) and Theobroma Cacao (Cocoa) Seed Butter (cocoa butter), may be equal to, or better than, shea butter for reduction in transepidermal water loss (TEWL). A study was therefore undertaken to explore the effects of these butters for cosmetic use on transepidermal

water loss, skin moisturisation and skin elasticity. The primary objective of the study was to determine the efficacy of these butters in skin care applications when incorporated in a standard formulation.

M. Farwick, S. Klee-Laquai, **Skin-identical ceramide for enhanced skin care,** Personal Care January 2013

Skin is a highly complex tissue acting as a protector against physical, chemical and biological attack. It plays a crucial role in the protection against dehydration and the control of body temperature. This barricade is provided by the „horny layer" (stratum corneum [SC]), representing the outermost layer of epidermis. The horny layer is a thin inert, water-retaining barrier which both regulates the moisture content of the skin and protects it aganist external influences. Due to its structure it is often compared to a brick wall in which the non-viable corneocytes are embedded like bricks in a matrix of lipids („mortar").

D. Scharpenack, **Einfluss eines Pflegetuchs auf die Haut mit begleitender Fragebogenerhebung zur Anwendung in der Pflege**, Dissertation Universitätsmedizin der Ernst-Moritz-Arndt Universität Greifswald, Institut für Hygiene und Umweltmedizin, Germany, 2012

Die Körperwaschung ist ein wesentlicher Bestandteil der Körperhygiene und wird im stationären Setting in Form der Teilkörperwaschung/Ganzkörperwaschung von der Pflegekraft für Patienten übernommen, die sich nicht selbständig waschen können. Neben Körperpflegeutensilien und Waschschüssel mit Waschwasser kommen Handtücher und Waschlappen zum Einsatz.Der Waschlappen wird mit Seife bzw. Waschlotion sowie mit dem Wasser aus der Waschschüssel getränkt. Dabei sollte flüssige Seife gewählt werden, da es durch Verwendung von Seifenstücken eventuell zur Übertragung von Krankheitserregerndurch ein kontaminiertes Seifenstück kommen kann (Kabara u. Brady 1984, Mc Bride 1984, Hegde et al. 2006). Tägliches Duschen oder Körperwaschung mit anschließendem Eincremen der Haut sind aktuelle Empfehlungen zur Körperhygieneund leiten sich aus Untersuchungen von Bergler (1973, 1989) und Kramer et al. (1993)ab. Das Waschen und analog das Abtrocknen wird vom Kopf beginnend abwärtsdurchgeführt und mit dem Genitalbereich mit separatem Waschlappen beendet, wobei jede Waschung unter Berücksichtigung der hygienischen Grundsätze den individuellen Bedürfnissen der Patienten angepasst werden kann (Kramer et al. 2011).Um eine Verschleppung von Krankheitserregern zu vermeiden, ist die Verwendung sauberer Waschlappen und Handtücher angezeigt. Für Waschlappen werden schnell trocknende Materialien (z. B. Frottee) empfohlen, wobei Handschuhwaschlappen wegen ihrer langsamen Trocknung ungeeignet sind. Nach Benutzung sollten Waschlappen in der Sanitärzelle oder am Waschplatz ausgebreitet aufgehängt werden, idealerweise erfolgt die Aufbereitung in einem eigenen Wasch- und Trockenraum.

H.-B. Pyun, M. Kim, J. Park, Y. Sakai, N. Numata, J.-Y. Shin, H.-J. Shin, D.-U. Kim, J.-K. Hwang, **Effects of Collagen Tripeptide Supplement on Photoaging and Epidermal Skin Barrier in UVB-exposed Hairless Mice**, Prev Nutr Food Sci*,* Vol 17, p. 245–253 (2012)

Collagen tripeptide (CTP) is a functional food material with several biological effects such as improving dry skin and wound and bone fracture healing. This study focused on the anti-photoaging effects of CTP on a hairless mouse model. To evaluate the effects of CTP on UVB-induced skin wrinkle formation *in vivo*, the hairless mice were exposed to UVB radiation with oral administration of CTP for 14 weeks. Compared with the untreated UVB control group, mice treated with CTP showed significantly reduced wrinkle formation, skin thickening, and transepidermal water loss (TEWL). Skin hydration and hydroxyproline were increased in the CTP-treated group. Moreover, oral administration of CTP prevented UVB-induced MMP-3 and -13 activities as well as MMP-2 and -9 expressions. Oral administration of CTP increased skin elasticity and decreased abnormal elastic fiber formation. Erythema was also decreased in the CTP-treated group. Taken together, these results strongly suggest that CTP has potential as an anti-photoaging agent.

Repairing Barrier Function with FLORAESTERS® 30 and FLORAESTERS K-100® Jojoba in a Shaving Cream, Poster Floratech 2012

Floraesters 30 and Floraesters K-100, alone and in combination, enhanced barrier function (reduced TEWL) over the vehicle with 1 % aloe vera post shave.

P. Kleesz, R. Darlenski, J.W. Fluhr, **Full-Body Skin Mapping for Six Biophysical Parameters: Baseline Values at 16 Anatomical Sites in 125 Human Subjects,** Skin Pharmacol Physiol 2012; 25; p. 25-33

The skin, as the outermost organ, protects against exogenous hazards (outside-in barrier) and prevents the loss of essential parts of the body (inside-out barrier) The epidermal barrier exerts several functions with specific morphological elements. Regional differences in skin functions are well known.

The aim of the present study was to assess and compare skin physiological parameters in vivo at 16 anatomical sites: Barrier function in terms of transepidermal water loss (TEWL), stratum corneum (SC) hydration (assessed by capacitace), skin surface pH, skin surface temperature, erythema index and skin pigmentation were quantified at 16 anatomical sites under basal conditions.

S. De Spirt, H. Sies, H. Tronnier, U. Heinrich, **An Encapsulated Fruit and Vegetable Juice Concentrate Increases Skin Microcirculation in Healthy Women,** Skin Pharmacol Physiol 2012;25: p. 2-8

Background/Aim: Microcirculation in the dermis of the skin is important for nutrient delivery to this tissue. In this study, the effects of a micronutrient concentrate (Juice Plus+; 'active group'), composed primarily of fruit and vegetable juice powder, on skin microcirculation and structure were compared to placebo. Study Design/Methods: This 12-week study had a monocentric, double-blind placebo and randomized controlled design with two treatment groups consisting of 26 healthy middle-aged women each. The 'oxygen to see' device was used to evaluate microcirculation. Skin density and thickness were measured using ultrasound. Measurements for skin hydration (Corneometer), transepidermal water loss and serum analysis for carotenoids and α-tocopherol were also performed. Results: By 12 weeks, microcirculation of the superficial plexus increased by 39%. Furthermore, skin hydration increased by 9% while skin thickness increased by 6% and skin density by 16% in the active group. In the placebo group, microcirculation decreased, and a slight increase in skin density was observed. Conclusion: Ingestion of a fruit- and vegetable-based concentrate increases microcirculation of the skin at 12 weeks of intervention and positively affects skin hydration, density and thickness.

Y. Zheng, B. Sotoodian, W. Lai, H.I. Maibach, **Buffering capacity of human skin layers: in vitro,** Skin Research and Technology 2012; 18: p. 114-119

Normal stratum corneum encompasses an acidic environment with normal pH ranging from 4-6. Skin exposure to aqueous acid or alkaline solutions induces changes in pH, which may rapidly revert to baseline values. This phenomenon is called buffering capacity. Hence, disturbed skin pH could be associated with skin disease. Factors contributing to buffering capacity include sweating, keratin, proteins, stratum corneum thickness, free amino acids and other epidermis water-soluble constituents. Heuss and later Schade and Marchionini introduced the concept of skins surface acidic characteristic.

P.A. Lehmann, T.J. Franz, **Assessing the Bioequivalence of Topical Retinoid Products by Pharmacodynamic Assay,** Skin Pharmacology and Physiology 2012, 25:269-280

Purpose: To develop a simple pharmacodynamic (PD) assay fot the evaluation of the bioequivalence of topically applied retinoid products. Methods: Daily applications of products containing tretinoin or adapalene were made to the forearms of human subjects for up to 21 days. Percutaneous absorption was enhanced through the use of polyethylene film occlusion (5h). Pharmacologic activity was assessed through the daily measurement of three cutaneous responses intimately linked to retinoid-induced changes in epidermal differentiation: (1) erythema; (2) exfoliation (scaling/peeling), and (3) increased transepidermal water loss.

G. Spongiatto, C. Mello-Sampayo, M.M. Pereira, H. Silva, M.F. Otuki, B.S. Lima, L.M. Rodrigues, **Studying the impact of age in the rat's skin physiology,** ISBS Copenhagen 2012

Animal models have been useful to study specific mechanisms affecting human skin. It is the case of ageing and the micromechanical changes determining wrinkle in UV irradiated mice. These models allowed to perceive that ageing involved many peculiar mechanical responses that cannot be explained by homogeneous deformation of the skin. Nevertheless, the different life span of these species also affects the processes and this is a majoraspect to consider. This project aimed to compare the skin properties of two Wistar rats groups with different ages – young-adult rats (n=7, 20-24 week-old, weight 379 ± 30g) and old-adult rats (n=5, 48-72 week-old, weight 520±60g).

L. Tavares, L. Palma, O. Santos, M.A. Almeida, M.J. Bujan, L.M. Rodrigues, **Body mass index and association with in vivo skin physiology**, ISBS Copenhagen 2012

Although poorly documented, obesity seems to impair normal skin's physiology. In fact modifications in skin's basic functions involving the « barrier » and epidermal hydration balance, skin biomechanics and repair mechanisms seems to be consistently present in these patients. The aim of this work is to evaluate how the body mass index (BMI) correlate with these skin indicators. This study invlved 51 female volunteers, aged between 20 and 46 (mean 29+7) years old, with no relevant pathologies except the overweight or obesity. All procedures respected Helsinky principles and respective amendments.

N. Waranuch, S. Maphanta, W. Wisuitiprot, **Effect of microparticles containing green tea extract on facial skin improvement,** ISBS Copenhagen 2012

To clinically evaluate an effectiveness of skin cream containing green tea extract loaded chitosan microparticles for facial wrikle treatment. Method: Tewnty-nine volunteers were randomly assigned to aplly skin cream containing 1% green tea extract loaded chitosan microparticles (GT-Cs) and a placebo cream on each of their half faces for 8 weeks. Skin elasticity was evaluated by using Cutometer and the photographs of each half faces were also compared. Skin moisture and skin irritation were determined by Corneometer and transepidermal water loss (TEWL) respectively.

L. Palma, L. Tavares, C. Monteiro, M.J. Bujan, L.M .Rodrigues, **Diet water seems to influence skin hydration and biomechanics,** ISBS Copenhagen 2012

The feeding habits of a given population were studied, specially regarding its daily regular water intake (dient and beverages) and tried to relate with those skin biometrical variables. This transversal study involved forty healthy volunteers, female, (mean 26,45 ≠ 7,95 y.o.), after informed written consent. All procedures respected Helsinky principles and respective amendments. A Feeding Frequency Questionnaire (FFQ) previously validated for the Portuguese population was applied. Transepidermal water loss (TEWL, Tewameter TM300), epidermal hydration (Corneometer CM825) and skin's biomechanics (Cutometer SEM575) were the cutaneous variables chosen.

C. Rosado, J. Ferreira, P. Pinto, L.M. Rodrigues, **Efficacy assessment of cosmetic formulations by dynamic tewl analysis,** ISBS Copenhagen 2012

The dynamic approach based on the mathematical modelling of TEWL values following a Plastic Occlusion Stress Test (POST) has been recently refined, since the conventional 30 minutes evaluation is time consuming. The aim of this work is to confirm that a reduction in the time of data collection has enough sensitivity to assess the efficacy of a moisturizer. Fifteen female healthy volunteers participated in the study. On D0, an occlusive patch was applied in the volar forearm of each volunteer 24 hours.

G. Spongiatto, C. Mello-Sampayo, M.M. Pereira, H. Silva, M.F. Otuki, B.S. Lima, L.M. Rodrigues, **An in vivo, minimally invasive rodent model to assess skin repair**, ISBS Copenhagen 2012

Skin healing pathophysiology is addressed by a micromodel designed to study cutaneous «barrier» recovery in the rat. The model uses a well known contact challenger-sodium lauryl sulphate (SLS). In small concentrations it evokes inflammation, edema and barrier impairment without any relevant histological changes. This study aimed to establish the minimal concentration of topically applied SLS able to evoke barrier impairment in the rat's skin.

L. Tavares, L. Palma, O. Santos, M.A. Almeida, M.J. Bujan, L.M. Rodrigues, **Looking for a global indicator of obese skin function,** ISBS Copenhagen 2012

The impairment of water balance and biomechanical behaviour of the skin seems to be consistently present in obesity, and probably related with most frequent signs and symptoms. The present work aimed to search for a global body mass index (BMI) related indicator for this functions. 51 female patients, aged between 20 and 46 (mean 29 ±7) years old, with no relevant pathologies except the overweight or obesity were involved. All procedures respected Helsinky principles and respective amendments. The Quetelet index (BMI) was calculated for each volunteer. Measurements took place under controlled conditions, in different anatomical areas (face; breast; and abdomen) and included skin hydration (Corneometer CM825), barrier function (Tewameter TM300) and biomechanical descriptors (Cutometer MPA580 and Reviscometer).

O. Schlappack, **Einmal wohlfühlen, bitte!,** Beauty Forum 10/2012

Bei Frauen tritt ein bösartiger Tumor am häufigsten in der Brust auf. Etwa 50.000 erkranken jedes Jahr in Deutschland neu daran. Bei der Behandlung werden u.a. Chriurgie, Chemo-, Hormon- und Strahlentherapie eingesetzt. Sie als Hautpflegeexpertin können durch bedürfnisgerechte Behandlungen und hilfreiche Beratung dazu beitragen, die Nebenwirkungen der Krebstherapie abzumildern.

S. Pérez Damonte, M. Baptista, M.A. Moyano, M. Nunez, A. Segall, **The effect of a lipoic acid on the skin: biomechanical properties,** IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

α –lipoic acid or the reduced form dihydrolipoate are potent scavengers of hydroxyl radicals, superoxide radicals, peroxyl radicals, singlet oxygen and nitric oxide with anti-inflammatory properties Previously, we have demonstrated in vivo the effect of α-lipoic acid (0.5%) and ascorbic palmitate (0.2%) in the improvement oft he skin barrier and diminished the redness is a sensitive skin. The aims of this study were to analyze the clinical efficacy of formulations containing α-lipoic at 2.5% and 5.0% by

measuring in vivo the biochemical parameters of transepidermal water loss TEWL and the color oft he skin initially and after the application.

J. Breugnot, D. Rondeau, M. Le Guillou, B. Closs, **Pilot study for a fast, qualitative and quantitative measurement of barrier function by fluorescence in-vivo laser scanning microscopy**, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

The skin's barrier function is essentially carried out by the stratum corneum (SC), the most external layer of the skin. Many extrinsic or intrinsic factors can affect the integrity of the barrier function and the SC. Clinically, excessive water loss and the apprearance of squamae on the surface of the skin are among the signs and symptoms of an altered barrier function.

S. Mac-Mary, A. Elkhyat, J.M. Sainthillier, A. Jeudy, K. Perrot, S. Lafond, O. Predine, P. Mermet, C. Tarrit, P. Humbert, **Specific cosmetic for children: an in vivo randomized single-blind study of efficacy in 7- to 12-year-old children**, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

Few cosmetics are dedicated to the skin of children: most of them have been developed for babies or the acneic skin of adolescents. However, literature seems to indicate that the children's sebum levels are very low. The aim of this study was to assess the acceptability and efficacy of a cosmetic specifically formulated for the skin of prepubertal children.

M. Okumiya, M. Minamoto, A. Saito, H. Taniguchi, **Study on the oil gel design filler product and its moisturizing effect,** IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

Cosmetic preparation which is composed of hydrophilic gel as outer phase and emulsified cream as inner phase has been marketed since 1980's as a design filler (Design Filler Product). This particular type of skin care product is very different from the ordinary emollient cream in terms of product form. It has been well appreciated by the cosmetic's consumer as it has beautiful appearance and high-tech image. In general, composition of transparent hydrophilic gel (Water Gel) as outer phase is hydrophilic polymers like carbomer, polyalcohols as humectants and active ingredients. On the other hand, cream and cholesteric liquid crystal are used as inner phase. Design filler product is prepared by injecting inner phase into outer phase by using computer programmed filling machine so that beautiful 3D design is drawn.

D. Tamburic, I. Macijauskaite, R. Parton, S. Williams, **Assessing the efficacy of high-flavanol cocoa extract: does higher concentration work better?**, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

It is well documented that antioxidants have a range of positive effects on human skin. However, there is a problem with their delivery to the site of action, an issue shared with most topical actives. Due to their chemical nature, antioxidants are also inherently unstable ingredients.

P. Msika, W. Fluhr, N. Lachmann, C. Baudouin, C. de Belilovsky, **What are the differences in skin physiology in neonates and children of different age groups compared to adults? A randomized in vivo study**, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

The skin of neonates and children has anatomical and physiological differences to adults with respect to water content, and perspiration, light sensibility, percutaneous permeability, susceptibility to infections and irritants and topical treatments. The aim of the present study was to investigate non-invasivley physiologic skin paramenters (transepidermal water loss (TEWL), stratum corneum (SC) hydration, surface pH and the biochemical skin composition (water profile and bulk NMF) to characterize neonatal skin in comparison to different children age groups and adults.

C. Barba, L. Coderch, E. Fernandez, A. Semenzato, G. Baratto, J.L. Parra, **Protection and repairing skin effects of ceramide containing formulations,** IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

Intercellular lipids of stratum corneum (SC) play a crucial role in keeping an optimal skin barrier function, regulating the water-holding capacity. Recent studies suggest that supplementing intercellular lipids of SC can stimulate the functioning of the skin. This work lends support to the reinforcement capacity and the repairing effect of different formulations, with the presence in all of them of the three main lipid families present in the SC, free fatty acids (FFA) cholesterol and ceramides. In particular, we compared the protection and repairing effects of the lipid mixture (creamide: cholesterol: FFA) solubilised in the oily phase of oil in water emulsions, dispersed as solid microparticles in a gel formulation, and as liposome solution.

M.V. Velasco, R. Vieira, F. Fialho-Pereira, A. Ferandes, I. Salgado-Santos, C. Pinto, C. Moraes, T.

Kaneko, A. Baby, **Short-term clinical of peel-off facial mask moisturizers**, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

Facial masks have been used as cosmetic prepartations since antiquity. Today, their popular use is related their multifunctional characteristics. Peel-off facial masks, based on polyvinyl alcohol (PVA), are formulations that, after the application and drying, form an occlusive film over the face. Their effects may include cleaning and moisturizing of the skin; providing tautness; and removing dead cells, residues and other materials that was deposited on the stratum corneum. The soybean extract fermented by Bifidobacterium animalis has sugars, amino acids, peptides, proteins and free isoflavonoids in high concentrations, when compared to the unfermented extract, and it may provide benefits to the cosmetic formulations including anti-aging, moisturizing and tensor effects. Therefore, the aims of this study is: compare the efficacy of a peel-off facial mask, after its application and removal from the skin, with an oil-in-water (O/A) emulsion. The study was designed as a one-sided blind and randomized trial using three sites for application on each arm of the volunteers.

B. Martínez-Teipel, R. Armengol, E. Rubio, **Natural ppar$_\gamma$ agonist: from silico prediction to a real cosmetic active,** IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

Peroxisome proliferator-activated receptors (PPARs) are ligand activated transcription factors that belong to the nuclear hormone superfamily. Three isoforms have been identified, PPAR α, - δ/ β and – γ. PPAR γ is mainly expressed in adipose tissue and is a mediator of adipocyte differentiation and lipid metabolism. More recently, PPARs have been shown to regulate cell proliferation, differentiation and inflammatory responses in skin. In keratinocytes, PPAR δ/ β is the predominant subtype, whereas PPAR γ is induced during epidermal differentation. PPAR γ activators show promise for the treatment of inflammatory skin disease, such as atopic dermatits and psoriasis and have also been shown to increment involucrin and trans-glutaminase 1 levels in human keratinocyte cultures and loricrin, involucrin and filaggrin in vivo.

W. Voss, I. Bunge, **Dermatological Reports on Cosmetics: Intensions and Possibilities**, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

Dermatological reports and claims in accordance with scientific criteria are of decisive value for the safety and efficacy of cosmetics. Whether a cosmetic product is well tolerated or causes irritations or allergic reactions must be proven by dermatological tests. The value of dermatological reports directly depends on the respectability of the commissioned dermatologists. Pitfalls occur, whenever non qualified scientific results are generously used for advertising campains like “dermatologically tested”, “allergy tested”, “hypo-allergen” etc. Additionally a lot of reports are scientifically insufficient. Dermatological reports on cosmetics therefore must be valid in methodology and practical execution. With Dermatest you benefit from more than 30 years of testing experience and dermatological expertise.

C. Try, R. Messikh, A. Elkhyat, F. Aubin, P. Humbert, **Utilisation de oxybutynine a la posologie de 7,5 mg par jours dans le traitement des hyperhidroses primitives**, Rev Med Liège 2012; 67: 10: p. 520-526

Oxybutynin is being increasingly being prescribed in the treatment of hyperhidrosis but currently, there is no precise dosage for this treatment. Nine patients were treated for primary hyperhidrosis resistant to conventional therapies with oxybutynin between January to May 2010. The treatment was progressively increased at 7.5 mg per day. Oxybutynin efficacy was evaluated by iodine starch test and biometrological measurements at 2 and 4 weeks of treatment. Hyperhidrosis Disease Severity Scale (HDSS) and Dermatology Life Quality Index (DLQI) were obtained for each patient. The means of HDSS and DLQI were respectively 3.2 ± 0.7 and 17.0 ± 5.1 before treatment and were 1.8 ± 0.4 and 4.6 ± 4.4 at 4 weeks of treatment. Oxybutynin at 7.5 mg per day significantly decreased intensity and area of sweat for palms but not for soles. Trans Epidermal Water Loss, conductance, pH and Skin temperature were modified with treatment. Oxybutynin at 7.5 mg per day has improved patient’s quality of life. Efficiency of oxybutynin in primary palmar hyperhidrosis was proved by biometrological measurements and iodine starch test. *(Article in French)*

L. Tavares, L. Palma, O. Santos, M.A. Almeida, M.J. Bujan, L.M. Rodrigues, **Relationship between skin hydration and elasticity in normal weighted subjects and the influence of age**, Biomed Biopharm Res. , 2012; (9) 2: 191-198

Skin is the largest organ of the human body. It is a protective organ and of all its known functions, the most significant is the capacity to adapt itself to the contours of the body. The current study aims to determine the extent to which hydration influences or is influenced by elasticity, by comparing the parameters of hydration and elasticity. A convenience sample of 42 volunteers was selected all of whom were female, healthy and with normal BMI according to WHO. The “barrier” function was characterized

by the transepidermal water loss (Tewameter TM300); the superficial epidermal hydration was measured by Moisturemeter SC and Corneometer and the “envelope” function was assessed by the Cutometer MPA580 and by the reviscometer RV600. Measurements were taken on the face (zygomatic and frontal areas), in the breast and in the abdominal areas. The most significant results show that almost all hydration and elasticity parameters fluctuate with age, which corresponds to previous studies. Moreover, there is some interaction between hydration parameters and some elasticity descriptors that should be investigated in future studies.

S. Schliemann, P. Elsner, **Entwicklung eines standardisierten Testverfahrens zur Wirksamkeitstestung von Schutzpräparaten gegen beruflich relevante lipophile Hautirritantien**, Universität zu Jena, DGVU Abschlussbericht FP 243, September 2012

Zielsetzung: Hautschutzprodukte sind Kosmetika, die an Arbeitsplätzen zur Prävention irritativer Kontaktekzeme eingesetzt werden, wenn eine Verwendung von Schutzhandschuhen nicht angezeigt oder unmöglich ist. Ihre prinzipielle Wirksamkeit ist zwischenzeitlich im Zusammenhang mit Feuchtarbeit und Kontakt zu wässrigen Irritantien, speziell Tensiden wie SLS, wissenschaftlich positiv belegt worden. Hautschutzprodukte werden aber auch bei multiplen Expositionen und Umgang mit lipophilen Arbeitsstoffen von Herstellern empfohlen. Insbesondere bei Auslobung zum Schutz gegen lipophile Arbeitsstoffe, zu denen auch organische Lösemittel zählen, fehlen jedoch bisher positive Wirksamkeitsnachweise, zumindest was Ergebnisse aus repetitiven in vivo-Testverfahren angeht, die von berufsdermatologischer Seite empfohlen werden. Aktivitäten/Methoden: Im Rahmen des vorgelegten Forschungsprojektes wurden an einem berufsdermatologischen Zentrum wesentliche Entwicklungsarbeiten für ein transferfähiges Testverfahren zur Wirksamkeitstestung für berufliche Hautschutzmittel gegen lipophile Substanzen geleistet. Das in vivo-Irritationsmodell ermöglicht einen parallelen, intraindividuellen Vergleich von Wirksamkeiten mehrerer Hautschutzexterna an der Rückenhaut. Zwei beruflich relevante Lösemittel, darunter ein aliphatischer Kohlenwasserstoff (KW) (n-Octan, CAS-Nr. 111-65-9) und ein aromatischer KW (Cumol, Isopropylbenzol, CAS-Nr. 89-82-8), wurden als Modellirritantien implementiert. Der induzierte Irritationsgrad wird anhand der Zielparameter "klinischer Grad der kumulativen Irritation im Summenscore" und "Dehydratation des Stratum corneums" quantifiziert. Statistische Methoden wurden zur Absicherung der Produktwirkung entwickelt. Ergebnisse: In zwei aufeinanderfolgenden, verblindeten Studien zeigten sich bei zwei von sechs untersuchten Produkten nicht nur eine fehlende Schutzwirkung, sondern signifikant irritationsverstärkende Effekte. Eine isolierte Schutzwirkung vor Cumol-bedingter Dehydratation konnte im Modell für zwei von sechs Produkten nachgewiesen werden. Keines der untersuchten Externa wirkte ausreichend gegen Octan-bedingte Irritation. Aufgrund neuer Erkenntnisse zum toxikologischen Profil von Cumol wird die Substanz zwischenzeitlich nicht mehr uneingeschränkt als Modellsubstanz empfohlen. Das Projekt wurde daraufhin vor einer optionalen Multicentervalidierung des Testmodells beendet. Anschlussarbeiten auf dem Gebiet außerhalb des Projektrahmens sind notwendig.

Y.S. Shin, H.J. Kim, N.K. Moon, Y.H. Ahn, K.O. Kim, **The effects of uncoated paper on skin moisture and transepidermal water loss in bedridden patients**, J Clin Nurs. 2012 Sep; 21 (17-18): p. 2469-76

Aims and Objectives: The aims of this study were to measure skin moisture and transepidermal water loss after application of uncoated paper and to compare skin moisture and transepidermal water loss after use of uncoated paper and disposable underpads. Study Design: The study was a cross-over, prospective, open-labeled, randomized trial. Sample and Settings: Bedridden patients aged≥18 years at a medical center in Korea were included. Treatment order was randomly assigned using block randomization, with a block size of 4 and an assignment rate of one-by-one. Methods: Skin moisture was measured using a Corneometer 825 and transepidermal water loss was measured using a Tewameter 300. Results: Skin moisture after application of an uncoated paper was significantly lower than observed after application of a disposable underpad (mean 40.6 and SD 13.1 vs. mean 64.6 and SD 23.7, $p<0.001$). Transepidermal water loss also showed greater health scores after using uncoated paper (mean 11.1 and SD 5.7 g/m2/hour) than after applying a disposable underpad (mean 23.2 and SD 11.1 g/m2 /hour, $p<0.001$). There were no statistical between-group differences in room temperature, relative humidity, and body temperature. Conclusion: We found that uncoated paper was helpful in avoiding excessive moisture without adverse effects. Relevance to Clinical Practice: As indicated by the results of this study, uncoated paper can be applied to bed-ridden patients who required incontinence care. Nurses may consider using uncoated paper as one of nursing methods in the routine care of bed-ridden patients for moisture control.

Y. Zheng, H.I. Maibach, **In Vitro Buffering Capacity of Human Skin Layers,** Cosmetics & Toiletries Vol.127, No.6/June 2012

Normal stratum corneum (SC) is acidic, with typical pH ranges from 4 to 6, and while skin exposed to aqueous acid or alkaline solutions exhibits changes in pH, it may rapidly restore to the baseline values. This phenomena is called buffering capacity. Many factors contribute to skin's buffering capacity including kreatin, proteins, sweat, SC thickness, free amino acids and other water-soluble epidermis constituents. Previous studies demonstrate that skin buffering capacity can be measured in vitro by applying several concentrations of hydrogen chloride (HCl) and sodium hydroxide (NaOH) on skin and evaluating the pH change pre-and post-dosing. Here, the authors employed this technique to evaluate the buffering capacity of skin layers including intact SC, denuded SC and dermis skin samples.

T. Kubota, **Evaluation of skin surface hydration state and barrier function of stratum corneum of dorsa of hands and heels treated with PROTECT X2 skin protective cream,** Drug Discoveries & Therapeutics. 2012; 6(3): p. 157-162

"Skin roughness" is a commonly utilized term in Japan for disturbed skin surface, which develops from synergistic interactions of various factors such as dryness and inflammation. The skin is composed from external to internal of the stratum corneum (SC), epidermis, dermis, and subcutaneous tissue. The SC covers the skin surface as an extremely thin membranous barrier and has an important protective role against the external environment (1). Approximately 30% of the content of the SC is water, which functions to maintain smoothness and softness of the skin surface even under dry external environmental conditions (2). Thus, the SC has an important barrier function to prevent the infiltration of harmful substances from outside of the body and also prevents water loss from the living tissues that it covers.

S. Ingeburg, A. Grieshaber, **Vergleichender Barrierefunktionstest mit Natrium-Laurylsulfat zur Einschätzung des Ekzemrisikos am Arbeitsplatz**, Dissertation Klinik für Dermatologie, Venerologie und Allergologie der Universität Mannheim

Berufskrankheiten im Bereich der Haut haben jährlich Kosten in Millionen Höhe zur Folge. Als Hauptrisiko für das Auftreten einer Hauterkrankung am Arbeitsplatz gilt eine anlagebedingte Bereitschaft gegen von außen einwirkende Substanzen eine Überempfindlichkeitsreaktion zu entwickeln. Ziel dieser Untersuchung war es, bei Atopikern und Nichtatopikern an klinisch gesunder Haut zwei unterschiedliche Testmethoden zur Einschätzung des individuellen Ekzemrisikos im Feuchtberuf zu vergleichen. Zur Barrierefunktionstestung wurden zum einen der repetitive Waschtest und zum anderen der Okklusivtest herangezogen. Bei beiden Testverfahren wurde Natrium-Laurylsulfat als Waschlösung verwendet. Der repetitive Waschtest, welcher derzeit das Standardverfahren zur Testung des individuellen Ekzemrisikos darstellt, erfolgte mehrfach täglich am Unterarm unter definierten Bedingungen über vierzehn Tage. Für den Okklusivtest wurde Natrium-Laurylsulfat am Oberarm in fünf verschiedenen Konzentrationen sowie destilliertes Wasser als Kontrollfeld über achtundvierzig Stunden aufgetragen.

K. Fritz, **Skin physiologic changes before and after laser treatment**, IMCAS, Congress of Plastic Surgery and Dermatoloy, Lecture number: 5462

The aim of the study was to compare the changes of the biophysical properties and to objectify the effects of treatments with various lasers on skin phsiology. Few studies have been reported to compare the effects of various lasers on the skin physiology wich could result in a customized skin care post treatment recommendation. The recent development of various biophysical devices has made it possible to have more accurate and objective assessment methods .The functional properties of the skin are measured by utilizing non invasive techniques, including the assessments for, skin color, trans-epidermal water loss (TEWL) and skin hydration and ph (Courage and Khazaka).

M. Tarutani, K. Nakajima, Y. Uchida, M. Takaishi, N. Goto-Inoue, M. Ikawa, M. Setou, T. Kinoshita, P.M. Elias, S. Sano, Y. Maeda, **GPHR-Dependent Functions of the Golgi Apparatus Are Essential for the Formation of Lamellar Granules and the Skin Barrier,** Journal of Investigative Dermatology (2012) 132, p. 2019–2025

Organelles located in secretory and endocytotic pathways are known to acidify their lumens, and therefore they are called acidic organelles. Compromising the acidic environments of those organelles using compounds such as monensin, bafilomycin, and ammonium chloride, which do not specifically affect the Golgi apparatus, causes marked effects on trafficking, processing, and glycosylation of proteins and lipids (Weisz, 2003), although the mechanisms by which those processes are regulated by the acidic pH are largely unknown. Recently, we identified a new anion channel named Golgi pH regulator (GPHR) (Maeda et al., 2008). GPHR functions as a counterion channel and is critical for Golgi acidification. The loss of GPHR function results in increased luminal pH, which in turn causes impaired transport, disrupted glycosylation, and abnormal Golgi morphology; thus, GPHR is

indispensable for normal Golgi functions (Maeda et al., 2008). As GPHR is localized in the Golgi, increased pH and impaired functions are observed in the Golgi selectively among acidic organelles (Maeda et al., 2008). Lamellar granules include lipids, proteases, protease inhibitors, and proteins (Elias et al., 1998; Madison, 2003; Ishida-Yamamoto et al., 2004; Elias and Choi, 2005) that are needed to generate the skin barrier (Odland and Holbrook, 1981), and functional defects in these factors lead to impaired barrier formation. The origin of lamellar granules has been thought to be the trans-Golgi network (TGN; Elias et al., 1998), but direct evidence for that has not been reported. If the origin of lamellar granules is the Golgi apparatus, impairing Golgi functions should result in the degeneration of lamellar granules. Here we show that skin-specific knockout of GPHR function markedly impairs the formation of lamellar granules, supporting the fact that they originate from the Golgi apparatus. The results further show that GPHR has a critical role in the skin barrier function, as well as in the development of other tissues.

Marine ingredients focus: a look at marine products, Personal Care, April 2012

The sea holds a huge amount of power and influence in the minds of humans. At once mysterious, alluring and terrifying, Earth's oceans also represent the birthplace of all life, both plant and animal, and are increasingly becoming a rich source of medical and personal care ingredients. In personal care, the popularity of marine-derived cosmetic ingredients is not only due to their efficacy, but also the connotations they come with. Consumers associate the sea with purity and freshness, two extremely important characteristics for personal care products, and skin care in particular. This is a deeply-ingrained association that has lead people to use sea flora as a skin care ingredient for many centuries as well as in soap, cleansers, and more recently shaving foams and shampoos.

S.H. Kim, S.H. Hwang, S.K. Hong, J.K. Seo, H.S. Sung, S.W. Park, J.H. Shin, **The Clinical Efficacy, Safety and Functionality of Anion Textile in the Treatment of Atopic Dermatitis,** Ann Dermatol, Vol. 24, No. 4, 2012, p. 438-443

Background: Several previous studies have suggested the improvement of atopic dermatitis (AD) in response to special fabrics. In particular, beneficial effects have been reported, following the use of anion textiles. Objective**:** The purpose of this study is to evaluate the effectiveness and safety of an anion textile in patients suffering from AD. Methods: We compared an anion textile with a pure cotton textile. Fifty-two atopic patients (n=52) were enrolled and divided into two groups. The patients in the test (n=25) and control (n=19) groups wore undergarments made of an anion textile or pure cotton over a period of 4 weeks. The overall severity of disease was evaluated using the SCORing atopic dermatitis (SCORAD) index, whereas, the treatment efficacy was measured using a Tewameter® (Courage & Khazaka, Cologne, Germany), Mexameter® (Courage & Khazaka) and Corneometer® (Courage & Khazaka). Results: At the end of the study, a significant decrease in the SCORAD index was observed among the patients with AD in the test group (mean SCORAD decreased from 47.2 to 36.1). Similarly, improvements in the mean transepidermal water loss, skin erythema and stratum corneum hydration were significantly greater among the patients with AD in the test group than in the control group. Conclusion: Anion textiles may be used to significantly improve the objective and subjective symptoms of AD, and are similar in terms of comfort to cotton textiles. The use of anion textiles may be beneficial in the management of patients with AD.

A. Firooz, B. Sadr, S. Babakoohi, M. Sarraf-Yazdy, F. Fanian, A. Kazerouni-Timsar, M. Nassiri-Kashani, M.M. Naghizadeh, Y. Dowlati, **Variation of Biophysical Parameters of the Skin with Age, Gender, and Body Region,** The Scientific World Journal, Volume 2012

Background: Understanding the physiological, chemical, and biophysical characteristics of the skin helps us to arrange a proper approach to the management of skin diseases. Objective: The aim of this study was to measure 6 biophysical characteristics of normal skin (sebum content, hydration, transepidermal water loss (TEWL), erythema index, melanin index, and elasticity) in a normal population and assess the effect of sex, age, and body location on them. Methods: Fifty healthy volunteers in 5 age groups (5 males and females in each) were enrolled in this study. A multifunctional skin physiology monitor (Courage & Khazaka electronic GmbH, Germany) was used to measure skin sebum content, hydration, TEWL, erythema index, melanin index, and elasticity in 8 different locations of the body. Results: There were significant differences between the hydration, melanin index, and elasticity of different age groups. Regarding the locations, forehead had the highest melanin index, where as palm had the lowest value. The mean values of erythema index and melanin index and TEWL were significantly higher in males and anatomic location was a significant independent factor for all of 6 measured parameters. Conclusion: Several biophysical properties of the skin vary among different gender, age groups, and body locations.

M. Borlu, Z. Karaca, H. Yildiz, F. Tanriverdi, B. Demirel, G. Elbuken, I. Cakir, H.S. Dokmetas, R. Colak, K. Unluhizarci, F. Kelestimur, **Acromegaly is associated with decreased skin transepidermal water loss and temperature, and increased skin pH and sebum secretion partially reversible after treatment,** Growth Horm IGF Res. 2012 Apr;22(2): p. 82-6

Background: Acromegaly is characterized by an acquired progressive somatic disfigurement, mainly involving the face and extremities, besides many other organ involvement. Wet and oily skin was described in acromegaly patients and it was attributed to hyperhidrosis and increased sebum production but this suggestion has not been evaluated with reliable methods. Objective: The aim of this study was to examine the skin parameters of patients with acromegaly using measurements of skin hydration, sebum content, transepidermal water loss, pH and temperature and particularly the effects of 12 months of treatment on these parameters. Methods: 52 patients with acromegaly and 24 healthy control subjects were included in this two blinded prospective study. Skin properties were measured on forehead and forearm by Corneometer CM825, Sebumeter SM810, Tewameter TM210 and Phmeter PH900 as non-invasive reliable measuring methods. Serum GH, IGF-1 and all measurements of skin properties on forehead and forearm were repeated at the end of the 3, and 6 months of therapy in 20 cases. Patients were treated with appropriate replacement therapy for deficient pituitary hormones. Results: The sebum content and pH of the skin of acromegalic patients were significantly higher and transepidermal water loss and skin temperature were found to be significantly lower in acromegalic patients when compared to the control group both on forehead and forearm. GH and IGF-1 levels were positively correlated with sebum levels and negatively correlated with skin temperature on both forehead and forearm. The sebum levels of the patients were significantly decreased both on forehead and forearm at 3rd and 6th months of treatment. Conclusion: The present study demonstrated increased sebum secretion, decreased transepidermal water loss, alkali and hypothermic skin surface in patients with acromegaly by reliable methods for the first time. These data suggest that GH and/or IGF-I may have a modulatory role on several skin characteristics which can be at least partially reversible with treatment.

M. Mateu, C. Davi, E. Canadas, A. Soley, R. Delgado, **Effective ingredients from marine biotechnology,** Personal Care, April 2012, p. 53-57

Cosmetic scientists are developing new ways to identify new natural sources, which enable innovative compounds with excellent cosmetic properties such as firming, restructuring, moisturising or anti-wrinkles. Biotechnology encompasses the use of microoranisms to come up with novel active ingredients that fulfil two of the demands that are leading trends in the cosmetic industry: natural and sustainable. Besides, complex molecules can be obtained, which otherwise would be impossible due to technical or economic limitations. Our approach is to take advantage of biotechnology to develop cosmetic ingredients which are naturally occurring in non-genetically modified organisms, through sustainable production while preserving the invironment, since there is no harvesting nor extracting from nature.

H.J. Park, Y.W. Lee, Y.B. Choe, K.J. Ahn, **Skin Characteristics in Patients with Pityriasis Versicolor Using Non-Invasive Method, MPA5**, Ann Dermatol Vol. 24, No. 4, 2012

Background: Skin pigmentary changes of pityriasis versicolor may occur as either hyperpigmented or hypopigmented lesions, depending on the outcome of interactions between *Malassezia* yeasts and the skin, such as lipoperoxidation process, stimulus of inflammatory cell to melanocytes, and increased thickness of keratin layer. Objective: To investigate skin characteristic factors that enhance the susceptibility to *Malassezia* yeasts and provoke different color changes of pityriasis versicolor patients. Methods: To clarify these factors, we investigated the skin characteristics of pityriasis versicolor patients, using a non-invasive method known as MPA 5® (Courage and Khazaka, Germany). A total of 90 normal healthy subjects and 30 pityriasis versicolor patients were included in this study. Results: Both hyperpigmented and hypopigmented pityriasis versicolor skin lesions showed higher humidity, increased sebum excretion rate and increased transepidermal water loss (TEWL) values than normal healthy subjects. But no significant difference of specific *Malassezia* yeasts species between hyperpigmented and hypopigmented skin lesions was evident. Conclusion: These results indicate that higher humidity and increased sebum level provide a better growing environment of *Malassezia* yeasts in the skin, leading to the assumption that interaction between *Malassezia* yeasts and skin barrier materials makes disruption of skin barrier causing increased TEWL.

J. Viladot, A. Fernández-Botello, S. Méndez, N. Alminana, J. Cebrián, **New delivery system for fast release of cosmetic actives from fabrics to the skin,** IFSCC Magazine, No. 3, 2012

We live in a period of increasing consumer demand for textile products with improved performance and new properties, both in the “traditional” clothing and home textile areas. Accordingly, research on functional textiles has experienced a significant increase [2-4], for example, in the medical

[4], personal protection [5] and anti-microbial activity areas [6]. The result of this research has been the appearance of a “cosmetotextile” concept that entails imparting cosmetic properties to textile materials [7] by anchoring actives to fabric. Typically, actives are not anchored as such but vectorized by microcapsules obtained by different techniques such as in situ polymerization reactions. However, reaction conditions for polymerization may eventually modify the chemical structure of the active, causing a loss efficacy.

N. Gerlach, M. Herling, U. Heinrich, H. Tronnier, **Kosmetisch-dermatologische Wirksamkeit und Verträglichkeit einer Dexpanthenol-haltigen Fußcreme,** Kosmetische Medizin 3.12

Mit der Dexpanthenol-haltigen Fußcreme steht eine Fußpflege zur Verfügung, die zur Pflege der trockenen und empfindlichen Haut entwickelt worden ist. Sie zeichnet sich durch eine sehr gute feuchtigkeitsanreichernde Wirkung aus und trägt gleichzeitig zu einer Stabilisierung der Hautbarriere bei. Durch die pflegenden Eigenschaften konnten die Hautrauigkeit und Hautschuppigkeit deutlich gemildert werden und eine übermäßige Hornhaut wurde reduziert. Die pflegenden Eigenschaften, die gute Wirksamkeit und sehr gute Verträglichekeit der Dexpanthenol-haltigen Fußcreme spiegelten sich in der hohen Zufriedenheit und Akzeptanz der Probanden wieder.

J.W. Fluhr, S. Sassning, O. Lademann, M.E. Darvin, S. Schanzer, A. Kramer, H. Richter, W. Sterry, J. Lademann, **In vivo skin treatment with tissue-tolerable plasma influences skin physiology and antioxidant profile in human stratum corneum**, Exp Dermatol. 2012 Feb; 21(2): p. 130-4

The antimicrobial treatment of wounds is still a major problem. Tissue-tolerable electrical plasma (TTP) is a new approach for topical microbial disinfection of the skin surface. The aim of the present study was to investigate the influence of TTP on a carotenoid profile in relation to skin physiology parameters (epidermal barrier function, stratum corneum (SC) hydration, surface temperature and irritation parameters). We were interested in the interaction of TTP and the antioxidative network, as well as the consequences for skin physiology parameters. These parameters are also indicative of TTP safety in vivo. For plasma application, 'Kinpen 09' was used (surface exposure 30-43°C) for 3 s. Beta-carotene and water profiles were assessed by in vivo Raman microspectroscopy (skin composition analyzer 3510). Skin physiology parameters were measured with Tewameter TM 300, Corneometer CM 825, skin thermometer and Chromameter CR 300. All parameters were assessed non-invasively on seven healthy volunteers before and after plasma application in vivo. We could show that TTP application leads to a decrease in beta-carotene especially in the superficial SC. Skin-surface temperature increased by 1.74°C, while the transepidermal water loss (TEWL) increase indicated an impaired barrier function. SC hydration decreased as seen in water profile especially in the superficial layers and capacitance values. A slight increase in skin redness was measurable. The induction of reactive oxygen species is probably the major contributor of TTP efficacy in skin disinfection. Skin physiology parameters were influenced without damaging the skin or skin functions, indicating the safety of TTP under in vivo conditions.

L.H. Kircik, **Transepidermal water loss (TEWL) and corneometry with hydrogel vehicle in the treatment of atopic dermatitis: a randomized, investigator-blind pilot study,** J Drugs Dermatol, 2012 Feb;11(2): p. 180-184

Disruption of the epidermal barrier, as indicated by a reduction in skin hydration and an increase in transepidermal water loss (TEWL) is a feature of atopic dermatitis (AD). Novel formulations of dermatologic therapies may enhance patient satisfaction and adherence and may possibly preserve and enhance epidermal barrier function. A single-center, investigator-blinded, randomized, split-body exploratory study was undertaken to assess the hydrating and barrier preserving effects of a water-based hydrogel vehicle. Subjects (n=20) with mild to moderate disease at baseline applied hydrogel vehicle or a moisturizing lotion (Eucerin Lotion®, Beiersdorf, Inc.) in a split-body fashion for two weeks. Corneometry and TEWL measurements were taken at baseline and week 2. Hydrogel vehicle produced a statistically significant improvement in skin hydration from baseline, as compared to a moisturizing lotion control. Hydrogel produced no statistically significant change in TEWL, while comparator lotion increased TEWL. Data from this pilot study indicate that the water-based hydrogel vehicle improves skin hydration and does not further impair epidermal barrier function, suggesting that it is an appropriate vehicle choice for patients with mild-to-moderate atopic dermatitis.

Y. Haruta-Ono, H. Ueno, N. Ueda, K. Kato, T. Yoshioka, **Investigation into the dosage of dietary sphingomyelin concentrate in relation to the improvement of epidermal function in hairless mice**, Anim Sci J. 2012 Feb;83(2): p. 178-83

We previously found that dietary sphingomyelin (SPM) concentrate from bovine milk improved epidermalfunction. In this study, we investigated the dosage of dietary SPM concentrate from bovine

milk in relation to the improvement of epidermal function. Thirteen-week-old hairless male mice were separated into four experimental groups, each fed one of four types of experimental diet: the control group, the low SPM group, the medium SPM group and the high SPM group. The mice were each fed the experimental diet for 6 weeks. The stratum corneum hydration and the transepidermal water loss (TEWL) were measured using a Corneometer and a Tewameter at 3 weeks and 6 weeks. After the feeding period, ceramides in the stratum corneum were analyzed. We found that the stratum corneum hydration in all the SPM groups was significantly higher than that in the control group, whereas TEWL in all the SPM groups was significantly lower than that in the control group. Ceramides increased significantly in mice fed the medium SPM diet and statistically tended to increase in mice fed the high SPM diet. Our results indicate that a daily intake of 17 mg SPM concentrate is enough to improve epidermal function in hairless mice.

Y. Lee, Y.-J. Je, S.-S. Lee, Z.J. Li, D.-K. Choi, Y.-B. Kwon, K.-C. Sohn, M. Im, Y.J. Seo, J.H. Lee, **Changes in Transepidermal Water Loss and Skin Hydration according to Expression of Aquaporin-3 in Psoriasis,** Ann. Dermatol. Vol. 24, No. 2, 2012, p. 168-174

Background: Aquaporins (AQPs) are a family of water transporting proteins present in many mammalian epithelial and endothelial cell types. Among the AQPs, AQP3 is known to be a water/glycerol transporter expressed in human skin. Objective: The relationship between the expression level of AQP3 and transpidermal water loss (TEWL) in the lesional and peri-lesional skin of psoriasis-affected patients, and skin hydration in the lesional and peri-lesional skin of psoriasis patients, was investigated. Methods: The expression of AQP3 in psoriasis-affected and healthy control skin was determined using immunohistochemical and immunofluroscence staining. TEWL and skin hydration were measured using a Tewameter® TM210 (Courage & Khazaka, Cologne, Germany) and a Corneometer® CM 820 (Courage & Khazaka), respectively. Results: AQP3 was mainly expressed in the plasma membrane of stratum corneum and the stratum spinosum in normal epidermis. Unlike the normal epidermis, AQP3 showed decreased expression in the lesional and peri-lesional epidermis of psoriasis. TEWL was increased, and skin hydration was decreased, in the lesional and peri-lesional skin of psoriasis patients, compared with the healthy control sample. Conclusion: Although various fac tors contribute to reduced skin hydration in the lesional and peri-lesional skin of psoriasis, AQP3 appears to be a key factor in the skin dehydration of psoriasis-affected skin.

T. Oliphant, R.A. Harper, **Advantages of jojoba esters in nonwovens,** Personal Care, February 2012, p. 94–96

Jojoba (Simmondsia chinensis) is a perennial shrub most commonly found in Arizona, California, and Northwestern Mexico. Jojoba seed oil, the oil produced by this plant, is a wax ester that has been used in the past as a folk remedy for renal colic, sunburn, chaffed skin, hair loss, headache, wounds, sore throats, prosiasis, and acne (e.g., sulfurised jojoba) The ester is composed of long-chain linear fatty alcohols, 20 to 24 carbons in length and long-chain linear fatty acids, 18 to 22 carbons in length. Nearly all of the acid and alcohol moieties are 9-mono-unsaturated. Hydrolysis of this wax ester produces a very unique ingredient that can be used in various commercial cosmetic and personal care formulations such as creams, body washes, hand sanitisers, and multiple nonwoven wipe applications.

B.A. Khan, N. Akhtar, K. Waseem, T. Mahmood, A. Rasul, M. Iqbal, S.-U. Zaman, **Visio Scan® VC98, Corneometer MPA 5 and Tewameter MPA 5**, African Journal of Pharmacie and Pharmatologie Vol. 6(3), p. 225-227, 22 January, 2012

Human skin is the largest exposed area of our body. There are number of physiological changes which may occur in response to internal or external sources. Biophysical techniques have been extensively employed to study any changes in human skin physiology. Usually these bioengineering techniques are equipped with non-invasive probes. Visioscan, Corneometer and Tewameter are the most widely used techniques in the characterization parameters of skin physiology, like skin hydration, transepidermal water loss and skin wrinkles. This research covers all aspects of these parameters, in skin analysis.

N. Carreras Parera, **Modelling drug delivery mechanisms for microencapsulated substances applied on textile substrates,** Dissertation University Politècnica de Catalunya, Spain, 2012

Microencapsulation is a coating technology based on solid small particles, drops of liquids, or gaseous components, with protective membranes – microparticle walls. These particles are known as microparticles. Microparticles are tiny particles with diameters in the range of nanometres or millimetres which consist of core materials and covering membranes. The most important feature of microparticles is their little size, providing large effective surface or interface area. Depending on the selection of the

covering materials and the core substances, microparticles can be endowed with a wide range of functions.

A.M. Hug, T Schmidts, J. Kuhlmann, D. Segger, G. Fotopoulos, J. Heinzerling, **Skin hydration and cooling effect produced by the Voltaren® vehicle gel**, Skin Research and Technology 2012; 18: p. 199–206

Background: Voltaren vehicle gel is the carrier substance of the topical Voltaren products. This vehicle gel is especially formulated to be easily applied on the skin, while providing some sensory benefits. The present study aims to substantiate the widely perceived hydrating and cooling effect of Voltaren vehicle gel. Methods: Volar forearm skin hydration and transepidermal water loss (TEWL) were measured and user satisfaction was evaluated by questionnaires, after application in 31 healthy, female volunteers. The cooling effect was investigated for 40 min with thermal imaging on 12 forearm sites of six healthy subjects. Results: Voltaren vehicle gel application increased skin hydration by 13.1% (P = 0.0002) when compared with the untreated site, 8 h after the final treatment after 2 weeks. TEWL decreased on both treated (0.37 g/m2/h) and untreated (0.74 g/m2/h) forearm sites after 2 weeks (8 h after last treatment), demonstrating a relative increase of 6.5% in water loss. Voltaren vehicle gel application resulted in a rapid reduction of skin surface temperature by 5.1°C after only 3 min with an average maximum reduction of 5.8°C after 10 min. The cooling effect was experienced by 94% subjects, while 74% felt that their skin became softer. No adverse events, including skin irritation, were reported during the study and by the 37 participants. Conclusion: This study showed a statistically significant increase in skin hydration as well as a rapid cooling effect lasting approximately 30 min, after application of Voltaren vehicle gel. The small relative increase in water loss may be attributed to an additional skin surface water loss secondary to the increased water content brought into the skin by the Voltaren vehicle gel. The use did not induce any skin irritation and was found acceptable to use by the majority of participants.

A.-E. Craciun, M. Moldovan, A. Rusu, C. Nita, C. Craciun, A. Tataru, **Predictors of changes in physical properties of skin in patients with diabetes mellitus,** Rom J Diabetes Nutr Metab Dis. 19(1): p. 33-40; 2012

Introduction: The skin, the largest human organ, is often affected by diabetes mellitus (DM). We know that DM affects the hydration of stratum corneum (SC), the sebum content of the skin and to some extent, the barrier function of the epidermis and elasticity, but we do not know the factors leading to these changes. Objectives: The objectives of this study were to determine the factors associated with changes in physical properties of the skin (skin hydration degree, sebumetry, transepidermal water loss and skin elasticity) in patients with diabetes. Materials and methods: The physical properties of the skin were assessed using the Multi Probe Adapter Systems MPA (Courage-Khazaka, Germany) in 57 patients with diabetes and 46 non-diabetic.

K. Miyamoto, Y. Inoue, K. Hsueh, Z. Liang, X. Yan, T. Yoshii, M. Furue, **Characterization of comprehensive appearances of skin ageing: an 11-year longitudinal study on facial skin ageing in Japanese females at Akita,** J Dermatol Sci. 2011 Dec;64(3): p. 229-36

Background: Facial appearance is regarded as a typical index of ageing. However, people of the same age do not necessarily show the same degree of the facial appearance. The ageing of facial skin proceeds relatively slowly and therefore requires long-term follow-up to elucidate the mechanism of ageing changes. Objectives: The purpose of this study was to identify facial skin parameters contributing the subjective impression of the overall ageing and characterize the degree of skin ageing by a 11 year longitudinal skin monitoring. Methods: One-hundred-eight healthy Japanese females excluded outside workers aged 5-64 at 1999, and lived in Akita, Japan till 2010 were enrolled. Facial images were collected to quantify various skin optical parameters. Skin colour, hydration and barrier function were measured with Chromameter, Corneometer and TEWAmeter, respectively. Results: The visual evaluation of the overall facial skin ageing impression was also carried out. The skin parameters contributing visible impression of skin ageing were identified by variable importance in projection analysis, and the degree of facial skin ageing over 11 years was statistically classified by a cluster analysis. Facial skin parameters that comprehensively influenced visible skin ageing, including hyperpigmented spots, wrinkles and texture were studied. The Skin Ageing Score calculated from these three skin factors was used to classify the subjects into a mild, age-appropriate, and severe skin ageing group. Conclusions: The mild skin ageing group maintained significant better both skin optical and physical conditions. Variability and classification of the degree of facial skin ageing appearance were studied from this longitudinal research.

M.C.G. Winge, T. Hoppe, B. Berne, A. Vahlquist, M. Nordenskjöld, M. Bradley, H. Törmä, **Filaggrin Genotype Determines Functional and Molecular Alterations in Skin of Patients with Atopic Dermatitis and Ichthyosis Vulgaris**, PLoS ONE 6(12)

Background: Several common genetic and environmental disease mechanisms are important for the pathophysiology behind atopic dermatitis (AD). Filaggrin (FLG) loss-of-function is of great significance for barrier impairment in AD and ichthyosis vulgaris (IV), which is commonly associated with AD. The molecular background is, however, complex and various clusters of genes are altered, including inflammatory and epidermal-differentiation genes. Objective: The objective was to study whether the functional and molecular alterations in AD and IV skin depend directly on FLG loss-of-function, and whether FLG genotype determines the type of downstream molecular pathway affected. Methods and Findings: Patients with AD/IV (n = 43) and controls (n = 15) were recruited from two Swedish outpatient clinics and a Swedish AD family material with known FLG genotype. They were clinically examined and their medical history recorded using a standardized questionnaire. Blood samples and punch biopsies were taken and trans-epidermal water loss (TEWL) and skin pH was assessed with standard techniques. In addition to FLG genotyping, the STS gene was analyzed to exclude X-linked recessive ichthyosis (XLI). Microarrays and quantitative real-time PCR were used to compare differences in gene expression depending on FLG genotype. Several different signalling pathways were altered depending on FLG genotype in patients suffering from AD or AD/IV. Disease severity, TEWL and pH follow FLG deficiency in the skin; and the number of altered genes and pathways are correlated to FLG mRNA expression. Conclusions: We emphasize further the role of FLG in skin-barrier integrity and the complex compensatory activation of signalling pathways. This involves inflammation, epidermal differentiation, lipid metabolism, cell signalling and adhesion in response to FLG-dependent skin-barrier dysfunction.

M.P. Szczepanik, P.M Wilkołek, ł.R. Adamek, Z.J.H Pomorski, **The examination of biophysical parameters of skin (transepidermal water loss, skin hydration and pH value) in different body regions of normal cats of both sexes,** Journal of Feline Medicine and Surgery (2011) 13, p. 224-230

The purpose of this study was to evaluate transepidermal water loss (TEWL), skin hydration and skin pH in normal cats. Twenty shorthaired European cats of both sexes were examined in the study. Measurements were taken from five different sites: the lumbar region, the axillary fossa, the inguinal region, the ventral abdominal region and the left thoracic region. In each of the regions, TEWL, skin hydration and skin pH were measured. The highest TEWL value was observed in the axillary fossa (18.22 g/h/m2) and the lowest in the lumbar region (10.53 g/h/m2). The highest skin hydration was found in the inguinal region (18.29 CU) and the lowest in the lumbar region (4.62 CU). The highest skin pH was observed in the inguinal region (6.64) and the lowest in the lumbar region (6.39). Statistically significant differences in TEWL were observed between the lumbar region and the left side of the thorax region (P ¼ 0.016), the axillary fossa (P ¼ 0.0004), the ventral region (P ¼ 0.005), and the inguinal region (P ¼ 0.009). There were significant differences in skin hydration between the lumbar region and the left thorax (P ¼ 0.000003), the axillary fossa (P ¼ 0.002), the ventral abdomen (P ¼ 0.03), and the inguinal region (P ¼ 0.0003) as well as between the thorax and the ventral abdomen (P ¼ 0.005). TEWL was higher in females (15 g/h/m2) than in males (4.57 g/h/m2). Skin hydration was higher in females (13.89 CU) than in males (12.28 CU). Significant differences were not found between males and females for TEWL and skin hydration. Skin pH was higher in males (6.94) than in females (6.54), which was significant (P ¼ 0.004).

H. Riebe, **Einfluss medizinischer Kompressionsstrümpfe auf die Barrierefunktion der Haut bei Patienten mit Chronischer Venöser Insuffizienz (CVI)**, Dissertation aus der Klinik und Poliklinik für Hautkrankheiten der Universitätsmedizin der Ernst-Moritz-Arndt-Universität Greifswald, Germany, Dezember 2011

Bei steigender Prävalenz der Chronischen Venösen Insuffizienz (CVI) ist eine kontinuierliche Auseinandersetzung mit aktuellen Diagnostik- und Therapieoptionen für eine effektive und symptomorientierte Patentenversorgung notwendig. Unter Berücksichtigung der Variabilität von Studienpopulationen hinsichtlich Rasse, Alter und Geschlecht, sowie der Definition und Diagnostik der CVI werden in der Literatur Prävalenzen zwischen 15 – 50 % angegeben (28;38;105). In der Bonner Venenstudie aus den Jahren 2000 - 2002 konnten bei einer Fallzahl von 3072 Probanden im Alter von 18 – 79 Jahren bei 59 % der Probanden isolierte Teleangiektasien und retikuläre Varizen nachgewiesen werden. Varikosen, allein im Stadium C2 der CEAP-Klassifikation, wurden bei 14,3 % der Probanden detektiert. Die Häufigkeit einer fortgeschrittenen CVI belief sich auf 3,3 %, die eines floriden oder abgeheilten Ulcus cruris venosum auf 0,7 % (100). Umfangreiche epidemiologische Studien machen gleichwohl auch die große sozioökonomische Bedeutung von Venenerkrankungen deutlich. So betrugen etwa Behandlungs- und Folgekosten durch Arbeitsunfähigkeit und Berentung entsprechend der Tübinger Studie im Jahr 1980 circa 1,3 Mrd. DM (38). Neben der medizinischen Interventionspflicht

sind somit auch die Aspekte Lebensqualität, Arbeitsbelastung und finanzieller Ressourcenverbrauch Grundlage für die Notwendigkeit einer frühzeitigen sowie konsequenten Diagnostik und Therapie der CVI (23;104). Das Krankheitsbild beinhaltet eine Vielzahl klinischer Erscheinungsbilder. Neben asymptomatischen Verläufen beschreiben viele Patienten eine Reihe unspezifischer Symptome wie Schwellung und Schweregefühl der Beine, deren Ausprägung nicht immer mit dem Schweregrad einer Insuffizienz korrelieren muss. Hingegen bedingen spezifische Symptome wie trophische Hautveränderungen und Ulzerationen immer eine schwerwiegende hämodynamisch relevante venöse Insuffizienz und stellen somit den Endbefund einer Makro- und Mikrozirkulationsstörung dar.

F. Herrmann, **Klinische Studie zur Validierung der barriere-protektiven Wirksamkeit bipolarer Lipide,** Dissertation am Universitätsklinikums Halle (Saale), Germany, November 2011

Das Stratum corneum stellt mit seinen drei Hauptkomponenten: dem Korneozyten, der interzellulären Lipidmatrix und dem „cornified envelope“ ein hochgeordnetes multilamellares System dar. Die Schicht ist durch ihre außergewöhnliche Lipidzusammensetzung charakterisiert und repräsentiert damit die Hauptpenetrationsbarriere der menschlichen Haut. Die vorliegende Arbeit befasst sich mit der Untersuchung der Wirksamkeit von bilayerbildenden Lipiden (DMS®) in Form des Physiogels® A.I. mit und ohne Lichtschutz nach topischer Applikation auf die Hydratation und Barrierefunktion des Stratum corneum.

L. Massoudy, **Klinische Untersuchung zu postnatalen Adaptionsprozessen der Hautphysiologie und zum Einfluss von Pflegeprodukten auf die Hautbarriere in der Windelregion bei reifen Neugeborenen**, Dissertation zur Erlangung der Doktorwürde der Charité Universitätsklinik Berlin, Germany, November 2011

Die Hautbarriere reifer Neugeborener: Die Haut eines reifen Neugeborenen mit einem Gestationsalter von mindestens 37 vollendeten Schwangerschaftswochen zeigt in anatomischer Hinsicht eine vollständige Entwicklung. Lediglich die epidermodermale Vernetzung, die Papillen und Reteleisten, die ein Ineinandergreifen der Dermis und Epidermis bewirkt, ist im Vergleich zum Erwachsenen vermindert.

P. Pinto, C. Rosado, C. Parreirao, L.M. Rodrigues, **Is there any barrier impairment in sensitive skin?: a quantitative analysis of sensitive skin by mathematical modeling of transepidermal water loss desorption curves,** Skin Research and Technology 2011; 17, p. 181-185

Sensitive skin is a vague, subjective and difficult to characterize affliction. If affects a large part of the population and is accompanied with great interest by the cosmetic industry. Some studies have suggested that sensitive skin is the result of impaired barrier function, which leads to the exposure of immune system cells and sensitive nerves, resulting in marked cutaneous responses to otherwise harmless stimuli. This study aimed to investigate the cutaneous barrier integrity of individuals with sensitive skin by a novel approach: a plastic occlusion stress test followed by measurement of transepidermal water loss (TEWL) desorption curves.

T. Roelandt, D. Roseeuw, J.P. Hachem, **Practical Use and Significance of Transepidermal Water Loss Measurements,** J. Fluhr (ed.), Practical Aspects of Cosmetic Testing, Springer-Verlag Berlin Heidelberg 2011

Transepidermal water loss (TEWL) is universally recognized to be a measure of skin barrier function, either at baseline, after experimentally induced barrier abrogation or following topical treatments. In mammals, it is also known as “insensible water loss” as it is a process over which organisms have little physiological control. Measurements of TEWL (grams per square meter per hour) is useful for identifying skin damage caused by certain chemicals, physical insult (such as “tape stripping”) or pathological conditions such as eczema as rates of TEWL increase in proportion to the level of damage even before the damage is clinically visible. It may thus be considered as the tool that evaluates the water barrier function of the epidermins.

G. Mayeux. E. Xhauflaire-Uhoda, G.E. Piérard, **Patterns of aluminium hydroxychloride deposition onto the skin,** Skin Research and Technology, 2011

The normal stratum corneum (SC) is nearly impermeable except for some small size xenobiotics and a minute amount of water evaporating from its surface. This property supports the concept of a diffusional barrier function that may be weakened in some conditions. The remarkable barrier effect results from the highly organized structure of the SC. The predominant route for water passage is though to reside in the intercorneocyte path composed of a complex mixture of lipids structured in rigid bilayer arrays. In practice, the measurement of transepidermal water loss (TEWL) is performed at rest in a cool

environment in order to assess this physiological process. Under physical or emotional stress, TEWL is severely altered by sweating.

M. Spiegel, **Moderne Tenside, Mild + biologisch abbaubar zugleich,** COSSMA 7-8/2011

Es gibt zwar viele moderne Tenside, doch gerade bei sensibler Haut können Produkte wie Sodium Laureth Sulfate (SLS) zu Problemen führen. Aminosäurebasierte Tenside dagegen erweisen sich selbst bei täglicher Anwendung als hautfreundlich. Martina Spiegel präsentiert Hautirritations-, Wirksamkeits- sowie Anwendungsuntersuchungen für Sodium Cocoyl Glutamate und Sodium Lauroyl Sarcosinate von Schill & Seilacher. Die Tenside erzielten bei Galenik und Reinigungswirkung, aber auch bei vollständig aerober und bei anaerober biologischer Abbaubarkeit gute Ergebnisse.

T. Oliphant, C. Dubbelde, R.A. Harper, **Moringa butter: ancient botanical in modern form,** Personal Care June 2011, p. 73-75

What was this mystery plant with over 100 different names in multiple languages around the world? Moringa Oleifera – “the miracle tree” whose leaves alone contain seven times the vitamin C of oranges, four times the vitamin A of carrots, four times the calcium of milk, more iron thatn spinach, three times the potassium of bananas, and twice the protein of yogurt. In addition, this vitamin –rich plant contains a variety of amino acids, as well as antioxidants and trace elements. The positive attributes of the moringa tree do not end with its nutritional benefits In fact, the seed oil from Moringa oleifera has the highest oxidative stability of any vegetable oil available.

E. Xhauflaire-Uhoda, G. Mayeux, P. Quatresooz, A. Scheen, G.E. Piérard, **Facing up to the imperceptible perspiration. Modulatory influences by diabetic neuropathy, physical exercise and antiperspirant,** Skin Research and Technology 2011; 17: p. 487-493

Eccrine Sweating is under the control of the cholinergic sympathetic innervation. It plays an essential role in regulating body temperature in physiologic and pathologic conditions. This function is altered by some systemic diseases including diabetic neuropathy, which commonly involves the distal sensorimotor innervation. The resulting peripheral sweating deficit is often responsible for unequivocal abnormalities of length-dependent thermoregulatory sweating. Hence, the legs affected by diagetic neuropathy most often present hypohidrosis that has been though to be compensated by hyperhidrosis on the upper body regions. Other sweating changes in diabetes include segmental hypohidrosis and more rarely isolated dermatome involvement.

P.M. Campos, D.G. Mercurio, M.D. Gianeti, A.T. Nobrega, **In vitro antioxidant activity and clinical efficacy of cosmetic formulation containing chamomile extract,** FAPESP

Botanical extracts have attracted great interest in the cosmetic area due to its rich composition and medicinal properties. Among these extracts, it can be mentioned the Matricaria chamomilla L. extract, which has been commonly used in cosmetics. Chamomile extract has being well studied once it presents therapeutic properties in terms of pharmacological applications. Various studies showed that chamomile have soothing, antiallergic, antioxidant and antiinflamatory effects. All of these properties are given by chamomile richest composition of organic components. It es added to the cosmetic formulations to provide skin moisturizing and smoothness.

U. Wehler, **Hautphysiologische Untersuchungen zu repetitiven Handschuhokklusionen**, Osnabrück, Mai 2011

Einleitung: Berufsbedingte Hauterkrankungen nehmen in Deutschland die führende Position unter den gemeldeten berufsbedingten Krankheiten ein (DGUV 2009). Als ein Risikofaktor für chronische, irritative Kontaktdermatitiden werden repetitive Handschuhokklusionen mit hautphysiologischen Auswirkungen auf die Epidermale Barriere (z.B. Exsikkationseffekte, Barriereschädigungen und Verschiebungen des HautoberflächenpH- Wertes) angeführt (FLUHR et al. 2005; FROSCH/JOHN 2006; GRAVES et al. 1995; JUNGBAUER et al. 2004a, 2004b und 2004c; RAMSING/AGNER 1996b; TSAI/MAIBACH 1999; WULFHORST et al. 2010; ZHAI/MAIBACH 2002). In der einschlägigen Literatur wird der hautschädigende Einfluss von Langzeit-Okklusionen jedoch kritisch diskutiert, da widersprüchliche Studienergebnisse vorliegen (FLUHR et al. 1999b; RAMSING/AGNER 1996a und 1996b; WETZKY et al. 2009a). Hardening-Effekte werden als ein Erklärungsansatz für die Kompensation hautschädigender Okklusionseffekte angegeben, die auch im Kontext von Spontanremissionen irritativer Dermatitiden trotz konstanter äußerer Risikofaktoren diskutiert werden (ELIAS et al. 2001; LAMMINTAUSTA/MAIBACH 1990; WATKINS/MAIBACH 2009; WULFHORST 1996a, 1996b, 1996c und 2000).

A. Rasul, N. Akhtar, **Formulation and in vivo evaluation for anti-aging effects of an emulsion containing basil extract using non- invasive biophysical techniques**, DARU 2011 19 (5), p. 344-350

Background and the purpose of study: Skin aging is a complex process induced by constant exposure to ultraviolet (UV) irradiation and damages human skin. UV generates reactive oxygen species leading to collagen deficiency and eventually skin wrinkling. Basil contains a number of phenolics and favonoids which possess antioxidant properties. The aim of this study was to formulate and investigate the antiaging potential of a cream containing Basil extract. Methods: A single blinded study was conducted using non-invasive methods. Formulation containing 3% of the concentrated extract of Basil was developed by entrapping in the inner aqueous phase of w/o emulsion and base contained no extract. Both creams were stored at different storage conditions of 8°C, 25°C, 40°C and 40°C+ 75% relative humidity to predict their stabilities. The formulation and base were evaluated for their effects on various skin parameters i.e., moisture and transepidermal water loss (TEWL), volume, energy and surface evaluation of the living skin (SELS). Results: Significant effects ($p \leq 0.05$) were observed for both creams in the case of TEWL. The base showed insignificant ($p \leq 0.05$) while formulation showed significant effects on skin moisture. Volume, SELS SEr (skin roughness), SEsc (skin scaliness), SEsm (skin smoothness), SEw (skin wrinkles) parameter showed significant decline while texture parameter of 'Energy' showed significant increase. Conclusion: The results statistically indicated that the active formulation containing extract of Basil exert antiaging effects when applied topically.

B.H. Oh, Y.J. Hwang, Y.W. Lee, Y.B. Choe, K.J. Ahn, **Skin Characteristics after Fractional Photothermolysis,** Ann Dermatol Vol. 23, No. 4, 2011, p. 448-454

Background: Fractional photothermolysis makes thousands of minute areas called microthermal treatment zones on the skin surface and transmits thermal injury to facilitate heat shock protein formation around the dermis. Potential side effects include acneiform eruption, herpes simplex virus outbreak, erythema, and post-inflammatory hyperpigmentation. Objective: To investigate and compare the changes in the skin of Asian patients after two different fractional photothermolysis systems (FPS) on a split face. Methods: A half-split face study was performed with 10,600 nm carbon dioxide FPS on the left and 1,550 nm erbium-doped FPS on the right side of the face. Only one session of laser irradiation and several biophysical measurements were done. Results: Although both FPS proved to be effective in treating acne scar and wrinkle patients, a slightly higher satisfaction rating was seen with the 10,600 nm FPS treatment. Both types of FPS showed a significant increase in transepidermal water loss which decreased gradually after treatment and returned to pre-treatment level after 1 week. A decreased reviscometer score was sustained for a longer period in wrinkle areas treated with 10,600 nm FPS. Conclusion: Even though the changes in skin varied according to different FPS wavelength, adverse outcomes, such as increased erythema and TEWL were entirely subdued within 3 months of treatment.

U. Heinrich, B. Garbe, M. Wiebusch, H. Tronnier, A. Boddie, **Supplementation with encapsulated vegetable and fruit juice concentrate improves microcirculation and ultrastructure in skin,** Annals of Nutrition and Metabolism 58(1): p. 55-56, April 2011

The objective of the study was to determine changes in skin parameters during the intake of an encapsulated vegetable and fruit juice concentrate. Skin hydratation properties, skin barrier function (TEWL), skin thickness and density as well as microcirculation (capillary blood flow) were determined during the study.

A. Thibodeau, **Anti-aging Skin Care Benefits of Saccharina longicruris Extract,** Cosmetics & Toiletries, Vol. 126, No. 3/March 2011

Skin appearance and functionality are affected by a complex combination of factors including both genetic, i.e. intrinsic, and actinic, i.e. extrinsic or environmental. Indeed, genetic and actinic factors act together to modulate the expression of key genes involved in skin homeostasis. Intrinsic aging is genetically regulated and follows a chronological clock inside of cells, while environmental factors such as UV exposure, humidity and air pollutants are responsible for actinic aging. Together, genetic and actinic aging target important metabolic pathways in skin cells that trigger the signs of aging such as skin roughness and wrinkling. At a molecular level, it has been demonstrated that collagen synthesis is reduced in aged skin cells and in cells damaged by UV radiation.

G. Guglielmini, **Shikimic Acid: An Innovative Ingredient for Multiple Cosmetic Uses,** IFSCC Magazine 3/2011, p. 203-207

This paper presents multiple cosmetic uses relating to a patented cosmetic ingredient of vegetable origin derived from Illicium verum (star anise) (INCI name: Shikimic Acid). Its efficacy was demonstrated by different in vivo and in vitro tests mainly for deodorant applications. It is also indicated

for its anti-acne, anti-danduff, and exfoliating activity. Shikimic acid is particularly suitable for formulations to be used for those applications intended to achieve enzymatic and bacterial inhibition for reduction or elimination of human body odor. Shikimic acid is a pure product found in plant. Its name is derived from the Japanese name shikimi (flower) for Illicium verum, the plant from which it is obtained.

A. Thibodeau, P. Jacobs, S. Amari, **Biomimetic ingredient offers formulation benefits,** Personal Care, March 2011, p. 115-118

The hydrolipidic film covers the surface of the skin and actively contributes to the skin surface smoothness and the skin barrier function. We have developed a biomimetic ingredient of the hydrolipidic film as per its fatty acid profile. Ethylhexyl olivate (INCI nomenclature) brings clinical benefits for numerous parameters and rheology advantages to the formulation. One single application of a formulation containing 3% ethylhexyl olivate was shown to significantly increase skin hydration (+12.2%, $p<0.05$), barrier function (+16.7%, $p<0.05$), visco-elastic properties (+6.7%, $p<0.05$) and skin surface profilometry (+11.2%, $p<0.05$) for up to eight hours. In another experiment, ethylhexyl olivate was compared to 10 different oil/emollients and ranked third for the viscosity enhancement and second for spreadability index on skin. Thanks to its molecular composition, ethylhexyl olivate creates a subtle veil naturally integrating itself within the hydrolipidic film and significantly improving skin sensorial properties. Ethylhexyl olivate stands as a key tool for formulation chemists while positively acting on skin physiological features as well as on sensorial properties.

A. Thibodeau, P. Jacobs, S. Amari, **Olive oil fatty acids: positive effects for the skin,** Personal Care, March 2011, p. 51-57

From the activity of B&T over the last 20 years we have collected vast knowledge of the effects of olive oil fatty acids on the skin showing positive benefits by reinforcing the effectiveness of the hydrolipidic film supporting the skin barrier function. In this paper we take three olive oil derivatives (Olivem 1000, Sensolene and Olivem 900) having different formulation functions and show how the olive oil fatty acids can provide positive effects on the skin in cosmetic applications.

M. Kusunoki, K. Itoh, Y. Gokan, Y. Nagai, C. Tani, H. Hisamitsu, **Water evaporation from substrate tooth surface during dentin treatments**, Dental Materials Journal 2011; 30(1): p. 87–92

The purpose of this study was to evaluate changes in the quantity of water evaporation from tooth surfaces. The amount of waterevaporation was measured using Multi probe adapter MPA5 and Tewameter TM300 (Courage+Khazaka Electric GmbH, Köln, Germany) after acid etching and GM priming of enamel; and after EDTA conditioning and GM priming of dentin. The results indicated that the amount of water evaporation from the enamel surface was signifcantly less than that from the dentin. Acid etching did not affect the water evaporation from enamel, though GM priming signifcantly decreased the evaporation (83.48±15.14% of that before priming). The evaporation from dentin was signifcantly increased by EDTA conditioning (131.38±42.08% of that before conditioning) and signifcantly reduced by GM priming (80.26±7.43% of that before priming). It was concluded that dentin priming reduced water evaporation from the dentin surface.

J. Blaak, R. Wohlfart, N.Y. Schürer, **Treatment of Aged Skin with a pH 4 Skin Care Product Normalizes Increased Skin Surface pH and Improves Barrier Function: Results of a Pilot Study,** Journal of Cosmetics, Dermatological Sciences and Applications, 2011,1, 50-58

Abstract: The physiological skin surface pH is just below 5. With age the skin surface pH increases up to 6. An increased pH correlates with reduced barrier integrity/cohesion. The present pilot study assesses possible normalization of an increased skin surface pH of the elderly and improvement of barrier function via application of ≈pH 4.0 skin care products. Baseline skin surface pH was determined in elderly (80+ years old; n = 15) compared to middle aged adults (31 - 50 years old; n = 15). The effect of o/w emulsions at pH-values of 3.5, 4.0, 4.5 and 5.5 on the skin surface pH was determined in both groups. Further, the effect of a 4-week treatment with a pH 4.0 skin care product on the skin surface pH, skin hydration and barrier integrity was assessed. Thirteen elderly females were involved in this home-in-use test. Increased baseline skin surface pH of the elderly normalizes to the physiological pH of 4.5 - 5.0 over 7 hours after single application of o/w-emulsions with a given pH of 3.5 or 4.0. A 4 week treatment employing the pH 4.0 skin care product improves the epidermal barrier integrity of the elderly significantly ($p = 0.005$). Reduction of the increased baseline skin surface pH of the elderly is accompanied by improved epidermal barrier integrity. Skin care products for the elderly have to be adjusted in the pH range of 3.5 to 4.0.

G. Dell'Acqua, K. Schweikert, G. Calloni, **Oak, Green Tea and Orange Derivatives to Disrupt JAK/STAT, NF-kB Irritation Pathways,** Cosmetics & Toiletries, Vol. 126, No. 1/January 2011

Skin is exposed to the external environment that brings with it daily aggressions such as UV light, chemicals, pollution, temperature, etc. these aggressions can create skin irritation, especially in sensitive skin individuals, leading to itching and discomfort. Moreover, in the long-term, irritation leads to skin damage and premature aging as a result of elastosis and matrix degradation. It is therefore important to stop skin irritation rapidly to not only reduce skin discomfort, but also avoid further skin damage. Skin irritation is sustained by a crosstalk mechanism between a keratinocyte in the epidermis layer and the infiltrating immune cell, e.g. T lymphocytes. This cross-talk creates an amplification loop that leads to overreaction and escalates the inflammatory process with consequent skin erythema and irritation.

G. Krogh Johnsen, A. B. Haugsnes, O. G. Martinsen, S. Grimnes, **A new approach for an estimation of the equilibrium stratum corneum water content,** Skin Research and Technolgy 2010; 16: p. 142-145

Water is the single most vital parameter governing the function of the epidermal stratum corneum (SC) and other keratinised tissues, and a knowledge of the hydration state therein is of general interest. The corneum hydration state has been shown to be an indicator in the determination and evaluation of non-visible skin disease such as atopic eczema. We want to investigate the possibility of finding an objective measuring method that estimates in vivo water content and hydration state of the SC.

J.L. du Plessis, F.C. Elofff, C.J Badenhorst, J. Olivier, P.J. Laubscher, M.N. van Aarde, A. Franken, **Assessment of Dermal Exposure and Skin Condition of Workers Exposed to Nickel at a South African Base Metal Refinery**, Ann. Occup. Hyg. Vol. 54, 2010

The objectives of this study were to assess dermal exposure of cell workers to nickel at a South African base metal refinery and to characterize their skin conditions by measuring skin hydration and and trans epidermal water loss (TEWL) indices.

M. Flach, **Untersuchung von Einflußfaktoren auf den Stratum corneum-Klebestreifenabrißtest und deren Auswirkungen auf die hervorgerufene Stratum corneum-Barriere-Schädigung**, Dissertation an der Medical Faculty of the Friedrich-Schiller-University Jena, Germany, December 2010

Der Klebestreifenabrißtest (tape stripping) ist ein etabliertes hautphysiologisches Untersuchungsverfahren. Seine Hauptanwendungsgebiete sind Untersuchungen zur Barrierefunktion des Stratum corneum (SC) und pharmakokinetische Studien zur Penetration von Lokaltherapeutika und Fremdstoffen. Trotz oder gerade wegen seiner breiten Anwendung ist der Test nicht standardisiert und es existieren unterschiedliche Protokolle. Ziel dieser Arbeit war es, unterschiedliche Einflußfaktoren auf den Klebestreifenabrißtest und die hervorgerufene Barriereschädigung zu untersuchen und basierend auf diesen Ergebnissen einen Vorschlag für ein standardisiertes Protokoll für den Klebestreifenabrißtest zu entwerfen. Dazu wurden bei zwölf hautgesunden Probanden in vier unterschiedlichen Körperregionen (Unterarm, Oberarm, Rücken, Wange) Klebestreifenabrisse durchgeführt. Die Klebestreifen wurden mit verschiedenen Anpreßdrücken (2 N, 7 N) und Anpreßzeiten (2 sec, 10 sec) auf die Hautoberfläche aufgebracht. Zum Ausgleich der durch die Hautfelderung entstehenden Furchen innerhalb des SC kamen verschiedene Methoden zum Anpressen der Klebestreifen zur Anwendung (Stempel bei gleichzeitigem Straffen der Haut, Roller, Andrücken mit dem Daumen). Neben einem Haushaltsklebeband wurden zwei speziell für den Klebestreifenabrißtest entwickelte Klebescheiben (D-Squame®, Corneofix®) getestet. Das Ausmaß der SCBarriereschädigung wurde durch Messungen des transepidermalen Wasserverlustes (TEWL) zu definierten Zeitpunkten vor, während und nach den Klebestreifenabrissen bestimmt. Zusätzlich erfolgten Messungen der Hautfarbe, Hornhautfeuchte sowie des pH-Wertes auf der Hautoberfläche vor und nach den Klebestreifenabrissen.

A. Mieczko, **Investigation of skin physiological parameters in term neonates and evaluation of the influence of bathing on skin barrier function in newborns during the first four weeks of life,** Dissertation 2010 Universitäsbibliothek der Freien Universität Berlin

Ultrastructural studies have shown that the epidermis of full-term infants born after 40 weeks of gestation is morphologically indistinguishable from that of adults. It was therefore assumed that the biophysical properties are similar as well. The present study investigated skin physiology in neonates, especially the barrier function during the first 4 weeks of life and the influence of bathing and washing.

Hylactive, Scientific Dossier Laboratory F. Bouffard, Dermatological Division Barcelona, Spain, www.pro-medic.com

The skin covers our entire body, and through it we project our image to other people. It reflects our age and the state or our health. Healthy skin is the organism's first defence barrier, and as such it

is subject to constant aggressions that can succeed in upsetting its structural balance.

Seba med Flüssig Wasch – Emulsion**, Erfahrungsbericht**, www.ciao.de

Welche eine sanfte ph - hautneutrale Reinigung verspricht und für problematische und empfindliche Haut geeignet sein soll. Zudem soll eine biologische Desodorierung garantiert sein. Gekauft habe ich das Produkt im örtlichen DM - Drogeriemarkt zu einem Preis von 4,95. Man bekommt einen Beutel mit 400 ml Inhalt. Sebamed Produkte gibt es meines Wissens auch nur bei DM und in der Apotheke. Aussehen der Verpackung . Die Emulsion befindet sich in einem knapp 18 cm hohen Beutel an dem links oben ein Drehverschluss angebracht ist. Der Hintergrund ist in einem schlichten weiss gehalten. Ganz oben rechts befinden sich Informationen zu der Verpackung, welche die Umwelt wohl nicht belastet und darunter befindet sich der Aufdruck über den ph - Wert und und noch weiter unten das Logo des Herstellers. Mittig findet man die Produktbezeichnung und darunter kann man nachlesen für welche Haut es geeignet ist. Ganz unten stehen noch etwas uninteressante Dinge und auf der Rückseite die Verpechen des Herstellers, die Inhaltsstoffe, der Inhalt, Anwendungsempfehlung und die Haltbarkeit sowie Kontakt - und Herstellerdaten. Das Design ist relativ unspektakulär und wirkt medizinisch. Hässlich finde ich es aber keinesfalls! Ein neuartiger Reinigungskomplex mit besonders milden Waschaktivsubstanzen reinigt die empfindliche Haut ohne Reizung und Austrocknung. Ein wertvoller Pflegekomplex mit Pentavitin®, Vitaminen, Aminosäuren, Glycerin und Panthenol spendet Feuchtigkeit und pflegt die Haut. Dadurch wird die Haut schon beim Waschen spürbar glatt und geschmeidig. Der pH Wert 5,5 stärkt den natürlichen Säureschutzmantel der Haut und schützt vor Austrocknung, schädlichen Umwelteinflüssen und Krankheitserregern. Hervorragende Eignung für empfindliche und problematische Haut dermatologisch-klinisch getestet. Bei Hauterkrankungen und Seifenverbot nach Rücksprache mit dem Arzt.

E.S. Abrutyn, **Skin Care Moisturizers,** Cosmetics & Toiletries Vol. 125, No. 12/December 2010, p. 18-25

Moisturizers are an important category of personal care products, and such formulas are designed to add moisture to the skin. Developing a good moisturizer requires carefully balancing the ingredients in a formula so that, upon application, the product maintains proper water content in the skin, i.e. 10-30%, to maintain its plasticity and barrier integrity. Insufficient water content can lead to the thickening or thinning of skin; fissure development, which produces chapped, rough and cracked skin; and the loss of pleasing skin aesthetics. Therefore, choosing the right moisturizer requires knowledge of its chemical, physical and performance properties and how to best utilize it against the targeted performance claims and consumer expectations. In addition, it requires knowledge of the skin to which it will be applied.

T. Ilknur, M.Ü. Biçak, P. Eker, H. Ellidokuz, S. Özkan, **Effects of the 810-nm diode laser on hair and on the biophysical properties of skin,** Journal of Cosmetic and Laser Therapy, 2010; 12: 269–275

Introduction: Laser therapy is clinically effective in hair removal; however, despite the development of various strategies, laser procedures still present a risk of adverse effects due to the overheating of the skin. *Objective* : To investigate the effects of 810-nm diode laser treatment on hair and on the biophysical properties of skin by using various non-invasive techniques on various parameters, including hair analysis, surface color changes, integrity of skin barrier, sebum production rate and pH level. Methods: In this randomized, right – left comparison study, 35 women with axillary hair received single-session diode laser therapy. Hair analysis and biophysical properties of the skin were assessed before treatment and at weeks 2, 4 and 6 after the therapy. Results: Hair density and thicknesses statistically signifi cantly decreased after the fi rst post-treatment evaluation. Regarding comparison of the biophysical properties of the skin, there was no statistically signifi cant difference in the assessments, except for the increase determined during the second week in the erythema index in the laser-treated areas. Conclusion: The fi ndings of this study showed that the diode laser can perform a signifi cant reduction in the hair amount without signifi cant epidermal damage, at least for a short period.

M.M. Pereira, L.M. Rodrigues, **Assessing the effects of different semi-occlusive wound dressing over the epidermal barrier recovery,** Skin Research and Technology 2010, 16; p. 488-489

To evaluate the impact of different wound dressings in the recovery of the skin “barrier” function. 30 healthy women, ages ranging 19-49 y.o. were selected after informed written consent. A Sodium Lauril Sulfate (SLS) solutation (5%) was applied under occlusion (24h) in predefined sites of both forearms (volar). This induction phase was followed by the repairing phase with the application of different wound dressings: hidroxipoliuretan (PermaFoam), Hialuronic acid (Hyalofill), polyurethane film

(Opsite Flexigrid) and gauze soaked in saline. Site distribution was previously randomized (Latin aquare).

M. Steiner, S. Aikman-Greed, F.D. Dick, **Side-by-side comparison of open chamber (TM 300) and closed chamber (Vapometer) TEWL,** Skin Research and Technology 2010; 16; p. 489-490

We compared a closed-chamber TEWL meter (transepidermal water loss, Delfin Vapometer (DV) against an open-chamber TEWL meter, which is viewed as the reference standard for TEWL measurements (Courage & Khazaka TM 300). The TM 300 was used in two modes, the standard open chamber method (CKO) and a closed mode (CKC) with a semi-permeable membrane chamber cover. 540 TEWL measurements were taken in 17 participants with sessions of three and six sets of measurements on different days, measuring the TEWL on the dorsum and palm of both hands on each occasion. Four participants took part on either day one or day two only. The order of TEWL measurements was randomised to exclude confounding by interference when taking repeated measures.

C. Try, R. Messikh, A. Elkhyat, J.M. Sainthillier, C. Vidal, T. Lihoreau, S. Mac-Mary, A. Jeudy, P. Humbert, **Biometrological Assessment of Sweat Secretion. Clinical Study of Oral Oxybutynin in Primary Hyperhidrosis**, ISBS 2010 Buenos Aires, Argentina

Primary hyperhidrosis may be a disabling condition causing emotional stress and negative impact on a patient's quality of life. Oral anticholinergics are some of the treatments available. There are few published data on the use of the anticholinergic drug oxybutynin given orally in the treatment of hyperhidrosis. To evaluate the efficacy and the safety of oral oxybutynin in the treatment of primary hyperhidrosis. From January to June 2010, patients with primary hyperhidrosis were treated with oral oxybutynin in the Department of Dermatology, Besançon, France, and attended follow-up. Treatment was started with oxybutynin 2.5 mg three times daily during 3 days. The 3 following days, the dose of oxybutynin was increased at 5 mg per day. Patients then took 7.5 mg of oxybutynin per day during 24 days. The study lasted 1 month from the first day of oxybutynin treatment. Patients were evaluated every two weeks by clinical and biometrologic methods. The following parameters were assessed on the palm and plant: degree of sweating was determined by measuring Trans Epidermal Water Loss (TEWL) using a double-probe Tewameter (TM 300; Courage+Khazaka), skin temperature (Thermometer® ST500), skin pH (pH-meter, PH 900) and skin hydration (Corneometer®, CM 825).

J. Descoubes, C. Faucheux, A. Bernois, C. Heusèle, J.C. Pittet, S. Schnebert, **Evaluation of in vivo Keratinocyte size with confocal Laser Scanning Microscopy at 830 and 445 nm,** ISBS 2010 Buenos Aires, Argentina

Confocal Laser Scanning Microscopy (CLSM) allows visualization of the keratinocytes of the different layers of the epidermis rapidly and non invasively. The aim of this study was to quantify in vivo the size of the keratinocytes of the granular and spinous layers with the new VivaScope® 1500 Multilaser to investigate the age effect on the forehead and the ventral forearm. A panel of 98 healthy Caucasian women aged 18 - 70 was recruited for the study. Photoageing was scored according to the Larnier scale. Biomechanical properties of the skin were measured with Cutometer SEM 575 (Courage & Khazaka) with a 2 mm probe and a 500 mBar suction on the cheek and the ventral forearm. Image acquisitions were taken with the VivaScope® 1500 Multilaser (Lucid - Mavig GmbH) on the forehead and the ventral forearm with 2 wavelengths: 445 nm and 830 nm. Three stacks, separated by 5 mm, with a 2 µm step were performed from the skin surface to 150 µm depth. Mosaics of images (3 x 3 mm) were acquired at the center of this region of interest at granular layer and spinous layer levels. Images were analyzed with ConfoScan V 02 (Orion Concept).

P.M.B.G. Maia Campos, M.D. Gianeti, D.G. Mercurio, L.R. Gaspar, **Assessment of Protective Effects of Cosmetics with UV-Filters, Vitamins, Ginkgo Biloba and Red Alga Extracts using Biophysical and Skin Image Techniques,** ISBS 2010 Bueno Aires, Argentina

The combination of UV filters with antioxidant substances and natural extracts with biological activity in terms of photoprotection can provide unique benefits to the skin, by increasing its protection against UV radiation and also by improving skin conditions. Thus, the aim of this study was the assessment of protective effects of cosmetic formulations containing UV-filters, vitamins, *Ginkgo biloba* and red alga *Porphyra umbilicalis* extracts by biophysical and skin image techniques. For this purpose, an emulsion was supplemented or not (F) with *Ginkgo biloba* extract (FG), or red alga *Porphyra umbilicalis* extract (FA), or the combination of these extracts and vitamins A, E and C (FGAV). These formulations were submitted to preliminary studies for the evaluation of Sun Protection Factor (SPF), which were carried out on a group of human volunteers according to the COLIPA methodology After that, the formulations were applied on 10 human volunteers' forearm skin, followed by the analysis of

their effects using biophysical and skin image techniques. This evaluation was done in terms of transepidermal water loss (TEWL) (Tewameter® TM 210), water content of the stratum corneum (Corneometer® CM 825), viscoelastic properties (Cutometer® SEM575), skin microrelief (Visioscan® VC 98) and the dermal thickness (Dermascan C®). The measurements were done before and after a 30 day-period of daily applications.

M.D. Gianeti, P.M.B.G Maia Campos, **Effects in tactile sensitivity and in skin moisturizing of cosmetic formulations containing vitamins and botanical extracts,** IFSCC 2010 Buenos Aires, Argentina

Skin is a sense organ with sensory nerve endings and receptors, which behaves like a body wrap with its protection and regulation functions. Sensorial informations are originated at the sensory receptors and it makes possible body representation, mediating physical world exploration. Experimental studies have shown that many factors may affect tactile sensations. For this purpose it was measured the current perception threshold (CPT) sensory nerve fibers by using an electric current sine wave stimulator (NeurometerTM) in 20 healthy women volunteers, aged from 25 to 35 years, before and after 2 hours of a single application of a formulation containing an association of vitamins A, C, E, *Ginkgo biloba* and *Phorphyra umbilicalis* extracts. The CPT for 5Hz, 250Hz and 2000Hz frequency current are reported to enable a selective quantification of the sensory thresholds of C, Ad, and Ab fibers respectively. In parallel, the stratum corneum hydration, the sebum content and the TEWL were measured using Corneometer™ CM285, Sebumeter™ SM810 and Tewameter™ TM210, respectively. Skin water and sebum content were significantly increased after 2 hours of the formulation application. The test group showed significantly decreased in the TEWL and in the CPT of 2000Hz, while the control group did not demonstrate any change on those parameters.

C.G. Benevenuto, M.A.S Di Matteo, P.M.B.G Maia Campos, L.R. Gaspar, **Influence of the Photostabilizer in the Photoprotective Effects of a Formulation Containing UV-Filters and Vitamin A,** IFSCC 2010 Buenos Aires, Argentina

Retinyl palmitate has been used in daily use moisturizing, antiageing and protective formulations since it acts on epithelization in dry and rough skin, as well as on keratinization considered being abnormal. However, some studies report that this substance shows some photoreactivity and can form photoproducts, which can lead to the impairment of safety and efficacy of cosmetic products containing this vitamin. Consequently, cosmetic formulators have been doing many efforts to stabilize formulations containing vitamin A derivatives and other photounstable substances such as searching for new UV-filters or using photostabilizers to increase their photostability and consequently their safety and effectiveness. Thus, the objective of this research was to evaluate the influence of different photostabilizers on the photoprotective effects of a cosmetic formulation containing UV-filters and a vitamin A derivative.

S.M. Bertucci, L.S. Freitas, L.R. Gaspar, D.G. Mercurio, M.D. Gianeti, P.M. Maia Campos, **Efficacy of Cosmetic Formulations Containing Green Tea and Ginkgo Biloba Extracts-Pre-Clincal and Clinical Studies,** IFSCC 2010 Buenos Aires, Argentina

This research aims to evaluate the effects of cosmetic formulations containing green tea (*Camellia sinensis*) and/or *Ginkgo biloba* glycolic extracts by histopathological and histometric studies and also to evaluate the immediate and long-term effects on human skin using biophysical techniques and skin image analyses. The pre-clinical efficacy evaluation was performed by the application of the formulations on the dorsum of hairless mice once a day for 5 days. For the clinical studies, formulations under study were applied to the forearm skin of 48 volunteers, which was evaluated by biophysical techniques and skin image analyses according to the following parameters: stratum corneum water content, transepidermal water loss (TEWL), skin elasticity and viscoelastic-to-elastic ratio and skin micro-relief, before (basal values) and after 3 hours (immediate effects), 15 and 30 days (long term effects). The histological analysis showed the formulations containing green tea extract, alone or in combination with the *Ginkgo biloba* extract, provoked significant enhancement in viable epidermis thickness and in the number of cell layers, suggesting a moisturizing effect and an induction of cell renewal. The clinical efficacy studies showed that the extracts under study had a moisturizing effect and also acted synergistically on skin viscoelastic-to-elastic ratio, related to hydration of deeper epidermal layers.

S.N. Park, J.E. Kim, M. J. Kim, M. K. Kang, **Antioxidative and Antimicrobial Activities of Onion (*Allium Cepa*) Peel Extracts and Antimicrobial Activity of the Extract-Containing Emulsion,** IFSCC 2010 Buenos Aires, Argentina

We investigated antioxidant activity and inhibitory effect on tyrosinase and elastase of the

xtract/fractions of Onion (*Allium cepa*) Peel. Besides the cream containing the ethyl acetate fraction of Onion (*Allium cepa*) Peel extracts was formulated. The skin hydration and transepidermal waterloss were investigated after topically application of the cream on skin. These results indicate that Onion (*Allium cepa*) Peel extract/fractions could be applicable to new functional cosmetics for antiaging. The skin is sensitive to stress by various environment factor (UV, pollution or oxidants). The major factor of oxidative stress is exposure of UVA or UVB on skin, it is occurred when there is ROS (reactive oxygen species) more than antioxidants in skin [1-2]. ROS includes singlet oxygen (1O2), superoxide anion radical (O2 -), hydroxyl radical (·OH) and hydrogen peroxide (H2O2). These can be produced significantly in cells by a variety of processes including high energy irradiation, photosensitization, phagocytosis and several enzymatic reactions [3]. Excessive production of ROS may accelerate skin aging by inducing mutations, inflammation, degradation of collagen or elastin, carcinogenesis and protein denaturation [4-7]. Besides, the flavonoids widely used as therapeutic agents are known to act as strong scavengers of ROS, and react with peroxyl radicals involving termination of radical chain reactions during the autoxidation of polyunsaturated fatty acids [8].

C. Selem, N. Delic, **Sphagnum Magellanicum Peat. Characterization and Proposal for Cosmetics Uses,** IFSCC 2010 Buenos Aires, Argentina

This paper focuses on the characterization of Spagnum Magellanicum peat, its properties and the different uses in cosmetic products. Studies were conducted to analyze the organic, inorganic and microbiological content of this material. The results determined that it is an important source of poliphenols with antioxidant capacity. It has anti-inflammatory action and is safe in contact with skin. It has germicide properties. Humic substances have a large capacity to retain multivalent ions forming metalorganic complexes acting as a natural organic sequestrant. Because the intensity of UV light absorption it can be used in the formulation of coloured sunscreen emulsions and taking into account the other properties tested in the development of others cosmetic products. Considering the results obtained we found that Sphagnum Magellanicum peat has interesting properties for being used in the cosmetic industry coupled with the benefit of this raw material which has the important property of being natural and organic.

J. Liu, W.Y. Man, C.Z. Lv, S.P. Song, Y.J. Shi, P.M. Elias, M.Q. Man, **Epidermal Permeability Barrier Recovery Is Delayed in Vitiligo-Involved Sites,** Skin Pharmacol Physiol, 2010; 23: p. 193–200

Background/Objectives: Prior studies have demonstrated that both the skin surface pH and epidermal permeability barrier function vary with skin pigmentation types. Although melanin deficiency is the main feature of vitiligo, alterations in cutaneous biophysical properties in vitiligo have not yet been well defined. In the present study, stratum corneum (SC) hydration, the skin surface pH and epidermal permeability barrier function in vitiligo were evaluated. Methods: A total of 30 volunteers with vitiligo comprising 19 males and 11 females aged 13–51 years (mean age: 27.91 8 2.06 years) were enrolled in this study. The skin surface pH, SC hydration, melanin/erythema index and transepidermal water loss (TEWL) were measured by respective probes connected to a Courage-Khazaka MPA5. SC integrity was determined by measuring the TEWL following each D-Squame application. The barrier recovery rate was assessed at 5 h following barrier disruption by repeated tape stripping. Results: In addition to SC hydration, both melanin and erythema index were significantly lower in vitiligo lesions than in contralateral, nonlesional sites, while no difference in skin surface pH between vitiligo-involved and uninvolved areas was observed. In addition, neither the basal TEWL nor SC integrity in the involved areas differed significantly from that in the unin volved areas. However, barrier recovery in vitiligo-involved sites was significantly delayed in comparison with uninvolved sites (40.83 8 5.39% vs. 58.30 8 4.71%; $t = 2.441$; $p < 0.02$). Conclusion: Barrier recovery following tape stripping of the SC is delayed in vitiligo. Therefore, improvement in epidermal permeability barrier function may be an important unrecognized factor to be considered in treating patients with vitiligo.

T. Hahn, K. Winkler, C.-M. Lehr, U.F. Schäfer, **Salbengrundlagen und die Wasserabgaberate der Haut**, DAZ 2010, Nr. 34, S. 59

Aus dem Körper verdunstet kontinuierlich Wasser über die Haut. Dieser transepidermale Wasserverlust (transepidermal water loss, TEWL) ist ein natürlicher Vorgang, der durch den Feuchtigkeitsgradienten in der Haut ausgelöst wird und je nach Zustand und Feuchtigkeitsgehalt der Haut variieren kann. Der TEWL lässt sich mit einer einfachen, nicht-invasiven Methode messen, die in der Kosmetik oft angewendet wird, um die Wirkung verschiedener Formulierungen zu testen. Im Rahmen eines Wahlpflichtpraktikums an der Universität des Saarlandes wurde untersucht, wie verschiedene apothekenübliche Salbengrundlagen nach jeweils einmaliger, kurzer Inkubation die Wasserabgaberate der Haut verändern.

V. Mahler, **Rizinuswachsperlen – eine icht irritierende Alternative zu reibemittelhaltigen Handreinigern,** KOM Newsletterservice Volume 1, Issue 8, September 2010

Zur Entfernung starker Industrieverschmutzungen (Öl, Fett, Ruß, Metallstaub, Graphit etc.) werden bislang Handreiniger mit abrasiven Bestandteilen wie Walnussschalenmehl, Sand oder Kunststoffmehle eingesetzt. Diese Reibekörper stehen jedoch aufgrund ihrer Materialeigenschaften im Verdacht Hautirritationen herbeizuführen. Als Alternative zu abrasiven Reibekörpern wurden Schmutzlösekörper aus hydriertem Rizinusöl (Active Soft Pearls) entwickelt. Durch ihre polare Oberfläche werden hartnäckige Verschmutzungen bei der Reinigung gelöst und entfernt. Ziel der vorliegenden Studie war es, unter standardisierten Bedingungen die in vivo Effekte von reibekörperhaltigen und reibemittelfreien Waschlösungen auf die menschliche Haut zu untersuchen.

S. Zimmermann, **Entwicklung der Hautphysiologie in der postnatalen Periode und deren Beeinflussung durch die Anwendung einer sauren Pflegecreme - Eine prospektive randomisierte kontrollierte Doppelblind-Studie in vivo**, Dissertation an der Medizinischen Fakultät der Friedrich-Schiller-Universität Jena, 2010

Probanden in einem annähernd neutralen Bereich. Im Verlauf der vier Wochen kam es zu einem Abfall des pH-Wertes auf der Hautoberfläche. Klinisch erschien die Haut zu Studienbeginn bei den Probanden unterschiedlich gerötet und trocken (teilweise mit Fissuren). Im Studienverlauf verbesserte sich das klinische Hautbild, was wissenschaftlich durch eine Abnahme der Gesamtpunktwerte des klinischen Irritationsscores innerhalb der vier Wochen gestützt wird. Das saure Pflegeprodukt führte zu einer verstärkten Zunahme der Stratum-corneum-Hydratation, einer Stabilisierung der epidermalen Barrierefunktion und zu keiner Erhöhung des klinischen Irritationsscores. Bei den Messungen mit dem Multiphotonen-Lasertomograph zeigte sich im Studienverlauf eine Zunahme des dermalen Kollagen- und Elastingehaltes. Basierend auf den Ergebnissen der Neugeborenenstudie lässt sich schlussfolgern, dass infolge der Anwendung eines sauren Pflegeproduktes die physiologische Entwicklung des Säureschutzmantels innerhalb der Neugeborenenperiode unterstützt wird. Die antimikrobielle Funktion des Säureschutzmantels und seine Bedeutung für das Gleichgewicht der Permeabilitätsbarriere für eine normale Stratum-corneum-Integrität kann durch ein derartiges Pflegeprodukt nicht negativ beeinflusst werden. Abweichungen oder Störungen pH-abhängiger epidermaler Funktionen können bei Neugeborenen pathologische Veränderungen hervorrufen. Die Zunahme der Stratumcorneum-Hydratation sowie die Tatsache, dass die Anwendung der Pflegeprodukte keine irritativen Hautveränderungen induzierte, lassen die Schlussfolgerung zu, dass esempfehlenswert ist, derartige Produkte in der postnatalen Periode zu verwenden. Es ist die erste Studie dieser Art, die bisher an Neugeborenen durchgeführt wurde. Die vorliegende Studie repräsentiert einen Ansatz in der Prävention und Therapie dermatologischer Erkrankungen von Neugeborenen. Die Messungen mit demMultiphotonen-Lasertomograph sollen im Rahmen dieser Studie lediglich als Pilotuntersuchungen für Folgestudien dienen, da eine zu geringe Probandenanzahl untersucht wurde.

G. Khazaka, C. Uhl, B. Becker, **Skin analysis techniques advance,** Personal Care, January 2010

New legal regulations and growing competition in the market of cosmetic products demand more and more tests in the field of bioengineering. R&D departments are looking out for bioengineering methods which are non-invasive, objective, sensitive and reproducible. Skin analysis techniques have significantly advanced and technology now allows multiple measurements to be conducted and real-time quantitative values calculated. Such testing can be reproduced in laboratories worldwide. For higher reproducibility, it is important to standardise the test protocol and documentation. For this reason, in 1993, EEMCO (European Group on Efficacy Measurement of Cosmetics and other Topical Products) was foundet in order to create guidelines for tests such as the one for the assessment of Trans Epidermal Water Loss in cosmetic sciences.

P. Lennon, J.-D. Rodier, **Improving Skin Moisturization with Polyglycerol-derived Plant Waxes,** Cosmetics & Toiletries, Vol. 125, No. 1 / January 2010

Moisturization remains the main objective of skin care cosmetics, coupled with secondary functions such as antiwrinkle, firming or brightening benefits. The moisturizing ability of a formulation generally is imparted by the use of polyols, mainly glycerin. Glycerin can help attract water from the formulation or the atmosphere and retain it in the epidermis Added to an emulsion at levels between 3% and 10%, glycerin ensures a good level of hydration that is maintained for several hours; the duration of this effect depends on the other components in the formulation.

K. de Paepe, E. Houben, R. Adam, J.-P. Hachem, D. Roseeuw, V. Rogiers, **Seasonal Effects on the Nasolabial Skin Condition,** Skin Pharmacol Physiol 2009; 22: 8-14

In the present work, nasolabial skin condition and the influence of seasonal changes during

autumn and winter were studied in 16 healthy female volunteers. Apart from visual scoring of erythema and skin scaliness, transepidermal water loss (TEWL), skin hydration, apparent skin pH, skin colour and skin desquamation were biophysically measured. The study results showed that nasolabial TEWL was significantly higher during wintertime than in autumn.

S. M. Davoudi, S. Keshavarz, B. Sadr, M. Shohrati, M. M. Naghizadeh, K. Farsinejad, M. Rashighi-Firouzabadi, H. Zartab, A. Firooz, **Skin hydration and transepidermal water loss in patients with a history of sulphur mustard contact: a case-control study,** JEADV 2009, 23, 940-944

Sulfur mustard is a powerful vesicant (blistering agent) and a member of the heterogeneous group of chemicals that are referred to as chemical warfare agents. This agent reacts with skin proteins, degrading structure of both cells and underlying extracellular matrix. Sulfur mustard DNA adducts are believedto be the most critical lesions.

D. Boudier, S. Mazalrey, S. Goffflo, E. Vignau, B. Closs, **Double approach to improve epidermal barrier function,** Personal Care, September 2009

The primary function of the skin is to act as a barrier against unwanted influences from the environment and to protect the body from waterloss. This barrier function is ensured mainly by the stratum corneum, the upper layer of the epidermis. The stratum corneum comprises corneocytes, which are keratinised keratinocytes, surrounded by lamellar lipid membranes. Thse lamellar lipids play a fundamental role in the structure and functions of the epidermis. They cement the corneocytes and with them form the permeabl barrier of the epidermis.

J. Stampka, **Vergleich der Hautverträglichkeit von Schaumseife und Flüssigseife,** Disseration an der Medizinischen Fakultät der Ernst-Moritz-Arndt-Universität Greifswald, Germany

Nach herkömmlichen Verfahren der Händewaschung wird Seife unter fließendem Wasser aufgeschäumt und zu einem großen Teil ungenutzt abgespült. Das führt nicht nur zu unnötig hohem Seifen- und Wasserverbrauch, sondern auch zu einer Mehrbelastung der Haut (Schwarz 1960, Daschner 1998, Herbst 1998). Beachtlich ist dabei die Tatsache, dass Hauterkrankungen an der Spitze der gemeldeten Berufserkrankungen stehen (Tronnier et al. 1989, Herbst 1998). Deren Heilung ist langwierig und die daraus folgenden Arbeitsausfälle sind kostenintensiv (Tronnier et al. 1989, Herbst 1998). Um dem entgegenzuwirken, wurde ein Verfahren entwickelt, bei dem Seifenkonzentrat auf das Mehrfache des gebräuchlichen Volumens aufgeschäumt wird. Der Vorteil liegt in einer besseren Verteilung auf der Handfläche, dem Verzicht des Aufschäumens unter fließendem Wasser und dem geringeren Seifenverbrauch. In einem zweimonatigen Praxistest mit einem Seifenschaumspender am Klinikum der Albert-Ludwig-Universität Freiburg konnte hinsichtlich der Ökologie und der Ökonomie eine positive Bilanz gezogen werden. Durch das Verschäumen ließen sich der Seifenverbrauch um die Hälfte und der Wasserverbrauch um ein Drittel senken, was zu entsprechender Kostenersparnis führte. Zudem konnten die Verbrauchskosten für Seifen um zwei Drittel, die Abwassergebühren um ein Drittel und die Kosten für Kunststoffabfälle um 50% reduziert werden (Daschner 1998).

H. Taylor, P. Xiao, **New techniques for occupational skin health surveillance,** ISBS Besancon 2009

Ill health due to skin exposure remains a considerable problem, particularly in the workplace. In our aim to reduce the incidence of occupational skin disease and ill health due to skin exposure we need to understand how exposure to substances and physical factors is affecting the skin and how best to identify early signs or pre-clinical signs of skin disease. This project investigated possible new techniques for occupational skin health surveillance. The project focused on techniques that would identify sub-clinical damage that could lead to irritant contact dermatitis.

W. Pratchyapruit, **Grading of improvement and relapse in melasma of Thai females after 8 weeks-treatment with a combined cream of hydroquinone, steoid and tretinoin,** ISBS Besancon, 2009

Melasma is a common skin problem in any races including Asians. It commonly occurs in Thai females, age 30-40 years and females outnumber males about 13:1. In addition to multiple etiologic factors, the environmental factor of Thailand as a tropical and sunny climate country constitutes a definite factor responsible for improvement and relapse of pigmentation after any treatments. At present, the topical treatment consisting of hydroquinone (HQ), steroid and tretinoin together with sunlight protection is a standard treatment for melasma.

P. Contreiras Pinto, C. Parreirao, L. Monteiro Rodrigues, **Characterization of sensitive skin syndrome volunteer's barrier by dynamical analysis,** ISBS Besancon, 2009 and Skin Research and Technology 2010; 16; p. 479

Several studies suggest that 50% of the population considers to suffer from some cutaneous sensibility. Some of these individuals do not show any objective skin sign and therefore his characterization is often difficult or even impossible. The auto-perception of these symptoms is the only way to diagnose the condition. The use of dynamical measurements such as the Plastic Occlusion Stress Test (POST) combined with compartmental analysis had been suggested to be a more sensitive method to discriminate small differences in the skin barrier function.

F. Morizot, J. Latreille, S. Gardinier, L. Staner, C. Guinot, A. Porcheron, E. Tschachler, **Effects of partial sleep deprivation on face appearance and skin properties,** ISBS Besancon, 2009 and Skin Research and Technology 2010; 16; p. 473-474

A reduction of sleep time on a chronic basis is a hallmark of life in modern society ("modern 24h-society"). Sleep has important homeostatic functions and sleep deprivation has effects on brain plasticity, energy conservation, tissue restoration, immune response and thermoregulatory function.Our objective was to investigate the effect of partial sleep deprivation on facial appearance and on skin functions (skin barrier, skin hydration, skin temperature, sebaceous secretions and skin sensitivity).

P. Contreiras Pinto, C. Parreirao, L. Monteiro Rodrigues, **Characterization of sensitive skin syndrome volunteer's barrier by dynamical analysis,** ISBS Besancon, 2009 and Skin Research and Technology 2010; 16; p. 479

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H. Tagami, **The barrier function and water-holding capacity of the stratum corneum are not simply inter-related each other but are influenced by underlying pathological conditions as well as by body locations**, ISBS 2009, Besancon

The barrier function and water-holding capacity constitutes the indispensable functional properties of the stratum corneum (SC). Both can be instrumentally evaluated *in vivo* as transepidermal water loss (TEWL) or as high frequency impédance, i.e., conductance and capacitance. From the observation of their behaviors in commonly observed skin changes, it is generally though that they are correlated each other. Recently, it is reported that the filaggrin gene mutations that causes dry, scaly skin changes of ichthyosis vulgaris based on the deficiency in filaggrin-derived amino acids, i.e., the natural moisturizing factor, ion the SC may also induce SC barrier impairment, leading to the development of atopic dermatitis by facilitating the penetration of various environmental antigens. However, the elevated TEWL values recorded instrumentally in patients with ichthyosis vulgaris is rather mild to allow the permeation of those large molecular environmental antigens, although the skin surface hydration state is extremely low even compared with sénile xérosis, another well known dry skin condition.

P. Contreiras Pinto, J.G. Morais, L. Monteiro Rodrigues, **TcpO2 decay rates used as a metabolic indicator of the human skin in vivo,** ISBS Besancon, 2009

Transcutaneous variables such as TepO2 and skin's microcirculation (LDF) had been used to approach skin metabolic activity, particularly in conditions that are related with the normal physiologic state. The sensibility of these variables to changes increase with the use of dynamical protocols that overstimulates skin and permits the study in extreme conditions. The 100% oxygen ventilation atmosphere used as a challenge test evokes the capacity to understand and quantify the maximum Oxygen disposition in the skin, which ultimately may be related with several skin conditions involving cutaneous perfusion

P. Contreiras Pinto, J.G. Morais, L. Monteiro Rodrigues, **To understand skin circulatory physiology by low perfusion experiments with a monocompartmental model. The influence of age,** ISBS Besancon, 2009

Monocompartmental evaluation of Laser Doppler Flowmetry (LDF) and transcutaneous oxygen (TepO2) data has been applied to low perfusion experiments, accepting that oxygen disposition rates may be reliable predictors of vascular impairment. After defining a new compartmental model to analyze TepO2 and LDF data from dynamical maneuvers, the authors applied this model to a group of normal individuals (young versus old) to evaluate the applicability of the model and the influence of age over those parameters.

I. Angelova-Fisher, D. Wuthe, D. Zillikens, B. Kahle, **Non-invasive bioengineering assessment of the skin barrier function in patients with chronic venous insufficiency,** ISBS Besancon, 2009

Chronic venous insufficiency (CVI) comprises all symptome caused by permanent venous and capillary hypertension. While the clinical manifestations of the disease have been well characterized, there is little knowledge on the skin barrier function in the affected individuals. The aim of the study was to assess non-invasively the epidermal barrier function in patients with CVI stage C2 and C4 according to the CEAP classification and compare the findings to a group of healthy controls (stage C0). 30 patients with CVI without concomitant diseases and 15 healthy, aged-matched volunteers were included in the study following photopletismography and duplex sonography examination of the lower extremities.

C. Rosado, P. Pinto, L.M. Rodrigues, **Assessment of moisturizers and barrier function restoration using dynamic methods,** Skin Research and Technology 2009; 15: 77-83

Dynamic methods, such as the mathematical modeling of the transepidermal water loss curves that result from a plastic occlusion stress test (POST), enable the complete characterization of the dynamic water balance established between the deep and the superficial skin structures. Previous studies have indicated that this methodology was able to detect impaired barrier function and differentiate normal and dry skin. The objective of the present study is to apply the discriminative capacity of the model to the efficacy testing of moisturizing products.

G. Stamatas, J. Nikolovski, **Non-invasive optical methods for the study of infant skin,** ISBS Besancon, 2009

Until recently, the study of infant skin in vivo has been limited to smple non-invasive techniques focusing on skin surface properties such as stratum corneum (SC) hydration, trans-epidermal water loss, and SC pH. With this work we demonstrate the development off non-invasive optical methods adapted for measurements on infant skin and the use of such methods to document skin maturation changes during the first years of life. Optical methods can be classified into methods relating to spectroscopy, microscopy, macroimaging, or a combination of the above. Skin spectroscopy can be achieved in vivo with the use of fiber optic probes that can come in contact with the skin site of interest.

P.M. Maia Campos, M.D. Gianeti, A. Kanashiro A, Lucisano-Y.M. Valim, L.R. Gaspar, **In vitro antioxidant and in vivo photoprotective effects of an association of bioflavonoids with liposoluble vitamins,** NCBI 2009

A new tendency in cosmetic formulation s is the association of botanical extracts and vitamins to improve skin conditions by synergic effects. The objective of this study was to determine the antioxidant activity of associated bioflavonoids, retinyl palmitate (RP), tocopheryl acetate (TA) and ascorbyl tetraisopalmitate (ATIP), as well as their photoprotective effects in preventing increased erythema, transepidermal water loss (TEWL) and sunburn cell formation in hairless mouse skin.

S.E. Dal Belo, L.R. Gaspar, P.M. Maia Campos, J.P. Marty, **Skin Penetration of Epigallocatechin-3-Callate and Quercetin from Green Tea and Gingko biloba Extracts Vehiculated in Cosmetic Formulation,** NCBI 2009

Green tea (Camellia sinensis) and Ginkgo biloba extracts in cosmetic formulations have been suggested to protect the skin against UV-induced damage and skin ageing. Thus, it is very important to assess the human skin penetration of their major flavonoids to verify if they penetrage and remain in the skin to exert their proposed effects. The aim of this study was to evaluate the human skin penetration of epigallocatechin-3-gallate (EGCG) and quercetin from green tea and G. biloba extracts vehiculated in cosmetic formulations. This study was conducted with fresh dermatomed human Caucasian skin from abdominal surgery mounted on static Franz diffusion cells.

P.M. Campos, G.M. Goncalves, L.R. Gaspar, **In vitro antioxidants activity and in vivo efficacy of topical formulations containing vitamin C and its derivatives studied by non-invasive methods,** NCBI 2009

Vitamins C and its derivatives, mainly due to their antioxidant properties, are being used in cosmetic producs to protect and to reduce the signs off ageing. However, there are no studies comparing the effects of vitamin C and its derivatives, magnesium ascorby phosphate (MAP) and ascorbyl tetra-isopalmitate (ATIP), when vehiculated in topical formulations, mainly using objective measurements, which are an important tool in clinical efficacy studies. Thus, the objective of this study was to determine the in vitro antioxidant activity of AA and its derivatives, MAP and ATIP, as well as their in vivo efficacy on human skin, when vehiculated in topical formulations.

L.R. Gaspar, F.B. Camargo Jr., M.D. Gianeti, P.M. Maia Campos, **Evaluation of dermatological effects of cosmetic formulations containing Saccharomyces cerevisiae extract and vitamins,** NCBI 2009

Saccharomyces cerevisiae extract (SCE) is used in cosmetics since it can act in oxidative stress and improve skin conditions. This study investigated dermatological effects of cosmetic formulations containing SCE and/or vitamins A, C and E. The formulation studied was supplemented or not (F1: vehicle) with vitamins A, C and E esters (F2) or with SCE (F3) or with the combination of vitamins and SCE (F4). Formulations were patch tested on back skin of volunteers. For efficacy studies, formulations were applied on volunteers and transepidermal water loss (TEWL), skin moisture (SM), skin microrelief (SMR) and free radicals protection wre analysed after 3h, 15 and 30 days of application.

L.R. Gaspar, P.M. Campos, **Photostability and efficacy studies of topical formulations containing UV-filters combination and vitamins A, C and E,** NCBI 2009

It is already known that the photostability of a sunscreen is important for its performance on human skin. On the other hand, there are many formulations besides sunscreens containing combinations of UV-filters and daily use active substances with other claims like hydration and anti-aging effects. Vitamins A, C and E are frequently added in these kinds of products and it is not known if the UV-filters have some influence on the hydration and antiaging effects of these vitamins on the skin as well as on their stability mainly when photounstable UV-filters like avobenzone and octoyl methoxycinnamate are present in the formulation.

S.E. Dal'Belo, L.R. Gaspar, P.M. Maia Campos, **Moisturizing effect of cosmetic formulations containing Aloe vera extract in different concentrations assessed by skin bioengineering techniques,** NCBI 2009

The polysaccharide-rich composition of Aloe vera extracts (Aloe barbadensis Miller), often used in cosmetic formulations, may impart moisturizing properties to the product. The aim of this study was to evaluate the effect of cosmetic formulations containing different concentrations of freeze-dried Aloe vera extract on skin hydration, after a single and a 1- and 2-week period of application, by using skin bioengineering techniques. Stable formulations containing 5% (w/w) of a trilaureth-4 phosphate-based blend were supplemented with 0.10%, 0,25% or 0,50% (w/w) of freeze-dried Aloe vera extract and applied to the volar forearm of 20 female subjects.

K.A. Tadini, L.R. Gaspar, P.M. Maia Campos, **Epidermal effects of tretinoin and isotretinoin: influence of Isomerism,** NCBI 2009

The efficacy of tretinoin is well established in the treatment of acne and photoaged skin, however as a typical side effect of tretinoin treatment most patients develop a low-grade irritant dermatitis. Since isotretinoin topical treatment usually shows much lower incidence and intensity of adverse effecs than tretinoin topical treatment, histological studies are needed to scientifically evaluate the effects of isotretinoin application on epidermis and also to assess if it can be used in anti-aging products as an alternative to tretinoin.

J. Alander, **Shea butter with improved moisturisatino properties,** Personal Care, September 2009, p. 31-33

Shea butter has recently become a very popular ingredient in cosmetics and personal care applications due to its good emoliency and moisturising properties. The high content of unsaponifiable lipids, especially triterpene cinnamates, contributes to skin healing and restoration by anti-inflammatory action. Shea butter in all its forms is also easy to formulate with, especially if one of the butters specifically developed for cosmetic applications is used. All in all, this indicates that shea butter is both a functional and marketable ingredient with a long history of safe use in cosmetics and explains well its popularity in modern skin care.

J. Fluhr, **Objektive Messmethoden bei dermatologischen Erkrankungen,** 18th Congress of EADV Berlin, 2009

Der Kurs unter Leitung von Priv. Doz. Dr. Fluhr, Berlin, Prof. Jemec, Kopenhagen (Dänemark) und Prof. Berardesca, Rom (Italien) ist darauf ausgelegt, das Basisverständnis für biophysiklische Messungen der Haut zu vermitteln. Diese Messungen sollen dann für die quantitative Bewertung der Schwere und Verlaufs von spezifischen Hauterkrankungen herangezogen werden. Über die letzten drei Dekaden wurden multiple nicht-invasive Instrumente für die quantitative oder semi-quantitative Erfassung von hautphysiologischen Parametern entwickelt und validiert.

N. Hashiguchi, Y. Tochihara, **Effects of low humidity and high air velocity in a heated room on physiological responses and thermal comfort after bathing: An experimental study,** International Journal of Nursing Studies 46, 2009, p. 172-180

In the present study we investigated the effects of low relative humidity (RH) and high air velocity (VA) on physiological and subjective responses after bathing in order to present the evidence for required nursing intervention after bathing. Eight healthy male subjects participated in this experiment. There were four thermal conditions which combined RH (20% of 60%) and VA (low: less than 0.2m/s or high: from 0.5 to 0.7 m/s) After taking a tub bath, subjects sat for 80 min in the test room under each condition. In addition, one condition under which the subjects were exposed to 20% RH and high VA condition for 80 min without bathing condition was conducted.

S. Farahmand, L. Tien, X. Hui, H.I. Maibach, **Measuring transepidermal water loss a comparative in vivo study of condenser-chamber, unventilated-chamber and open-chamber systems,** Skin Research and Technology 2009; 15; p. 392-398

Two main systems have been utilized for measuring transepidermal water loss (TEWL): open chamber and closed chamber. Yet, further validation aned standardization studies may be necessary to reveal the sensitivity, precision, and robustness of these instruments. Three instruments are compared for their applicability to assesss TEWL: unventilated chamber, open chamber and condenser chamber. The comparative study was performed on human forearm skin.

N.M. Kienle, **Botulinumtoxin versus thorakoskopische Sympathektomie bei Patienten mit palmarer Hyperhidrose**, Dissertation, 2009 Universitätsklinik für Thorax-, Herz- und Gefäßchirurgie Tübingen

Einleitung: Die ekkrinen Schweißdrüsen werden vom sympathischen Teil des vegetativen Nervensystems versorgt [33, 75, 88]. Der Sympathikus hat eine ergotrope Wirkung auf den Körper. Er vermittelt eine allgemeine Aktivierung mit Erhöhung der Leistungsbereitschaft und passt somit den Körper an Kampf-, Angst- und Fluchtsituationen („fight, fright and flight“) an. Die in diesen Situationen gesteigerte sympathische Aktivität führt zu Pupillenerweiterung, Erhöhung der Herzfrequenz, Vasokonstriktion mit konsekutivem Blutdruckanstieg und Hautblässe und zu feuchten, kalten Handflächen. Diese Reaktion wird auch als Abwehrreaktion („Defence Reaction“) bezeichnet [38, 82]. Im zentralen Nervensystem ist der Sympathikus sehr ausgedehnt repräsentiert: es gibt mehrere für die Schweißauslösung zuständige Zentren wie Teile des Großhirns, des limbischen Systems, des Zwischenhirns mit Thalamus, Hypothalamus und Basalganglien und des Hirnstammes [7, 88].

Positiver Effekt der Mani Bio-Olivenölcreme, www.mani.at/pages/gesundbheit/studie-zur-olivencreme.php

Motivation der Studie war herauszufinden, ob die Mani Bio-Oliven Crème anti-inflammatorische (entzündungshemmende) Eigenschaften hat und zur schnelleren Wundheilung beiträgt. Bei Behandlung von leichten Verbrennungen mit dieser Creme ist aufgefallen, dass der Schmerz schnell nachlässt und die Haut sich schneller regeneriert. Aus diesem Grund hat die Firma Bläuel in Zusammenarbeit mit alchemia-nova und Unterstützung der österreichischen Forschungsförderungsgesellschaft mbH beschlossen, diesen Erfahrungswert zu überprüfen. Eine Studie von alchemia-nova kann in diesem Auftragsumfang auf keinem Fall einer klinischen ähnlich kommen und eine Bewertung auf heilende Eigenschaften kann nicht zu medizinischen Zwecken erfolgen.

S. Gardinier, S. Guéhenneux, J. Latreille, C. Guinot, E. Tschachler, **Variations of skin biophysical properties after recreational swimming,** Skin Research and Technology 2009; 15; pp. 427-432

Sensations of itching and skin tightness are frequently reported after recreational swimming in pool water. Our objective was to measure the potential changes occurring at the skin surface under such conditions. Nine women participated in this study, which consisted of two periods. During a 4-day

control period, basal biophysical skin parameters were assessed every morning. On the first day, measurements were also performed in the afternoon. The second study period followed the same study design as for the control period, except that, on the first day, women swam for 1 h in a public pool, between the measurements performed in the morning and the afternoon.

R. Voegeli, A.V. Rawlings, M. Breternitz, S. Doppler, T. Schreier, J.W. Fluhr, **Increased stratum corneum serine protease activity in acute eczematous atopic skin**, Br J Dermatol, 2009 Jul;161(1):70-7

Background: Atopic dermatitis (AD) is a chronic inflammatory disease associated with changes in stratumcorneum (SC) structure and function. The breakdown of epidermal barrier function in AD is associated with changes in corneocyte size and maturation, desquamation, lipid profiles, and some protease activities. Objectives: The purpose of this study was: (i) to examine physiological changes in lesional (L) skin of acute eczematous AD, compared with nonlesional (NL) AD skin and healthy (H) skin, using sequential tewametry and SC protein analysis to estimate SC thickness; and (ii) to assess which serine proteases might be involved in pathogenesis. Methods: Six subjects with H skin, six AD patients with NL skin and six AD patients with mild to moderate eczema (L skin) were enrolled. Skin was assessed using several noninvasive techniques but SC thickness was estimated using tewametry and SC protein content of D-Squame strippings. SC integrity was determined by sequential tape stripping (D-Squame) and infrared densitometry. Kallikreins, plasmin, urokinase and leucocyte elastase protease activities together with a novel SC tryptase-like enzyme activity were quantified. Results: Transepidermal water loss (TEWL) levels after D-Squame stripping were elevated in L compared with NL and H skin at all sampling points ($P < 0.05$). Conversely, the amount of SC removed by sequential tape stripping was decreased in L skin, indicating increased intracorneocyte cohesion ($P < 0.05$). By correlating 1/TEWL values and SC removed as an estimate of SC thickness, a significantly thinner SC was observed in L compared with NL and H skin ($P < 0.05$). Elevated extractable serine protease activity was measured in AD skin in the order: SC tryptase-like enzyme (45x), plasmin (30x), urokinase (7.1x), trypsin-like kallikreins (5.8x) and chymotrypsin-like kallikreins (3.9x). Leucocyte elastase activity was not detected in H and NL skin but was observed in AD SC samples (L skin). All enzymes were elevated in the deeper layers of L SC compared with NL and H SC samples. All consistently elevated SC protease activities were significantly correlated with the bioinstrumental data. Conclusions: We report increased serine protease activities in acute eczematous AD, especially in deeper layers of the SC, including SC tryptase-like enzyme, plasmin, urokinase and leucocyte elastase activities. These elevations in protease activities were associated with impaired barrier function, irritation, and reduced skin capacitance. Increased SC cohesion was apparent despite elevated TEWL during tape stripping, which would indicate reduced SC thickness in acute eczematous lesions of AD. Indeed, this was observed using an estimate of SC thickness.

R. Gunathilake, N.Y. Schürer, B.A. Shoo, A. Celli, J.-P. Hachem, D. Crumrine, G. Sirimanna, K.R. Feingold, T.M. Mauro, P.M. Elias, **pH-Regulated Mechanisms Account for Pigment-Type Differences in Epidermal Barrier Function**, J Invest Dermatol. 2009 July; 129(7): p. 1719–1729

To determine whether pigment type determines differences in epidermal function, we studied stratum corneum (SC) pH, permeability barrier homeostasis, and SC integrity in three geographically disparate populations with pigment type I–II *versus* IV–V skin (Fitzpatrick I–VI scale). Type IV–V subjects showed: (i) lower surface pH (≈0.5 U); (ii) enhanced SC integrity (transepidermal waterloss change with sequential tape strippings); and (iii) more rapid barrier recovery than type I–II subjects. Enhanced barrier function could be ascribed to increased epidermal lipid content, increased lamellar body production, and reduced acidity, leading to enhanced lipid processing. Compromised SC integrity in type I–II subjects could be ascribed to increased serine protease activity, resulting in accelerated desmoglein-1 (DSG-1)/corneodesmosome degradation. In contrast, DSG-1-positive CDs persisted in type IV–V subjects, but due to enhanced cathepsin-D activity, SC thickness did not increase. Adjustment of pH of type I–II SC to type IV–V levels improved epidermal function. Finally, dendrites from type IV–V melanocytes were more acidic than those from type I–II subjects, and they transfer more melanosomes to the SC, suggesting that melanosome secretion could contribute to the more acidic pH of type IV–V skin. These studies show marked pigment-type differences in epidermal structure and function that are pH driven.

J. Woodruff, **Testing - backing up the claims,** Cosmetic Business, August 2010

Instrumental methods for efficacy testing of cosmetic producs have long been of interest. The first Journal of the Society of Cosmetic Chemists published in 1947 contained an article on cosmetic efficacy testing although the only instrumenal method quoted was the use of a spectrophotometer to measure UV absorbance of sunscreen agents. It is interesting to note that the need to determine if these were subject to photodegradation was mentioned. Papers on efficacy testing have appeared in almost

every issue of the journal since that first edition but most methods are subjective. Instrumental methods other than those to measure physical parameters or analytical ones to measure ingredient concentrations of the cosmetic composition were sadly lacking until 1956 when a paper describing the measurements of percutaneous absorption using radioisotopes to measure absorption journal during 1956 was an in-vitro method using radioisotopes to measure absorption by hair.

G. Fahrgruber, **Biophysical Characterization of Lesions of Acute and Subchronic Allergic Contact Dermatitis in Domestic Pigs**, Dissertation at the University of Veterinary Medicine of Vienna, Austria, May, 2010

Allergic contact dermatitis (ACD) or contact hypersensitivity is a common eczematous skin reaction in sensitized individuals (WEEDON and STRUTTON, 2002; BAKER (a),2006; NOSBAUM et al., 2009). Very familiar are contact allergic reactions to nickel sulfate containing jewelry or occupational diseases of hair dressers, health care persons or construction workers who experience cutaneous hypersensitivity reactions after repeated contact with particular ingredients of hair dyes or chemicals in latex gloves or in building materials (MOWARD and MARKS, 2003; GERAUT et al., 2009). Urushiol is a very potent allergen in leaves of genus Toxicodendron, a plant native in North America. Farmers, workers in forestry or hikers suffer from ACD after incidental repeated contacts with these plants (GLADMAN, 2006). They are, therefore, named poison ivy, poison oak or poison sumac.

D. Boudier, C. Lenaers, C. Sabbadini, D. Creel, B. Closs, **Certified Organic Actives For Cosmetic Formulations,** HAPPI, May 2009, p. 70-77

With more consumers interested in following a healthy and eco-conscous lifestyle, demand for natural and organic beauty care products has grown tremendously in the past couple of years. Indeed, it is more than a trend, consumers today expect their cosmetics to be natural. Silab has more than 20 years of experience in the field of natural active ingredients. Most recently, we have developed a range of certified organic active ingredients that respond to the main cosmetic claims: anti-aging, anti-free radicals, moisturizing and soothing.

S.W. Hwang, J.H. Kang, J.E. Seol J.K. Seo, D. Lee, H.S. Sung, **The Correlation between SCORAD Index and Instrumental Assessment in Evaluation of Atopic Dermatitis Severity**, Korean J Dermatol., 2010 Apr;48(4): p. 266-271

Background: Atopic dermatitis is a chronic relapsing inflammatory skin disease characterized by dry skin, pruritus, and typical distribution of the lesions. Because an objective tool for the assessment of disease severity of atopic dermatitis has yet to be agreed upon, many dermatologists are dependent on subjective history and clinical scoring. Recently, instrumental measurements have been used for the assessment of skin barrier function. Objective: The purpose of this study was to assess the correlation between SCORAD (scoring of atopic Dermatitis) index and the results of instrumental assessments of disease severity in atopic dermatitis. Additionally, we compared the values of instrumental measurements on normal and lesional skin. METHODS: From February to April 2007, 44 patients with atopic dermatitis were treated with topical steroids, topical calcineurine inhibitors, oral antihistamine agents and systemic steroids. At initial visit, and after 1, 2, 3, and 4 weeks of treatment, the SCORAD index was measured, and instrumental measurements of skin surface hydration (SSH), transepidermal water loss (TEWL), and pH were performed on the antecubital fossa (lesional skin) and flank (normal skin) of the patients by Corneometer(R), Tewameter(R), and skin-pH-meter(R). Results: Significant correlation was found between SCORAD index and SSH ($p<0.0001$), TEWL ($p<0.0001$), and pH ($p=0.1680$). SSH and TEWL improved within 1 week of treatment but pH improved after 2 weeks of treatment. Instrumental assessments showed lesional skin had lower SSH, higher TEWL, and more alkaline pH than normal skin. Conclusion: Instrumental measurements showed correlation with SCORAD index. Therefore, we can use instrumental assessments as well as SCORAD index in the assessment of disease severity of AD.

*M. Ionescu, A. Gougerot, A.M. Matta, L. Lefeuvre, M. Bohbot***, Melanocytes' dendricity down-regulated by the association niacinamide-ascorbic acid,** JAAD, March 2009, San Francisco

To assess the effects of the association niacinamide-ascorbic acid on melanogenesis process in human skin explants exposed to solar simulated radiation (SSR). Normal human skin explants were treated (untreated control) by an O/W emulsion based on the assiciation niacinamide-ascorbic acis (2mg/explant, 1 time per day from baseline to day 9, 30 min before SSR irradiation).

H. Maibach, H. Zhai, **Tape Stripping Method in Humans: Comparison of Evaporimetric Methods,** Cosmetics & Toiletries magaine, Vol. 124, No. 2, February 2009, p. 26-30

The stratum corneum (SC) has been well recognized as a principal water barrier of the skin. It is a cellular tissue, a fabric of cornified cells creating a tough, flexible, coherent membrane, acting as a two-way barrier, minimizing water loss, electrolytes and other body constituents, and decreasing the entry of noxious substances from the external environment. Maintenance of the SC structural integrity is critical to barrier function. Transepidermal water loss (TEWL) documents the integrity of SC water barrier function, and is a sensitive indicator of skin water barrier alternation.

S. Bielfeldt, V. Schoder, U. Ely, A. van der Pol, J. de Sterk, K.-P. Wilhelm, **Assessment of Human Stratum Corneum Thickness and ist Barrier Properties by In –Vivo Confocal Raman Spectroscopy,** IFSCC Magazine, Vol. 12, No. 1 / 2009-05-15

Measurement of water concentration profiles across living human skin by confocal Raman spectroscopy has developed into a powerful tool for a better understanding of distribution and function of water in the epidermis. From the water profile across the epidermins the border between stratum corneum and stratum granulosum can be estimated. This is due to the steep drop in water concentration from the inner to the outer side of the stratum corneum.

Y. Cheng, Y.-Y. Dong, M.-X. Dong, C. Wang, N. Su, Y.-T. Sun, J. Liu, H.-Y. Zheng, A. Schrader, M. Rohr, W. Liu, **Protection effect of cosmetics on human skin under simulated rigorous environment,** Skin Research and Technology 2008, 14, p. 45-52

The efficacy of cosmetics on human skin measured under normal mild laboratory environment might be discounted by exterior environment factors such as wind, UV exposure, etc. Few studies have focused on the “genuine” efficacy of cosmetics on human skin during exposure to external rigorous environment

E. Houben, R. Adam, J.-P. Hachem, D. Roseeuw, V. Rogiers, K. de Paepe, **Clinical scoring and biophysical evaluation of nasolabial skin barrier damage caused by rhinorrhea,** Contact Dermatitis 2008, 59; 296-300

Suffering from an acute viral cold – caused by rhinoviruses or coronaviruses – probably is the most common illness known. A common cold usually is mild and self-limiting. Apart from an overall discomfort, cold symptoms are sneezing, serous nasal secretion, and obstruction of nasal breathing caused by the swelling and inflammation of the sinus membranes. These symptoms occur 2-3 days after the infection and usually last for 7-10 days. In acute viral rhinitis, only the symptoms can be treated and common over-the-counter medication for a cold may already be effective.

S.H. Lim, S.M. Kim, Y.W. Lee, K.J. Ahn, Y.B. Choe **Change of biophysical properties of the skin caused by ultraviolet radiation-induced photodamage in Koreans,** Skin Research and Technology 2008; 14, p. 93-102

Ultraviolet (UV) irradiation affects the function and complecion of the skin by inducing changes in physical properties through formation of erythema, proliferation of epithelial cells, DNA damage, activation or inactivation of various enzymes and proteins, and free radical formation. In this study, the authors intended to observe the overall course of changes in barrier function and reflectance of the skin induced by photodamage, and healing reaction in the course of time, and alteration of skin complexion

M. Jünger, **VenoTrain® micro balance - Klinische Studie,** Universität Greifswald für Bauerfeind

Die Ergebnisse einer klinischen Studie bestätigen den positiven Einfluss und die hervorragende Verträglichkeit der aktiven Pflegesubstanzen auf wichtige Eigenschaften der Haut.

M. van Houte, A. M. Harmze, V.H.M. Deneer, R.A. Tupker, **Effects of oxybytin on exercise-induced sweating in healthy individuals,** Journal of Dermatological Treatment 2008;19

Objectives: Oxybutynin has been proven to be effective in patients with generalized hyperhydrosis. Some dermatoses aggravate as a result of sweating. Therefore, oxibutynin might also be useful in such normohidrotic patients. The aim was to avaluate the afficacy and safty of different does of oxybutynin on exercise-induced sweating in healthy individuals. Methods: Two randomized, double-blind, placebo-controlled, cross-over studies were performed, in which two different dosges (2.5 and 5 mg) of oxybutynin were tested. The degree of sweating was determined by transepidermal water loss (TEWL) measurement on the forearm and hand during exercise. Futhermore, the effectiveness was evaluated by means of the individual`s global assessment score, and side effects were noted. Results: No significant differences between oxybutynin and placebo were found on the forearm and the hand at both dosages of oxybutynin with respect to TEWL values and the individual`s global assessment score. Side effects consisted of diarrhoea, dizzines, dry mouth and dry eyes. Conclusions: In this model, oxybutynin did not result in inhibition of exercise-induced sweating in healthy volunteers.

B. Sommer, **Regenerationsergebnisse nach Nervenverletzungen an der oberen Extremität – Einflussfaktoren und die Optimierung klinischer Untersuchungsmethoden**, Dissertation aus der Klinik für Plastische Chirurgieder Universität zu Lübeck, Lübeck 2008

Klinik der Nervenverletzungen: In der Handchirurgie nimmt die Verletzung peripherer Nerven der oberen Extremität mit 10% aller zu versorgenden Fälle einen wesentlichen Stellenwert ein. Durch motorische und sensible Ausfälle im entsprechenden Versorgungsgebiet des Nerven kommt es zum Verlust von sensomotorischen Fertigkeiten, die zu Bewältigung von Situationen im Berufsleben als auch im häuslichen Lebensumfeld von zentraler Bedeutung sind. Der hohe Anteil der postoperativen Arbeitslosigkeit [51] hat in den letzten Jahren den wirtschaftlichen Einfluss auf das Gesundheitssystem nach Verletzungen der oberen Extremität immer mehr in den Fokus neuer Studien gerückt [34,94]. Insbesondere Nervenverletzungen haben einen nachhaltigen Einfluss auf den sozioökologischen Status des Patienten und können zu erhöhten Behandlungskosten vor allem im Bereich Rehabilitation und sekundärer Rekonstruktion führen [34]. Trotz der hohen klinischen Relevanz können Nervenverletzungen im Rahmen vermeintlicher Bagatellverletzungen leicht übersehen werden (Abb. 1).

M. van Houte, A. M. Harmze, V.H.M. Deneer, R.A. Tupker, **Exercise-induced Sweating in Healthy Subjects as a Model to predict a Drug`s Sweating-reducing Properties in Hyperhidrosis: a Prospective, Placebo-controlled, Double-blind study,** Acta Derm Venereol 2008, 88

The aim of this study was to develop a model to evaluate the efficacy of drugs with expected sweat-reducing properties in healthy subjects in order to select candidate drugs for the systemic treatment of primary generelized hyperhidrosis. A randomized, double-blind, placebo-conrolled cross-over study was performed in 8 healthy subjects. Sweating was induced by exercise. The degree of sweating at different exercise levels was determined by measurement of transepidermal water loss.

J.W. Fluhr, M. Breternitz, P. Elsner, **Glycerol-based emollient enhances stratum corneum (SC) barrier homeostasis, SC hydration and *in vivo* corneocyte morphology after acute barrier disruption in a controlled, double-blinded study,** Skin Physiology Laboratory, Department of Dermatology, Friedrich-Schiller-University, Jena, GermanyBackground and Purpose: Glycerol is known to exert barrier repairing and moisturizing properties. The underlying mechanism for the barrier repair after an acute insult is still under discussion. Furthermore, most of the studies on glycerol-based emollients are not placebo controlled. The aim of the study was to test effect of a glycerol-based emollient (V00034CR) vs. placebo on barrier homeostasis and SC hydration after acute disruption of the skin barrier. Furthermore, we investigated the effect of glycerol on corneocyte morphology assessed by *in vivo* confocal microscopy.

R. Ramírez, M. Martí, C. Barba, S. Méndez, J.L. Parra, **Internal Wool Lipids Rich in Ceramides for Skin Care,** IFSCC Barcelona 2008

Wool is a natural fibre that is mainly made up of protein. It contains external lipids (lanolin) and a small amount of internal lipids (1.5%). Internal wool lipids (IWL) are rich in cholesterol, free fatty acids, cholesteryl sulphate and ceramides, and resemble those from membranes of other keratinic tissues such as human hair or stratum corneum from skin. Intercellular lipids of skin stratum corneum, mainly ceramides, play an important role in the barrier function of the skin by preventing penetration of external agents and controlling the transepidermal water loss to maintain the physiological skin water content. Recent studies have shown that formulations containing lipids that resemble the natural components of the skin, especially ceramide supplementation, can improve disturbed skin conditions.

K.-Y. Jeong, J.-H. Choi, Y.-J. Lee, T.-H. Jeong, D.-K. Lee, **Development of the skin analogue liquid crystal in non-aqueous condition and its cosmetic application to improving atopic dermatitis: An innovative atopy care,** IFSCC Barcelona 2008

Atopic dermatitis (AD) has been issued as a serious disease and the prevalence of atopic dermatitis has been rising progressively in developed countries since the 1940's. However, the reason is not enough to explain the increasing prevalence of atopic dermatitis, and some researchers suggest that there must be crucial factors in the expression of the disease like environmentals and allergics.[5] According to recent studies, the damage of skin barrier has beeen reported as one of the main reasons which cause atopic dermatitis.

K.-F. Huang, E. Tsai, D. Chang-Chin Kwan, Y.-F. Chen, K.-C. Chen, M.-F. Wang, **Studies of Ceramide Lotion on Moisture of Skin**, IFSCC Barcelona 2008

Stratum corneum intercellular lipids such as ceramides play an important role in the regulation of skin water barrier homeostasis and water-holding capacity. The aim of the pöresent study was to

evaluate the potential water retension capacity of an oil-in-water emulsion containing ceramide.

G. Lemos Anconi, P.M.B.G. Maia Campos, **Stability and Clinical Efficacy of Cosmetic Formulations Containing Different Peptides,** IFSCC Barcelona 2008

Wrinkles, as a sign of skin aging, have an important social impact, especially because of longer lifetimes and more frequent social relationships; consequently, they are an important factor influencing our way of communication. Wrinkles represent the more evident outcome of cutaneous ageing. Their onset is linked to a variety of events, resulting from both chrono- and photoageing. Both *intrinsic* (hormones, racial and genetic factors, oxidative stress, systemic disease) and *extrinsic* (temperature, air pollution, smoke, alcohol) factors worsen skin condition. However, wrinkles deriving from skin texture, or micro-relief, modification afflict women more than all other wrinkles as signs of ageing in the common mind.

*A. Thibodeau***, Biomimetic Liquid Crystals as Skin Barrier Restructuring Agents,** IFSCC Barcelona 2008

The main roles of the skin are: protection from UV radiation (melanogenesis), immune defense and a barrier function preventing the penetration of foreign particles. Perhaps of greater importance, skin is dynamically involved in the management of internal water levels [1]. As an example of its interconnection with internal organs, it is interestingly to note that the skin is the site for the photoproduction of vitamin D that will be distributed through all the body, and also the site of cutaneous distribution of vitamin E (through sebum secretion) obtained from nutrition.

*P.M.B.G. Maia Campos, F. Bueno de Camargo Jr., S.M. Bertucci, E. Esteves de Oliveira, G. Lemos Anconi, L. Rigo Gaspar***, Clinical efficacy of cosmetic formulations containing *Myrtus communis* extract,** IFSCC Barcelona 2008

The Research & Development of cosmetic products that are able to act in skin ageing alterations has been a challenge in Cosmetic area. This way, a great number of botanical extracts have been proposed as active ingredients for anti-ageing cosmetic development. *Myrtus communis* is a plant rich in polysaccharides, essential oils, flavonoids, among other substances. Some studies showed that its different hydroalcoholic extracts have a potent antioxidant activity mainly due to the presence of polyphenols *Myrtus communis* leaves hydrolyzed extract has been proposed as cosmetic ingredient with anti-ageing properties because it is rich in galacturonic acid, ramnose, galactose, glucose, xylose and fructose.

V.R.L. Silva, M.A. Schulman, J.M. Gimenis, A.R. Baby, C. Ferelli, M.E.S. Taqueda, M.V.R. Velasco, T.M. Kaneko, **Assessment of Transepidermal Water Loss (TEWL) and Comparison Between Equipments,** IFSCC Barcelona 2008

Moisturizers are used on large body surfaces to maintain the smoothness of the skin. It is well known moisturizers can increase stratum corneum hydration by occlusion of the skin surface or by water-attracting properties. This study presents a discussion of different equipments, Tewameter®, (Courage&Khazaka) and Vapometer® (Delfin) after treatment with different moisture substances to evaluate the transepidermal water loss.

*L. Barbosa-Barros, C. Barba, L. Coderch, A. de la Maza, O. López***, Relevance of Lipid Self-Assembly in Nanostructures on the Skin Properties,** IFSCC Barcelona 2008

Phospholipid systems show high morphological diversity as a function of its structure and composition [1]. This fact plays an important role in the applications of aggregates such as micelles, bicelles and vesicles, which are extendedly used in skin research [2]. Thus, investigations that help clarifying the relation of structural parameters with the effect of the phospholipid aggregates in the skin are needed. Liposomes and micelles have often been used for skin treatment [3-4], although their application is debated due to some aspects. Liposomes seem to be too large to penetrate into the narrow interlamellar spaces of stratum corneum (SC) lipids [5]. Concerning to the micelles, the usual presence of surfactant in their composition supposes a problem due to the well known irritating effect of these solubilising agents on the skin [6]. In this line, the use of bicelles (discoidal micelles constituted by phospholipids) for skin treatment may report advantages comparing to the use of liposomes and micelles: the size of bicelles is small enough for passing through the SC lipid lamellae and their composition consists exclusively of lipids.

L.R. Gaspar, F.B. de Camargo Jr., M.D. Gianeti, P.M.B.G. Maia Campos, **Evaluation of the Safety and Efficacy of Cosmetic Formulations Containing *Saccharomyces cerevisae* Extract and Vitamins,** IFSCC Barcelona 2008

There are many substances frequently used in anti-aging products due to their moisturizing, photoprotective and skin barrier effects and among them we can point out vitamin A, C and E derivatives. Vitamin A palmitate acts on epithelization and on abnormal keratinization. Vitamin E acetate is a free radical scavenger and can reduce DNA damage and keratinocytes death (sunburn cell formation) and also can enhance stratum corneum hydration and reduce skin roughness. Tetra-isopalmitoyl ascorbic acid (VC-IP) releases vitamin C in physiological conditions and enhances cellular tolerance against UVB and reactive oxygen species as well as reduces the production of interleukin-1a and prostaglandin E2.

H. Tronnier, M. Wiebusch, U. Heinrich, **Skin-Physiological Test in Weightlessness in the ISS Space Station,** IFSCC Magazine, Vol. 11, No. 3/2008

A prolonged stay in weightlessness includes several medical alterations of the human body and also results in impairment of the skin. The stratum corneum, epidermal barrier as welle as other skin compartments are affected in terms of their susceptibility to dryness, desquamation and pruritus. This can lead, for example, to wound healing disorders. Skin physiological tests were performed on the skin of an astronaut during and after the the ASTROLAB-Mission within the Skin Care program initiated by the ESA.

H. Tronnier, M. Wiebusch, U. Heinrich, **Change in Skin Physiological Parameters in Space - Report on and Results of the First Study on Man,** Skin Pharmacol Physiol 2008;21: p. 283-292

Astronauts often show skin reactions in space. Systematic tests, e.g. with noninvasive skin physiological test methods, have not yet been done. In an interdisciplinary cooperation, a test series with skin physiological measurements was carried out before, during and after a long-term mission in the International Space Station. The hydration of the stratum corneum (Corneometer), transepidermal water loss (Tewameter), and the surface structure of the skin (SkinVisiometer) were measured. In order to record cutaneous states, the suction elasticity was measured (Cutometer), and an ultrasound measurement with 20 MHz (DermaScan) was also made. In addition, one measuring field of the two inner forearms was treated with a skin care emulsion. There were indications of a delayed epidermal proliferation of the cells, which would correspond to the clinical symptoms. Hydration and TEWL values are improved by respective skin care. On the cutaneous level, the elasticity measurements and the ultrasound picture showed results which correspond to a significant loss of elasticity of the skin. Further examinations are necessary to validate these preliminary results.

J. Lademann, J. Fluhr, **This Issue at a Glance: Skin Reactions of Astronauts in Space and Microstructures of Topically Applied Formulations,** Skin Pharmacology and Physiology 2008; 21:245

The analysis and characterization of the properties of human skin under natural conditions and under topical treatment on Earth is a topic of comprehensive investigation. In the present issue, it is demonstrated that there is also a skin physiology outside the Earth in the universe. Tronnier et al. Investigated the changes in skin physiological parameters in space. Astronauts often show skin reactions. In an interdisciplinary cooperation, a test series with skin physiological measurements was carried out before, during and after a long-term mission at the International Space station.

K. de Paepe, E. de Rop, E. Houben, R. Adam, V. Rogiers, **Effects of lotioned disposable handkerchiefs on skin barrier recovery after tape stripping,** Skin Research and Technology 2008; 14, p. 440-447

Background/purpose: In the present work, it was studied whether repeated use of lotioned disposable handkerchiefs on tape-stripped forearm skin was able to improve skin barrier recovery. Methods: Skin assessments included scoring of visual erythema and dryness/scaliness; and measuring of skin redness (Chromameter® CR300), skin hydration (Corneometer® CM825), and transepidermal water loss (Tewameter® TM300). Four different lotioned paper handkerchiefs – randomly assigned to one of two subject groups (n=20) – were tested vs. the non-lotioned control handkerchief. The results were also compared with those obtained using a topically applied oil-in-water barrier cream (Dermalex®). Results: The three-day lasting protocol revealed that handkerchief wiping itself delayed skin recovery, but a significantly better performance was seen for the lotioned handkerchiefs containing fatty alcohols and mineral oils. This shows that the use of lotioned tissues helps to prevent skin damage inevitably caused by the wiping process. Conclusion: The controlled pre-damaged forearm method with tape stripping appears to be a suitable model to study the effects of repetitive wiping on irritated skin with disposable handkerchiefs of different quality. More specifically, the model seems applicable to mimic the nasolabial skin damage observed during a common cold associated with frequent use of disposable handkerchiefs.

M. Tilaar, W.L. Wih, A.S. Ranti, M. Suryaningsih, **Indonesian plants yield useful agents,** Personal Care, Nov. 2008; p. 25-27

The demand for naturally-derived active ingredients for cosmetics continues to increase. Our objective was to look for moisturising and antioxidative agents from Indonesian botanical resources which contain flavonoid and polyphenol. The article describes natural ingredients extracted with ethanol from Indonesian plants namly Orthosiphon aristatus (Blume) miq = OE (patent pending) and Phyllantus niuri L = PE (patent pending). The study was carried out using DPPH scavenging activity for antioxidant agent in vitro; and Corneometer and Tewameter for moisturising effect.

N. Gerlach, H. Grosch-Rafalski, M. Wiebusch, U. Heinrich, H. Tronnier, **Skin physiological experiments in space,** Poster Dermatronnier Experimental Dermaltology

Over the duration of a long-term microgravity space flight, human bodies undergo dramatic changes. Impairments due to circulatory and vestibular disturbances of the equilibrium are the prevalent medical side effects astronauts suffer from. These are followed by dermatological problems. The effects of microgravity on skin reported by crewmembers are slow healing of contusions and lacerations, dryness and cracking as wells as rashes and itchiness.

J. Darózy, G. Fekete, E. Sólyom, W. Kollecker, R.R. Kaiser, **Lokale adjuvante Behandlung der atopischen Dermatitis und anderer Hauterkrankungen mit Pelsano® med Salbe bei Kindern,** Ars Medici 11, 2008

In einer offenen multizentrischen Studie wurden insgesamt 48 Kinder mit atopischer Dermatitis und anderen Hauterkrankungen mit Pelsano® med Salbe behandelt. Während der dreiwöchigen Intervalltherapie verbesserten sich die typischen Leitsymptome trockene Haut, Juckreiz, Schuppung, Erythem und Lichenifikation hochsignifikant ($p < 0,001$). Die während der Behandlung durchgeführten Messungen verschiedener Hautparameter zeigten eine hoch - signifikante Verbesserung der Hydratation der Haut bei gleichzeitiger Reduktion des transepithelialen Wasserverlustes (TEWL), was auf eine verbesserte Barrierefunktion hinweist.

K.-H. Schrader, **Cremes auf dem Prüfstand**, Beauty Forum 09/2008, S. 100-102

Ob Anti-Aging oder UV-Schutz: Kosmetische Mittel sollten „gut" verträglich sein und eine Wikung haben. Beides sollte am Bestimmungsort der Kosmetika – auf Haut, Haaren etc. – auch nachweisbar sein. In modernen Speziallabors wird daher geprüft, was Cremes und Co tatsächlich leisten.
Die fertigen Produkte werden In-vivo-Tests unterzogen, also am lebendigen Organismus auf ihre Wirksamkeit geprüft. Generell unterscheidet man dabei subjektive und objektive Prüfungen. Wird beispielsweise die Wirkung einer Anti-Aging-Creme untersucht, dienen subjektive Anwendungstests dazu, die sensorische Beurteilung und die Hautverträglichkeit zu prüfen. Mit objektiven Messungen werden dagegen z.B. die Wasserretention und das Hautoberflächenprofil bestimmt, der Sonnenschutzfaktor geprüft und das antioxidative Potenzial des Produkts ermittelt.

G. Campos, J. Coll, L. Campderros, M. Recasnes, D. Panyella, J. Ginestar, **Comparison of the anti-aging efficacy of a cream versus a cream plus serum treatment,** Abstract, EADV Paris 09/2008

Objectives: The purpose of this study is to compare, using bioengineering methods, the efficacy of applying an anti-aging cream alone or in combination with an antiaging serum. The anti-aging products included in this study contain a peptide similar to procollagen fragment, hyaluronic acid, a glycosaminoglycans complex and polysaccharides with urea.

T. Reuther, S. Schröder, M. Kerscher, **Analysis of site- dependent differences of transepidermal water loss, skin capacitance and skin surface pH using both, T-test and correlation analysis,** Abstract, EADV Paris 09/2008

Transepidermal water loss (TEWL), skin capacitance (SC) and skin surface-pH (pH) are today standard parameters for assessing skin barrier function. While there are many studies analysing the relationship between absolute values from different sites using t-test investigations providing information from the analysis of such data using correlation analysis are very rare. Therefore the aim of the present study was to analyze TEWL, SC and pH of the forearm (FA) and the forehead (FH) using and comparing t-test and correlation analysis.

Z.D. Draelos, E. Baltas, **Skin barrier and desquamation in patients with mild plaque psoriasis is improved with the use of a gentle moisturizing cream,** Abstract, EADV Paris 09/2008

Psoriasis is a disorder characterized by faster than normal skin growth and replacement. The result of this rapid skin growth and replacement is a build-up of red, thickened areas with a scaly

appearance. The most commonly affected areas are the scalp, elbows, knees and back. These plaques are often dry and non-pliable areas on the skin that can be a source of pain and/or discomfort to affected individuals. Moisturization of these areas may provide some relief by increasing hydration.

S. Louth, **Physiogel Intensive - A new effective moisturizing agent,** Abstract, EADV Paris 09/2008

Background: Studies showing an increase in transepidermal water loss (TEWL) and a decrease in water-binding properties in atopic dry skin suggest that the skin barrier function is compromised in patients with atopic dermatitis. These studies also suggest that the judicious use of effective moisturisers can improve the epidermal barrier function. Objectives: As part of an assessment program for a new and innovative moisturiser (Physiogel Intensive), the efficacy of Physiogel Intensive as a skin barrier and moisturizer was evaluated.

A. Firooz, S. Davoudi, B. Sadr, S. Keshavarz, M. Naghizadeh, **Comparative study of skin hydration and transepidermal water loss in patients with sulfur mustard-induced dermatititis and normal controls,** Abstract, EADV Paris 09/2008

Background: Skin lesions are among the most common chronic side effects of sulfur mustard intoxication. Objectives: We conducted this comparative study to evaluate skin hydration and trans-epidermal water loss (TEWL) in patients with sulfur mustard-induced dermatitis.

M. Chang, J. Han, C. Lee, S. Kim, **The surface profiles of lip corneocytes are different from face and arm skin,** Abstract, EADV Paris 09/2008

A novel approach about the surface characteristics of corneocytes has been studied by atomic force microscope (AFM) nowadays. The physical properties of lip skin is very particular compared to normal skin, face and arm. But there are little studies about the lip skin. In this study, we have studied the characteristics of surface profiles of lip skin, and we have compared lip to face and arm skin.

H. Tronnier, M. Wiebusch, U. Heinrich, **Skin physiological parmeters in space – results of the European long-term mission in the ISS (ASTROLAB),** Abstract, EADV Paris 09/2008

Background: Since in weightlessness many astronauts report skin problems like dryness, itching, tendency to get injured, impaired wound healing etc., a “Skin Care” program was initiated for the ASTROLAB Mission of ESA (European Space Agency). It was carried out by a consortium with different tasks.

U. Heinrich, B. Garbe, H. Tronnier, W. Stahl, C. Moore, M.J. Arnaud, **Supplementation with green tea extract improves skin physiological parameters,** Abstract, EADV Paris 09/2008

Background: The objective of the study was to determine changes in skin parameters during the intake of a beverage rich in green tea extract. The detection of hydration properties, transepidermal water loss (TEWL), changes of skin surface (SELS), skin elasticity, skin thickness and density as well as serum analyses were determined during the study. Methods: Hydration measurements were carried out with the Corneometer CM 825 prior to and during the study. Transepidermal water loss (barrier function of the skin) was measured with the Tewameter, skin surface (SELS) with the Visioscan and skin elasticity with the Cutometer (Courage & Khazaka Electronics, Cologne, Germany).

A. Reich, J. Kopyra, K. Korfanty, E. Pióro, K. Postrzech, **Influence of soap on epidermis barrier,** Abstract, EADV Paris 09/2008

Background: Washing the body is the human's basic need. However, soaps, one of the most often used washing products, can damage epidermic barrier and disturb the protective function of the skin. Objective: The purpose of this study was to compare the influence of three different soaps on epidermis moisture and transepidermal water loss (TEWL).

S. Gardinier, J. Latreille, C. Guinot, E. Tschachler, **The skin hydration state as determined by a score based on biophysical parameters and Raman spectrometry data,** Abstract, EADV Paris 09/2008

The skin hydration state can be assessed by various instrumental methods, including conventional measurements, e.g. capacitance, transepidermal water loss (TEWL), and more sophisticated methods like Raman spectroscopy. These techniques are considered complementary, as they investigate different aspects of skin hydration. The objective of this study was to summarize and quantify in a synthetic way the skin hydration state by a score based on biophysical parameters, as well as the content of some skin components assessed by confocal Raman spectroscopy.

G. Lembo, S. Lembo, S. La Bella, V. Lo Conte, D. Martellotta, F. Ayala, **In vivo evaluation method of barrier creams’ protective effect,** Abstract, EADV Paris 09/2008

Theoretically, skin barrier creams reduce or even prevent the penetration into the skin by building up a physical barrier, like a thin film, between the skin and the toxic substance. Practically, controversial experiences concerning the effectiveness of barrier creams exist. For this, we propose an in vivo method to evaluate the efficacy of barrier creams trough clinical and instrumental analysis.

D. Khazaka, **Useful and practical advice for measuring TEWL and skin moisture with Cornemeter® and Tewameter®,** Presentation, CHI 2008, Bitec Bangkok

The presentation gives an overview about the measurement of the barrier function and hydration of the skin with worldwide standard devices. The history of those techniques as well as the benefits and pitfalls are described. Multi centric studies which have been performed in this field to show accuracy of the instruments and between different instruments and new approaches, as the recent use of this technology in space or measurements of hydration in different depth of the skin and field devices for consumer tests for laboratories are presented. New methods to look at porphyrines on the skin surface, to measure skin color and skin gloss and methods to access the deep lines (e.g. "crow's feet") with a camera and oblique light are explained in the session.

D. Bürkle, **Die Haut der Astronauten- Erstes kommerzielles ISS-Experiment aus NRW,** http://www.wdr.de/themen/wissen/astronomie/blick_ins_all/raumfahrt/060701.jhtml

Auf der Raumstation ISS, zu der Thomas Reiter am 1. Juli startet, wird er viele Experimente durchführen. Mit seiner eigenen Haut wird er für den ersten Versuch herhalten, den Unternehmen aus NRW in Auftrag gegeben haben.Wie viele Falten während seines sechs Monate langen Aufenthalts auf der Internationalen Raumstation ISS dazugekommen sind, wird Thomas Reiter am Ende ganz genau wissen. Alle zwei Wochen holt der deutsche Astronaut einige Messgeräte aus den Regalen der Raumstation, testet damit den Wasserverlust seiner Haut und kontrolliert, ob neue Fältchen dazugekommen sind.

H. Tronnier, M. Wiebusch, U. Heinrich, **Project Skin Care of the European Long-Term Mission (Astrolab) on the ISS,** DermaTronnier Research, Poster

Impairments due to circulatory and vestibular disturbances of the equilibrium are the prevalent medical side effects astronauts suffer from. These are followed by the dermatological problems. In order to examine these skin problems and find ways to prevent them, skin-physiological measurements as a project "Skin Care" were carried out within the framework of the European long-term mission (ASTROLAB) 2005-2007.

M. Andreas, R. Bilenchi, G. Mariotti, M. Centini, L. Andreassi, C. Anselmi **Phytic Acid: a Novel Topically Active Antioxidant Suitable for Cosmetic Preparations**, 21st World Congress of Dermatology, Buenos Aires, Argentina, 2008

Many substances with antioxidant activity are present in the human skin, and their concentrations are generally higher in the epidermis than in the dermis. Under the effect of an oxidative stress, such as that caused by ultraviolet (UV) rays, these substances are strongly depleted, especially in the external epidermal layer

B. Piot, J. De Rigal, C. Yarhi, D. Compan-Zaouati, M. Lefebvre, **The skin sebageous function: in Asian and Caucasian climate influences,** 21st World Congress of Dermatology, Buenos Aires, Argentina, 2008

Objective of the study: The first objective was to compare the sebaceous function in Asian and Caucasians, female, in real life conditions, using both intrumental measurement and visual evalutation by expert. A second objective was to investigate climate induced changes in the sebaceous function on a separate group of Japanese women, using the same methodology.

N. Garcia Bartels, A. Mieczko, H. Proquitté, R. Wauer, T. Schink, U. Blume-Peytavi, **Influence of Bathing in Newborns: A Prospective, Randomized Clinical Study on Skin Barrier During the First Four Weeks of Life,** 21st World Congress of Dermatology, Buenos Aires, Argentina, 2008

Background: The adapting process of skin barrier to extra-uterine life and the influence of bathing on term neonates's skin is not completely understood. Thus, we investigated the effect of bathing on skin barrier during the first four weeks of life. Methods: Monocenter, prospective, randomised study with 57 healthy full-term newborns (32 boys and 25 girls).

J.W. Fluhr, M. Miteva, G. Primavera, M. Ziemer, P. Elsner, E. Berardesca, **Functional Assessment of an Acidic Skin Care System in Patients under Chemotherapy,** 21st World Congress of Dermatology, Buenos Aires, Argentina, 2008

Background: Cancer patients undergoing chemotherapy frequently experience skin problems e.g. xerosis. The aim of this study was to verify whether a concomitant treatment with an acidic washing and emollient products (pH 5.5) can significantly improve the quality of the skin in such patients

H. Seirafi, K. Farsinejad, A. Firooz, S.M. Davoudi, R.M. Robati, M.S. Hoseini, A.H. Ehsani, B Sadr, **Biophysical characteristics of skin in diabetes: a controlled study,** JEADV 2008, 23, p. 146-149

Cutaneous complications are common in diabetes, with approcimately 30% of patients experiencing some skin involvement during the course of their illness; these may also be the first presenting sign of diabetes or even herald the diagnosis by many years. The skin involvement in diabetes encompasses various clinical entities such as acanthosis nigricans, necrobiosis lipoidica, diabetic dermopathy and neuropathy, sclerodema and granuloma annulare.

Interventionsstudie „Hautschutz" - Vergleichende Untersuchung zur Überprüfung der Wirksamkeit von Hautschutzpräparaten im Rahmen des dreistufigen Hautschutzplanes – Gefährdungsanalyse und Schutzmaßnahme, BGFA Report, Dezember 2008

Zur primären sowie sekundären Prävention von beruflich bedingten Hauterkrankungen zählt – neben dem Tragen von Schutzhandschuhen – der Hautschutz in Form von Hautmitteln (Hautschutz-, Hautreinigungs-, Hautpflegepräparate). In Deutschland nehmen Berufskrankheiten (BK)-Anzeigen im Bereich der Haut nach wie vor einen Spitzenplatz ein. Ausreichende und belastbare Studien zur Wirksamkeit von Hautmitteln fehlen bislang. Ein objektivierbarer Wirksamkeitsnachweis von Hautmitteln unter den tatsächlichen Arbeitsplatzbedingungen liegt somit bis jetzt noch nicht vor.

Y. Haruta, K. Kato, T. Yoshioka, **Dietary Phospholipid Concentrate from Bovine Milk Improves Epidermal Function in Hairless Mice**, Biosci. Biotechnol. Biochem., 72 (8), p. 2151**-**2157**,** 2008

We investigated the effect of dietary phospholipid (PL) concentrate from bovine milk on the epidermis. Thirteen-week-old hairless male and female mice (Hos:HR-l) were separated into two experimental groups, each fed two experimental diets: the control group and the PL group. The mice were given the experimental diets for 6 weeks. Stratum corneum hydration and transepidermal water loss (TEWL) were measured using Corneometer CM825 and Tewameter TM300 (Courage and Khazaka Electronics, Cologne, Germany) at 3 weeks and 6 weeks. After the feeding period, ceramides in stratum corneum were analyzed. We found that stratum corneum hydration and ceramides in the PL group were significantly higher than those in the control group and that TEWL in the PL group tended to decrease. These results indicate that dietary PL concentrate improves epidermal function by increasing the amount of ceramides, resulting in higher hydration.

J.A. Goldstein, B.Grubstein, M. Rothman, **Compositions and Methods for the Treatment of Wounds ans Scar Tissue,** http://www.faqs.org/patents/app/20080317830

Compositions for the treatment of wounds and/or scars are described herein. The compositions contain between 1 and up to 30% by weight, more preferably between 1 and 20%, most preferably between about 5 and 10% by weight particles, such as titanium dioxide or a similar material in a pharmaceutically acceptable base or carrier, such as petrolatum. The compositions are less greasy than petrolatum alone, and thus are more aesthetically pleasing. The compositions exhibit occlusive properties comparable to petrolatum. The compositions are absorbed into the skin, unlike petrolatum, and exhibit significant wound healing characteristics not observed with petrolatum alone. In one embodiment, the pharmaceutically acceptable base is petrolatum and the particles are titanium dioxide. The compositions can be used to treat complex, hard to heal wounds, such as diabetic ulcers; pressure sores, such as bed sores; lacerations; bite wounds; burns; penetrating wounds; surgical wounds, etc. The composition can also be used to promote normal healing of scar tissue. The compositions can also be used for the topical delivery of one or more active agent. The compositions can be used to reduce fine lines and wrinkles, and to rehydrate skin or to treat dry skin.

N. Otberg, D. Grone, L. Meyer, S. Schanzer, G. Hoffmann, H. Ackermann, W. Sterry, J. Lademann, **Water-filtered infrared-A (wIRA) can act as a penetration enhancer for topically applied substances,** GMS German Medical Science 2008, Vol. 6

Background: Water-filtered infrared-A (wIRA) irradiation has been shown to enhance penetration of clinically used topically applied substances in humans through investigation of functional effects of penetrated substances like vasoconstriction by cortisone. Aim of the Study: Investigation of the influence of wIRA irradiation on the dermatopharmacokinetics of topically applied substances by use of optical methods, especially to localize penetrating substances, in a prospective randomised controlled study in humans. Methods: The penetration profiles of the hydrophilic dye fluorescein and the lipophilic dye curcumin in separate standard water-in-oil emulsions were determined on the inner forearm of test

persons by tape stripping in combination with spectroscopic measurements. Additionally, the penetration was investigated in vivo by laser scanning microscopy. Transepidermal water loss, hydration of the epidermis, and surface temperature were determined. Three different procedures (modes A, B, C) were used in a randomised order on three separate days of investigation in each of 12 test persons. In mode A, the two dyes were applied on different skin areas without water-filtered infrared-A (wIRA) irradiation. In mode B, the skin surface was irradiated with wIRA over 30 min before application of the two dyes (Hydrosun radiator type 501, 10 mm water cuvette, orange filter OG590, water-filtered spectrum: 590-1400 nm with dominant amount of wIRA). In mode C, the two dyes were applied and immediately afterwards the skin was irradiated with wIRA over 30 min. In all modes, tape stripping started 30 min after application of the formulations. Main variable of interest was the ratio of the amount of the dye in the deeper (second) 10% of the stratum corneum to the amount of the dye in the upper 10% of the stratum corneum. Results: The penetration profiles of the hydrophilic fluorescein showed in case of pretreatment or treatment with wIRA (modes B and C) an increased penetration depth compared to the non-irradiated skin (mode A): The ratio of the amount of the dye in the deeper (second) 10% of the stratum corneum to the amount of the dye in the upper 10% of the stratum corneum showed medians and interquartile ranges for mode A of 0.017 (0.007/0.050), for mode B of 0.084 (0.021/0.106), for mode C of 0.104 (0.069/0.192) (difference between modes: p=0.0112, significant; comparison mode A with mode C: p<0.01, significant). In contrast to fluorescein, the lipophilic curcumin showed no differences in the penetration kinetics, in reference to whether the skin was irradiated with wIRA or not. These effects were confirmed by laser scanning microscopy. Water-filtered infrared-A irradiation increased the hydration of the stratum corneum: transepidermal water loss rose from approximately 8.8 g m(-2) h(-1) before wIRA irradiation to 14.2 g m(-2) h(-1) after wIRA irradiation and skin hydration rose from 67 to 87 relative units. Skin surface temperature increased from 32.8 degrees C before wIRA to 36.4 degrees C after wIRA irradiation. Discussion: The better penetration of the hydrophilic dye fluorescein after or during skin irradiation (modes B and C) can be explained by increased hydration of the stratum corneum by irradiation with wIRA. Conclusions: As most topically applied substances for the treatment of patients are mainly hydrophilic, wIRA can be used to improve the penetration of substances before or after application of substances - in the first case even of thermolabile substances - with a broad clinical relevance as a contact free alternative to an occlusive dressing.

B. Cravello, A. Ferri, **Relationships between skin properties and environmental parameters,** Skin Research and Technology 2008; 14: p. 180–186

Background/purpose: Many authors have written about skin physiological parameters and their changes according to different environmental conditions. Nevertheless, the literature puts in evidence disagreement among different studies due to the great variability in these parameters and due to the difficulty in comparing the results obtained under different working conditions. Hence, the aim of this work is to attempt to clarify the relationship between some skin properties, such as transepidermal water loss (TEWL), skin hydration and mean skin temperature (Tsk), and the environmental parameters of ambient temperature (Ta) and relative humidity (RH), with the help of a climatic chamber to make the environment reliable.This work must be considered as the preliminary step of a wider project dealing with textile engineering: the results will be used in identifying criteria for textile design with the aim of producing more comfortable clothing. Methods: Experiments were carried out in a climatic chamber with independently controlled Ta and RH. All the combinations between three levels of Ta (20 1C, 25 1C and 30 1C) and four levels of RH (25%, 45%, 65% and 85%) were used on a panel of six young female subjects. The assessments made were: skin surface hydration using an electrical capacitance method, TEWL using a Tewameter and Tsk using a set of thermistors. Results: The results showed a significant correlation between TEWL and Ta, while the RH had a weaker effect on TEWL in the temperature range under investigation. Also, Tsk showed a higher correlation with Ta compared with RH. Finally, skin surface hydration was found to be strongly affected by both environmental parameters. Conclusions: The analysis of experimental data resulted in the elaboration of some easy empirical models useful to evaluate the changes in TEWL, skin hydration and Tsk in different climatic conditions.These relationships must be considered to be valid only in a restricted range of Ta (20– 30 1C) and RH (25–85%) for young female subjects (25–35 years old).

B. Cravello, A Ferri, **Relationships between skin properties and environmental parameters,** Skin and Research Technology Vol. 14, No. 2, May 2008

The skin represents the most superficial layer of the body, so it is constantly exposed to different environmental stimuli. Many authors have written about the influence of the environment on human skin. Egawa et al. (1) studied the effect of exposure of human skin to a dry environment: they found a decrease in the stratum corneum water content and related to this lack of water, a deterioration of the skin texture and the formation of fine wrinkles.

C. Cartigliani, A. Bonfigli, F. Distante, **Long-term instrumental evaluation of skin compatibility of a shaving treatment for sensitive skin**, Journal of Plastic Dermatology 2008; 4, 3

In order to evaluate the long-term skin compatibility of the treatment Vichy Homme Sensi-Baume Ca and Mousse à Raser Anti-Irritations, 30 volunteers, having sensitive skin, used it for the daily shave for 3 weeks. Instrumental evaluations of transepidermal water loss (TEWL), skin redness and blood micro-flow were performed on the cheeks, before and 30 minutes after the shaving, at the beginning and at the end of the period of use. TEWL: the highly significant increase in the transepidermal water loss values detected after the shaving with the habitual treatment indicated a worsening in skin barrier health. After the shaving with the new treatment, a non significant decrease in the same parameter was detected. Furthermore, the comparison between the habitual and the new treatment was highly significant. These results indicate that the shaving with the new treatment preserved the barrier health and the integrity of the skin. The comparison between the TEWL values recorded before the shaving, at the basal control and at the end of the study, showed a statistically significant decrease in the values. This indicated that the new treatment is also effective in protecting and strengthening the skin after a long-term use. Cutaneous colorimetry and blood micro-flow: a statistically significant increase in the skin redness and in blood micro-flow values was detected after the shaving with the habitual treatment. No significant variation in the same parameters was instead detected after the shaving with the new treatment. The comparison between the habitual and the new treatment was statistically significant. These results showed that the new treatment is effective in preventing the onset of skin irritations after the shaving.

I. Wontroba, **Der Einfluss von linear polarisiertem Licht auf Hauttemperatur, Hautwasserabgabe und sudomotorische Aktivität**, Digitale Dissertation FU Berlin, p. 1-37

Zur Untersuchung, welche Auswirkungen inkohärentes polarisiertes Licht (VIP = visible incoherent polarized light) auf die menschliche Haut zeigt, sind in unterschiedlichen Messreihen an insgesamt 48 Probanden Veränderungen von Evaporation und Temperatur über der Haut des Unterschenkels in einem Messzylinder (Tewameter) untersucht worden. Verwendet wurde eine im Rahmen der VIP-Lichttherapie eingesetzte Lichtquelle der Firma Bioptron.

H. Yim, Y.-S. Cho, C.–H. Seo, B.-C. Lee, J.-H. Ko, D. Kim, J. Hur, W. Chun, J.-H. Kim, **The use of AlloDerm on major burn patients: AlloDerm prevents post-burn joint contracture**, BURNS, Vol. 36, Issue 3, p. 322-328

A total of 64 patients received AlloDerm graft selectively on joint areas during the study period from March, 2005 to July, 2007. From January to March, 2008, a total of 31 patients returned to our burn center to examine the functional results by measuring range of motion of joints. Additionally, the quality of grafted skin condition criteria of skin elasticity, scar thickness, trans-epidermal water loss, melanin and erythema level was measured in a total of 11 patients among them. By analyzing the limitation level of 55 joints excluding hand areas, we found that 24 joints (43.6%) showed no limitations, 12 joints (21.8%) showed limitations below 10%, 16 joints (29.1%) showed limitations between 10 and 19% and 3 joints (5.5%) showed limitations over 20%. The scar thickness of non-AlloDerm applied areas was 2.5 ± 0.9 mm and AlloDerm applied areas was 1.8 ± 0.7 mm ($p = 0.396$). Trans-epidermal water loss for non-AlloDerm applied areas was 20.9 ± 7.7 g/h/m^2 and AlloDerm applied areas was 10.8 ± 3.4 g/h/m^2 ($p < 0.001$). Erythema value for non-AlloDerm applied areas was 436.1 ± 65.8, whereas AlloDerm applied area was 394.4 ± 61.2 ($p < 0.001$). Acellular dermal matrix is a good option for treating major burns to prevent scar formation after burn and loss of joint function.

T. Weber, A. Kowcz, N. Trookman, R. Rizer **Evaluation of a moisturizer containing sodium acetate and urea to ameliorate senile xerosis,** AB33 J. Am. Acad. Dermatol.

Objective: to asses the ability of a commercially available moisturizing cream to ameliorate the dry skin condition of subjects 65 to 86 years of age. Methods: in this 7-week, single-blinded, controlled clinical study, 28 subjects with moderate to severe xerosis were treated twice daily for 6 weeks with a moisturizing cream containing 10% urea and 5% sodium lactate.

N. Akhtar, G. Ahmed, M. Ahmed, N. Ranjha, A. Mahmood, **Grapefruit Extract Cream: Effects on Melanin and Skin**, Cosmetics and Toiletries Magazine, Vol. 123, No. 1/January 2008, p. 55-68

Emulsions are thermodynmically unstable systems defined as microscopic dispersions of liquid droplets contained within another liquid, with a diameter ranging from 0.5 to 100 um. Emulsions usually consist of mixtures of an aqueous phase with various oils or waxes.

D. Voegeli, **The Effect of Washing and Drying Practices on Skin Barrier Function,** J Wound Ostomy

Continence Nurs.**,** 2008;35(1): p. 84-90
Purpose: The aim of this study was to explore the potential contribution to skin damage caused by standard washing and drying techniques used in nursing. Design: An experimental cohort design was used, with healthy volunteers (n = 15) receiving 6 different washing and drying techniques to the volar aspect of the forearm. Subjects underwent 3 washing and drying techniques on each arm; each technique was repeated twice, separated by a 2-hour rest period. Methods: Skin integrity was assessed by measuring transepidermal water loss (TEWL), skin hydration, skin pH, and erythema. Comparisons were made between washing with soap or water alone, and drying using a towel (rubbing and patting) or evaporation. The significance of any difference was assessed by nonparametric analysis. The study was approved by the local research ethics committee, and all volunteers gave informed consent. Results: TEWL was seen to increase following each type of wash, and increased further following repeated washing. Drying of the skin by patting with a towel increased TEWL to give readings identical to those obtained from wet skin. There was an increase in skin pH with all washing and drying techniques, particularly when soap was used. Erythema also increased with repeated washing, particularly when soap was used. No significant changes were observed in skin hydration as measured by a corneometer, although there was a tendency for the values to decrease with washing. Conclusions: These data suggest that washing with soap and water and towel drying has a significant disrupting effect on the skin's barrier function. There is tentative evidence to suggest that a cumulative effect may exist with damage increasing as washing frequency increases. Drying the skin by patting with a towel offers no advantage to convention.

S. Uhlig, **Irritabilität und Regeneration der Epidermalen Permerabilitätsbarriere in Abhängigkeit vom Weiblichen Zyklus und dem Psychischen Wohlbefinden - Hautphysiologische und psychologische Untersuchungen,** Dissertation zur Erlangung der Doktorwürde der Universität Osnabrück, 2007

H. Scheuvens, **Bestimmung des Irritationspotentials von Dusch- und Badeölen auf normaler bis trockener Haut**, Dissertation aus der Universitätshautklinik der Albert-Ludwigs-Universität Freiburg, 2007

Irritativ-toxische Kontaktekzeme und allergisch bedingte Dermatitiden sind ein zunehmendes Problem, das Patienten aller Altersgruppen betrifft. Nicht immer ist dabei die hautirritierende Substanz bekannt, die diese entzündlichen Hautveränderungen hervorruft. Bei diesen Patienten ist es daher besonders wichtig, eine sorgfältige, dermatologische Basisbehandlung durchzuführen, die die gestörte Permeabilitätsbarriere nach entzündlich bedingten Hauterkrankungen wieder herstellt und das erneute Eindringen von Irritanzien und Allergenen verhindert. Zu dieser Basistherapie gehören auch medizinische Dusch- und Badeöle mit ihrer rückfettenden Wirkung auf die ausgetrocknete Haut. Lodén et al. [38] konnten in ihren Versuchsreihen erstmals nachweisen, dass einige Dusch- und Badeöle die Hautbarriere schädigen können, indem sie hautirritierende Substanzen auf der Hautoberfläche zurücklassen. Sie zeigten weiterhin, dass andere Badeöle eine protektive Ölschicht auf der Haut aufbauen.

G. Yosipovitch, M.I. Duque, T.S. Patel, Y. Ishiuji, D.A. Guzman-Sanchez, G. Dawn, B.I. Freedman, Y.H. Chan, D. Crumrine, P.M. Elias, **Skin barrier structure and function and their relationship to pruritus in end-stage renal disease,** NDT Advance Access published online on June 25, 2007

The relationship between dry skin and uraemic pruritus remains controversial. In addition, there is a lack of published data describing the structure and function of the stratum comeum (SC) in end stage renal disease (ESRD). The purpose of the present study was to assess the function and structure of the skin barrier in patients with ESRD and to correlate any abnormalities with uraemic pruritus.

Aectan - der natürliche Zellschutz mit Ectoin, www.aectan.de, Hommel Pharma GmbH & Co.KG, Produktinformation, 2007

Die Zellen der menschlichen Haut sind täglich vielen schädlichen Umweltfeinflüssen ausgesetzt. Intakte Zellen können sich in den meisten Fällen dagegen wehren. Sollte dennoch eine Schädigung erfolgen, regenerieren sie sich mit Hilfe eines eigenen Zellreparatur-Mechanismus. Wenn dieser natürliche Zellreparatur-Mechanismus gestört oder überfordert können kosmetische oder pharmazeutische Wirkstoffen eine Lösung sein. In jüngster Vergangenheit wurde eine neue Klasse solcher Zell-reparierender und schützender Substanzen identifiziert. Gefunden wurden sie u. a. dort, wo deren Eigenschaften von lebensnotwendiger Bedeutung sind – in Organismen die unter extremen Bedingungen wie z. B. in den Salzseen der Wadi Natrun Wüste (Abb. 1) in Ägypten existieren.

G. Betz, **In Vivo Comparison of Various Liposomal Formulations for Cosmetic Application**, IcoS, June 2007, Istanbul Türkiye, p. 14-16

Liposomal formulations have been used for skin moisturization, due to the occlusive effect of a phospholipid film deposited on the skin surface. Furthermore, interactions between liposoal lipids and Stratum corneum lipids may affect positively the structure of the Stratum corneum. Phospholipids themselves are hygroscopic and bind water.

G. Maaß, **Anwendungsstudie der sebamed TROCKENE HAUT Produkte bei Kindern mit atopischem Ekzem**, Kosmetische Medizin 6/2007, S. 288-290

Es erfolgte in einer vierwöchigen Anwendungsuntersuchung eine klinische Überprüfung der sebamed TROCKENE HAUT Pflegeprodukte – Waschlotion, Pflegelotion, Tagescreme und Nachtcreme – bei Kindern mit atopischem Ekzem anhand von quantitativen Meßgrößen, von klinischen Befundurteilen sowie von qualitativen Beurteilungen der Pflegewirkungen.

University of Basel, Inst. of Pharmaceutical Technology, **In Vivo Comparison of Various Liposomal Formulations for Cosmetic Application**, 7th Int. Cosmetic Symposium (IcoS), 20-22 June 2007, Istanbul Türkiye

Liposomal formulations hae been used for skin moisturization, due to the occlusive effect of a phospholipid film deposited on the skin surface. Furthermore, interactions between liposomal lipids and Stratum corneum lipids may affect positively the structure of the Stratum corneum. Phospholipids themselves are hygroscopic and bin water.

G. Khazaka, **Useful and practical advice by measuring TEWL and skin moisture with Corneometer® CM 825 and Tewameter® TM 300**, The Journal of Skin Barrier Research

The Skin bioengineering measurement of skin hydration and transepidermal water loss is a useful tool to evaluate the physicochemical status of skin. As integrated skin barrier function is also derived from the interaction between subject and surrounding environment, the bioengineering measurement technique has been evolved to predict the dynamic aspect of skin biology.

G. Feller-Heppt, C. Wagner, S. Ugurel, **Wirksamkeit und Patientenzufriedenheit verschiedener Pflegecremes bei Atopikern und Neurodermitispatienten im erscheinungsfreien Intervall**, Kosmetische Medizin 5/2007, S. 28-34

Bei Neurodermitispatienten stehen vor allem die Symptome trockene Haut und ausgeprägter Juckreiz im Vordergrund. Hierdurch kommt es zu vermehrtem Kratzen und nachfolgend möglicherweise zum Eintritt infektiöser Erreger bei gestörter Hautbarrierefunktion und gestörter zellulärer Immunität. Ein neuer Ekzemschub kann entstehen und den Juckreiz noch verstärken.

H. Fujita, T. Hirao, M. Takahashi, **A Simple and non-invasive visualization for assessment of carbonylated protein in the stratum corneum,** Skin Research and Technology 2007, p. 84-90

Stratum corneum (SC) ist the interface of body and environment and is continuously exposed to oxidative stress, resulting in oxidative modification of proteins. Consequent carbonylated proteins (CPs) have so far been labelled with 2,4-dinitrophenyl (DNP) hydrazine and subsequently detected with anti-DNP antibody.

U. Eich, **Thermische Verletzungen im Kindes- und Jugendalter,** Dissertation Universität zu Lübeck 06.06.2007

Einführung**:** Jedes Jahr verunglücken circa 7100 Kinder im Alter von 0 bis 20 Jahren durch thermische Unfälle, sodass sie stationär in einem der 44 Betten für Kinder in einem Schwerbrandverletztenzentrum in Deutschland behandelt werden müssen[86]. Thermische Verletzungen entstehen im Kleinkind- und Vorschulalter vorwiegend (etwa 85%) in Form von Verbrühungen, d.h. bei Kontakt mit heißen Flüssigkeiten[18, 20, 84]. Der Inhalt einer Tasse mit heißem Wasser genügt, um bis zu 30% der Körperoberfläche eines Säuglings- oder Kleinkindes zu verbrühen[27]. Verbrennungen treten hingegen häufiger bei Schulkindern auf und werden vornehmlich durch Hausbrände, Grillunfälle und Experimentieren mit dem Feuer hervorgerufen[11, 43, 62]. Bei circa 3000 Kindern verbleiben nach der Therapie einschränkende Narben[43, 62]. Diese sind häufig hypertroph, verursachen Schmerzen und Juckreiz und können zu funktionellen Einschränkungen führen[32]. Gut sichtbare Narben, insbesondere an Gesicht und Händen, können zudem auch psychosoziale Probleme im Leben der Kinder nach dem Unfall hervorrufen[51].

K. Shimada, K. Awai, H. Irie, **Ceramide Polymer improves skin texture**, Personal Care, May 2007, p. 47-50

Anti-ageing cosmetics are increasingly demanded today. Many consumers, especially women, care about keeping their skin young by controlling wrinkles and freckles and keeping their skin soft, firm, smooth and beautifully white. Ingredients for controlling the ageing of the skin are demanded and are actively studied.

M. Kerscher, T. Reuther, G. Schramm, **Chlormadinonacetat enthaltende Mikropille verbessert unreine Haut**, Frauenarzt 48 (2007), Nr. 4, S. 373-378

Moderne Mikropillen zeichnen sich besonders durch eine Reihe von Zusatznutzen aus. Den wichtigsten stellt die Verbesserung des Hautbildes dar. Für die Chlormadinonacetat-haltige Mikropille Belara wurde in klinischen, kontrollierten Studien bei leichter bis mittelschwerer Akne die Überlegenheit im Vergleich zu einer Levonorgestrel-haltigen Mikropille und zu Plazebo nachgewiesen

C. Rosado, P. Pinto, L.M. Rodrigues, **Comparative assessment of the performance of two generations of Tewameter: TM210 and TM300**, Blackwell Synergy, Int J Cosmet Sci, Volume 27, Issue 4, p. 237ff

The mesurement of transepidermal water loss (TEWL) has been established as one of the main parameters in the assessment of skin barrier function. One of the most widely employed devices to measure TEWL is the Tewameter. Courage and Khazaka launched the TM300 in 2003 and successfully eliminated some of the limitations of the previous model.

T. Yoshihara, K. Shimada, Y. Momoi, K. Konno, T. Wasaki, **A new method of measuning the Transepidermal Water Loss (TEWL) of dog skin,** J. Vet. Med. Sci. 69(3), 2007

Abstract: Human skin barrier funktion is evaluated by measuring transepidermal water loss (TEWL). However, this conventional method has not been applied to assess canin skin barrier function because the equipment is not suitable for dogs due to the effects of eir turbulence resulting movement of the subject and vapor from the subject`s hair coat. The TEWL analyzer CC-01 was developed as a closed-chamber method device; this means that instead of using the open-chamber method, it has a vantiilated chamber that uses dry air. TEWL value s measured by CC-01 show less variability than those measured by the convetional method. An ambient temperature of 20-26°C is optimal for measurement with the CC-01, and humidity affects the length of measurement but not the values. The CC-01 may be more reliable for measuremnet of TEWL than the conventional methods and may give new insights in the evaluation of skin barrier function in dogs.

P.J. Dykes, **The effect of adhesive dressing edges on cutaneous irritancy and skin barrier function,** Jornal of Wound Care, Vol 16, No 3, March 2007

Objective: To assess the effect of repeated application and removal of adhesive edges from woundcare products on cutaneous irritancy and barrier function in normal volunteer subjects. Method: This was a study using a 'repeat-insult patch test'. Adhesive edges from six commonly used wound-care products were applied continuously to the same site (six applications over a 14-day period) in 30 normal volunteer subjects.The test sites were assessed clinically before product reapplication using established ranking scales for cutaneous erythema.The cumulative irritancy score (CIS) for each test site was determined by adding the erythema scores at days 3,5,8, 10, 12 and 15. At the study end the barrier function of each test site was assessed by measuring transepidermal water loss (TEWL). Results: The CIS showed that the products fall into two distinct groups, with Mepilex,Tielle and Allevyn giving low scores and Biatain, Comfeel and DuoDERM higher scores. Statistical analysis indicated significant differences ($p<0.05$) between Mepilex and Biatain, Mepilex and Comfeel, Mepilex and DuoDERM,Tielle and Biatain,Allevyn and Biatain. The mean TEWL values also indicated that the products fall into two distinct groups: Mepilex,Tielle and Allevyn with low mean values close to that of normal adjacent back skin and Biatain, Comfeel and DuoDERM with much higher mean values. Statistical analysis indicated that Mepilex, Tielle and Allevyn were not significantly different from normal skin ($p<0.05$), whereas Biatain, Comfeel and DuoDERM were significantly higher than normal skin and *tHe* other products tested. Conclusion: The results show clear differences between products; the clinical scores and TEWL measurements indicate that the products fall into two distinct groups.This novel approach seems able to discriminate between adhesive borders and may be useful during product development and in selecting products for clinical trials.

H. Zhai, E. Dika, M. Goldovsky, H.I. Maibach, **Tape-stripping method in man: comparison of evaporimetric methods,** Skin Research and Technology 2007, p. 207-210

If the occlusion time of a closed chamber evaporimeter on the skin is too long, saturation might occur. We previously compared an open chamber and a closed chamber device on healthy volunteers. Comparable data on stripped skin with higher evaporation rates are not available.

J. Fluhr, **What's Wrong with the Barrier,** Dermatologie in Beruf und Umwelt, Jahrgang 55, Nr. 2/2007, p. 67

Irritant contact dermatitis is frequently observed not only in occupational dermatology but also in the context of atopic dermatitis and under house-hold conditions. Functional analysis of epidermal barrier-related parameters are performed using non-invasive instruments, based on biophysical measurements

E. Berardesca, **Bioengineering as a Tool in Occupational Dermatology,** Dermatologie in Beruf und Umwelt, Jahrgang 55, Nr. 2/2007, p. 67

Bioengineering techniques have been proven to be helpful in monitoring changes in skin physiology and quantifying skin disease. Detection of subliminal or non visual changes is a challenge in order to predict potentially pathological conditions such as irritation or pre-clinical dermatitis.

W. Gehring, **New Concept of Skin Protection after Occlusion and Wet Work,** Dermatologie in Beruf und Umwelt, Jahrgang 55, Nr. 2/2007, p. 89

Occlusion and wet work induce barrier damage, increasing the risk for the development of contact dermatitis. The use of adstringent agents before exposure to the noxious conditions does not always provide sufficient protection.

R. Muggli, **Systemic Evening Primrose Oil for Irritated Skin Care,** Cosmetics & Toiletries magazine, Vol. 122, No. 2/February 2007

Dry skin is a common complaint from men and women alike and its incidence and severity increase with age. This condition is the result of an impaired barrier function, increased transepidermal water loss (TEWL) and a significantly lower level of ceramides in the horny layer that causes the skin to lose an excessive amount of water.

M. Miteva, S. Richter, P. Elsner, J.W. Fluhr, **Approaches for optimizing the calibration standard of Tewameter TM 300**, Exp Dermatol 2006: 15: 904–912, 2006 The Authors Journal Compilation Blackwell Munksgaard

Abstract: Calibration of devices measuring transepidermal water loss (TEWL) is in intensive discussion. Comparative studies revealed that comparable measuring systems, e.g. open and closed chamber systems, do not always deliver the same results, even when expressing the measured values in SI units, namely in g/m2/h. Therefore, adequate and reliable calibration procedures need to be established. We were able to test the reliability of a multi-step calibration algorithm for an open chamber system such as Tewameter TM 300. In order to achieve reliable measurements, the maintenance of stable microclimate conditions without air turbulences is mandatory. The TEWL values should be compared with those determined gravimetrically on heated skin simulators. The reproducibility of the results is warranted by consecutive measurements on different adjacent spots of a defined area. Preheating of the probe sensors is an effective approach for shortening the measuring time and gaining a rapid steady-state. The accurate calibration of the probe can be checked under laboratory conditions any time. The critical point of the calibration and ultimately the accuracy of in vivo measurements maintain the steady functional capacity of the probes during the entire duration of continuous studies. The studied calibration procedure ensures these requirements.

E. Houben, K. de Paepe, V. Rogiers, **Skin condition associated with intensive use of alcoholic gels for hand disinfection: a combination of biophysical and sensorial data**, Contact Dermatitis 2006: 54, p. 261-267

Hand hygiene of healthcare workers (HCWs) is of major concern to avoid nosocomial infections (1-4). Therefore, hospitalwide infection control programmes prescribe disinfection of the hands after each patient contact (5, 6).

G. Kutz, C. Bruns, S. Hennig, M. Enga, **Current ingredients in semi-solid formulations and their effects on skin hydration, transepidermal water loss and water resistance**, Life Science Technologies – Pharmaceutical Engineering, Fachhochschule Lippe und Höxter, Germany, 2006, Poster Presentation

A series of factors like excessive treatment with detergents or organic solvents, UV irradiation as well as low humidity are known to damage skin. Frequent barrier malfunction is due to a reduced amount of lipids.

Beurteilung von frühkindlichen Verbrennungen – Objektivität optimiert Therapie; aesthetic

Tribune, Ausgabe 8, Dezember 2006

Die Beurteilung von Narben erfolgt im Allgemeinen visuell und palpatorisch durch den Arzt. Darin liegt allerdings auch ein grosses Fehlerpotential begraben, da jeder Untersucher die Narbe subjektiv eurteilt. Was leistet die objektive Einschätzung mittels Apparaten? Zur Beurteilung von Narben hat sich die Vancouver Scar Scale (VSS) etabliert. Mit ihr werden Hautrötung, Pigmentierung, Erhabenheit und Elastizität beurteilt. Allerdings spielen hier zahlreiche subjektive Einflussfakoren durch den Untersucher mit, sodass diese Methode insbesondere den wissenschaftlichen Ansprüchen nicht genügt. Dr. Jörn Lohmeyer von der Plastischen, Hand- und Wiederherstellungschriurgie und Intensivstation für Schwerbrandverletzte in Lübeck stellte Methoden vor, Narben nach frühkindlichen Verbrennungsunfällen mit objektiven Kriterien zu beurteilen.

F. Tokumura, Y. Yoshihura, T. Homma, H. Nukatsuka, **Regional differences in adhesive tape stripping of human skin,** Skin Research and Technology 2006, 12, p. 178-182

Medical pressure-sensitive adhesive tapes are applied to various regions of the human body for many purposes. Although some adhesive tapes are designed for a specific purpose and applied to a single region, such as first-aid bandages for the fingers and a variety of adhesive pads for foot-care, a large number of adhesive tapes are applied to various regions.

S. M. Fuchs, C. Heinemann, S. Schliemann-Willers, H. Härtl, J.W. Fluhr, P. Elsner, **Assessment of anti-inflammatory activity of *Poria cocos* in sodium lauryl sulphate-induced irritant contact dermatitis**, Skin Research and Technology 2006, 12, p. 223-227

A great number of compounds is available for the treatment of inflammatory skin diseases like atopic dermatitis (1), dermatitis solaris or psoriasis (2), the most effective external anti-inflammatory compounds being glucocorticoids. Their side effects (3) have motivated a continuing search for other therapeutical compounds, and fungal metabolites like *Poria cocos* (PoCo) have figured in the literature. The present study was designed to evaluate the anti-inflammatory efficacy of PoCo extracts against experimentally induced irritant contact dermatitis (ICD) in a non-invasive human *in vivo* model with different parameters.

J. Ishikawa, H. Narita, N. Kondo, Y. Takagi, Y. Masukawa, T. Kitahara, **Regional Analysis of Ceramides within the Human Stratum Corneum by Normal Phase Liquid Chromatography Electrospray Ionization Mass Spectrometry**, Oral Presentation on the 24th IFSCC Congress, Osaka, Oct. 2006

Ceramides (CERs) are the major component of the stratum corneum (SC), accounting for 30-40% of SC lipids by weight. SC CERs, together with cholesterol and fatty acids, form extracellular lamellae that are responsible for the epidermal permeability barrier. Previous studies reported decreases of SC CERs in atopic dermatitis patients, who have low cutaneous barrier function. Such alterations of CER contents may be responsible for the impaired water-barrier function of the skin in atopic dermatitis.

C. Katagiri, J. Nakanishi, T. Hibino, **Identification of a Regulatory Molecule in Keratinocyte Denucleation and its Relevance to Barrier Disruption**, Oral Presentation on the 24th IFSCC Congress, Osaka, Oct. 2006

The terminal differentiation of keratinocytes results in the formation of stratum corneum, that serves as a protective barrier against hazardous environments. During the transition phase from granular to cornified cells, keratinocytes lose their nuclei to form the cornified layer, a crucial step in completing differentiation and to invoke subsequent physiological functions. Disordered differentiation frequently leads to the persistent presence of nuclei in the cornified layers, a condition known as parakeratosis that seriously disrupts the barrier function of the skin. This study is aimed at elucidating the mechanisms of keratinocyte denucleation and its disorder, parakeratosis.

M. Miwa, N. Nakajima, T. Hirose, Y. Iwasaki, A. Murakami, M. Matsunaga, K. Watanabe, **Age distribution of transepithelial water loss in human nasal mucosa**, Arerugi. 2006 Oct;55(10): p. 1337-9, (Article in Japanese)

Background: Dry nose is a common complaint in the elderly. Methods: Age distribution of transepithelial water loss of human nasal mucosa (TEWL) value was evaluated in this study. Eighty-eight volunteers (50 men and 30 women) ranging from 10 to 75 years old were recruited for this study. Measurement of TEWL was performed on the inferior nasal turbinate. TEWL was measured with an evaporation meter applying Fick's law (Tewameter TM 300; Courage and Khazaka, Cologne, Germany). Results: TEWL value tends to increase in order of age, indicating that the barrier function of epithelium may decline with age. Conclusion: The measurement of transepithelial water loss should be contributed to assess the efficiency of nasal mucosal barrier disorders in the elderly.

M. Miteva, S. Richter, P. Elsner, J.W. Fluhr; **Approches for optimizing the calibration standard of Tewameter TM 300,** Experimental Dermatology 2006, p. 904–912

Calibration of devices measuring transepidermal water loss (TEWL) is in intensive discussion. Comparative studies revealed that comparable measuring systems, e.g. open and closed chamber systems, do not always deliver the same results.

J.W. Fluhr, K.R. Feingold, P.M. Elias, **Transepidermal water loss reflects permeability barrier status: validation in human and rodent in vivo and ex vivo models,** Experimental Dermatology 2006, p 483 – 492

Permeability barrier function is measured with instruments that assess transepidermal water loss (TEWL), either with closed- or open-loop-systems. Yet, the validitiy of TEWL as a measure of barrier status has been questioned recently.

C. Mas-Chamberlin, P. Mondon, F. Lamy, K. Lintner, **Potential preventive performance**, SPC, June 2006, p. 38-40

It is not easy to measure the preventive efficacy of skin care products, but Claire Mas-Chamberlin, Philippe Mondon, Francois Lamy, Karl Lintner, Claire Jossan and Frederique Girard report on an accelerated skin ageing-type process used to investigate active efficacy.

U. Wollina, J. Kubicki, **Dexpanthenol supports healing of superficial wounds and injuries**, Kosmetische Medizin 5+6/2006, p. 240-249

Oberflächliche Hautverletzungen und Wunden sind häufig. Unter Einsatz eines Spektrums verschiedener In-vivo-Modelle der epidermalen Barrierestörung und der Wundsetzung untersuchten wir das Potential der topischen Dexpanthenol-Anwendung in der Förderung der epidermalen Regeneration und der Wundheilung.

*B.-I. Bettzüge-Pfaff, H. Prieur***, Nutzen einer adjuvanten Basiscreme bei trockener, atopischer Haut,** Kosmetische Medizin 5+6/2006, p. 261-263

Im Rahmen eines dermatologisch kontrollierten Anwendungstests und hautphysiologischer Messungen an Patienten mit atopischem Ekzem hat sich eine lipidreiche Basiscreme auch bei Kindern als effektive und gut verträgliche Formulierung erwiesen. Nach Anwendung der Creme wurde eine Steigerung der Hautfeuchtigkeit und Hautfettung sowie eine Verbesserung der Hautbarrierefunktionen erreicht.

H. Heinrich, B. Garbe, H. Tronnier, M. Béjot, J.M. Mauretta, **Supplementation with Nutritional Cartilage Extract Positively Influences Skin Hydration, Skin Barrier and Skin Structure: A Double-Blind, Randomized, Placebo-Controlled Study,** IFSCC Magazine, Vol. 9, No. 4/2006, p. 319-323

The aim of the study was to evaluate the efficacy of polysaccharides from fish cartilage with regard to their skin aging properties. An application test was carried out during the intake of cartilage tablets as a nutrinional supplement.

Experiment „SkinCare“ auf der Raumstation: Hautphysiologische Messungen in Schwerelosigkeit, Newsletter #1/2006, Raumstation: Fachinformationsdienst zur Nutzung der Internationalen Raumstation, April 2006, p. 10

Im Rahmen der geplanten europäischen ISS-Langzeitmission von Juli bis Dezember 2006 sollten erstmals systematisch physiologische Parameter der menschlichen Haut bei einem längeren Aufenthalt in Schwerelosigkeit erfasst werden. Dabei erlaubt der Einsatz moderner nicht-invasiver Messverfahren, durch die Bestimmung von Parametern wie Feuchtigkeit, Barrierefunktion und Mikrostruktur, den physiologischen Hautzustand exakt zu charakterisieren.

Reevaluation of the importance of Barrier Dysfunction in the Nonlesional Dry Skin of Atopic Dermatitis Patients through the use of two barrier creams, Karger 09.03.2006

Background: Atomic dermatitis (AD) can be considered a barrier disease in which antigens and irritations that can easily penetrate clinically normal, nonlesional skin due to its defective barrier function trigger and worsen the dermatitis. Thus, repleneshing the barrier function in clinically normal, nonlesional skin of patients with AD seems to be a key for preventing the refractory nature of the dermatitis.

H. Matsuki, K. Kiyokane, T. Matsuki, S. Sato, G. Imokawa, **Recharacterization of the Nonlesional Dry Skin in Atopic Dermatitis through Disrupted Barrier Function**, Exogenous Dermatology, March 2006

The etiology of the nonlesional dry and barrier-disrupted skin of patients with atopic dermatitis (AD) is still unclear. Objective: To determine whether disrupted barrier function in the nonlesional skin is associated with inflammatory or postinflammatory events, which are relevant to the severity of AD or local dry skin properties, respectively.

H. Matsuki, K. Kiyokane, T. Matsuki, S. Sato, G. Imokawa, **Reevaluation of the Importance of Barrier Dysfunction in the Nonlesional Dry Skin of Atopic Dermatitis Patients through the Use of Two Barrier Creams,** Exogenous Dermatology, March 2006

Atopic dermatitis (AD) can be considered a barrier disease in which antigens and irritants that can easily penetrate clinically normal, nonlesional skin due to its defective barrier function trigger and worsen the dermatitis.

C.M. Weimer, **Irritation durch Waschen und Desinfizieren,** Digitale Bibliothek der Universität Marburg, 2006

Ziel dieser Studie war die Irritaion der Haut, hervorgerufen durch alkoholische Desinfektionsmittel und das Detergens Natriumlaurylsulfat (0,5% NLS) in einem repetitiven Testdesign zu untersuchen. Mittels nicht invasiver Untersuchungsmethoden quantifizierten wir die irritativen Effekte von Sterillium, 2-Propanol 45% v/v, 1-Propanol 30% v/v, welches die alkoholische Grundlage von Sterillium darstellt sowie von Wasser und NLS 0,5%.

D. Seiler, **Untersuchung der Wirksamkeit von Pflanzenextrakten im Natrium-LaurylsulfatIrritanzientest,** Dissertation der Medizinischen Fakultät der Albert-Ludwigs-Universität Freiburg im Breisgau, Germany, 2006

Die Anwendung von Pflanzen in der Dermatologie geht auf eine lange Geschichte zurück und gewinnt in der heutigen Zeit wieder zunehmend an Bedeutung. Gerade im Bereich der Behandlung von entzündlichen Hauterkrankungen wächst das Interesse an Alternativen zu den Standardtherapeutika wie beispielsweise Kortikoiden. Um solche Alternativen auf ihre Wirksamkeit zu prüfen, bieten sich epikutane Testmodelle an. Sie haben folgende Gestaltung: Ein Irritans reizt gezielt ein Hautareal, so dass dort eine umschriebene Entzündung entsteht. Diese wird regelmäßig mit der Prüfsubstanz behandelt. Gleichzeitig werden Messparameter, die mit der Inflammation der Testareale korrelieren, in ihrem Verlauf beobachtet und beurteilt. So können die Prüfsubstanzen auf eine mögliche antientzündliche Wirkung getestet werden. In der Dermatologie anerkannte Epikutantest-Modelle sind z.B. der UV-Erythem-Test, bei dem UV-Strahlen die Haut irritieren, und der Natrium-Laurylsulfat-Irritanzientest (NLS-Test), bei dem das Detergens Natrium-Laurylsulfat (NLS) die Entzündung hervorruft. In zwei vorangegangenen Studien der Universitäts-Hautklinik Freiburg von Schempp und Mitarbeitern wurden bereits verschiedene Pflanzenextrakte und in der Praxis verwendete Standardprodukte im UV-Erythem-Modell untersucht [Kessler 2004; Hornstein 2004; Jocher 2005]. Hier zeigten einige Pflanzenextrakte, wie z.B. Salbei und Tormentilla, gute Effekte, die z.T. mit denen der Standardprodukte, beispielsweise Hydrokortison, vergleichbar waren [Hornstein 2004; Jocher 2005]. Aufgrund dieser Ergebnisse scheint die Nutzung einiger Pflanzenextrakte in der Dermatologie möglich und soll in dieser Studie mit dem NLS-Test weiter untersucht werden.

M. Schunck, C. Neumann, E. Proksch, **Artificial Barrier Repair in Wounds by Semi-Occlusive Foils Reduced Wound Contraction and Enhanced Cell Migration and Reepithelization in Mouse Skin**, J Invest Dermatol 125: p. 1063 –1071, 2005

The repair of the permeability barrier to prevent the entry of harmful substances into the body is a goal in wound healing. Semi-occlusive foils, which provide an artificial barrier, are commonly used for the treatment of wounds. We examined the effects of foils on wound contraction, cell migration, and reepithelization. Full-thickness skin wounds in mice were covered with occlusive latex foils or semi-occlusive water vapor-permeable hydrocolloid foils for either the entire, the first half, or the second half of the wound-healing period. We found that application of foils for the entire healing period initially reduced wound healing during the first week of treatment, whereas healing was enhanced during the second week. Foils were found to reduce wound contraction, but enhanced reepithelization during the second week of wound healing because of increased proliferation and migration of keratinocytes. These effects were also noted when the hydrocolloid foils were applied for the second part of the healing period, only. The fully occlusive latex foil led to irritation of the skin, whereas less irritation occurred under semi-occlusive conditions. In summary, we found that artificial barrier repair with semi-occlusive foils in wounds reduced wound contraction and enhanced cell migration and reepithelization without irritation.

W. Rungsima, S. Apichati, T.Papapit, **Transepidermal water loss, hydration, pH and elasticity of skin in atopic dermatitis and normal Thai subjects**, Siriraj Medical Journal, 2005 Nov; 57(11): p. 486-490

In order to obtain objective data on skin functions in patients with atopic dermatitis (AD), we studied, by means of measurement of transepidermal water loss (TEWL), skin surface hydration, pH, and elasticity of dry and normal skin at the dorsum and volar aspects of the forearms in patients with atopic dermatitis compared with normal subjects. Transepidermal water loss (TEWL), skin surface hydration, pH, and elasticity function were measured using Tewameter TM 210, Corneometer CM 820, Skin-pH-meter pH 900, and Cutometer SEM 575, respectively. Forty-one subjects, twenty-five atopic dermatitis patients with dry skin, sixteen atopic dermatitis patients without dry skin, and twenty normal subjects, were recruited in the study. Considering all skin sites together, no significant differences were found between the mean values of TEWL in the same sites, the dorsum and volar forearms, of subjects in each group of patients ($p = 0.717$, and $p = 0.981$, respectively). Statistically, there were significant differences between the mean values of skin surface hydration at the dorsum and volar forearms ($p = 0.019$ and $p = 0.019$, respectively) and skin pH at the dorsum and volar forearms ($p = 0.036$ and $p = 0.043$, respectively). Regarding the elasticity function of the dorsum, immediate recovery and biological elasticity were significant differences in each group of the patients ($p = 0.048$ and $p = 0.019$, respectively), meanwhile, the elasticity function of the volar forearms, immediate recovery, elasticity index, elastic recovery index, viscoelastic ratio and relative elastic recovery were significant differences ($p = 0.014$, $p = 0.029$, $p < 0.001$, $p < 0.001$ and $p < 0.001$, respectively). Therefore, further wellcontrolled studies, investigating the skin morphology of patients with atopic dermatitis, should be pursued to provide more targeted therapies and establish an optimal standard of care for all patients with atopic dermatitis.

C. Rosado, P. Pinto, L.M. Rodrigues, **Comparative assessment of the performance of two generations of Tewameter®: TM210, TM300**, International Journal of Cosmetic Science. 2005. 27. p. 237-241

The measurement of transepidermal water loss (TEWL) has been established as one of the main parameters in the assessment of skin barrier function. One of the most widely employed devices to measure TEWL is the Tewameter®. Courage and Khazaka launched the TM300 in 2003 and successfully eliminated some of the limitations of the previous model.

D. Kowatzki, C. Machold, K. Krull, P. Elsner, J.W. Fluhr, **Regeneration kinetic of sweating, Stratum Corneum hydration, Surface pH, Sebum production and mechanical properties is not altered by regular sauna bathing,** Presentation on the ISBS Meeting 2005 in Philadelphia and Skin Research and Technology 2005, 11 (abstracts)

Wellness and especially sauna bathing are of growing interest in modern health care. The positive effect of sauna for general health is well documented. However, to our knowledge no controlled studies have been published on the effect of sauna on skin physiology.

J.W. Fluhr, M. Breternitz, M. Flach, P. Elsner, **Acute eperimentally induced barrier disruption by tape stripping is influenced by pressure, time and anatomical location: Integrity and Cohesion assessed by sequential tape stripping,** Presentation on the ISBS Meeting 2005 in Philadelphia and Skin Research and Technology 2005, 11 (abstracts)

Tape stripping is a well-known procedure in stratum corneum physiology research. Adhesive films are pressed to the surface of SC and then removed. The superficial layers of SC adhere on the film and are accessible for further investigations. Although this method is widely used, only few information about standardization are known.

L. Bankova, P. Kleesz, R. Grieshaber, P. Elsner, J.W. Fluhr, **Irritant potential of food additives: a bioengineering irritation study,** Presentation on the ISBS Meeting 2005 in Philadelphia and Skin Research and Technology 2005, 11 (Abstracts)

Goal of the study: To assess the skin irritant effects of food additives and the potential relevance for the development of irritant contact dermatitis. Methodoloy: The irritants (ascorbic acid, acetic acid and sodium hydroxide at different pH values) were applied to the skin of the mid-back of 19 volunteers twice daily for four days using and occlusive epicutaneous patch test system and in combinations with sodium lauryl sulfate (SLS).

C. Heinemann, C. Paschold, J.W. Fluhr, W. Wigger-Alberti, S. Schliemann-Willers, P. Elsner, **Induction of a hardening phenomenon by repeated application of SLS and subsequent analysis of the**

changes in the lipid composition of the stratum corneum, Presentation on the ISBS Meeting 2005 in Philadelphia and Skin Research and Technology 2005, 11 (abstracts)

The hardening phenomenon results from the adaptation of the skin to repeated influence of exogenous irritative noxes. This study focuses on the lipid composition on the stratum corneum before and after induction of a hardening phenomenon.

Y. Sunwoo, C. Chou, J. Takeshita, M. Murakami, Y. Tochihara, **Physiological and Subjective Responses to Low Relative Humidity,** Journal of Physiological Anthropology 2005; p. 7-14

In order to investigate the influence of low relative humidity, we measured saccharin clearance time (SCT), frequency of blinking, heart rate (HR), blood pressure, hydration state of skin, transepidermal water loss (TEWL), recovery sebum level and skin temperature as physiological responses. We asked subjects to judge thermal dryness and comfort sensations as subjective responses using a rating scale. Sixteen non-smoking healthy male students were selected. The pre-room conditions were maintained at an air temperature (Ta) of 25°C and a relative humidity (RH) of 50%. The test room conditions were adjusted to provide a Ta of 25°C and RH levels of 10%, 30% and 50%.

M. Fischer, C. Donath, J. Radke, W. C. Marsch, J. Soukup, **Skin function parameters in intensive-care patients**, Skin Research and Technology 11/05, p. 268-271

Intensive-care patients are at risk for organic failures. But there are hardly any results known for the skin barrier function of patients in intensive care. There are only studies of transepidermal water loss (TEWL) in premature infants (1,2). It was found that premature infants have an insufficient cutaneous barrier, which can be improved by bland local therapy (2).

C. Rosado, P. Pinto, L.M. Rodrigues, **Modeling TEWL-desorption curves: a new practical approach for the quantitative in vivo assessment of skin barrier**, Exp Dermatol 2005: 14: 386-390 Blackwell Munksgaard, 2005

The objective of the present study was to test the discriminative capacity of the mathematical modeling of the transepidermal water loss (TEWL) curves that result from a plastic occlusion stress test (POST) to variations in the skin barrier – insults inflicted to the skin or differences in two distinct anatomical regions. This study was exclusively performed in the arm. On the first part of the work, three different insults to the skin barrier were assessed: tape stripping, lipid extraction with ether: acetone, and skin-surface biopsy.

G. Primavera, J. W. Fluhr, E. Berardesca, **Standardization of Measurements and Guidelines**, Bioengineering of the Skin: Water and the Stratum Corneum, Second Edition, CRC Press 2005, p. 83-95

Measurement of transepidermal water loss (TEWL) is widely used to characterize the water barrier function of skin (both in physiological and pathological conditions), to perform predictive irritancy tests, and to evaluate the efficacy of therapeutic treatments on diseased skin. TEWL assessment can be performed using different techniques [1,2] (closed-chamber method, ventilated-chamber method, and open-chamber method).

I. Hütter, A. Behler, S. Cornelsen, **Vitamin of surfactants profiled,** Personal Care, Nov. 2005, pp. 45-47.

Natural alpha hydroxy acids (AHA) or so-called “fruit acids” such as citric, malic or glycolic acid, have been used for years in personal care applications. They are highly appreciated for their cosmetic benefits, such as anti-ageing and moisturising.

K. Damer, **Epidermale Permeabilitätsbarriere - Irritabilität und Regeneration in Abhängigkeit von psychischen Faktoren - Regeneration unter impermeablen und semipermeablen Handschuhmaterialien - Psychologische und hautphysiologische Untersuchungen**, Dissertation der Oniversität Osnabrück, Oktober 2005

Die vorliegende Arbeit wurde im Rahmen des interdisziplinären DFGGraduiertenkollegs „Integrative Kompetenzen und Wohlbefinden“ durchgeführt. Unter besonderer Berücksichtigung des interdisziplinären Anspruchs des Graduiertenkollegs wurden sowohl psychodermatologische als auch hautphysiologische Zusammenhänge untersucht. Es galt, die Verknüpfung psychologischer und naturwissenschaftlicher Aspekte innerhalb einer Untersuchung anzustreben.

J. Molinero, R. Ojeda, J. Coll, A. Mirada, C. Trullas, C. Pelejero, M. Sánchez Ragaña, **Clinical and bioengineering evaluation of the efficacy and safety of 30% urea cream in the treatment of hyperqueratotic skin disorders,** Presentation at the EADV London, Oct. 2005

Topical products with high concentrations of urea have been recently incorporated to dermatological vademecum. Urea, an active ingredient with a long history in dermatology has been extensively used in several skin diseases due to their moisturizing, desquamating, antiproliferative and antipruritic effect.

S. Savic, S. Tamburic, S. Vesic, G. Vuleta, C. Müller-Goymann, **Effect of Vehicle Composition on In vitro/ in vivo Hydrocortisone Penetration,** Presentation at the EADV London, Oct. 2005

Diffusion/penetration properties of locally applied drugs are affected by both the status of the stratum corneum (SC) and by the composition and colloidal structure of the vehicle.

H. Zhai, E. Dika, M. Goldovsky, H.I. Maibach, **Tape Stripping Method in Man: Comparison on Evaporimetric Methods,** Presentation at the EADV London, Oct. 2005

Transepidermal water loss (TEWL) documents integrity of stratum corneum (SC) water barrier function and is a sensitive indicator of skin water barrier alteration. Adhesive tape stripping is commonly used for investigating SC physiology, bioavailability and bioequivalence of topical drugs.

H. Tronnier, T. Dirschka, U. Heinrich, **Periorale Dermatitis (PD) – Eine kosmetisch relevante Dermatose,** Poster Presentation at the EADV London, Oct. 2005

Die periorale Dermatitis (PD) als Krankheitsentität ist 1964 von Mihan und Ayres erstmals in den USA beschrieben worden.

P.M.B.G. Maia Campos, M. D. Gianeti, G. M. S. Gonçalves, L. R. Gaspar, **Assessment of *in vitro* antioxidant and *in vivo* anti-ageing effects of cosmetic products containing vitamin C and its derivatives on human skin,** Presentation at the IFSCC in Florence 2005

The objective of this study was to determine the *in vitro* antioxidant activity of vitamin C (AA) and its derivatives, magnesium ascorbyl phosphate (MAP), ascorbyl tetra-isopalmitate (ATIP) as well as their *in vivo* anti-ageing effects by using Cutaneous Bioengineering Techniques on human skin. The study of antioxidant activity *in vitro* was made with an aqueous and a lipid system, the luminol-chemiluminescence, and malondialdehyde assay, respectively.

T. Tsuchiya, S. Haze, T. Hirao, J. Hosoi, A. Kikuchi, K. Shoji, M. Tanida, T. Tsuda, **Odorant Inhalation Lowered Stress Levels Systemically, Subsequently Resulting in the Improvement of Cutaneous Functions: Linkage Between Olfactory Sensation and Skin,** Presentation at the IFSCC Florence 2005

Our research conducted over several years has demonstrated that odorant inhalation produces an effect on cutaneous functions by inducing changes in the neuroendocrinological system. For example, inhalation of the natural sedative component of the rose flower, DMMB (1,3-dimethoxy-5-methylbenzene), inhibited an increase in plasma cortisol levels and barrier recovery delay or an increase in forehead sebum, which was induced by stress. These findings were obtained using authentic experimental patterned stress and short-period odorant inhalation.

N. Branco, I. Lee, H. Zhai, H.I. Maibach, **Long-term repetitive sodium lauryl sulfate-induced irritation of the skin: an in vivo study,** Contact Dermatitis 2005: 53: p. 278-284

Skin may adapt to topical irritants through accommodation. This study focuses on long-term exposure to irritants and attempts to demonstrate accommodation. Sodium lauryl sulfate (SLS) induced irritant contact dermatitis at 3 concentrations (0,025% to 0,075%).

M. Alberth, J. Nemes, **Protective Glasses and Dental Fear,** Poster (PPT)

For the patients' own safety, certain dental treatments require them to use protective glasses. Until recently wearing of glasses during dental treatment was not a generally accepted and widely used method in Hungary. In our study we wanted to find out whether this unusual circumstance has any effect on the children's dental fear, and what effect – if any – the lens color of the protective glasses makes.

S.M. Fuchs, S. Schliemann-Willers, T.W. Fischer, P. Elsner, **Protective effects of different marigold (Calendula officinalis L.) and rosemary cream preparations against sodium-lauryl-sulfate-induced irritant contact dermatitis**, Skin Pharmacol Physiol, Jul-Aug 2005;18(4): p. 195-200

In the present study, we evaluated the protective action of cream preparations containing seven different types of marigold and rosemary extracts in vivo in healthy volunteers with experimentally

induced irritant contact dermatitis (ICD). Marigold and rosemary extracts in base cream DAC (Deutscher Arzneimittel-Codex = German Pharmaceutical Codex) were tested in a 4-day repetitive irritation test using sodium lauryl sulfate. The effect was evaluated visually and quantified by noninvasive bioengineering methods, namely chromametry and tewametry. When the test products were applied parallel to the induction period of ICD, a statistically significant protective effect of all cream preparations was observed by all methods. This effect, although not statistically significant, was superior to control by undyed marigold und faradiol ester-enriched extracts in chromametry and by dyed and undyed rosemary extracts in tewametry. The sequential treatment (postirritation) once a day for 5 days was without any effect. Thus, a protective effect of some marigold and rosemary extracts against ICD could be shown in the elicitation phase.

A.S.G. Ansel, **Schadstoffe und Allergene in der Innenraumluft: Untersuchung zur Beeinflussung von Hautfunktion und allergologischer Reaktivität bei Patienten mit atopischem Ekzem,** Dissertation 2005 an der Technischen Universität München

Da sich besonders in den modernen westlichen Ländern ein starker Anstieg allergischer Erkrankungen verzeichnen lässt, werden insbesondere Umweltfaktoren als eine mögliche Ursache für die Zunahme der Allergien diskutiert. Ring [96] und der Rat von Sachverständigen für Umweltfragen [10] nennen als mögliche Gründe die Wirkung von Umweltverunreinigungen, die Zunahme von Aeroallergenen in Außen und Innenluftbereich, das Auftreten neuer Allergene, die geringere Stimulation des kindlichen Immunsystems (weniger Infektionen, Parasiten, Impfungen) und einen westlichen Lebensstil. In dem Gutachten wird außerdem darauf hingewiesen, dass die luftgetragenen Allergenträger des Innenraumes und der Außenluft die häufigsten und wichtigsten natürlichen Umweltfaktoren für die Auslösung und Unterhaltung atopischer Erkrankungen sind.

J.A. Tunggal, I. Helfrich, A. Schmitz, H. Schwarz, D. Günzel, M. Fromm, R. Kemler, T. Krieg, C.M. Niessen, **E-cadherin is essential for *in vivo* epidermal barrier function by regulating tight junctions,** The EMBO Journal, Vol. 24, No. 6/2005, p. 1146-1156

Cadherin adhesion molecules are key determinants of morphogenesis and tissue architecture. Nevertheless, the molecular mechanisms responsible for the morphogenetic contributions of cadherins remain poorly understood *in vivo*. Besides supporting cell–cell adhesion, cadherins can affect a wide range of cellular functions that include activation of cell signalling pathways, regulation of the cytoskeleton and control of cell polarity. To determine the role of E-cadherin in stratified epithelium of the epidermis, we have conditionally inactivated its gene in mice. Here we show that loss of E-cadherin in the epidermis *in vivo* results in perinatal death of mice due to the inability to retain a functional epidermal water barrier.

B. Gabard, **Testing the Efficacy of Moisturizers,** 2005 by CRC Press LLC

Among the beneficial properties claimed for dermatological and cosmetic productsm “moisturizing” is possibly the most widely used. This term has been coined after the now classic observations of Blank, who discovered the plasticizing effect of water in the stratum corneum (SC). A common skin surface disturbance, xerosis, or so-called dryness of the skin, is experienced by most persons at some time, by a few persons all the time, and by all individuals increasingly as they grow older. Thus, as consumers advance in age, concern about dry skin increases. In addition, moist, clean, soft, and wrinkle-free skin is perceived as youthful, and for this reason, moisturizers are widely used, and skin care with these products is regarded as a dominant growth area in cosmetics and toiletries.

M. Lodén, **Transepidermal Water Loss and Dry Skin,** 2005 by CRC Press LLC

The outer layer of the skin, the stratum corneum (SC), is produced by the basal layer in the epidermis. The SC consist of about 20 stacked layers of dry, flattened dead bodies of epidermal cells; the corneocytes. The protein-enriched corneocytes and the lipid-enriched intercellular domains make SC highly resistant to physical and chemical trauma.

C. Uhl, **Neue Wege in der Hautdiagnostik,** Kosmetische Praxis, Juni 2005

Der Einstieg in die professionelle Hautberatung ist stets das persönliche Gespräch mit dem Kunden. Dabei ist es entscheidend, neben der Beurteilung des optischen Eindrucks der Haut herauszufinden, welche individuellen Lebensgewohnheiten vorliegen. Genetische Disposition, Ernährung, Risikofaktoren wie Rauchen, Stress oder hoher Alkoholkonsum, sportliche Aktivitäten, Schlafverhalten und Alter beeinflussen entscheidend den Hautzustand und müssen daher in die Beratung mit einbezogen werden. Basis einer qualitativen und auf die Bedürfnisse des Kunden zugeschnittenen Körperkosmetik ist die Bestimmung des individuellen Hautzustands.
Diese Information ist unentbehrlich, um eine fundierte Hautberatung durchzuführen. Auf dieser

Diagnose soll der gesamte Pflegeplan aufgebaut werden, der essentiell für den Erfolg der Behandlung und damit für die Zufriedenheit der Kunden ist. Lesen Sie, welche Methoden es gibt und wie man vorgeht.

J.W. Fluhr, J. Praessler, A. Akengin, S.M. Fuchs, P. Kleesz, R. Grieshaber, P. Elsner, **Air flow at different temperatures increases sodium lauryl sulphate-induced barrier disruption and irritation in vivo**, Br J Dermatol, 2005 Jun; 152(6): p. 1228-1234

Background: Combined exposure to dry climatic conditions and local heat sources together with detergents represents a common workplace situation. These conditions may support the induction of chronic barrier disruption leading subsequently to irritant contact dermatitis (ICD). Objectives: To test the irritant and barrier disrupting properties of air flow at different temperatures and velocities. Methods: Using noninvasive biophysical measurements such as transepidermal water loss (TEWL) (TM 210; Courage & Khazaka, Cologne, Germany) we assessed the effects of short-term exposure to air flow at different temperatures (24 degrees C and 43 degrees C) in combination with sodium lauryl sulphate (SLS) 0.5% on the skin of 20 healthy volunteers in a tandem repeated irritation test. Chromametry was used to control the accuracy of the SLS irritation model. Results: In our study air flow alone did not lead to a significant increase in TEWL values. Sequential treatment with air flow and SLS led to an impairment of barrier function and irritation stronger than that produced by SLS alone. The two different air flow temperatures led to different skin temperatures but had no influence on permeability barrier function. Conclusions: Warm air flow has an additional effect on the SLS-induced barrier disruption in a tandem irritation test with sequential exposure to SLS/air flow. This combination is suspected to promote ICD in workplace and household situations, especially in short-term applications as tested in our model.

A. Bornkessel, M. Flach, M. Arens-Corell, P. Elsner, J. W. Fluhr, **Functional assessment of a washing emulsion for sensitive skin: mild impairment of stratum corneum hydration, pH, barrier function, lipid content, integrity and cohesion in a controlled washing test,** Skin Research and Technology, 2005-11, May, p. 53-60

Sensitive skin has been described as a skin type with higher reactivity than normal skin and exaggerated reactions to external irritants. Washing with soaps is harmful for barrier-related parameters.

K. de Paepe, E. Houben, R. Adam, F. Wiesemann, V. Rogiers, **Validation of the VapoMeter, a closed unventilated chamber system to assess transepidermal water loss vs. the open chamber Tewameter®,** Skin Research and Technology 2005-11, May, p. 61-69

The Stratum Corneum (SC) – the uppermost layer of the epidermis – contains the barrier function of the skin. Besides the proteinaceous hydrophilic corneocytes, this barrier consists of lipid-rich hydrophobic intercellular bilayers.

F. Tokumura, K. Umekaga, M. Sado, S. Otsuka, S. Suda, M. Taniguchi, A. Yamori, A. Nakamura, J. Kawai, K. Oka, **Skin irritation due to repetitive application of adhesive tape: the influence of adhesive strength and seasonal variability**, Skin Research and Technology 2005-11, May, p. 102-106

Medical pressure-sensitive adhesive tapes are applied to human skin in one of two ways, depending on their indication for use. Either they are replaced and applied on the same site every day, as is the case with traditional sticking plasters and surgical tapes, or they are pressed on to and remain on the skin for a few days when used at the site of the transdermal delivery of drugs.

G. Korinth, T. Göen, H. M. Koch, T. Merz, W. Uter, **Visible and subclinical skin changes in male and female dispatch department workers of newspaper printing plants**, Skin Research and Technology 2005-11, May, pp. 132-139.

Irritant hand dermatitis is one of the major occupational diseases. Approximately 90% of all cases of hand eczema are caused by occupational exposure. It is a well-established fact that wet work and skin exposure to detergents or solvents often trigger irritant contact dermatitis. Even water can be a skin irritant itself.

J.W. Fluhr, D. Kelterer, S. Fuchs, M. Kaatz, R. Grieshaber, P. Kleesz, P. Elsner, **Additive impairment of the barrier function and irritation by biogenic amines and sodium lauryl sulphate: a controlled in vivo tandem irritation study,** Skin Pharmacol Physiol, 2005 Mar-Apr;18(2): p. 88-97

Biogenic amines are potential irritants e.g. in fish-, meat-, milk- and egg-processing professions like cooks, butchers and bakers. The aim of this study was to test the irritative and barrier-disrupting properties of the biogenic amines ammonium hydroxide (AM), dimethylamine (DMA) and trimethylamine (TMA). A repeated sequential irritation of 30 min twice per day was performed over a total of 4 days

(tandem repeated irritation test) on the back of 20 healthy volunteers of both sexes with AM, DMA, TMA and sodium lauryl sulphate (SLS). The epidermal barrier function was assessed with a Tewameter TM 210, stratum corneum surface pH was measured with a Skin-pH-Meter 900, inflammation was assessed with a Chromameter CR-300 on the a* axis for redness and a visual score was recorded. All tested biogenic amines (AM, DMA and TMA) induced a barrier disruption and a pH increase paralleled with a 1-day-delayed onset of inflammatory signs. These effects were further enhanced and accelerated by a sequential application of SLS together with the biogenic amines, and inflammation occurred earlier than with the single compounds. Acetic acid (AA) in contrast did only show mild barrier disruption and no significant inflammatory signs. Our system allowed a ranking of the different compounds in their irritative potential in the tandem irritation with SLS: SLS > NaOH > TMA > AA > AM > DMA. The results are suggestive that in the food-processing industry the simultaneous contact with biogenic amines and harmful detergents like SLS should be minimized.

V. Brazarelli, T. Barbagallo, F. Prestinari, C. Rona, A. de Silvestri, V. Trevisan, G. Borroni, **Non-Invasive Evaluation of Tacalcitol plus PUVA Versus Tacacitol plus UVB-NB in the Treatment of Psoriasis: "Right-Left Intra-Individual - Pre/Post Comparison Design",** International Journal of Immunopathology and Pharmacology Vol. 18, No. 4, p. 755·760 (2005)

Photochemotherapy with psoralen plus ultraviolet A (PUVA) and phototherapy with UVB narrow band (UVB-NB) are used in the treatment of psoriasis. Numerous studies have shown that the additional administration of either topical or systemic antipsoriatic agents may effectively increase the efficacy of these therapies. This study aimed to compare through objective data the efficacy of topical tacalcitol in combination with PUVA or UVB-NB versus PUVA and UVB-NB monotherapy in the treatment of mild to moderate chronic plaque psoriasis. Modified Psoriasis Area and Severity Index (PAS!) score, transepidermal water loss (TEWL) and stratum corneum hydration were used to monitor the restoration of skin barrier in the psoriatic plaques of 40 patients during photochemotherapy. The study was a right-left, intra-individual, pre/post comparison trial. PUVAand UVB-NB treatments were given three times a week. On those plaques localized on the right side ofthe body tacalcitol ointment was applied once a day, in the evening. Corneometry, TEWL and modified PASI score were used to evaluate the response to the treatment at baseline, one month and two months. Thirty-six ofthe forty enrolled subjects completed the study. The comparison between combination treatments and the PUVAlUVB-NB monotherapy showed no significant differences with regard to modified PASI index. However, significant differences were recorded with regard to TEWL and corneometry. The combination oftacalcitol plus PUVAor tacalcitol plus UVB-NB restored epidermal barrier functions as well as skin hydration faster than PUVA or UVB-NB monotherapy (TEWL: p=O.0050 and corneometry: p=O.003). The combination of tacalcitol plus UVB-NB allowed a better restoration of skin barrier functions than tacalcitol plus PUVA (p=0.013). In conclusion, the combination of tacalcitol plus PUVA or plus UVB-NB improves the therapeutic result. In addition, the data from TEWL and skin hydration suggest a means in which tacalcitol plus UVB-NB induces a better normalization of skin biophysical parameters.

R. Debowska, K. Rogiewicz, T. Iwanenko, M. Kruszewski, I. Eris, **Folic Acid (Folacin) – New Application of a Cosmetic Ingredient**, Kosmetische Medizin 3/2005, p. 16-22

Many years of trials and research tests proved that a lot of well-known vitamins could be successfully used in cosmetology. The available data indicate that one of them – folic acid plays an important role in life process of mitotically active tissues and its deficiency increases background level of DNA damage.

K. Friebe, **Einfluß von Okklusionseffekten auf die Epikutantestung mit Natriumlaurylsulfat,** Dissertation an der Philipps-Universität Marburg, Germany, 24.02.2005

Zur Bestimmung der Hautempfindlichkeit werden Epikutantestungen mit dem Detergens Natriumlaurylsulfat (NLS) schon seit Jahren in der dermatologischen Diagnostik als Hautirritationstests eingesetzt. Eine klinische Relevanz besitzen diese Irritationstests für die chronisch-irritative Kontaktdermatitis, die zu den häufigsten Hauterkrankungen gehört. Bei der Bewertung der infolge der Testung auftretenden Hautreaktionen kommen neben der visuellen Beurteilung verschiedene nicht-invasive hautphysiologische Meßmethoden zum Einsatz, von denen die Messung des transepidermalen Wasserverlustes (TEWL) am aussagekräftigsten erscheint.

H. Drexler, **Hautbelastung, Hautbeanspruchung und Hautschutzverhalten bei Krankenpfelgeschüler(inne)n**, Institut u. Poliklinik für Arbeits-, -Sozial- und Umweltmedizin der Univers. Erlangen-Nürnberg

Fragestellung: Wie hoch ist die Inzidenz beruflich verursachter Dermatosen unter Berücksichtigung von Risikofaktoren, Exposition und Hautschutzverhalten bei Berufsanfängern in der Krankenpflege? Welche Parameter sind geeignet, die berufliche Belastung zu objektivieren?

"Symposium Medical – Für sie referiert", **Hautzustandsmessung als Präventionshilfe am Arbeitsplatz**, Symposium Medical 2004, S. 22

Während Augen, Ohren, Lunge und andere Organe, die am Arbeitsplatz Schadstoffen oder Belastungen ausgesetzt werden, in der Arbeitsmedizin schon seit vielen Jahren überwacht und gemessen werden, wird die Haut, die mit ca. 1,8 m² das größte menschliche Organ darstellt, vielfach außer Acht gelassen oder maximal visuell überprüft

F.H.W. Jungbauer, J.J. van der Harst, J.W. Groothoff, P.J. Coenraads, **Skin protection in nursing work: promoting the use of gloves and hand alcohol**, Contact Dermatitis 51, p. 153-140, 2004

Nursing has been indentified as a wet-work occupation, with a high prevalence of occupational irritant contact dermatitis. Reduction of exposure to skin irritants contributes to the prevention of occupational skin disease in nurses. The role of the use of soap and water, hand alcohol and gloves in prevention programmes is discussed.

H. Dickel, T.M. Bruckner, S.M. Erdmann, J.W. Fluhr, P.J. Frosch, J. Grabbe, H. Löffler, H.F. Merk, C. Pirker, H.J. Schwanitz, E. Weisshaar, J. Brasch, **The "strip" patch test: results of a multicentre study towards a standardization,** Arch Dermatol Res (2004) 296: 212-219, Springer Verlag

The „strip" patch test (SPT) is a variant of patch testing which is used for substances with a poor percutaneous penetration. Penetration of the substance is enhanced by repeated applications of adhesive tape prior to their application to the skin. However, no guidelines exist for standardized performance of the SPT.

U. Kappes, S. Schliemann-Willers, L. Bankova, C. Heinemann, T.W. Fischer, M. Ziemer, H. Schubert, J. Norgauer, J.W. Fluhr, P. Elsner, **The quality of human skin xenografts on SCID mice: a noninvasive bioengineering approach**, Br J Dermatol, 2004 Nov;151(5): p 971-976

Background: Animal models are important tools for studies in skin physiology and pathophysiology. Due to substantial differences in skin characteristics such as thickness and number of adnexa, the results of animal studies cannot always be directly transferred to the human situation. Therefore, transplantation of human skin on to SCID (severe combined immunodeficiency) mice might offer a promising tool to perform studies in viable human skin without the direct need for human volunteers. Objectives: To characterize the physiological and anatomical changes of a human skin transplant on a SCID animal host. Methods: In this study human skin was transplanted on to 32 SCID mice and followed for 6 months. Barrier function was assessed by transepidermal water loss (TEWL; tewametry) and moisture content of the stratumcorneum was studied by measurement of electrical capacitance (corneometry). Results: The results showed considerable deviations of TEWL values and skin hydration between the grafts and human skin in vivo. The human skin showed epidermal hyperkeratosis and moderate sclerosis of the corium 4 and 6 months after transplantation on to SCID mice. Conclusions: Our results indicate that human skin does not completely preserve its physiological and morphological properties after transplantation on to SCID mice. Therefore, results from experiments using this model system need to be discussed cautiously.

V. Nikolai, K. Quecke, **Beobachtungen zur Feuchtigkeitsregulation am Pferdehuf mittels TEWL-Messung**, Der praktische Tierarzt 85, Heft 11, S. 816-819, 2004

Die Hornqualität des Pferdehufes wird sowohl in Fachkreisen als auch von Laien oftmals anhand des Feuchtigkeitsgehaltes des Hornes beurteilt. Aussagekräftige Messungen des tatsächlichen Feuchtigkeitsgehaltes liegen jedoch noch nicht vor. Vielmehr wird lediglich eine grobsinnliche Beurteilung des Hufhornes durchgeführt. Unter Einsatz eines aus der Humandermatologie stammenden Gerätes zur Bestimmung des transepidermalen Wasserverlustes wurde eine praktikable Methode zur indirekten Erfassung des Feuchtigkeitsgehaltes von Hufhorn erprobt.

S. Savic, S. Tamburic, M. Savic, N. Cekic, J. Milic, G. Valuta, **Vehicle-controlled effect of urea on normal and SLS-irritated skin**, International Journal of Pharmaceutics, Oct. 2004

It is known that, depending on the concentration, treatment with urea could improve skin barrier function, despite its penetration-enhancing properties. This controversial skin effect of urea has been explored systematically in this study in terms of the effect of vehicle on the performance of urea. In the first part, a series of four semi-solid emulsions with 5% (w/w) urea, varying in the type of emulsion,

nature of emulsifier and polarity of oil ingredients, have been evaluated with regard to their skin hydrating and transepidermal water loss (TEWL)-modifying properties.

H. Shibayama, H. Indo, K. Ueda, K. Yoshio, Y. Kook Choi, Y. Ishigami, M.S. Yang, D.S. Lim, G.Y. Lee, S.S. Lee, **New Derivatives of Supiculisporic Acid as Biosurfactants and Application for Cosmetics,** IFSCC Orlando USA, 2004

It is well known that some microorganisms produce surface-active substances on cultural conditions.

G. Vielhaber, J. Ley, O. Koch, **N-Palmityl-4-Hydroxy-L-Proline Palmityl Ester: A Ceramide Analogue that provides efficient skin barrier repair,** IFSCC Orlando 2004, Podium Proceedings

The epidermal permeability barrier protects the skin against uncontrolled water loss and environmental damage. It is located in the horny layer and consists of a compact lipid matrix of ceramides, fatty acids and cholesterol embedded between the corneocytes.

B.M. Morrison, M. Paye, V. Charbonnier, H.I. Maibach, **The Effect Of Surfactants On Skin As Measured By Squamometry : A Sensitive Way To Observe Sub-Clinical Irritant Dermatitis**, IFSCC Orlando 2004, Podium Proceedings

In order to define the early parameters of surfactant induced skin dryness, an exaggerated hand washing model has been chosen to assess the effects of three surfactants, SLS, SLES, and AOS on stratum corneum function as measured visually, instrumentally, and through Squamometry. These three surfactant solutions were compared to their water controls.

H. Lambers, S. Piessens, A. Bloem, H. Pronk, P. Finkel, E. Voss, **Natural skin surface pH is on average below 5, which is beneficial for its resident flora,** Skin Research and Technology 10, Abstracts, 2004

The acidic surface pH as well as the pH gradient over the gradient over the stratum corneum (SC) are important for a good skin condition, supporting optimal structure and function of the lipid barrier and SC homeostasis.

*M. Gloor, B. Senger, M. Langenauer, J. W. Fluhr***, On the course of the irritant reaction after irritation with sodium lauryl sulphate**, Skin Reserach and Technology 2004, 10, p. 144-148

The sodium lauryl sulphate (SLS) irritation test is a well-established model for irritant contact dermatitis after the effects of surfactants. The course of changes in corneometric measurements (stratum corneum hydration), in transepidermal water loss (TEWL), in laser Doppler measurements (epidermal perfusion) and in colorimetric measurements (skin redness), after a single SLS irritation, should be studied over time.

P.M. van Kemenade, M.M.J. Houben, J.M. Huyghe, *L.F.A. Douven,* **Do osmotic forces play a role in the uptake of water by human skin?**, Skin Research and Technology 2004 10, p. 109-112.

Background/Purpose: To describe the water and ion transport through the skin under different conditions, we developed a three-component mixture model. This model has proven to describe the transient change in transepidermal water loss (TEWL) after a change in relative humidity and the result of damage to the skin.

K. Matsumoto, K. Mizukoshi, M. Oyobikawa, H. Ohshima, H. Tagami, **Establishment of an atopic dermatitis-like skin model in a hairless mouse by repeated elicitation of contact hypersensitivity that enables to conduct functional analyses of the stratum corneum with various non-invasive biophysical instruments**, Skin Research and Technology 2004, 10, p. 122-129

Pathogenesis of atopic dermatitis (AD) has been studied in animal models such as the NC/Nga mouse strain or Balb/C mice that are repeatedly treated with 2,4,6-trinitro-1-chrolobenzene (TNCB). These mice exhibit features of chronic contact dermatitis, including an intensified early type skin reaction, increased number of mast cells and elevated serum IgE levels with a shift of cutaneous cytokine expression from a type 1 to type 2 profile.

M. Gloor, B. Wasik, W. Gehring, R. Grieshaber, P. Kleesz, J.W. Fluhr, **Cleansing, dehydrating, barrier-damaging and irritating hyperaemising effect of four detergent brands: comparative studies using standardised washing models**, Skin Research and Technology 2004; 10: 1-9.

Background and problem: It is well known that the damaging effect of surfactants on the stratum corneum varies according to the surfactant used. The present investigations aim to compare four standard commercial cleansing solutions (Esemptan® Cleansing Lotion, Stephalen® Shower Gel,

Manipur® Antimicrobial Cleansing Solution and Tork® Mevon55™ Liquid Soap) with respect to their cleansing and skin barrier-damaging effects.

J. W. Fluhr, J. Ennen, **Standardized washing models: facts and requirements**, Skin Research and Technology, 2004, 10, p. 141-143

Regular skin cleansing with washing substances has medical, cosmetic, hygienic and socio-cultural functions. In western cultures, the hygienic and cosmetic aspects prevail. The aim of a washing process is to remove or reduce dust particles, microorganisms and odorous substances. The resident skin flora in a washing process can be reduced significantly. The antiseptic effect of washing is gained independently from the function of tensides, through the removal of dust and dandruff material from the skin and hence through a reduction of growth medium for bacteria.

C. Packham, **You need hands: protecting your hands from the working environment**. Health & Safety International, October 2004

In our daily life our hands will be exposed to many different hazards. Some of these will occur, or mainly, at work, some in the home or in our hobbies or free time activities. In principle we can divide these hazards into two main groups: physical and chemical.

L.M. Rodrigues, P.C. Pinto, J.M. Magro, M. Fernandes, J. Alves, **Exploring the influence of skin perfusion on transepidermal water loss**, Skin Research and Technology 10, p. 257-262, 2004.

Eventual relationships between the vascular function and transepidermal water loss (TEW), in vivo, have not been entirely explored. By promoting local perfusion alterations through a well-known challenge test, the “tourniquet-cuff occlusion” manoeuvre, the present study searches for other dynamical factors influencing the cutaneous barrier, further exploring the applicability of these flow-related variables in dermatological research.

I. Angelova-Fischer, I. Petrov, P. Elsner, J.W. Fluhr, T.L. Diepgen, **The objective severity assessment of atopic dermatitis (OSAAD) score: interobserver variability with reference to the SCORAD score**, Skin Research and Technology 10, Abstracts, 2004.

The need for reliable and reproducible measures for assessment of atopic dermatitis severity has resulted in the development of numerous scores most of which have not been adequately tested in terms of validity, reliability, responsiveness to change and acceptability. The SCORAD index of the European Task Force on Atopic Dermatitis has been considered the standard outcome measure in clinical trials in the last decade.

L. Monteiro Rodrigues, J. Martins Magro, P. Contreiras Pinto, M. Mouzinho, A. Almeida, **Non-Invasive Assessment of Wound-Healing Pathophysiology by Transcutaneous Indicators,** Annals of Burns and Fire Disasters, Vol. XVII, No. 3, September 2004

Summary: The non-invasive assessment of post-burn wound recovery allows new insights into wound-healing pathophysiology. This pilot study enrolled thermal burn patients (n = 9) with autografted wounds. Grafted lesion (GL) and donor lesion (DL) areas were followed for 6 months by non-invasive measurement of local microcirculation, transcutaneous PO2, and transepidermal water loss (TEWL); the contralateral intact areas were used as controls. The results show that local flow changes in GL were significantly different ($p < 0.05$) from normal until week 6, while in DL differences still persisted at week 8. No differences between GL and DL were found for transcutaneous PO2 measurements. However, full functional recovery was achieved earlier in DL, while in GL statistically significant differences ($p < 0.05$) between the lesion and the control area were still present at week 26. TEWL evolution demonstrated that significant differences ($p < 0.05$) between lesions, compared with the respective controls, persisted in week 26, probably resulting from different recovery mechanisms. Globally, the present study helps to define the wound-healing functional profile of the lesions, highlighting the interest of the non-invasive assessment of wound pathophysiology in burn care and rehabilitation.

A.L. Agero, V.M. Verallo-Rowell, **A randomized double-blind controlled trial comparing extra virgin coconut oil with mineral oil as a moisturizer for mild to moderate xerosis**, Dermatitis, 2004 Sep;15(3): p. 109-116

B*ackground*: Xerosis is a common skin condition (1) characterized by dry, rough, scaly, and itchy skin, (2) associated with a defect in skin barrier function, and (3) treated with moisturizers. People in the tropics have effectively used coconut oil as a traditional moisturizer for centuries. Recently, the oil also has been shown to have skin antiseptic effects. A moisturizer with antiseptic effects has value, but there are no clinical studies to document the efficacy and safety of coconut oil as a skin moisturizer.

O*bjective*: This study aimed to determine the effectivity and safety of virgin coconut oil compared with mineral oil as a therapeutic moisturizer for mild to moderate xerosis. M*ethods*: A randomized double-blind controlled clinical trial was conducted on mild to moderate xerosis in 34 patients with negative patch-test reactions to the test products. These patients were randomized to apply either coconut oil or mineral oil on the legs twice a day for 2 weeks. Quantitative outcome parameters for effectivity were measured at baseline and on each visit with a Corneometer CM825 to measure skin hydration and a Sebumeter SM 810 to measure skin lipids. For safety, transepidermal water loss (TEWL) was measured with a Tewameter TM210, and skin surface hydrogen ion concentration (pH) was measured with a Skin pH Meter PH900. Patients and the investigator separately evaluated, at baseline and at each weekly visit, skin symptoms of dryness, scaling, roughness, and pruritus by using a visual analogue scale and grading of xerosis. R*esults*: Coconut oil and mineral oil have comparable effects. Both oils showed effectivity through significant improvement in skin hydration and increase in skin surface lipid levels. Safety was demonstrated through no significant difference in TEWL and skin pH. Subjective grading of xerosis by the investigators and visual analogue scales used by the patients showed a general trend toward better (though not statistically evident) improvement with coconut oil than with mineral oil. Safety for both was further demonstrated by negative patch-test results prior to the study and by the absence of adverse reactions during the study. C*onclusion*: Coconut oil is as effective and safe as mineral oil when used as a moisturizer.

S.L. Hester, C.A. Rees, R.A. Kennis, D.L. Zoran, K.E. Bigley, A.S. Wright, N.A. Kirby, J.E. Bauer, **Evaluation of Corneometry (Skin Hydration) and Transepidermal Water-Loss Measurements in two Canine Breeds**, The American Society for Nutritional Sciences J. Nutr. 134:2110S, August 2004

Mammalian skin is a highly dynamic organ that is constantly adapting to changes in its environment. It provides structural, sensory, immunologic, and physiologic functions and contributes an essential barrier function against potential environmental insults.

R. Rudolph, E. Kownatzki, **Corneometric, sebumetric and TEWL measurements following the cleaning of atopic skin with a urea emulsion versus a detergent cleanser,** Contact Dermatitis, 2004 Jun;50(6): p. 354-358

A non-detergent urea emulsion cleanser and a detergent cleanser with added moisturizers were compared for their effects on stratum corneum moisture, surface lipids and transepidermal water loss (TEWL) of atopic skin. Following a single wash with either cleanser, low corneometry and sebumetry values increased and elevated TEWL values decreased. Over the course of more than 6 h, all induced changes gradually returned to their starting points. In all instances, the changes induced by the urea emulsion lasted significantly longer than those caused by the detergent cleanser. The sebumetry increase after a wash with the lipid-free detergent cleanser indicated that this method recognized not only true lipids but also the lipid-derived and skin lipid-depleting detergents. The transient TEWL normalization with either cleanser could not be attributed to a passing barrier restoration nor to an occlusion. It is speculated that the TEWL changes were related to stratum corneum water binding capacity.

M. Fröschle, R. Plüss, K. Bojarski, A. Peter, **Antiaging Effect with Cosmotropic Substances**, SOFW-Journal, 130, 4 2004, S. 36-43

Water is one of the most important and limiting factors for plants, animals and humans. The human being consists of 60-65% water and loses daily up to several liters through the skin. The regulation of water content is therefore very significant. Plants especially have developed fascinating physiological and structural strategies to minimize water loss and survive periods of dryness.

K.L. Gebhard, **Evaluation und Standardisierung von Hauttestungen zur Diagnostik der irritativen Kontaktdermatitis**, Dissertation des Fachbereichs Humanmedizin der Philipps-Universität Marburg, April 2004

Die irritative Kontaktdermatitis (IKD) ist eine im klinischen Alltag häufig anzutreffende Erkrankung, deren Diagnostik jedoch, aufgrund ihres morphologisch sehr ähnlichen Erscheinungsbildes zur allergischen Kontaktdermatitis (AKD) (Björnberg, 1968) und anderen dermatologischen Krankheitsbildern, oft sehr schwierig ist. Zur Erleichterung der Diagnostik werden routinemäßig epikutane Irritationstests durchgeführt. Mit Hilfe solcher Tests kann die Diagnosestellung einer IKD vereinfacht, aber auch frühzeitig Hautrisikogruppen identifiziert werden. Ein Standardtest ist hier der Natriumlaurylsulfat (NLS)-Test. Dieser Test besteht klassischer Weise aus einer 24-stündigen Applikation okklusiver Testpflaster, die mit einer 0,5 %-igen NLS-Lösung in aqua destillata (aqua dest.) getränkt sind. Zur objektiven Messung der Testergebnisse stehen verschiedene nicht-invasiveb

hautphysiologische Meßmethoden zur Verfügung, z.B. die Messung des transepidermalen Wasserverlustes (TEWL).

E. Camel, L. Arnaud-Boissel, L. Basset, S.K. Tan, J.-P. Guillot, **Do Skin Moisturization, pH Colour, Water Loss, Lipids or Age, Phototype and Racial Origin (Asian/Caucasian) Affect S.P.F.?**, Personal Care Ingredients Asia, Guangzhou, March 2004

The aim of these studies was first to investigate the possible reasons inducing S.P.F. variations during clinical testing, as regards specific cutaneous parameters (skin colour, hydration, barrier function, pH, surface lipids …), and secondly to assess the effect of racial origin (Asian/Caucasian) in a large range of sunscreen products (S.P.F. 4 to 30).

A.D. Ormerod, P.-N.Woo, J. Islam, M.-M. Cals-Grierson, **An investigation into the effect of the nitric oxide synthase antagonist L-name and plant extracts on the irritability and barrier function of the skin**, JAAD, March 2004, Volume 50, Issue 3, Supplement, p. P68

Background: Nitric oxide (NO) synthesis is upregulated in dermatitis, which may lead to deterioration in skin barrier function (1). It may also be involved in the modulation of keratinocyte proliferation and formation of the cornified envelope (2). On the other hand, beneficial effects of NO in damaged skin have been reported, which suggest that the source of NO and its relative concentrations in defined locations may be important (3). A better understanding of the role of NO in skin irritation could lead to the development of new medications for patients with irritable skin or at risk of developing irritant contact dermatitis. Objective: To examine the possible effects of modulators of NO production on erythema and transepidermal water loss (TEWL) induced by sodium lauryl sulphate (SLS). Methods: Ten volunteers with normal skin were patch tested with water and SLS 0.2%, 0.5% and 1% on the back. The outcomes of TEWL was assessed, using the TEWLA meter (Courage & Khazaka, Cologne, Germany) and erythema was measured by skin reflectance and a visual scoring method. at 1, 6, 25 and 49 hours. The effects of the NO inhibitors, L-NAME, extracts of Olea europa and Ginkgo biloba (as 1% gel solutions) and of the NO donor, glyceryl trinitrate (as 2% ointment) were compared with their control gel and ointment. Results: L-NAME and the plant extracts reduced TEWL. The TEWL induced by 0.5% SLS was significantly diminished by L-NAME at 1 and 6 hours and by ginkgo extract at 6 and 49 hours. Erythema was too mild for reflectance measurements to show significant inhibition, but erythema scores tended to be lower at 6 hours the application of NO inhibitors. Conclusion: NO inhibitors may protect skin barrier function from the adverse effects of chemical irritants.

J. W. Arbogast, E. J. Fendler, B. S. Hammond, *T.J. Cartner, M.D. Dolan, Y. Ali, H.I. Maibach,* **Effectiveness of a Hand Care Regimen with Moisturizer in Manufacturing Facilities Where Workers Are Prone to Occupational Irritant Dermatitis**, Dermatitis, Vol. 15, No 1 (March), 2004: p. 10-17

Background: Limited information documents the prevention and treatment benefits of a hand care regimen using moisturizer in a controlled manner for employees in typical manufacturing situations. Objective: The objective was to assess the effectiveness of a comprehensive skin care program including skin conditioning lotion in multiple manufacturing environments where employees are at high risk for skin disease.

S. Amari, C. Schubert, **From Olive Oil an Innovative O/W Peg-free emulsifier: OLIVEM 1000**, Euro Cosmetics, Ausgabe 2-2004, S. 18-22

Olive Oil is the one of the lipids showing the highest compatibility with our skin. Olive Oil in fact is a precious vegetable oil as it has got a high similarity to human skin lipids. The sebum secreted by the sebaceous glands works through an important activity: to protect the skin against the environment and to reduce the Trans-Epidermal-Water Loss.

I. Arsic, S. Tamburic, S. Savic, I. Homcek, G. Vuleta, **The Effect of Chamomile Extract on Skin Hydration and Tewl: Is it more effective when encapsulated in Liposomes**?, Euro Cosmetics, Ausgabe 2-2004, S.12-17

The aim of this study was to investigate whether the extract of chamomile (Chamomilla recutita, (L) Rausch, Asteraceae) increases skin hydration level and its barrier properties when used in an O/W cream. In addition, it was of interest to find out whether the encapsulation of chamomile extract in liposomes affects its skin functionality.

R. von Pelchrzim, St. Soost, M. Worm, **Klinischer Hautzustand bei Beschäftigten im Gesundheitswesen und der Einfluß von Präventionsmaßnahmen**, Dermatologie in Beruf und Umwelt, Jahrgang 52, Nr. 1/2004, S. 26-32

Mitarbeiter des Gesundheitswesens sind aufgrund der häufig durchzuführenden Feucht- und Naßarbeiten besonders gefährdet, toxisch-irritative Handekzeme zu entwickeln. Durch geeignete Hautschutz- und pflegepräparate können die körpereigenen Reparaturmechanismen unterstützt werden. In einer prospektiven Untersuchung wurden der klinische Hautzustand und die hautphysiologischen Parameter bei Mitarbeitern des Pflegepersonals von Intensivstationen (IS) und Normalstationen (NS) überprüft.

A. Kramer, *V. Mersch-Sundermann*, *H. Gerdes, E.-A. Pitten, H. Tronnier,* **Toxikologische Bewertung für die Händedesinfektion relevanter antimikrobieller Wirkstoffe**, in Günter Kampf (Ed.): Hände-Hygiene im Gesundheitswesen, Springer Verlag, 2003, Kapitel 5

In zahlreichen Ländern (z.B. Belgien, Dänemark, Deutschland, Finnland, Schweden, Schweiz und allen osteuropäischen Ländern) sind Hände-Desinfektionsmittel Arzneimitteln gleichgestellt und zulassungspflichtig.

M. I. Nogueira de Camargo Harris, **Propriedades biomecânicas da pele,** Pele: estrutura, propriedades e envelhecimento, Editora Senac, Sao Paulo, 2003

A biometrologia cutânea, ramo da ciência que avalia quantitativamente as propriedades biomecânicas da pele, tem encontrado na cosmetologia um importante aliado, pois o apelo mercadologico dos produtos destinados aos cuidados com a pele e com os cabelos tem-se baseado cada vez mais em evidências cientificas e tecnicas sensiveis, precisas e validadas, ao inves de serem fundamentadas em especulacoes.

G. Korinth, T. Goen, K.-H. Schaller, W. Uter, J. Angerer, H. Drexler, **Vergleichende Untersuchung zur Belastung und Beanspruchung am Arbeitsplatz durch Reinigunsmittel auf Mineralöl-und auf Pflanzenölbasis unter besonderer Berückstichtigung akuter und Chronischer Hauterkrankung,** Abschlussbreicht zur Feldstudie „Alternative Reinigungsmittel“ der Universität zu Erlanden, Dezember 2003

E. Hernandez, **Bioengineering in Dermatology and Cosmetology: Methods, Studies and Prospects**, SOFW-Journal, 129. Jahrgang, 11-2003

One of the trends in modern dermatology and its perspectives for the near future are skin bioengineering and imaging. The 1st joint meeting of two scientific societies focusing on measurements and visualisation of skin function, structure and physiology – the International Society for Skin Imaging (ISSI) – took place in Hamburg, May 21-24, 2003. Before that, the meetings and conferences organised by these societies had been held separately.

J.L. Sugarman, J.W. Fluhr, AJ.Fowler, T. Bruckner, T.L. Diepgen, M.L. Williams, **The Objective Severity Assessment of Atopic Score – An Objective Measure Using Permeability Barrier Function and Stratum Corneum Hydration with Computer Assisted Estimates for Extent and Disease**, Arch. Dernatol., Vol. 139, Nov. 2003

Clinical scores used to assess the severity of atopic dermatitis (AD) rely entirely on subjective criteria to the severity of lesions and the extent of involvement.

C. Rodrigues da Silva, **A Rain Forest Botanical Improves Bar Soap Properties,** Happi, Nov. 2003.

The Amazon Rain Forest presents incomparable biodiversity, representing approximately 25% of all the plants on earth. Its inhabitants, Indians or natives of the region often referred to as “caboclos”, utilize this diversity to improve their health and beauty. The “traditional use” of these plants is often referenced in the product stories told by cosmetic companies.

T. Yokota, M. Matsumoto, T. Sakamaki, R. Hikima, S. Hayashi, M. Yanagisawa, H. Kuwahara, S. Yamazaki, T. Ogawa, M. Hayase, **Classification of sensitive skin and development of a treatment system appropriate for each group,** IFSCC Magazine, Oct./Dec. 2003, Vol. 6, No. 4

In order to find an effective approach to improve sensitive skin, it is important to know the detailed mechanism of sensitive skin. In this study, detailed characteristics of sensitive skin were investigated using non-invasive methods. Sensitive skin was classified into three different types based on their particular characteristics.

A. del Pozo, C. Romero, A. Viscasillas, D. Black, **In vivo screening of surfactant effects on stratum corneum,** Association de Pharmacie Galenique Industrielle, Paris 22-23 Oct. 2003

Prolonged or repeated exposure of skin to surfactants used in personal care products or cleaners often results in damage to the stratum corneum (SC) barrier function. Prevention of stratum

corneum damage requires careful formulation of such products and suitable screening methods to detect changes in stratum corneum function.

S. Vertuani, P. Ziosi, N. Solaroli, V. Buzzoni, M. Carli, E. Lucchi, L. Valgimigli, G. Baratto, S. Manfredini, **Determination of antioxidant efficacy of cosmetic formulations by non-invasive measurements**, Skin Res Technol, 2003 Aug;9(3): p. 245-253

Background/Aims: Antioxidants have been proposed, over the last decade, as functional ingredients for anti aging preparations and to prevent and modulate oxidative skin damages. Up to date, beside the photo-induced oxidative skin damages model, none in vivo protocols have shown sufficient reproducibility for the validation of the antioxidant claim for a cosmetic finished product. To this aim, we have recently anticipated a new in vivo protocol based on a microinflammatory model, driven by reactive oxygen species. In the present study our model was validated by comparison with four different instrumental methods. Methods: The effects of a pre-treatment of two different formulations based on antioxidant functional ingredients, were investigated on forearm skin of 15 healthy volunteers, and compared to a cosmetic base and control area. The instruments considered in the study were Chromameter (CR-300 Minolta), Tewameter TM 210 (Courage-khazaka, Cologne, Germany), Laser Doppler Perfusion Imager (PIM1.0 Lisca Development AB, Sweden), in comparison to DermAnalyzer(R), an easy to use software program developed by us, using the CIE L*a*b* color space parameters. Results: The comparative measurements showed that the antioxidant formulations tested were all able to reduce, in different but statistically significant extent, the intensity of skin redness, and of cutaneous blood flow, when compared to control area ($P < 0.0001$). Conclusions: The methyl nicotinate (MN) based microinflammatory model, in conjunction with objective measure- ments, resulted an effective tool for in vivo assessment of oxidative skin injuries. In view of the high level of repeatability, short time of answer and simplicity, the procedure by us developed, is proposed as a possible protocol for the evaluation of in vivo efficacy of antioxidant functional ingredients in cosmetic formulations.

H. Lambers, H. Pronk, S. Piessens, E. Voss, **Natural human skin surface pH is on average below 5,** Gordon Conference, Aug. 2003

The acidic surface pH and the pH gradient over the stratum corneum (SC) are important for optimal condition of the skin, supporting the following functions: regulation of skin microflora, thereby preventing pathogenesis, optimal structure and function of the lipid barrier, optimal stratum corneum homeostasis.

L.R. Gaspar, P.M.B.G. Maia Campos, **Evaluation of the protective effect of alpha-tocopheryl acetate in a sunscreen, preventing erythema formation, transepidermal water loss and sunburn cell formation,** IFSCC, Vol. 6, No. 3/2003

Nowadays, vitamin E acetate is used as an antioxidant and moisturizer in sunscreens. Although free vitamin E presents UV protection effects, little data has been forthcoming documenting the beneficial effects of vitamin E acetate on cutabeous photodamage, when combined with sunscreens. The aim of this study was to evaluate the protective effect of a sunscreen formulation with or without vitamin E acetate on erythema in hairless mice, transepidermal water loss (TEWL) and sunburn cell formation.

S.-J. Choi, M.-G. Song, W.-T. Sung, D.-Y. Lee, J.-H. Lee, E.-S. Lee, J.-M. Yang, **Comparison of Transepidermal Water Loss, Capacitance, and pH Values in the Skin Between Intrinsic and Extrinsic atopic Dermatitis Patients**, J Korean Med Sci 2003, 18, 93-6, p. 93-96

Atopic dermatitis (AD) is characterized by an intensely pruritic skin disease with typical distribution and morphology. The age of onset is nearly always within the first 5 yr of life, and lifetime prevalence in children is roughly 10 to 15% in industrialized countries.

M. Takahashi, M. Egawa, T. Hirao, **The frictional feel analyzer**, Skin Research and Technology, Vol. 9, No. 2, May 2003, Abstract No. 18

Sensory evaluation is important in the testing of cosmetic products. Several devices for the measurement of sensory properties have been developed in recent years. The objective here is to measure skin surface friction using these devices and to examine the correlation with other physiological parameters in order to evaluate the feasibility of using physical measurement to predict tactile sensation.

S. Savic, N. Cekic, S. Tamburic, J. Milic, G. Vuleta, **The effect of urea from dermo-cosmetic emulsions on skin hydration and its barrier function: a vehicle-controlled study**, Skin Research and Technology, Vol. 9, No. 2, May 2003

A number of studies have shown that, depending on the concentration, treatment with urea could improve skin barrier function, despite of its penetration enhancing properties. This controversial skin effect has not been explored systematically in terms of the effectof vehicle on the performance of urea.

L. Monteiro Rodriguez, J. Martins Magro, M. Mouzinho, P. Pinto, M. Almeida, **Bioengineered characterisation of the thermal burn injury healing process**, Skin Research and Technology, Vol. 9, No. 2, May 2003

Full thickness burn injuries may be followed-up through non-invasive bioengineered methodologies. This elegant approach to this complex multifactorial process allows us to obtain quantitative data involving several variables representing structure and function, providing more objective support to practical management and therapeutical intervention.

J. Fluhr, J.S. Kao, P.M. Elias, K.R. Feingold, **Short-term glucocorticoid treatment compromises both permeability barrier homeostasis and stratum corneum integrity: inhibition of epidermal lipid synthesis accounts for functional abnormalities**, Skin Research and Technology, Vol. 9, No. 2, May 2003

Prolonged exposure of human stratum corneum to excess endogenous or exogenous glucocorticoids (GC) can result in well-recognized cutaneous abnormalities. Here, we determined wheter short-term GC treatment would alter two key functions of the skin, permeability barrier homeostasis and stratum corneum (SC) integrity and cohesion, and the basis for these changes.

P.C. Pinto, R. Minhos, L.M. Pereira, L. Monteiro, **Validation of a compartmental model to quantitatively describe transepidermal water loss**, Skin Research and Technology, Vol. 9, No. 2, May 2003

New computational methods are being applied to analyze data from TEWL experiments mostly using non-linear algorithms. A new strategy involving the application of a compartmental model to TEWL data obtained from a Plastic Occlusion Stress Test (POST) has been used with encouraging results. This strategy is now being validated in order to establish its major determinants affecting the model`s parameters.

P.C. Pinto, L.M. Pereira, L. Monteiro Rodriguez, **Skin water dynamics: disposition-decomposition analysis (DDA) od transepidermal water loss (TEWL) and epidermal capacitance**, Skin Research and Technology, Vol. 9, No. 2, May 2003

Knowledge about human skin water dynamics seems to represent a growing importance to understand the organ's normal physiology. Mathematical modelling of (cutaneous water) related variables obtained through skin bioengineering, provided new perspectives to approach this problem.

M. Bock, H.J. Schwanitz, **Site variations in susceptibility to SLS at the volar forearm evaluated by TEWL measurement**, Skin Research and Technology, Vol. 9, No. 2, May 2003

According to the "guidelines on sodium lauryl sulphate (SLS) exposure test" of the ESCD standardisation group the flexor side of forearm skin with cubital fossa and wrist excluded is the preferred study site'. This study analyses the exact anatomic region within the suggested test area in respect to the outcome of SLS exposure test.

J.W. Fluhr, L. Bankova, P.M. Elias, K.R. Feingold, **Assessment of permeability barrier function measuring transepidermal water loss: comparing 3 closed-loop systems and 4 open-loop systems in vivo and in vitro**, Skin Research and Technology, Vol. 9, No. 2, May 2003, Abstract No. 10

The permeability barrier function is traditionally measured with instruments assessing the transepidermal water loss (TEWL) relaying on (i) closed loop systems (ii) open loop systems. In the present study three closed loop system-based instruments were compared under different experimental in vivo conditions with 4 open-loop based instruments: MEECO, H4300, VapoMeter, TM 210, TM 300, DermaLab and EP.

S.M. Fuchs, C. Heinemann, J.W. Fluhr, S. Schliemann-Willers, U. Gräfe, P. Elsner, **Anti-inflammatory efficacy of Poria cocos in SLS induced irritant contact dermatitis and UVB-induced erythema**, Skin Research and Technology, Vol. 9, No. 2, May 2003, Abstract No. 39

A great number of compounds is available for the treatment of inflammatory skin diseases, the most effective external anti-inflammatory compounds being glucocorticoids. Their side effects have

motivated a continuing search for other therapeutical compounds, and fungal metabolites like Poria cocos have figured in the literature.

M. Kucharekova, M. Hornix, T. Ashigaka, S. T'kint, G.J. de Jongh, J. Schalkwijk, P.C.M. van de Kerkhof, P.G.M. van der Valk, **The effect of the PDE-4 inhibitor (cipamfylline) in two human models of irritant contact dermatitis,** Archives of Dermatological research, Vol. 295, April 2003

Repeated application revealed that betamethasone-17-valerate caused a statistically significant reduction in erythema and TEWL compared to cipamfylline and placebo. We also observed a significant suppression of proliferating cells and cytokeratin 16 expression at sites treated with betamethanose compared to the other sites.

D. Kelly, J. Bessiere, J. Crimmins, S. Renard, **Anti-inflammatory properties of Amazonian Oil**, SOFW-Journal, 129. Jahrgang 4-2003

The rainforest regions of South America are the most bio-actively diverse natural phenomena on the planets housing 70 % of the world's flora and fauna, 10-15 million insects and 20000 different species of planet life.

H. Löffler, A. Steffes, R. Happle, I. Effendy, **Allergy and Irritation: An Adverse Association in Patients with Atopic Eczema**, Acta Derm Venereol 2003; 83: p. 328–331

The pathomechanism of atopic eczema is complex. Two of the most important exogenous factors for atopic eczema are allergenic and irritant substances. In this study we investigate the combined effect of topical aeroallergens and irritation on the skin of atopic individuals. We performed patch testing with several aeroallergens (atopy patch test) and with an irritant, sodium lauryl sulphate, on clinically unaffected skin of 30 sensitized patients with atopic eczema. Application was conducted alone and as a consecutive application. Healthy volunteers served as controls. Evaluation was made by measurement of transepidermal water loss 2 h after removal of the patches. In atopic patients, we found increased levels of transepidermal water loss induced by the aeroallergens as well as by sodium lauryl sulphate. The most impressive barrier disruption was seen after application of house dust mite, followed by cat dander and grass pollen. However, the consecutive application of aeroallergens and sodium lauryl sulphate led to a highly pronounced increase in transepidermal water loss. Hence, in sensitized atopic subjects the combined effect of aeroallergens and detergents may cause severe skin problems, and this may be relevant in daily practice

E. Kawai, Y. Kohno, K. Ogawa, K. Sakuma, N. Yoshikawa, D. Aso, **Can inorganic powders provide any biological benefit in stratum corneum, while residing on skin surface?**, Revista SRCC, Vol. 3, Nr. 3/2003

The plasminogen (Plg) activation system plays a role in the process leading to dry skin. In this study, we have discovered that a urokinasetype Plg activator (UK), a trigger of thePlg activation system, which was previously believed to work within the epidermis, also exists in stratum corneum (SC).

J. Fluhr, Jeffrey L. Sugarman, Thomas L. Diepgen, M. L. Williams, **The Objective Severity Assessment of Atopic Dermatitis (OSAAD) Score,** 61st Meeting of the American Academy of Dermatology, March 21-26, 2003

Measurements of epidermal permeability barrier function and SC hydration correlated closely with clinical estimates of disease severity. PH was found not to be a sensitive measure of AD severity. The OSAAD score correlated well with current "gold standard" of AD severity, the SCORAD ($p<0,001$; Spearman correlation coefficient of $r=0,63439$).

Y. Yoshizawa, K. Kitamura, S. Kawana, H. Maibach, **Water, salts and skin barrier of normal skin,** Skin Research and Technology, Vol.9, No. 1, Feb. 2003

We recently reported that open application of seawater for 20 min ameliorated experimental irritant contact dermatitis induced by sodium lauryl sulphate (SLS) cumulative irritation. The efficacy was overall contributed by 500 mM of sodium chloride (NaCl) and 10mM of potassium chloride (KCl), which are consistent with the each concentration in seawater.

R. Huei Chen, W. Yuu Chen, **Skinhydration effects, film formation time, and physicochemical properties of a moisture mask containing Monostroma nitidium water-soluble mucilage,** Journal of Cosmetic Science, Vol. 54, No. 1, Jan./Feb. 2003

The objectives of the study were to explore the effects of using the water-soluble mucilage of Monostroma nitidium to replace the humectant and half of the thickening agent on the rheological properties, color, storage stability, water-holding capacity, and film formation time of moisture masks

thus prepared. Results showed that moisture masks containing water-soluble mucilage were pseudoplaxtic fluids.

Methods for treatment of human skin damaged by laser treatment or chemical peelings and compositions useful in such methods, http://www.surechem.org/index.php?Action=document&docId=271329&db=USPT. Publication Number: 20030012762 Application Date: 20030116

Field of invention: The present invention is concerned with methods for treatment of human skin damaged by laser treatment or chemical peelings and compositions useful in carrying out such methods. Background of the invention: Laser treatments are nowadays widely used in cosmetics, dermatology and surgery. A wide selection of laser devices are available for these purposes, such as: Neodymium Yttrium-Aluminium-GarnetLaser[Neodymium:YAG] (1064 nm) This laser provides a high penetration depth and produces a photothermolysis. By superposition of a potassium titanyl phosphate crystal the frequency can be doubled, thus halving the wave length to 532 nm. The emerging green light is well absorbed by structures containing melanine or oxyhemoglobin. Thus, this laser is used for the treatment of epidermic pigmented lesions.

E.H. Choi, W.-S. Park, E.-D. Son, S.M. Hwang, M.J. Kim, S.K. Ahn, S.H. Lee, **The effect of change in epidermal calcium gradient on stratum corneum lipid and epidermal differentiation,** The Essential Stratum Corneum, chapter 10, edited by R. Marks, et al., Martin Danitz Ltd., London, 2002

Lamellar bodies (LBs) are the source of lipid composition of the stratum corneum (SC). SC intercellular lipid bilayers formed from secreted LBs are the most important structure of the permeability barrier. The cornified cell envelope (CE), formed during the terminal differentiation of keratinocytes, is a specialized structure covalently bound with SC intercellular lipids. This forms a structurally and functionally complete permeability barrier. Also, during epidermal differentiation, specific keratins are synthesized.

T. Schmidt, N. Widler, F. Gafner, G. Imanidis, **Stratum Corneum lipid composition as a predective tool for permeability?,** The Essential Stratum Corneum, edited by R. Marks, J.-L. Lévêque, R. Voegeli, Martin Danitz Ltd., London, 2002

This theory envisages a linear correlation between the logarithm of the steady-state flux and the exchange cohesive energy between the permeating molecule and the lipid compounds of the stratum corneum (SC). The latter cohesive parameter is obtained from solubility parameter calculations and an attempt is made to verify the theoretical approach with experimental permeability data.

J. Gareiss, M. Ghyczy, **Normalization of inflammation and humidity in sodium lauryl sulfate (SLS) – perturbed skin in vivo by gel state phosphatidylcholine,** The Essential Stratum Corneum, chapter 55, edited by R. Marks, J.-L. Lévêque, R. Voegeli, Martin Danitz Ltd., London, 2002

Phosphatidylcholine (PC) is the most abundant component of biological membranes. It possesses an intrinsic hydration force, and its metabolites are essential osmoprotectants. PC that is composed of saturated fatty acids (hydrogenated PC), also named gel-state PC or HPC, possesses physical properties that are comparable with those of the components of the skin permeability barrier.

K. De Paepe, J.-P. Hachem, E. Vanpee, D. Roseeuw, V. Rogiers, **Beneficial corneotherapeutic effects of skin-tolerance-tested moisturizing creams,** The Essential Stratum Corneum, edited by R. Marks, J.-L. Lévêque, R. Voegeli, Martin Danitz Ltd., London, 2002

In the present work, an oil-in-water (o/w) moisturizing cream was applied to experimentally elicited, scaly skin in order to investigate whether the product could promote a more rapid recovery of the disturbed barrier function (as measured by transepidermal water loss (TEWL measurements) than physiological barrier repair. Experimental models of both irritant (ICD) and allergic (ACD) contact dermatitits were applied. ICD was provoked by sodium lauryl sulfate (SLS), well known for its damaging action on the skin barrier function. The ACD study concerned a nickelmediated contact allergy patch (CAP) test, carried out in nickel-sensitized volunteers.

V. Rogiers, E. Houben, K. de Paepe, **Transepidermal Water Loss Measurements in Dermato-Cosmetic Sciences**, in Bioengineering of the Skin: Water and the Stratum Corneum, sec. Edition, CRC Press 2002, p. 63-76

The stratum corneum (SC) plays an important role in the clinical appearance of the skin as a result of its water-holding capacity and lipidic content. In addition, it acts as a barrier to protect the body from percutaneous absorption of a wide variety of xenobiotics, from desiccation, and from insults by a number of environmental conditions.

M. Egawa, M. Oguri, T. Kuwahara, M. Takahashi, **Effect of exposure of human skin to a dry environment,** Skin Research and Technology, Vol. 8, No. 4, Nov. 2002

There was a significant decrease of water content of stratum corneum at both test sites from the time points 0 h to 3 h and 6 h ($P<0.01$) and transepidermal water loss from the time point 0 h to 6 h ($P<0.05$). Regarding the roughness parameters, a significant increase of Rz in the directions of 45º/225º and 90º/270º to the body axis and Sm in the directions of 0º/180º ($P<0.05$) on the forearm and VC1 ($P<0.05$) on the cheek.

K. de Paepe, D. Roseeuw, V. Rogiers, **Repair of acetone- and sodium lauryl sulphate-damaged human skin barrier function using topicallyapplied emulsions containing barrier lipids,** J Eur Acad Dermatol Verereol, 2002, Nov;16(6): p. 587-594

Background: It is generally acknowledged that well-formulated moisturizing skin care products can restore disturbed barrier function that can be assessed by transepidermal water loss (TEWL) measurements. When ceramides and/or other barrier lipids are incorporated, it is, however, not always clearly demonstrated which ingredients of the formulation exert the beneficial effects. Objectives: In this study the effects of topically applied ceramide-containing mixtures on the barrier repair of sodium lauryl sulphate (SLS)- and acetone-induced skin damage have been studied in human volunteers. TEWL and stratum corneum hydration measurements were carried out. The emulsions applied contained either a mixture of two types of ceramides, CerIII and CerIIIB (emulsion 1) or a complete mixture of ceramides III, IIIB and VI together with phytosphingosine, cholesterol and the free fatty acid linoleic acid (emulsion 2). Results: After SLS damage, it was observed that barrier recovery was significantly accelerated by topical application (14 days, 2 x/d) of emulsion 2 compared with the results obtained with emulsion 1. Corneometrical results were not relevant due to the occurrence of scaly fissured skin, failing to provide a good skin/probe contact. Although no effect on TEWL could be observed, the improvement of skin hydration after acetone treatment and a single application of the emulsions, was significantly more positive for emulsion 2 than for emulsion 1. Conclusions: The investigative methods used in this study show that ceramides combined with other skin lipids can improve barrier repair after damage.

J.W. Fluhr, J.L. Sugarman, T.L. Diepgen, M.L. Williams, **The objective severity assessment of atopic dermatitis (OSAAD),** 2002 U.S. Symposium of the International Society for Bioengineering and the Skin, Baltimore Oct. 24-26, 2002 (Poster)

An objective measure utilizing permeability barrier function and stratum corneum hydration, with computer-assisted estimates for extent of disease.

E. Kawai, Y. Kohno, K. Ogawa, K. Sakuma, N. Yoshikawa, D. Aso, **Can inorganic powders provide any biological benefit in stratum corneum, while residing on skin surface?,** IFSCC magazine, Vol. 5, No. 4, Oct./Dec. 2002

The plasminogen (Plg) activation system plays a role in the process leading to dry skin with impaired barrier function, and serine protease inhibitors are known to improve dry skin. In this study. We have discovered that a urokinase-type Plg activator (UK), a trigger of the Plg activation system, which was previously believed to work within the epidermis, also exists in stratum corneum (SC). Focusing on the UK reaction in SC, we sought to develop a method of dry skin prevention.

B.S. Hammond, E. Fendler, **The Impact of a Skin Care Program in a Fiberglass Facility utilizing Bioengineering Techniques**, International Conference on Occupational and Environmental Exposures of Skin to Chemicals, September 8-11, Hilton Crystal City, Washington DC

A study was conducted at a fiberglass manufacturing facility to better understand the effects of a skin care regimen. A comprehensive skin care program was implemented that included site surveys and anlyses. A training program and the use of Gojo products.

T. Yokota, M. Matsumoto, T. Sakamaki, R. Hikima, S. Hayashi, M. Yanagisawa, H. Kuwahara, S. Yamazaki, T. Ogawa, M. Hayase, **Classification of sensitive skin and development of a treatment system appropriate for each group**, Proceedings of the 22nd IFSCC Congress, Edinburgh 23.-26. Sep. 2002

Recent consumer marketing surveys have shown that the number of female consumers, assessed as having sensitive skin, has been increasing. In order to find an effective approach to improve sensitive skin, has been increasing. In order to find an effective appraoch to improve sensitive skin, it is important to know the detailed mechanism of sensitive skin.

K. Matsumo, K. Mizukoshi, M. Oyobikawa, H. Ohshima, H. Tagami, **Benefits of cosmetics bases in treating atopic dermatitis: Studies using a mouse chronic dermatitis model provided by repeated hapten applications**, Posters of the 22nd IFSCC Congress, Edinburgh 23.-26. Sep. 2002

Competition has driven manufacturers to incorporate into their skin-care products an ever increasing number of new active ingredients. While many of these materials are beneficial to the skin, some can cause adverse reactions. In this age of cosmeceuticals, it is easy to forget that simple cosmetic bases, without actives, can contribute substantially to cutaneous health. Although this benefit has long been suspected, few published studies are available. We focused on the effects of cosmetic bases on atopic dermatitis (AD), a skin disease characterized by itchiness and dryness which affects many cosmetic users.

L.R. Caspar, P.M.B.G. Maia Campos, **Evaluation of the protective effect of alpha-tocopherol acetate in a sunscreen, preventing erythema and transepidermal waterloss**, Posters of the 22nd IFSCC Congress, Edinburgh 23.-26. Sep. 2002

The recent rapid growth of sunscreens marketing indicates that even though a suntan is still desired, people are nevertheless quite conscious of accompaying dangers like actinic changes (wrinkling, premature sgeing of the skin, irregular thinning of the epidermis, hyperpigmented macules), development of premalignancies (solar keratoses) and skin cancer (melanomas, basal and squamous cell carcinomas) occuring as a result of excessive ultraviolet (UV) radiation.

S. Seidenari, **Non-Invasive Techniques for Diagnosis and Monitoring of Skin Diseases: an Updating of Recent Techniques useful in Dermatology,** 20th World Congress of Dermatology, Paris 2002

Besides the necessity of a realistic assessment of spontaneous course of diseases, the evaluation of the cost/benefit ratio of potentially new treatments is increasingly required. Objective documentation of dermatological disorders can be achieved by means of bioengineering techniques, which provide numerical values as a basis for statistical analysis and enable instant in vivo information in the absence of interferences with the spontaneous course of the disease.

I. Le Fur, S. Lopez, F. Morizot, J. Latreille, C. Guinot, E. Tschachler, **Age-Related Reference Ranges for Skin Biophysical Parameters in Healthy Women,** 20th World Congress of Dermatology, Paris 2002

Purpose: The aim of this study was to establish age-related reference ranges in healthy Caucasian women for some widely used skin biophysical parameters.

E.A. Holm, G.B.E. Jemec, **Objective Measurement of Atopic Dermatitis with Non-Invasive Techniques,** 20th World Congress of Dermatology, Paris 2002

Quantification of desease severity is a prerequisite for the development of evidence based therapy. Today, patient history and clinical scoring are the main tools for dermatologists when attempting to assess the morbidity of patients with atopic dermatitis AD. These methods however have their limitations, as they all are operator dependant and frequently show poor inter- and intra-observer reproducibility.

I. Le Fur, A. Reinberg, S. Lopez, F. Morizot, M. Mechkouri, E. Tschachler, **Facial Skin Circadian Rhythms of Healthy Women Investigated Using Non-Invasive Methods,** 22th IFSCC Congress, Edinburgh, 23-26 September 2002 and 20th World Congress of Dermatology, Paris 2002

When studying the biophysical parameters it is of major importance to know about their possible time-dependant changes.

C. Urquhart, C. Rayner, **Mavena® Mg^{46} Dead Sea Salt Balneotherapy Accelerates Restoration of Barrier Function in Japanese Skin,** 20th World Congress of Dermatology, Paris 2002

Therapeutic bathing in Dead Sea salt solution in the ambulatory setting is commonly referred to as “Balneotherapy”. Chronic skin diseases such as atopic dermatitis and psoriasis are often associated with a poor hydration status and a compromised barrier function of the skin. Dead Sea salts have a different mineral composition to salts arising from other sources.

U. Uksal, C. Atasavun, B. Özcelik, S. Utas, A. Ferahbas, **The effects of hormone replacement therapy on the skin of postmenopausal women (abstract),** 11th Congress of the European Academy of Dermatology and Venereology, Prag 2002

The study was performed to compare skin pH, transepidermal water loss (TEWL), skin surface lipids and hydration in postmenopausal women receiving hormone replacement therapy (HRT) and

those who not. Two parallel age-matched groups (each 24) of 48 postmenopausal women evaluated by tewameter, sebumeter, pHmeter and corneometer.

I. Le Fur, A. Reinberg, S. Lopez, F. Morizot, M. Mechkouri, E. Tschachler, **Analysis of Circadian and Ultradian Rhythms of Skin Surface Properties of Face and Forearm of Healthy Women**, J Invest Dermatol, Vol. 117, NO. 3 September 2001, p. 718–724

Biologic rhythms of cells and organisms are well documented and have been extensively studied at the physiologic and molecular levels. For the skin, many circadian changes have been investigated but few systematic studies comparing skin at different body sites have been reported. In this study we investigated facial and forearm skin circadian rhythms in eight healthy Caucasian women. Noninvasive methods were used to assess skin capacitance, sebum excretion, skin temperature, transepidermal water loss, and skin surface pH on fixed sites of the face and the volar forearm during a 48 h span under standardized environmental conditions. Using the cosinor or ANOVA methods, circadian rhythms could be detected for sebum excretion (face), transepidermal water loss (face and forearm), skin temperature (forearm), pH (face), and capacitance (forearm). No circadian rhythmicity was found for the other biophysical parameters. In addition to the 24 h rhythm component, rhythms with periods of 8 h were found for sebum excretion, of 8 and 12 h for transepidermal water loss (face and forearm), and of 12 h for skin temperature (forearm). Our study confirms that rhythms of skin surface parameters are readily measurable and that these rhythms differ between different sites. Furthermore, we demonstrate for the first time that, for transepidermal water loss (face and forearm), sebum excretion, and skin temperature (forearm), in addition to circadian rhythms, ultradian and/or component rhythms can be detected.

C. Packham, H. Packham, **Health and Safety at work: special report**, Occupational Skin Management Update, Croner, Issue 60, August 2002

M. Stücker, M. Hoffmann, P. Altmeyer, **Instrumental evaluation of retinoid-induced skin irritation,** Skin Research and Technology 2002, No. 8

Adapting retinoid therapy to the patient's skin type can reduce the initial irritative side-effects. During the first days, patients with skin type 1 or 2 should add a medium potency corticosteroid. Stronger skin irritation caused by tazarotene therapy increases therapy effects.

F. Distante, L. Rigano, R. D'Agostino, A. Bonfigli, E. Berardesca, **Intra- and Inter-Individual Differences in Sensitive Skin,** Cosmetics &Toiletries July 2002, Vol. 117, No. 7,

The authors investigated the intra-individual and the inter-individual variations of transepidermal water loss, capacitance and microcirculation in 10 different facial areas in subjects with "sensitive skin" and in subjects with "non-sensitive skin".

Hurdles getting to the Market…is the product right?…is it safe?….is it legal? A report from the Britisch Society of Cosmetic Chemists, IFSCC Magazine – Vol. 5, No. 3/2002

The 2002 spring symposium at the Royal Society of Medicine proved to be a great success

M. Fuchs, S. Schliemann-Willers, C. Heinemann, P. Elsner, **Tacrolimus enhances irritation in a 5-day human irritancy in vivo model,** Contact Dermatitis, May 2002, Vol. 46, No. 5

Tacrolimus (FK 506) is a macrolide discovered in 1984 as a metabolic product of Streptomyces tsukabaensis. It has been used successfully in treating atopic dermatitis, allergic contact dermatitis, lichen planus mucosae and pyoderma gangrenosum. In the present study, we evaluated the antiinflammatory activity of FK506 in 2 human skin inflammation models.

P. Contreiras Pinto, L. M. Pereira, R. Minhós, L M. Rodrigues, **Testing the Discriminative Capacity of Compartmental Modeling for the Analysis of the IN-VIVO Epidermal Water Content Changes Following Topical Application under Occlusion,** IFSCC Magazine, April/June 2002, Vol. 5 No. 2

Mathematical modelling of cutaneous variables is an attractive strategy to meet the complex nature of in-vivo skin, especially in the presence of an external stimulus such as a topical product.

B. Roy, **Duoskin: significant hydratisierende Wirkung,** Kosmetische Medizin, Ausgabe 5/2002, 23. Jahrgang

Die hydratisierende Wirkung der beiden Präparate Duoskin Gesicht und Duoskin Körper wurde bewertet und mit der von zwei hydratisierenden Referenzprodukten verglichen. Es handelt sich um eine monozentrische, vergleichende, randomisierte Studie. Die Ergebnisse beziehen sich auf 12 Frauen mit sehr trockener Haut. Jede Probandin war gleichzeitig ihre eigene Kontrolle, da ein Areal unbehandelt blieb.

J. Djordjevic, G. Vuleta, J. Milic, H. Zhai, H. Maibach, **O/W Emulsions Enriched with Vitamin E,** Cosmetics & Toiletries 2002 April, Vol. 117, Nr. 4

Vitamin E has an important protective function for the entire organism. It is believed that the broad biological activities of vitamin E are due to its ability to inhibit lipid peroxidation and stabilize biological membranes.

F. Rippke, V. Schreiner, H-J. Schwanitz, **The acidic milieu of the horny layer,** Am J Clin Dermatol 2002; 3 (4): 261-272

The acidic pH of the horny layer, measurable on the skin surface, has long been regarded as a result of exocrine secretion of the skin glands. The 'acid mantle' was thought to regulate the bacterial skin flora and to be sensitive primarily to skin cleansing procedures. In recent years, an increasing number of investigations have been published on the changes in, and constituents and functions of, the pH of the deeper layers of the stratum corneum, as well as on the influence of physiological and pathological factors.

H. Tronnier, **Effects of Textiles on Human Skin***,* SOFW Journal, 128. Jahrgang 4-2002

Very often, the people concerned as their employers make detergent residues in clothes responsible for skin reaction to textiles. Sometimes allergies are suspected.

J. Woodruff, **Body of evidence,** Soap, Perfumery & Cosmetics 2002 April

Proving effect may not be new but it is of course an absolute requirement these days. And there are many different ways of going about it, explains John Woodruff

B. Gabard, S. Schliemann-Willers, **Better Skin Protection with New Barrier Creams,** SOFW Journal, 128. Jahrgang 4-2002

Skin protection creams are considered judicially as cosmetics. Besides a good efficacy, a main requirement to be fulfilled by these preparations is maximal safety as they are often applied on lesioned skin.

E. Proksch, H.P. Nissen, M.F. Bremgartner, C.J. Urquhart, **Erhöhung der Hautfeuchtigkeit durch Mg-reiches Duschgel,** Kosmetische Medizin, 4/2002, 23. Jahrgang

Baden oder Duschen mit gewöhnlichen Detergenzformulierungen kann zu Problemen bei Patienten mit Psoriasis, Ekzemen und bei trockener Haut führen. Detergenzien können eine Irritation verursachen und die Trockenheit der Haut verschlimmern. Die therapeutische Wirkung des Totes Meer Salzes bei Hauterkrankungen ist seit der Antike bekannt; Magnesiumsalze sind der überwiegende Bestandteil des Salzes aus dem Toten Meer. In der vorliegenden Untersuchung wurde die Wirkung eines Duschgels, welches ein besonders magnesiumchlorid-reiches Salz aus der Tiefe des Toten Meeresenthält (Mavena Derma Line Mg46 Duschgel), zur Reinigung bei Psoriatikern eingesetzt.

A. Kramer, T. Bernig, G. Kampf, **Clinical double-blind trial on the dermal tolerance and user acceptability of six alcohol-based hand disinfectants for hygienic hand disinfection**, Journal of Hospital Infection, 2002, 51: 114-120

Six commercially available available alcohol-based hand rubs (AHD 2000, Desderma, Muscasept A, Manorapid (Poly-Alkohol, Spitacid, and Sterillium)) were investigated in a clinical double-blind trial involving 10 participants who had no previous experience of using hand rubs (Group 1) and seven who had substancial professional experience of using hand rubs (Group 2, viro laboratory staff).

M. Ghyczy, V. Vacata, **Phosphatidylcholine and Skin Hydration,** "Skin Moistarization", Cosmetic Science and Technical Series Vol. 25, ed. by J. Leyden, Marcel Dekker Inc., New York, 2002

Phosphatidylcholine (PC) is the most abundant phospholipid in animal cells. It possesses an intrinsic hydration force, and its metabolites are essential osmoprotectants. Phosphatidylcholine composed of saturated fatty acids (hydrogenated PC; HPC) possesses physical properties which are comparable with those of the components of the skin permeability barrier.

L.A. Young, J.C. Dodge, K.J. Guest, J.L. Cline, W.W. Kerr, **Age, Breed, Sex and Period Effects on Skin Biophysical Parameters for Dogs Fed Canned Dog Food**, American Society for Nutritional Sciences, J. Nutr. 132: 1695S–1697S, 2002

Noninvasive skin biophysical methods have been used in clinical and experimental dermatology for humans (1). The application of some of these methods has also been investigated for companion animals (2–9). Skin biophysical measurements have been reported to be affected by age, breed, sex,

site of measurement, animal excitement, evaluation (time) period or season, gonadal status and even coat color (9). The objective of this study was to look at the effect of age, breed, sex and time period on skin biophysical parameters for dogs fed a nutritionally complete and balanced canned food for adult dogs.

M. Egawa, M. Oguri, T. Hirao, M. Takahashi, M. Miyakawa, **The evaluation of skin friction using a frictional feel analyzer,** Skin Research & Technology, 2002 Feb;8(1): p. 41-51

Background/Aims: Sensory evaluation is an important factor for cosmetic products. Several devices for the measurement of sensory properties have been developed in recent years. The objective here is to measure skin surface friction using these devices and examine the correlation with other physiological parameters in order to evaluate the potential of physical measurement of tactile sensation. Methods: A KES-SE Frictional Analyzer, a commercial device for measurement of surface frictional characteristics, was used in this study. An arm holder was added to this device for measurement on the human forearm. The frictional coefficient (MIU) and its mean deviation (MMD) were used as the parameter to indicate surface friction. The moisture content in the stratum corneum was measured with a Corneometer CM825, the transepidermal water loss with a Tewameter TM210, the viscoelastic properties of the skin with a Cutometer SEM575 and the skin surface pattern by observing the negative replica using silicon rubber. Results: The MIU was not influenced by load; however, it was increased due to water application on the skin. The relationship between MIU and the moisture content in the stratum comeum, between MMD and skin surface pattern and between MMD and viscosity of both normal human forearm skin and SDS (sodium dodecyl sulfate)-induced dry skin were confirmed by statistical analysis in a test on human subjects. There was also a correlation between either MIU or MMD and sensory evaluation in the morning after the application of moisturizing products. Human skin surface friction was measured by using a KES-SE Frictional Analyzer. Conclusion: Judging from the correlation between either MIU or MMD and sensory evaluation, we considered this instrumental analysis to be useful for evaluating the tactile impression of human skin.

S. Richert, A. Schrader, K.-H. Schrader, **Comparing Methods to Measure Porcine Skin Integrity In Vitro,** Cosmetics & Toiletries, January 2002, Vol. 117, Nr. 1

To confirm the integrity of porcine skin prior to penetration tests, published studies show that measuring transepidermal water loss, transdermal electrical resistance or caffeine penetration levels are often chosen techniques. New results demonstrate that TEWL is the superior method.

C. Hun Huh, K. Il Seo, S. Duck Kim, J. Han, H. Chul Eun, **Biophysical changes after mechanical injury of the stratum corneum in normal skin,** Contact Dermatitis, January 2002, Vol. 46 No. 1

Scrubbing off the stratum corneum with a rough towel after soaking in warm water is a bathing custom unique to Korea. However, Korean dermatologists have advised against this practice due to the potential harm that it may cause, though there is little data to support this advice.

S. Schliemann-Willers, W. Wigger-Alberti, P. Kleesz, R. Grieshaber, P. Elsner, **Natural vegetable fats in the prevention of irritant contact dermatitis,** Contact Dermatitis, January 2002, Vol. 46 No. 1

Chronic irritant contact dermatitis (ICD) is one of the most pressing problems in occupational medicine and is common in the food processing industry. To date, protective creams that fulfil the special requirements in the foodstuffs industry have not been available.

M. Rohr, A. Schrader, **FOITS – corneometry influenced by peripheral expperimental conditions,** Congress Stratum Corneum III, Basel, September 2001 and The Essential Stratum Corneum, edited by R. Marks, J.-L. Lévêque, R. Voegeli, Martin Danitz Ltd., London, 2002

Besides a good compatibility, which should be a matter of course for cosmetic products, the skin's physiological effectiveness, in particular moisture and skin-smoothing effects, are of main interest for this kind of product. Techniques such as FOITS (Fast Optical In vivo Topometry of human Skin), and corneometry are used to investigate their effectiveness. In order to succeed in reproducible and statistically significant results, experimental side conditions, such as a defined panel, controlled climatic conditions or a test design that includes a positive and a negative standard, are the basic starting tools.

R. Lambrecht, P. Clarys, K. Alewaeters, A. O. Barel, **Influence of in vivo iontophoresis on the skin barrier and percutaneous penetration**, Congress Stratum Corneum III, Basel, September 2001 and The Essential Stratum Corneum, chapter 21, ed. by R. Marks, J.-L. Lévêque, R. Voegeli, Martin Danitz Ltd., London, 2002

Iontophoresis is a technique used to enhance the transdermal delivery of a drug by means of an electric current. The iontophoretic transport is influenced by several factors, such as concentration,

size, ionic strength and the Ip of the drug and pH of the solvent, and also by the applied intensity and shape of the current and the application time.

I. Le Fur, F. Morizot, S. Lopez, C. Guinot, J. Latreille, E. Tschachler, **Seasonal changes in skin biophysical properties in healthy Caucasian women**. Congress Stratum Corneum III, Basel, September 2001.

M. Egawa, T.Hirao, M. Takahashi, **The measurement of skin friction using a frictional feel analyser**, Congress Stratum Corneum III, Basel, September 2001

Sensory evaluation is an important factor for cosmetic products. Several devices for the measurement of sensory properties have been developed in the recent years.

K. de Paepe, K. Janssens, J.P. Hachem, D. Roseeuw, V. Rogiers, **Squamometry as a screening method for the evaluation of hydrating products**, Skin Research and Technology, Vol.7, No. 2, August 2001

Squamometry is a combination of sampling corneocytes by adhesive coated discs following by colour measurements after staining the cells. In this study, the correlation between stratum corneum (SC) hydration and scaling was investigated using capacitance measurements and squamometry, respecitively.

H. Blitz, H.-P. Nissen, S. Sustmann, **Body care for sensitive and especially dry skin**, Scientific Study Eubos Med, 2001

Alkali soap-free synthetic detergents, i.e. washing preparations with a neutral or skin-neutral pH-value, have proved themselves as mild cleansing agents for general use.

S. Sustmann, **Body care for dry skin**, Scientific Study Eubos Med, 2001

Dry skin is a widespread phenomenon of our time and is characterized by a deficiency of fat and moisture.

S. Sustmann, **Face care for sensitive and particularly dry skin**, Scientific Study Eubos Med, 2001

Daily influences, such as stress and the effects of weather, attack our skin and cause damage that is initially slow and scarcely detectable.

H.-P. Nissen, S. Sustmann, **Body care for normal to oily and sensitive skins**, Scientific Study Eubos Med, 2001

Body cleansing is particularly important in modern civilization, with its emphasis on hygiene, and it makes an important contribution to individual well-being.

H. Löffler, H. Dickel, O. Kuss, T. Diepgen, I. Effendy, **Characteristics of Self-estimated Enhanced Skin Susceptibility,** Acta Derm Venereol 2001; 81: 343–346

A considerable number of people complain about enhanced skin sensitivity. The aim of this study was to investigate the characteristics of subjective statements and objective measurable parameters in subjects with self-estimated enhanced skin susceptibility. Four-hundred-and-twenty volunteers completed a questionnaire form with a self-estimation of skin susceptibility, possible triggering factors and other skin problems. In addition, basal values of transepidermal water loss, cutaneous blood flow and skin hydration were measured.

*H. Lambers, H. Pronk***, Biophysical Methods for Stratum Corneum Characterization**, in T. Förster (Editor): Cosmetic Lipids and the Skin Barrier, 2001 by Marcel Dekker

There is no doubt that the application of cosmetic lipids has many positive effects on the structure and function of the skin. These effects are pleiotropic, caused either by direct interaction with the epidermis, particularly the stratum corneum, or indirectly, by influencing the physiologic, homeostatic condition of the skin.

T.H. Kim. E.H. Choi, Y.C. Kang, S.H. Lee, S.K. Ahn, **The Effects of Topical α-Hydroxyacids on the Normal Skin Barrier of Hairless Mice**, British Journal of Dermatology 4011, 2001

α-hydroxyacids (AHA) such as glycolic acid and lactid acid have recently been used in cosmetic and dermatological formulations.

I. Castiel-Higounenc, R. Jourdain, C. Queille-Roussel, C. Ferraris, P. Bastien, R. Schmidt, O. de Lacharrière, **Is barrier function disrupted in atopic xeroxis?,** Poster for SFIC,Lausanne, July 2001

Atopic dermatitis (AD) is thought to be accompanied by alterations of the epidermis including reduction in water content and an augmentation in the transepidermal water loss (TEWL). In addition, studies have suggested that qualitative and quantitative differences exist in certain epidermal lipids of the intercorneocyte spaces of atopic patients, as compared to healthy subjects. Recent studies, however, have challenged these findings and indicate that the results obtained are highly dependent upon the skin zone evaluated as well as the clinical characteristics of the subjects being studied. The purpose of the work presented here was to more thoroughly characterize the water content and the barrier function of the cutaneous barrier of atopic xerosis patients as well as to analyze the type and quantity of intercorneocyte lipids found in the epidermis of these same patients.

J.W. Fluhr, H. Dickel, O. Kuss, I. Weyher, T.L. Diepgent, E. Berardesca, **Impact of anatomical location on barrier recovery, surface pH and stratum corneum hydration after acute barrier disruption,** British Journal of Dermatology 2001; 146: p. 770-776

It is not known whether distinct anatomical locations will respond with different recovery rates following acute barrier challenges. To investigate whether barrier parameters differ at five body sites during recovery from acute disruption. Acute barrier disruption was achieved by tape stripping and by acetone extraction of stratum corneum lipids. Transepidermal water loss (to assess barrier function) capacitance (for stratum corneum hydration) and skin surface pH were measured at each of five different body sites in 14 human volunteers. Individual measurements were obtained every 24 h for 96 h. Lipid-rich skin areas (e.g. the forehead) were the most vulnerable to barrier disruption by either method.

M. Ghyczy, W. Gehring, V. Vacata, B. Gertchen-Ohligschläger, **Normalisation of Skin Humidity in SLS Pertubed Human Skin In Vivo by Gel State Phosphatidylcholine,** Cosmetic Science Conference 2001, Düsseldorf

The central role of skin moisturizers in stratum corneum (SC) for the healthy skin was established in the last decade.

C.Y. Levin, H.I. Maibach, **Do cool water or physiologic saline compresses enhance resolution of experimentally-induced irritant contact dermatitis?,** Contact Dermatitis Vol. 45 No. 3, September 2001

Acute irritant contact dermatitis (ICD) is frequently treated with cool water or saline compresses. While presumed effective, little quantitative evaluation documents the treatment's benefit. This study sought to determine the efficacy of both distilled water and physiologic saline compresses on experimentally-induced ICD.

M. Gloor, B. Wasik, W. Gehring, **Hat ein Hamamelis-Destillat eine entzündungshemmende Wirkung?,** H+G Zeitschrift, Ausgabe 7/8-2001.

Fragestellung: Beeinflußt der Wirkstoff Hamamelis die irritative Reaktion der Haut bei experimentellen Irritationsmodellen? Versuchsanordnung: Bei 15 Versuchspersonen wurde der Natriumlaurylsäure (NLS)-Irritationstest an jeweils 4 Versuchsstellen beider Unterarme volar durchgeführt. Es wurde einmal täglich 1% NLS 30 Minuten lang appliziert. Nach Beendigung der NLS-Einwirkung wurden die Prüfpräperationen aufgetragen. An den jeweils 4 symmetrischen Versuchsstellen wurden geprüft.

F. Ourvrard-Baraton, A. Bernois, D. De Queral, B. Le Varlet, C.M. Vincent, B. Nagot, C. Ailaud, M. Bayer, N. Garcia, C. Miquel, N. Perichou, P. Courtellemont, O. Doucet, A. Mavon,C. Mikler, J.P. Marty, **Validation inter-laboratoire d'un modèle d'absorption percutanée in vitro: pouvoir discriminant de la peau d'oreille de porc. Infuence de la perte insensible en eau (P.I.E.) et de la pilosité**. Poster for SFIC, Lausanne/CH, Juli 2001

B. Deog Park, Y. Kim, M. Jin Lee, J.K. Youm, S. Jeong, E. Ho Choi, S. Hun Lee, **Properties of a Pseudoceramide Multi-Lamellar Emulsion In Vitro and In Vivo**, Cosmetics & Toiletries, June 2001

Many physiochemical and biological functions of skin-care products in the last decade were generally concerned with the stratum corneum (SC). The structure of the SC was proposed as a "brick & mortar model" by Elias in 1981. Bricks represented the corneocytes and intercellular lipids (composed of cholesterols, fatty acids and ceramides) formed the mortar.

J. Djordjevic, G. Vuleta, H. Zhai, H.I. Maibach, J. Milic, **Effect of the Oil Phase of O/W Emulsions with Vitamin E Acetate on Skin Moisutre Content and Skin Barrier Function**, IFSCC Conference, Stockholm/Sweden, May 7-9, 2001

Three cosmetic emulsions with vitamin E acetate (5%) were formulated using polymeric emulsifier, with different type but same amount of emoillient oil (25 %).

R. Roguet, C. Faller, F. Dreher, C. Lotte, I. Harris, M. Bracher, D. Pollet, U. Pfannenbecker, N. Dami, M. Ponec, **Evaluation of Reconstructed Human Epidermis Kits for the In Vitro Assessment of Cosmetic Safety**, IFSCC Conference, Stockholm/Sweden, May 7-9, 2001

Reconstructed human epidermis is one of the most promising tools for in vitro evaluation of cometics.

N. Widler, A. Sigrist, F. Gafner, **Lipid Analysis and Transepidermal Water Loss in Snakes**, IFSCC Conference, Stockholm/Sweden, May 7-9, 2001 and IFSCC Magazine – Vol. 5, No. 1, 2002

The lipids of 101 snake sheddings from 32 different species kept at Pentapharm's serpentarium were extracted and analyzed by HPLC/LSD (light scattering detection and TLC. The snake shedding extracts were compared with those of human stratum corneum.

W. Wigger-Alberti, A. Krebs, N. Göritz, K.-P. Wilhelm, P. Elsner, **Concurrent Testing of Cutaneous Irritants in Vivo**, IFSCC Conference, Stockholm/Sweden, May 7-9, 2001

In clinical practice, cutaneous exposure to a variety of irritants such as surfactants and solvents is frequent.

H.M. Ribeiro, J. Morais, L. Rodrigues, **Long-term Influence of Polymers on the Biological Properties of the In Vivo Normal Human Skin**, IFSCC Conference, Stockholm/Sweden, May 7-9, 2001

Cosmetic formulations are actually included into the normal skin care daily habits and often aim to contribute to the normal skin physiology.

P. Contreiras Pinto, L.M. Pereira, R. Minhos, J. Serra, L. Rodrigues, **The In Vivo Skin Water Content Dynamical Analysis Through Compartmental Modeling a Validation Approach,** IFSCC Conference, Stockholm/Sweden, May 7-9, 2001

Trans Epidermal Water Loss (TEWL) is one of the most important variables used to characterize skin water balance.

A.O. Barel, R. Lambrecht, P. Clarys, B.M. Morrison Jr., M. Paye, **Comparative study of the effect on the skin of two soap bars in normal use and in the soap chamber test,** Experimental Dermatology Vol 6 No 5, ISICD and ISBS Meeting Rome 2-4 October 1997 and Skin Research and Technology, Vol. 7, No. 2, May 2001

A double-blind study of the normal use during 10 weeks of two soap bars (soap and a syndet) was carried out on 25 female subjects. Eventual skin changes were evaluated by bioengineering measurements during the ten weeks treatment. Characterization of the skin was carried out using measurements of the skin colour, hydation, skin surface pH and TEWL.

W. Gehring, M. Gloor, **Der Effekt von Dexpanthenol bei experimentell geschädigter Haut**, (The effect of dexpanthenole in experimentally damaged skin). H+G, Band 76, April 2001-05-21

Im Rahmen einer randomisierten vehikelkontrollierten, doppelbilinden Studie wurde Dexpanthenol in zwei unterschiedlichen lipophilen Vehikeln im repetitive Waschtest untersucht.

N. Ota, T. Horiguchi, N. Fujiwara, N. Kahibuchi, Y. Hirai, F.Mori, **Identification of Skin Sensitivity through Corneocytes Measurements,** IFSCC Magazine, Vol. 4, No.1, 2001

Surveys conducted in many nations suggest that up to 50% of cosmetic users believe they have sensitive skin and products specifically designed for this skin type have become an important cosmetic category. In developing such products, objective assessment of the degree and the type of sensitivity is desirable. Unfortunately, currently available methods, including measurements of trans-epidermal water loss (TEWL) and lactic acid stinging test do not correlate well with self-assessed sensitivity and cannot be used to identify persons who are more prone to develop adverse skin reactions than other users.

C. Fuchs, C. Heinemann, S. Schliemann-Willers, P. Elsner, **Wirksamkeitsnachweis eines Pflegeproduktes**, Kosmetische Medizin 4/2001

Berichtet wird über eine dreiwöchige Anwendungsbeobachtung eines Pflegeproduktes, in welcher der Einfluss des Produktes auf die Hornschichtfeuchtigkeit an 20 Probanden mit atopischer Hautdisposition und trockener, irritierbarer Haut in Form einer Kurz- und Langzeitstudie getestet wurde.

W. Gehring, M. Gloor, **Der Effekt von Dexpanthenol bei experimentell geschädigter Haut**, (The effect of dexpanthenole in experimentally damaged skin). H+G, Band 76, April 2001-05-21

Im Rahmen einer randomisierten, vehikelkontrollierten, doppelblinden Studie wurde Dexpanthenol in zwei unterschiedlichen, lipophilen Vehikeln im repetitiven Waschtest untersucht.

B.D. Park, J.K. Youm, S. Jeong,E.H. Choi, S. Hun, **The Effectiveness of Multi-Lamellar Emulsion Damaged Skin,** Personal Care Ingredients Asia, March 2001

Skin is a barrier to physical and chemical environment.

L. Rigano, F. Distante, A. Bonfigli, E. Berardesca, **Functional map of "normal" and "sensitive" facial skin for trans-epidermal water loss**, **capacitance and microcirculation,** 5th ASCS March 2001

Different body sites are reported to show significant variations in skin biophysical and functional properties such as the response to locali applied stimuli or substances, including cosmetic products.

M.K. Park, S.C. Ma, J.H. Kim, H.B Pyol, **Study of Preparation of Sodium Chloride-Free w/s Emulsion Using NFM, Chitin Derivatives and the Other**, 5th ASCS March 2001

In general a w/o or o/w emulsion is stabilized by sodium chloride which is hydrated by and increases electric conductivity of aqueous solutions.

D. Iliev, U. Hinnen, P. Elsner, **Skin Bioengineering Methods in Occupational Dermatology**, Skin Bioengineering Vol. 26, March 2001

Measuring biophysical properties of the skin is not only useful to study cutaneous physiology and pathology but may also be of value for the prediction of eczema risk, for the detection of subclinical eczema and for therapy control in occupational dermatology.

B. Gabard, P. Treffel, **Correlation of in vitro and in vivo Testing,** Skin Bioengineering, Vol. 26, March 2001

A major problem encountered during the development of topical preparations not designed for transdermal but for local activity is to ensure sufficient therapeutic activity or, in the case of generic formulations, bioequivalence with the branded product. There are several possible approaches to evaluate the penetration of drugs into the skin and to investigte the effect of different vehicles on topical drug delivery.

Y. Yoshizawa, H. Tanojo, S.J. Kim, H.I. Maibach, **Sea Water or its Components Alter Experimental Irritant Dermatitis in Man**, Skin Research and Technology, Vol. 7, No. 1, February 2001

Ocean bathing has been considered "healthy" for skin, but its efficacy remains testimonial in nature.

S.J. Bashir, A. Chew, A. Anigbogu, F. Dreher, H.I. Maibach, **Physical and Physiological Effects of Stratum Corneum Tape Stripping,** Skin Research and Technology, Vol.7 , No. 1, February 2001

Tape stripping of human startum corneum has been performed to measure stratum corneum mass, barrier function, drug reservoir and percutaneous penetration.

T. Reuther, S.C. Behrens-Williams, M. Kerscher, **Untersuchungen zur Wirkung von Mometasonfuroat-Fettcreme auf die epidermale Barriere**, H+G, Supplement 2/2001

J. Lübbe, C. Ruffieux, G. van Melle, D. Perrenoud, **Irritatives Potenzial des Händedesinfektions-mittels n-propanol auf vorgeschädigter Haut**, H+G, Supplement 1/2001

Die alkoholische Händedesinfektion ist Methode der Wahl zur Vorbeugung der Übertragung nosokomialer Infektionen in Spitälern.

H. Dobrev, **In vivo Study of Skin Mechanical Properties in Psoriasis Vulgaris**, Acta Derm. Venerol., 2000; 80, p. 1-5

The aim of this study was to investigate the mechanical properties of the skin in psoriatic plaques before and after treatment with dithranol in clinically uninvolved psoriatic skin in comparison with skin of healthy controls.

*P. Wirtz***, Objektive Beurteilung physiologischer Parameter der Haut von an atopischem Ekzem erkrankten Kindern: eine Untersuchung von pHWert, transepidermalem Wasserverlust und Corneometrie an der Haut gesunder und erkrankter Kinder mit klinisch nicht betroffener und**

mittels lokalem SCORAD differenzierter ekzematöser Haut, Dissertation zur Erlangung der Doktorwürde der Technischen Universität München, 2000

C. Houghton, **New natural oils**, Cosmetic Science & Business 2000
Here we look at a selection of vegetable oils from different sources which have recently come under R&D spotlight.

A. M. Koehler, H.I. Maibach, **Skin hyporeactivity in relation to patch testing,** Contact Dermatitis, 2000, Vol. 42, p. 1-4
False negative patch tests are clinically relevant.

J. Brasch, M. Hüttemann, E. Proksch, **Iontophoresis of nickel elicits a delayed cutaneous response in sensitized individuals that is similar to an allergic patch test reaction**, Contact Dermatitis, 2000, Vol. 42, p. 36-41
Wearing of patch test chamber fro 1-2 days is uncomfortable for the patients.

J. Min Choi, J. Young Lee, B. Kee Cho, **Chronic irritant contact dermatitis: recovery time in man**, Contact Dermatitis 42, 2000
Chronic irritant contact dermatitis (ICD) is a common skin disease, especially in the workplace, but determining the recovery time of chronic ICD is not easy. To measure the recovery time of chronic ICD, we examined the skin reactivity to a model surfactant, sodium lauryl sulfate (SLS), on previous chronic ICD and normal sites by visual grade and non-invasive instruments.

O. Tanno, Y. Ota, R. Hikima, M. Matsumotor, M. Ota, S. Inoue, **An Increase in Endogenous Epidermal Lipids Improves Skin Barrier Function**, XXIst IFSCC Congress 2000, Berlin
Stratum corneum lipids, especially ceramides, cholesterol, and fatty acids, play a critical role in the formation and maintenance of the epidermal permeability barrier.

A. Teglia, A. Mondelli, **Short Term Effects of Hydrophilic Ingredients on the Hydration Parameters of the Stratum Corneum,** XXIst IFSCC Congress 2000, Berlin
Though the real benefit of raising the skin's water content is not fully explained, it is evident to everyone that without an adequeate amount of water, skin displays undesirable perceivable changes (brittleness, flakiness, roughness) and its protective function tends to be impaired.

N. Ota, T. Horiguchi, N. Fujiwara, N. Kashibuchi, Y. Hirai, H. Mori, **Identification of Skin Sensitivity through corneocytes Measurements,** XXIst IFSCC Congress 2000, Berlin
Surveys conducted in many nations suggest that up to 50% of cosmetic users beleive they have sensitive skin and products specifically designed for this skin type have become an important cosmetic category. In developing such products, objective assessment of the degree and the type of sensitivity is desirable.

A. Teglia, A. Mondelli, **Short Term Effects of Hydrophilic Ingredients on the Hydration Parameters of the Stratum Corneum,** XXIst IFSCC Congress 2000, Berlin
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M. Gotsche, R. Dieing, A. Jentzsch, P. Hoessel, W. Schrof, **Investigations of Polymers for Skin Care**, XXIst IFSCC Congress 2000, Berlin
There is a need for improved skin care products due to a demographic shift in the population. A major challenge for the cosmetic chemist in this area is the improvement of skin smoothness and moisturization.

F. Distante, L. Rigano, S. Sirigu, R. D'Agostino, A. Bonfigli, E. Berardesca, **Intra- and Inter-Individual Differences in Facial Skin Functional Properties: Influence of Site and "Skin Sensitivity" for Bioengineering Studies**, XXIst IFSCC Congress 2000, Berlin
Biophysical and functional skin differences according to the body site have been widely reported by non-invasive studies of skin bioengineering in the past years.

D.T. Floyd, H.I. Leidreiter, **Performance-Driven: New Silicone CoPolymers,** Global Cosmetic Industry September 2000

It is hard to recall when silicones were not considered key ingredients for personal care products.

M. Takahashi, **Recent Progress in Skin Bioengineering and its Application to Evaluation of Cosmetics,** SOFW Journal, September 2000

With the advances in skin bioengineering technology, great progress has been made in the techniques used for testing the efficacy of cosmetics to the skin ranging from the physical properties to the biochemical characteristics of the skin.

S. Sakai, S. Sasai, Y. Endo, K. Matue, H. Tagami, S. Inoue, **Characterization of the Physical Properties of the Stratum Corneum by a New Tactile Sensor**, Skin Research and Technology, Vol. 6, No. 3, August 2000

The physical properties of the stratum corneum (SC) change with its water content which is regulated by the presence of water solutes (natural moisturizing factors) and lipids in the SC, and are considered to be responsible for the induction of desquamation, skin surface roughness and fine wrinkles.

G. Yosipovitch, A. Maayan-Metzger, P. Merlob, L. Sirota, **Skin barrier properties in different body areas in neonates,** Pediatrics. 2000 Jul;106(1 Pt 1): p. 105-108

Objective: The aim of the study was to investigate skin barrier function in neonates in different anatomic sites during the first 2 days of life. Design: The study population consisted of 44 healthy full-term newborn infants. Transepidermal water loss (TEWL), stratum corneum hydration (SCH), and skin surface pH were measured in different anatomic sites (forehead, flexor part of forearm, upper back, abdomen, inguinal region, palms, and soles) during the first 10 hours of life and 24 hours later. Measurements were recorded with a Tevameter, a Corneometer, and a skin pH meter with a flat glass electrode. Results were compared with those in 20 healthy adults. Results: TEWL was lower in infants than in adults in the forehead, palms, soles, and higher in the forearms. It was significantly higher on day 1 than on day 2 in the soles, palms, and forearms, and in the forearm, palms, and inguinal region compared with the other anatomic sites. SCH was significantly lower in the infants on the forehead, back, and abdomen, and higher on the forearms and palms; it was significantly higher on the first day of life on the forearms and palms, and lower in the inguinal region. Skin surface pH was significantly higher in the infants in all body sites (>6.6 in most measurements). On day 2, it was significantly lower than on day 1, but still higher than in adults. SCH correlated positively with TEWL in the neonates but not in the adults. None of the variables were related to gestational age, sex, mode of delivery, or body weight. Conclusdions: Changes take place in SCH, water loss, and pH in the first 2 days after birth, suggesting that the stratum corneum barrier is still in the process of adapting to extrauterine life. The significant anatomic variability in TEWL and SCH should be taken into account in evaluating the permeation of skin care products and topical medications in newborns.

H. Zhai, F. Brachman, A. Pelosi, A. Anigbogu, M.B. Ramos, M.C. Torralba, H.I. Maibach, **A bioengineering study on the efficacy of a skin protectant lotion in preventing SLS-induced dermatitis,** Skin Research and Technology, Vol. 6, No. 2, May 2000

The study evaluated the efficacy of adimethicone skin protectant against sodium layryl sulfate (SLS) induced irritant contact dermatitis (ICD) by clinical visual grading and bioengineering techniques in 12 healthy humans.

A. Leal, J. Alves, L. Rodrigues, **Usefulness of Transcutaneous Indictors as Predictors of Peripheral Dysfunction**, 13th ISBS Jerusalem, March 2000 and Skin Research and Technology, Vol. 6, No. 3, August 2000

Transcutaneous monitoring of biological signals has been a major research objective specially for cicular (haemodinamics) of hydro-electrolytic parameters.

J.P. Hachem, K. de Paepe, E. Vanpée, L. Kaufman, V. Rogiers, D. Roseeuw, **Combination Therapy Improves the Recovery of the Human Skin Barrier Function: An Experimental Model Using Contact Allergy Patch Test Combined with TEWL Measurements,** 13th ISBS Jerusalem, March 2000 and Skin Research and Technology, Vol. 6, No. 3, August 2000

We have recently shown that contact allergy patch (CAP) testing is a suitable method for studying the skin barrier function under allergic contact dermatitis (ACD) condition in double blind human models.

K. Janssens, K. de Paepe, D. Roseeuw, V. Rogiers, **Lack of Correlation between Stratum Corneum Hydration and Scaling Pattern: Evaluated by Corneometry and Squamometry,** 13th ISBS Jerusalem, March 2000 and Skin Research and Technology, Vol. 6, No. 3, August 2000

Squamometry is a combination of smapling corneocytes by adhesive coated discs followed by colour measurements after staining of the cells.

J.W. Fluhr, O. Kuss, T. Diepgen, S. Lazzerini, A. Pelosi, E. Beradesca, **Testing for Irritation with a Multiparametric Approach: Comparison of Eight Parameters and Five Different Irritation Models,** 13th ISBS Jerusalem, March 2000 and Skin Research and Technology, Vol. 6, No. 3, August 2000

The assessment of irritated skin reactions by non-invasive bioengineering methods is widely used.

K. de Paepe, J.M. Lagarde, Y. Gall, D. Roseeuw, V. Rogiers, **Study of the Human Skin Microrelief by a Standardised Light Transmission Method**, 13th ISBS Jerusalem, March 2000 and Skin Research and Technology, Vol. 6, No. 3, August 2000

Human skin topography can be studied invivo using non-invasive bioengineering techniques.

L. Rodrigues, P. Pinto, L.M. Pereira, **The Quantitative Assessment of the In Vivo "Barrier Function",** 13th ISBS Jerusalem, March 2000 and Skin Research and Technology, Vol. 6, No. 3, August 2000.

Epidermis surface is far from being an ideal membrane, depending on and being affected by multiple environmental determinants.

A.O. Barel, K. Alewaeters, P. Clarys, **Non-Invasive Bioengineering Study of the Effects on the Human Skin of a Direct Electric Current,** 13th ISBS Jerusalem, March 2000

The effects of a small intensity direct electric current (galvanic current) on the volar forearm skin was examined in vivo by several non-invasive bioengineering methods.

K. O'goshi, M. Iguchi, H. Tagami, **Functional analysis of the stratum corneum of scalp skin:studies in patients with alopecia areata and androgenetic alopecia,** Arch. Dermatol. Res. (2000), Springer-Verlag

Because of the presence of thick long hairs on the scalp, little information is available concerning the functional characteristics of the stratum corneum (SC) of scalp skin. We therefore conducted a functional study of the SC of lesional scalp skin of patients with alopecia areata and of patients with androgenetic alopecia.We compared the scalp with the cheek and the flexor surface of the forearm (volar forearm). The water barrier function of the scalp SC of both patient groups, in terms of transepidermal water loss (TEWL), was almost comparable to that of the volar forearm, and was far better than that of facial skin.

M. Winnefeld, M.A. Richard, M. Drancourt, J.J. Grob, **Skin Tolerance and Effectiveness of Two Hand Decontamination Procedures in Everyday Hospital Use**, British Journal of Dermatology 2000

Hand decontamination is crucial to control nosocomial infections. The utility of hand decontamination is related not only to its antimicrobial effectiveness, but also to ist acceptability by hospital staff.

H.E. Packham, C.L. Packham, **Skin Bioengineering as a Contribution to Product Performance and Safety**, Cosmetics & Toiletries 03/2000

With today's increasing consumers sophistication and the demand both for products that work and are safe for the user, there is a need for greater objectivity and accuracy in both formulations and claims made by the manuafcturer.

J.S.C. English, J. Ratcliffe, H.C. Williams, **Irritancy of industrial hand cleansers tested by repeated open application on human skin,** Contact Dermatitis, Vol. 40, No. 2

The aim of this study was to compare the irritancy potential of 2 industrial hand cleansers with a brand leader of "mild" children's hand cleanser and with an emollient.The products were tested using repeated open application tests (ROATs) on the forearms of 40 subejcts. Scoring of signs and symptoms (itching or burning), transepidermal water loss (TEWL) and stratum corneum hydration (Corneometer) evaluated responses.

S. Lopez, I. Le Fur, F. Morizot, G. Heuvin, C. Guinot, E. Tschachler, **Transepidermal Water Loss, Temperature and Sebum Levels on Women's Facial Skin Follow Characteristic Patters,** Skin Research and Technology, Vol. 6 No. 1, February 2000.

The aim of this study was to compare the biophysical properties of different facial zones.

W. Pittermann, T. Gassenmeier, S. Nieveler, T. Förster, M. Kietzmann, **Experimentally Induced Epidermal Barrier Perturbation: Measurement of Transepidermal Water Loss (TEWL) Using the Perfused Bovine Udder Skin (BUS) Model**, Poster Henkel 5/1998 and IFSCC Vol. 3, No. 1, January/March 2000-04-12

This paper describes the measurement of the TEWL under in vitro conditions using the isolated perfused Bovine Udder Skin (BUS) model.

W. Gehring, R. Bopp, F. Rippke, M. Gloor, **Effect of topically applied evening primrose oil on epidermal barrier function in atopic dermatitis as a function of vehicle,** Arzneimittel-Forschung/Drug Research 49(II), 7, 635-642 (1999)

The aim of this study was to establish the effect on barrier function in atopic dermatitis of topical evening primrose oil in an amphiphilic and a stable water-in-oil emulsion. The studies were vehicle-controlled in two populations of 20 atopic subjects. Barrier function was assessed in terms of transepidermal water loss and stratum corneum hydration after a 4-week treatment period and a 1-week treatment-free period.

C. Packham, **Bio-engineering and the skin,** AOHNP(UK) 1999
In this article a modern approach to the age-old problem of irritant contact dermatitis is examined.

E. Schnetz, O. Kuss, J. Schmitt, T.L. Diepgen, M. Kuhn, M. Fartasch, **Intra- and inter-individual variations in transepidermal water loss on the face: facial locations for bioengineering studies**, Contact Dermatitis 40, 1999

The volar forearm is the favored location for bioengineering studies. However, transepidermal water loss (TEWL), which is an important indicator of the function of the epidermal barrier, shows regional variations, and for the evaluation of cosmetic formulations, facial skin would be more suitable. In this study, we have compared 10 facial locations with 1 test site on the volar forearm for absolute TEWL values, reproducibility, and correlation.

M. Fischer, I.M. Schneider, R. Neubert, W. Wohlrab, **Über den Einfluss methylverzweigter Fettsäuren auf die Barrierefunktion des Stratum corneum,** Dermatosen in Beruf und Umwelt, 47/221-264, Nov/Dez 1999

Es wurde die Wirkung von methylverzweigtem Fettsäuren (2 % bzw. 5 % 10-Methylpalmitinsäure und 10-Methylhexadec-9-ensäuren als Penetrationsehancer untersucht.

J. Fluhr, M. Gloor, L. Lehemann, S. Lazzerini, F. Distante, E. Berardesca, **Glycerol Accelerates Recovery of Barrier Function In Vivo,** ISBS and EEMCO Meeting, Liege, 09/1999

The 2 studies were performed in order to evaluate 1) with 12 healthy volunteers the effect of occlusion and glycerol in the modulation of barrier repair after tape stripping and 2) on 20 healthy volunteers the effects of glycerol in the barrier repair after a repeated SLS-washing especially in the post treatment period.

V. Rogiers, **EEMCO Guidance for the Assessment of the Transepidermal Water Loss (TEWL),** EEMCO Group 1999

The startum corneum (SC) constitutes a natural barrier which not only provides protection against percutaneous absorption of a wide variety of xenobiotics but also prevents the loss of endogenous molecules including water from the deeper layers of the epidermis.

K. Lanzerath, **Eine Notwendigkeit für die dermatolische Praxis? Die apparative Bestimmung von Hautparametern,** H+G Band 74, Heft 6, 1999

Transepidermaler Wasserverlust (TEWL), Corneometrie, Sebumetrie, Melanin- und Erythembestimmung – Schlagworte, die in der dermatologischen Forschung und Praxis immer mehr an Bedeutung gewinnen.

E. Thumm, E.G. Jung, C. Bayerl, **Überprüfung der Auswirkung von Kosmetika auf Hautrauhigkeit, Feuchtigkeitsgehalt und Barrierefunktion der Haut**. Kosmetische Medizin 3 Juni 1999

In einer seitenkontrollierten Studie wurde drei Kosmetikpräparate auf liposomaler Basis hinsichtlich ihrer Auswirkung auf a)Hautrauhigkeit (Skin Visiometer SV 500), b) den Feuchtigkeitsgehalt des Stratum corneum (Corneometer CM825) und c) die Hautbarrierefunktion bzw. den transepidermalen Wasserverlust/TEWL (Tewameter TM 210) untersucht.

L. Rodrigues, P. Pinto, N. Galego, P.A. Da Silva, L.M. Pereira, **Transepidermal water loss kinetic modeling approach for the parameterization of skin water dynamics**. Skin Research and Technology, Vol.5 No. 2, May 1999

The evaluation of transepidermal water loss (TEWL) is one of the methods most frequently used in studies involving skin water dynamics. However, TEWL does not provide a direct measurement of epidermal barrier function, being rather a surrogate effect of it. In particular, when external stimuli change cutaneous water balance, these stimuli must be taken into account in order to achieve a rigorous interpretation of the results.

Y. Kawasaki, D. Quan, K. Sakamotor, R. Cooke, H.I. Maibach, **Influence of Surfactant Mixutres on Intercellurlar Lipid Fluidity and Skin Barrier Function**, Skin Research and Technology, Vol. 5 No. 2, May 1999

Surfactant mixtures are used in cosmetic and pharmaceutical formulas in order to establish product efficacy while maintaining mildness and skin lipids. The electron paramagnetic resonance (EPR) technique of the spin labeling method with a nitroxide spin probe is a valuable method in the study of biological membranes. The objective of this study was to define the influence of surfactant mixtures on intercellular lipid.

S. Bielfeldt, H. Köhler, J. Gassmüller, **Minimalinvasive Verfahren in der Wirksamkeits- und Verträglichkeitsprüfung von Kosmetika**,13. Symposium der DGK Bad Neuenahr, 1999

D. Peiler, **Hautschutz im Dentallabor**, Dissertationsarbeit 1999

G. Kutz, D. Peltner, **Aktuelle Formulierungskonzepte moderner Hautkosmetika am Beispiel der trockenen Haut**, Kosmetische Medizin, Nr. 5, 1999

Es ist bekannt, dass die Wirksamkeit eines Dermatikums nicht nur von der Art und Konzentration des eingesetzten Wirkstoffs abhängt, sondern in großem Ausmaß auch von dem Vehikel beeinflusst wird.

M. Puschmann, A. Melzer, H.P. Nissen, **Hautglätende, hautelastische und hautschützende Wirkung einer Urea-Ceramid-Kombination,** Kosmetische Medizin Nr. 4, 1999-11-22

Sebostase ist ein häufiges dermatologisches Krankheitsbild. Sie wird durchexogene Faktoren, (Klima, Waschgewohnheiten) und/oder konstitutionelle Faktoren wie Alter und atopische Hautdiathese hervorgerufen. Eine auffällige Häufung derartiger Symptome findet sich in der kalten Jahreszeit. Hier ist das Klima (Temperatur, Luftfeuchtigkeit) sowohl im Freien als auch in den Gebäuden als wichtiger Kofaktor anzusehen. Zur Therapie trockener Haut werden traditionell Salben/Fettsalben, Ölbäder sowie harnstoffhaltige Zubereitungen eingesetzt.

C. Dani, E. Martelli, M.F. Reali, G. Berini, G. Panin, F.F. Rubaltelli, **Effects of Application of Vitamin E Ointment to Premature Neonates' Skin***,* Pediatric Research April 1999

Following the hypothesis that oxidative stress plays a role in the development of skin lesions in preterm infants, we planned a prospective tudy to investigate the effects of application on epidermis of a vitamin E ointment.

*W. Voss, G. Schlippe, M. Breuer***, Tests on Cosmetics Scientific Standards**, SOFW-Journal 4/99

In general, body care articles and cosmetics have only a low allergy potential. The probability that toxic-irritative reactions will arise after proper use is even lower.But especially with patients with sensitive skin, unclear skin reactions, which can frequently be confused with allergies, can arise. The cosmetics manufacturers, however, would like to produce safer products and naturally want to avoid that type of problem from the start.

H. Tronnier, **Empfindliche Haut,** Seminar Hausarzt Praxis März/April 1999

Die Empfindlichkeit der Haut hat keineswegs nur somatische Aspekte und Ursachen, sondern auch psychogene. Sie wird damit partiell vergleichbar mit anderen menschlichen Empfindungen, deren Existenz niemand bestreitet, deren Definition aber alles andere als einfach ist. Kann man einer Haut ihre Empfindlichkeit ansehen?

M. Bock, H.J. Schwanitz, **Modulation der epidermalen Permeabilitätsbarriere durch die topische Anwendung von CO_2 – imprägniertem Wasserklinische und hautphysiologische Untersuchungen**, Allergologie 3, 03/1999

Eine Stabilisierung der epidermalen Permeabilitätsbarriere bzw. der physiologische Wiederaufbau nach Barrierstörungen werden zu den wichtigesten Zielen der Externabehandlung gezählt.

T. Fischer, W. Wigger-Alberti, C. Greif, P. Elsner, **Irritative Wirkung von abrasiven Reinigungsmitteln auf die Barrierefunkton der Haut,** Allergologie 3, 03/1999

Dermatologische Hautreinigung am Arbeitsplatz sollte schadstoffbezogen so mild wie möglich und so reinigend wie nötig sein.

C. Greif, W. Wigger-Alberti, M. Arens-Corell, P. Elsner, **Beurteilung einer Körperlotion für trockene und empfindliche Haut,** Poster – 5. Tagung der ABD, Aachen 03/99 und Allergologie 3, 03/1999

Durch häufige Reinigungsmaßnahmen kann es zu einer starken Entfettung des Stratum corneum und zu Störungen der epidermalen Permeabilitätsbarriere kommen.

U. Berndt, U. Hinnen, D. Iliev, P. Elsner, **Eignung hautphysiologischer Meßmethoden als Screening-Verfahren zur Identifizierung ekzemgefährdeter Personen**, Allergologie 3, 03/1999

Die Erkennung Ekzemgefärdeter Personen ist in Berufen mit hoher Hautbelastung wünschenswert, um gerade in dieser Personengruppe eine intensive primäre Prävention durchzuführen.

H.-G. Ji, B.-S. Seo, **Retinyl Palmitate at 5% in a Cream: Its Stability, Efficacy and Effect,** Cosmetics &Toiletries, 03/99.

This paper evaluates the stability, efficacy and effect of retinyl palmitate at 5% in four different cream formulations: w/o water-in-silicone, o/w and multilamellar vesicles.

W. Pittermann, **Tierversuchsfrei forschen mit dem Rindereuter-Modell,** Parfümerie und Kosmetik, Nr. 3/99

Haut und Schleimhaut sind nicht nur wegen der anatomischen und funktionellen Unterschiede Zielorgane besonderer Art. In der regulären Sicherheitsprüfung für den Arbeits- und Verbraucherschutz werden sie als mögliche Angriffspunkte für lokal oder systemisch schädigende Rohstoffe oder Chemikalien behandelt. Im Mittelpunkt der kosmetischen Forschung steht jedoch die Pflege von Haut und Schleimhaut sowie die Wirksamkeit von Inhaltsstoffen und Formulierungen.

A. Bauer, R. Bartsch, M. Stadeler, U. Vollina, P. Elsner, **Evaluierung von prädiktiven Parametern für die Entwicklung von Handekzemen im Ausbildungsverlauf bei Auszubildenden des Bäcker- und Konditorhandwerks,** Allergologie 3, 03/1999

Im Rahmen einer prospektiven ausbildungsbegleitenden Kohortenstudie wurde die Inzidenz von beruflich bedingten Handekzemen bei 91 Auszubildenden im Bäcker- und Konditorhandwerk im Ostthüringer Raum des Ausbildungsjahres 9/96 untersucht.

K. de Paepe, P. van Damme, M. P. Derde, D. Roseeuw, V. Rogiers, **Body Lotions Enriched with Skin Identical Lipids: A TEWL Study of Aged Skin and SLS-Induced Scaly Skin,** Euro Cosmetics 2 Vol. No. 7, 02/99.

Recently, it has been shown that both the qualitative lipid composition of the intercellular lamellar sheets of the straum corneum (SC) are important for the maintenance of the barrier function of the skin. In order to investigate whether supplementation of major barrier lipids to skin care products could exert a beneficial effect on a damaged barrier function as measured by transepidermal water loss (TEWL), a body lotion, with known composition, was enriched with ceramides, cholesterol and fatty acids using a weight ration of 50 / 25 / 25, the appropriate ration found in the SC.

C. Packham, **Chemicals and your health: Beware!**, Engine Repair and Remanufacture, January 1999.

Most people working in the engineering industry will at some time be exposed to chemicals, the range of which, is enormous and includes substances, such as the solvents used in paint spraying or to degrease engine components; this includes metal working fluids, epoxy resin compounds, and even the skin cleanser used by the mechanic or fitter to clean hands after work.

G. Yosipovitch, B. Mevorah, M. David, **Migratory Ichthyosiform Dermatosis With Type 2 Diabetes Mellitus and Insulin Resistance**, Arch Dermatol. 1999; 135(10): p. 1237-1242

Background**:** In addition to the well-defined hereditary primary ichthyoses, many sporadic or less well-defined keratinization disorders with or without systemic manifestations have been reported. Herein we describe ichthyosiform dermatosis associated with type 2 diabetes mellitus. **Observations**: The patients were members of a large Arab family with heavy consanguinity. Eighteen members were

affected with a variously severe scaly disorder. They showed migratory polycyclic keratotic scaly plaques evolving into diffuse generalized scaling or complete remission. Acanthosis nigricans–like lesions were also noted, and there was an association with type 2 diabetes mellitus. A scarcity of intercorneocyte lamellae and reduction in lamellar body contents were observed. **Conclusions**: We could not find a report of a similar dermatosis. Furthermore, an association between ichthyosis and diabetes has not been documented. Therefore, we believe that this may constitute a new entity. In addition to the well-defined groups of hereditary primary ichthyoses, many sporadic or familial ichthyosiform disorders have been described. In the latter group of less well-defined ichthyoses, there may be extracutaneous manifestations. Whereas excessively dry skin of the shins with mild ichythyosiform skin changes has been associated with diabetes,[1] true ichthyosis has not been reported, and, to the best of our knowledge, hereditary ichthyosiform dermatosis has not been associated with diabetes.Herein described is a heavily consanguineous Arab family, originating in Africa, that displays a unique form of migratory ichthyosiform dermatosis as well as type 2 diabetes mellitus, probably representing a new entity.

J.W. Fluhr, S. Lazzedni, F. Distante, M. Gloor, E. Beradesca, **Effects of Prolonged Occlusion on Stratum Corneum Barrier Function and Water Holding Capacity**, Stratum Corneum II Symposium, Cardiff, 09/98

Occlusion is used in clinical practice to enhance transcutaneous penetration and drug delivery to the skin. Occlusion can also be generated by the professional use of protective garments, gloves and cosmetics.

A.V. Schreiner, Zeden, G. Gercken, U. Hoppe, P. Gerson, **Comparison of Barrier Properties of Different Layers of Stratum Corneum of Xerotic Skin of Elderly and Normal Skin**, Stratum Corneum II Symposium, Cardiff, 09/98

Dry skin tends to be itchy, scaly and sometimes even chappy.

G. Yosipovitch, A. Mayan, M. David, P. Merlov, L. Sirota, **Transepidermal Water Loss, Stratum corneum Moisture and Skin Surface pH of the New Born Infant in Different Body Areas,** 12th ISBS, Boston, 06/98

R.R. Warner, K.J. Stone, Y.L. Boissy, N. Lilly, M.J. Spears, K.L McKillop, **Electron Microscopy of Hydrated Skin: Water Disrupts the Barrier Lipids,** 12th ISBS, Boston, 06/98

Using conventional transmission electron microscopy of RuO_4-fixed tssue combined with cryo/scanning electron microscopy (Cryo-SEM) of frozen biopsies, prolongued water exposure is shown to seriously disrupt stratum corneum (SC) lipid ultrastructure and the intercellular space.

E.J. Fendler, B. Hammond, R.A. Williams, M.J. Dolan, **A Controlled Use Trial Of Protective Hand Cream in The Metal Working Industry,** 12th ISBS, Boston, 06/98

This investigation extends our studies of the use of protective skin cream by automotive technicians to workers in metal working/engineering industries.

E. Berardesca, S Lazzerini, F. Pirot, M. Singh, H.I. Maibach, **Racial Differences in pH and TEWL Gradient into Superficial Stratum Corneum,** 12th ISBS, Boston, 06/98

Purpose of this study was to assess the changes of pH and TEWL gradients in relation to depth into stratum corneum (SC) and possible differences between white and black skin.

R.R. Warner, K.J. Stone, Y.L. Boissy, N.Lilly, M.J. Spears, **Electron Microscopy of Hydrated Skin: Water Disrupts the Barrier Lipids.** 12th ISBS, Boston, 06/98.

J. Fluhr, M. Gloor, F. Distante, S. Lazzerini, E. Berardesca, **Glycerol Modulates Recovery of Barrier Function In Vivo,** 12th ISBS, Boston, 06/98

The mechanism promoting barrier repair in vivo after applying of the stratum corneum are not completely clear; the modulation of water flux is probably the key factor involved.

P. Clarys, A.O Barel, **Percutaneous Penetration Models In Vivo - Evaluation By Means Of Non-Invasive Biophysical Measurement Techniques,** 12th ISBS, Boston, 06/98

The methods for in vivo percutaneous penetration on human volunteers are limited.

J.W. Fluhr, M. Gloor, W. Gehring, **Protective Value of Bath Oils With Different Solvent Characteristics Against Irritation,** The Journal of Investigative Dermatology, Vol. 110, No. 4, April 1998 and 12th ISBS, Boston, 06/98

The presented study was carried out to evaluate the the protective value of bathoils with different solvent characteristics and different content of non-ionic tenside against 3 different irritation models (NLS 2 %occluded, water, mechanical irritation).

T. Fischer, C. Greif, W. Wigger-Alberti, P. Elsner, **Instrumentelle Methoden zur Bewerbung der Sicherheit und Wirksamkeit von Kosmetika**, Kursprogramm Sicherheitsaspekte in der Kosmetik, Basel, Mai 1998

Durch die Erfordernisse eines Wirksamkeits- und Sicherheitsnachweises für Kosmetika gewinnen nichtinvasive biophysikalische Meßmethoden zunehmend an Bedeutung. Neben der Bestimmung des transepidermalen Wasserverlustes und der Messung der Hautfeuchtigkeit, des Oberflächenfettes, des pH-Werts, und der Elastizität kommen der Bestimmung des Oberflächenreliefs, der Farbe und der Hautdurchblutung große Bedeutung zu. Mit diesen Methoden können u.a. die hautfeuchtigkeitsfördernden, glättenden und straffenden Wirkungen von Topika sowie der Grad der Irritation durch Externa valuiert werden. Zur Messung der Vergleichbarkeit dieser unterschiedlichen Funktionsparameter sind standardisierte Meßbedingungen erforderlich.

P. Teofoli, G. Monticone, O. De Pita, M. Ribuffo, **Hydroquione Or Kojic Acid For The Treatment Of Malasma Colorimetric Evaluation And Effects On Skin Barrier Function (TEWL) And Hydration,** 3rd Int.Symposium on Cosmetic Efficacy, May 1998
Melasma and Hyperpigmentated cutaneous disorders are a challenge for dermatologists since they are very difficult ti treat.

E.J. Thumm, C. Bayerl, E.G. Jung, **Evaluation Of The Efficacy Of Cosmetic Products By Using Profilometry,** 3rd Int.Symposium on Cosmetic Efficacy, May 1998

Efficacy of three cosmetic products was studied by using laser profilometry for skin roughness, by corneometry for the hydration of stratum corneum and by assessment of transepidermal water loss (TEWL).

J.I. Ademola, A. Cua, S. Amin, P. Liu, J. Avalos, L. Miller, M. Miller, N. Scrofani, A. Anigbogu, H.I. Maibach, **Dermatopharmacokinetics Of Topical Formulations In Human Stratum Corneum,** The Journal of Investigative Dermatology, Vol. 110, No. 4, April 1998.

Stratum corneum tape stripping has been used to study percutaneous of topical applied substances.

N.Y. Schürer, **Beeinflussung der epidermalen Barriere durch Externa**, Kosmetische Medizin Nr. 5, 1998

Beim Studium der Beeinflussung der epidermalen Barriere durch Externa ist ein Studium der Hautphysiologie genau so wichtig, wie das der Externa, ihrer kosmetischen Wirkstoffe und ihrer Galenik. Gerade in vivo unterliegen die meßergebnisse vielen, meist nur teilweise greifbaren, intra- und interindividuellen Einflüssen.

C. Greif, W. Wigger-Alberti, M. Arens-Corell, P. Elsner, **Beurteilung einer Körperlotion für trockene und empflindliche Haut**, Kosmetische Medizin Nr. 5, 1998

In einer offenen kontrollierten Anwendungstudie über 3 Wochen wurde an 30 Probanden eine Body Milk auf Hautverträglichkeit und Wirksamkeit getestet. Dazu wurden folgende hautphysiologische Parameter erfaßt: Hautfeuchtigkeit, transepidermaler Wasserverlust, Hautelastizität, pH-Wert sowie Hauttemperatur.

H. Tronnier, **Empfindliche Haut**, Kosmetische Medizin 4, 10/98
Eine einheitliche Ursache für eine empfindliche Haut gibt es nicht. Zahlreiche Funktionsabweichungen, die anamnestisch zu erfassen und mit geeigneten Methoden zu bestimmen sind, können individuell das Muster einer empfindlichen haut abgeben oder die Grundlage einer empfindlichen haut darstellen. Wesentlichen Einfluß können psychogene Faktoren haben.

H. Zhai, Y. Chang, M. Singh, H.I. Maibach, **An In Vivo Nickel Allergic Contact Dermatitits (ACD) Human Model For Topical Therapeutics,** AAD, Orlando, March 1998

An improved human model system for the quantification of the effects of topical agents by various bioengineering techniques was developed.

G. Yosipovitch, G.L. Xiong, E. Haus, L. Sackett-Lundeen, I. Ashkenazi, H.I. Maibach, **Time-Dependent Variations of the Skin Barrier Function in Humans: Transepidermal Water Loss, Stratum Corneum Hydration, Skin Surface pH, and Skin Temperature**, J Invest Dermatol 110: p. 20–23, 1998

Although circadian rhythms have been described for many human functions, there are minimal data on circadianrhythmsrelatedtoskinphysiology. This study investigated the circadian rhythmicity of skin variables related to skin barrier function in humans. We measured transepidermal water loss, stratum corneum moisture, skin surface pH, and skin temperature in 16 healthy volunteers (nine men and seven women, aged 23–53 y). Subjects were sampled every 2 h in two sessions over a 24 h span. Twelve samples were obtained for each variable in the following sites: forehead, forearm, upper back, and shin. We used cosinor analysis and ANOVA to validate observed differences. Time-dependent rhythms were detected in most skin vari ables except in stratum corneum hydration. We found a statisticallysignificant circadianrhythmicity characterized by cosinor analysis in transepidermal water loss, skin surface pH, and skin temperature on the forearm, forehead, and shin. Peak–troughdifferencesoccurredin alllocations. The values of the same variables measured at different sites correlated positively, whereas the values of the different variables did not. Theseresults suggestthat skinpermeability is higher in the evening and night than in the morning. These data may be clinically relevant in several aspectsapplied to skin physiology and topical drug application.

W. Gehring, F. Schwan, Th. Meyer, M. Gloor, **Eignung von Emulsionen als Vehikel für verschiedene Ceramide,** Kosmetische Medizin Nr. 2, 1998

In einer O/W-Emulsion wurden ein Phytoceramidgemisch und 2 synthetische Ceramide bei intakter Barrierefunktion und nach Lipidextraktion untersucht. Einmalige Applikation der Ceramide in beiden VehikeIn hat keinen Effekt auf die Barrierefunktion der Epidermis erkennen lassen, der auf den Ceramidgehalt zurückzuführen ist. Zwei Stunden nach Applikation der Formulierungen wurde ein Barrierefunktionstest mit Nikotinsäureester durchgeführt. Nur durch die syntetischen Ceramide in der O/W-Emulsion konnte nach Lipidextraktion eine Reduktion des Nikotinsäure-Erythems festgestellt werden.

S. dos Santos Guerra Filho, **Evaluation of Potential Irritation of Cosmetic Products**, International Cosmetic Expo'98, Miami February 1998

The continual need in the cosmetic industries for developing products with low irritation or sensibilizing potential has forced constant improvements in evaluation techniques utilized by the testing laboratories. The scientific literature is extensive in papers discussing the direct correlation between the increse of the TEWL in parallel with the skin irritation in products. It is not appropriate to generalize this fact because in some cases the increased TEWL is not matched at the same intensity by skin irritation. We have evaluated emulsion and tensoactive systems utilized in hair products, and our conclusion is that in some systems the TEWL increase did not necessarily correlate to the irritation due to the molecular weight of the tensoactive utilized. The evaluation of a formulation must include both TEWL and irritation tests simultaneously.

G. Gallacher, H.I. Maibach, **Is Atopic Dermatitis a Predisposing Factor for Experimental Acute Irritant Contact Dermatitis?**, Contact Dermatitis Vol. 38 No. 1, January 1998

Proclivity to acute irritant contact dermatitis has been reviewed by comparing the response in patients with atopic dermatitits to controls. Although several controlled studies demonstrate such a poclivity, others do not, suggesting that the mechanisms involved are complex.

P.M. Müller, R. Jermann, **The Skin**. IFSCC Magazine, Vol.1 No. 1, 1998

The authors inroduce a novel psycho-physical approach to determining subjective skinfeel involving weights on panelists' volar forearms. Through this method and by determining defferentiation threshold values, the authors demonstrate that sin moisturized with a liposomal formulation performs better than skin dehydrated with sodium dodecyl sulfate and aqueous ethanol.

M. Arens-Corell, J. Welzel, HH Wolff, **Beurteilung von Hautreinigungsmitteln für trockene und empfindliche Haut**. Kosmetische Medizin 1/1998.

Die zunehmende Problematik trockener und empfindlicher Haut in der Bevölkerung macht die Entwicklung geeigneter Reinigungsmittel notwendig. Ihre Hautverträglichkeit und minimierte Austrocknungwirkung kann in dermatologisch kontrollierten Anwendungsbeobachtungen unter Einbeziehung der Messung hautphysiologischer Parameter objektiv geprüft werden. Das Beispiel eines Duschöls und einer Waschemulsion für trockene und empfindliche Haut zeigt, daß durch einen hohen Ölanteil ebenso wie durch die Auswahl milder Syndetsubstanzen bei Anpassung des pH-Wertes im

Hautphysiologischen, leicht sauren Bereich die Hautreinigung unter Praxisbedingungen ohne Austrocknung und Irritationen möglich ist.

EnviroDerm's Skin Breakthrough. Engine Repair and Remanufacture, 01/98

Until now, prevention of occupational skin disease was very much a hit and miss affair. There was no practical way of detecting unseen damage to the skin from working practice or contact with chemicals.

H. Zhai, Y-H. Leow, H.I. Maibach, **Human Barrier Recovery After Actue Acetone Perturbation: An Irritant Dermatitis Model,** Clinical and Experimental Dermatology, Vo. 23 No. 1 January 1998

The Efficacy of a topical agent in barrier recovery was evaluated after acetone-induced acute water loss barrier disruption in vivo in humans. The upper back of several volunteers was rubbed with acetone-soaked cotton balls until elevated rates of transepidermal water loss (TEWL) occurred.

Beweiskraft der Tests. Beauty Forum 1/98

Für jedes Hautproblem bietet die Kosmetikindustrie die wirksame Patentlösung - zumindest laut werbekräftiger Aussagen.

H. Lautenschläger, H.P. Nissen, W. Wieland, **Neue Untersuchungen zur Hautverträglichkeit von Kühlschmierstoffen,** Arbeitsmedizin Sozialmedizin Umweltmedizin, Heft 12, Dezember 1997

Kühlschmierstoffe sind sehr weit verbreitete Arbeitsstoffe, insbesondere in der metallverarbeitenden Industrie. Aus arbeitsmedizinischer Sicht steht die Hautverträglichkeit dieser Produkte im Vordergrund. Die vorliegende Messungen und Daten zum transepidermalen Wasserverlust und zur Chromametrie zeigen, daß Kühlschmierstoffe hinsichtlich ihrer akuten Hautverträglichkeiten und der Langzeitwirkungen auf die Haut differenziert werden können. Dadurch werden sowohl dem Hersteller als auch dem Verwender meßbare Kriterien bezüglich der Auswhl dieser Arbeitsstoffe an die Hand gegeben.

R.A. Tupker, **The value of transepidermal water loss measurement in skin irritancy testing,** Experimental Dermatology Vol 6 No 5, ISICD and ISBS Meeting Rome 2-4 October 1997

Transepidermal water loss (TEWL) measurement is a highly sensitive method to determine barrier function impairment of the stratum corneum. By means of TEWL measurement it is possible to discriminate between detergents according to their irritancy, using different types of exposure methods. The same holds true for other irritants that exert their irritant action by impairing the barrier function of the skin.

A. di Nardo, A. Conti, M. Martini, S. Seidenari, I**n vivo assessment of n-alkyl-sulfate-induced skin irritation: By means of non invasive methods,** Experimental Dermatology Vol 6 No 5, ISICD and ISBS Meeting Rome 2-4 October 1997

Sodium Lauryl sulfate is the most frequently used model for studying in vivo irritation. It is also one of the most frequent surfactants in soap preparations and cosmetic emulsions. To investigate the irritant potential of sodium salts of n-alkyl sulfates with different carbon chain length (n=8, 12, 14) we applied these substances on the volar forearm of 10 human healthy volunteers aged 24 to 35.

D.A. Comes, M.J. Dolan, E.J. Fendler, R.A. Williams, **Characterization and treatment of occupational contact dermatitis**, Experimental Dermatology Vol 6 No 5, ISICD and ISBS Meeting Rome 2-4 October 1997

During the last two decades, bioengeneering techniques have emerged as highly effective tools for the evaluation of skin condition. Studies have been performed to assesss the potential of skin bioengineering instrumentation and techniques for the evaluation and treatment of occupational skin condition. Using large panels of automotive technicians, bioengineering techniques, such as TEWL and skin hydration, were used to characterize the extent of contact dematitis and the effectiveness of intervention with protective moisturizing creams.

G. Richter, S. Großmann, **Comparison of special skin protective creams and ointment basis (German Pharmacopoeta DAB 10) in different irritation models,** Experimental Dermatology Vol 6 No 5, ISICD and ISBS Meeting Rome 2-4 October 1997

Skin irritation was performed with sodium lauryl sulphate (1% and 2%, big Finn Chamber, 30 min, day 1 to 5 and 8 to 11, volar side of the right forearm) or with the skin disinfectant Sterillium® (open, 30 min, 3 times daily, day 1 to 5 and 8 to 11, volar side of the left forearm), respectively on all 21 human volunteers. Assessment data: Tewameter-, Chromameter-, Corneometer-data and visual score.

E. Schnetz, O. Kuss, H. Merck, P. Elsner, P.J.Frosch, M. Lange, T.L. Diepgen, M. Fartasch, **Development and evaluation of an in vivo test model for cumulative irritation - first results of a multi center study,** Experimental Dermatology Vol 6 No 5, ISICD and ISBS Meeting Rome 2-4 October 1997

The aim of this multi center study is the development of a protection factor for barrier creams. The first step is to find a test model which produces reliable results and is reproducible in all centers and easy to handle. We tested a cumulative irritation model over 14 days with a break at the weekend.

H.-K. Ji, Y.-H. Jeon, **Study on Stability, Efficacy, and Effect of a Cream Containing 5% of Retinyl Palmitate,** IFSCC Conference Mexico 25-27 September 1997

Retinyl Palmitate, the skin normalizer, is useful to promote greater skin elasticity, to diminish lipid peroxidation and skin roughness following UV exposure, and promote a youthful general skin appearance. In manufacturing creams, Retinyl Palmitate (RP), which is a derivative of retinol, is used since retinol is easily oxidized by heat and light. However, only a small mount of retinyl palmitate is used since using a large amount of it may be harmful to its stability. In this study, thermal stability and UV stability of W/O-, W/S-, O/W-and MLV-type creams containing 5% of retinyl palmitate and 10% of tocopheryl acetate (TA) are measured by Chroma Meters, and the content of RP is quantitatively analyzed by HPLC at 25°C and 45°C. Also, how RP has been changed by heat, light, etc. is measured by HPLC, and toxicity of the changed substance is studied. Particle size of each type of the cream is measured, cellular renewal is measured by using DHA (dihydroxyacetone) and Chroma Meters in order to study their efficacy and effect, moisture content is measured by using Corneometer and Tewameter, and how much wrinkles are improved is studied by using Image Analyzer. Development of MLV-type cream containing 5% of RP and 10% of TA, and satisfying conditions for better creams has been successful.

Gute Pflege für die Fältchen, Tagescremes für die "reife" Haut, Stiftung Warentest, Juli 1997

Für die „reife“ oder „anspruchsvolle“ Haut – charmant umschreiben die Kosmetikfirmen ihre Angbote für die ältere Haut.

A. Di Nardo, S.Seidenari, P.W. Wertz, A. Giannetti, **Barrier impairment in atopic dermatitis skin correlates with an alteration in ceramide stratum corneum composition,** Australian Journal of Dermatology: Abstracts 19th World Congress of Dermatology, Sydney, June 1997

Atopic dermatitis skin shows a tendency to be easily irritated and appears dry. This clinic pecularity corresponds to impaired barrier function and to increased TEWL values. A few studies suggest that a reduced amount of total ceramides (especially of ceramide 1) deriving from epidermal keratinocytes are responsible for functional abnormalities of the skin of atopic dermatitis (AD) patients. The aim of the present study was to analyze the relationship between epidermal lipids and barrier impairment in atopic dermatitis skin.

I. Effendy, H.I. Maibach, I**n vivo functional changes in human stratum corneum induced by substances with known irritation properties,** Australian Journal of Dermatology: Abstracts 19th World Congress of Dermatology, Sydney, June 1997

Functional changes in stratum corneum of normal human skin induced by repeated application of all-trans retinoic acid (RA), glycolic acid (GA) and calcipotriol was investigated in 6 healthy volunteers in comparison with sodium lauryl sulphate (SLS), a standard irritant. RA (0.1%) in ethanol, GA (12%) in water, calcipotriol (0.005%) ointment and SLS (1%) in water were applied with occlusion for 60 minutes once a day, over a period of 2 weeks (5 consecutive days weekly) on dansyl chloride-labelled skin and on untreated skin. Changes in stratum corneum were examined utilizing noninvasive bioengineering techniques.

D.A. Comes, M.J. Dolan, E.J. Fender, R.A. Williams, **Treatment of contact dermatitis in the health care and automotive occupations**, Australian Journal of Dermatology: Abstracts 19th World Congress of Dermatology, Sydney, June 1997

Irritant and allergic contact dermatitis is a serious problem in many occupations. Among those with the most severe problems are automotive and body shop technicians and health care professionals. However, there is a dearth of studies which objectively characterize the extent of contact dermatitis in these occupations.

T. Hariya, K. Inoue, Y. Umino, H. Ichikawa, **Alteration of physiological parameters and the amount of skin sIgA in sensitive skin,** Australian Journal of Dermatology: Abstracts 19th World Congress of Dermatology, Sydney, June 1997

In recent surveys, more than 30% of healthy female as well as patients suffered from certain skin diseases such as atopic dermatitis or rosacea-like dermatitis believe that they have sensitive skin, and the population of this group has been expanding. It has been reported that a symptom of atopic dermatitis is influenced by exacerbating factors such as physical conditions. In this study, we examined the effects of these excerbating factors on skin physiological parameters and secretory lgA amount in healthy female volunteers with sensitive skin.

H.-P. Nissen, S. Sustmann, **EUBOS Sensitive DUSCHÖL F – Körperpflege für sensible und besonders trockene Haut,** Gutachten 1997

Alkaliseifen-freie Syndets, d.h. Waschpräparate mit neutralem oder einem sogenannten hautneutralen pH-Wert, haben sich als milde Reinigungsmittel für den generellen Gebrauch bewährt. Speziell für Personen mit erhöhter Hautirritabilität, mit Hautproblemen angeborener oder erworbener Art, bietet diese Entwicklung die Möglichkeit einer schonenden Hautreinigung: Durch den neutralen bis leicht sauer eingestellten pH-Wert wird eine alkalische Quellung der Haut, mit all ihren möglichen Folgen, vermieden. Deshalb werden Syndets auch von Dermatologen als Adjuvans therapeutischer Maßnahmen empfohlen (z.B. EUBOS flüssig). Trotz der Vorteile der modernen seifenfreien Körperreinigungsprodukte kann es bei trockener und sehr trockener Haut, jedoch insbesondere auch bei vorgeschädigter Haut, zu einer weiteren Exsiccation kommen. In Verbindung mit den Waschgewohnheiten (z.B. tägliches Duschen) ist eine Austrocknung der Haut, Schuppung und Jucken vor allem bei Personen mit Hautproblemen, welche den Dermatologen aufsuchen, ein belastendes Problem.

D.A. Comes, M.J. Dolan, E.J. Fendler, T.K. Turner, and R.A. Williams, **Physiological and Microbiological Effects of Topical Alcohol Gel Use,** GOJO Industrie, Inc. 1997

M. Fartasch, **Praktischer Einsatz von Bioengineering-Methoden in der Berufsdermatologie: Möglichkeiten und Grenzen,** 3. Dermatologisches Alpenseminar Berchtesgaden 1997

Nicht-invasive hautphysiologische Meßmethoden (bioengineering methods) bieten neue Möglichkeiten zur Erfassung der unterschiedlichen Reaktion der Haut auf die Irritation. Schädigungen der Haut, die zunächst nicht sichtbar sind, können durch einige dieser Meßverfahren bereits frühzeitig registriert werden.

M. Gebhardt, C. Hersmann, A. Bauer, R. Bartsch, U. Wollina, W. Schneider, M. Stadeler, P. Grieshaber, **Erfassung von Hautschädigungen im Rahmen einer Untersuchung von Auszubildenden des Bäcker- und Konditorhandwerks,** 3. Dermatologisches Alpenseminar Berchtesgaden 1997

In einer dermatologischen Verlaufsuntersuchung von Auszubildenden sollen Faktoren evaluiert werden, die die Vorhersage des Auftretens von berufsbedingten Hautproblemen ermöglichen und prämorbide oder Risikozustände charakterisieren helfen.

P. Clarys, I. Manou, A.O. Barel, **Influence of temperature on irritation in the hand/forearm immersion test,** Contact Dermatitis Vol.36 No. 5 1997

As indicated by in vitro experiments the penetration of irritants through the skin is significantly influenced by the temperature of the solution. In vivo experiments, demonstrated equally a significant influence of temperature in surfactant-induced skin irritation. In order to evaluate the irritant potential of detergent solutions under normal user conditions, we used the hand/forearm immersion test. We compared 2 detergents with different anionic character in a repetitive immersion protocol (30 min immersion on 4 consecutive days). The solutions were tested at 2 temperatures (37°C and 40°C). The irritation was quantified by assessment of the stratum corneum barrier function (transepidermal water loss), skin redness (a*colour parameter) and skin dryness (capacitance method). Both detergents affected the integrity of the skin in a significant way. The anionic content as well as the temperature of the solutions were found to be determinative for the irritant potential, with a stronger response for higher anionic content and temperature, respectively.

H.M. Ribeiro, L. Nougiera, L. Rodrigues, L. Pereira, J. Morais, **Skin Surface Kinetic Analysis to Assess the Efficacy of Haircare Polymers Applied to Skin Care Formulations,** Poster, IN COSMETICS/ISCD Conference, Düsseldorf 4-7 May 1997

Stratum corneum (SC) water retension properties are a crucial factor in keeping the skin supple and flexible.

M. Lodén, **Barrier recovery and influence of irritant stimuli in skin treated with a moisturizing cream,** Contact Dermatitis Vol. 36 No. 5 1997

Moisturizers are used daily by many people to alleviate symptoms of clinically and subjectively dry skin. Recent studies suggest that certain ingredients in creams may accelerate the recovery of a disrupted barrier and decrease the skin susceptibility to irritant stimuli. In the present single-blind study, a moisturizing cream was tested for its influence both on barrier recovery in surfactant-damaged skin and on the susceptibility of normal skin to exposure to the irritant sodium lauryl sulphate (SLS). Parameters measured were transepidermal water loss (TEWL) and skin corneometer values, indicating degree of hydration. Treatment of surfactant-damaged skin with the test cream for 14 days promoted barrier recovery, as observed as a decrease in TEWL. Skin corneometer values also normalized more rapidly during the treatment. In normal skin, use of the test cream significantly reduced TEWL after 14 day of treatment, and irritant reactions to SLS were significantly decreased. Skin corneometer values increased after only one application and remained elevated after 14 days. In conclusion, the accelerated rate of recovery of surfactant-damaged skin and the lower degree of SLS-induced irritation in normal skin treated with the test cream may be of clinical relevance in attempts to reduce contact dermatitis due to irritant stimuli.

W. Gehring, **Einfluß von Ceramiden auf die Barrierefunktion der Haut in Abhängigkeit von ihrem Vehikel,** SOFW 4/97

Ceramide stellen einen wesentlichen Bestandteil der epidermalen Barrierelipide dar. In dem hohen Gehalt der Barrierelipide an Ceramiden wird ein wesentlicher Parameter für die epidermale Barrierefunktion und ein grundlegender Faktor für das Wasserbindungsvermögen der Hornschicht gesehen. Gegenstand der Untersuchungen war es, den Einfluß einer einmaligen Ceramidanwendung in einer W/O- und einer O/W-Emulsion sowie in liposomaler Formulierung auf die Barrierefunktion der Epidermis und die Hydratation des *Stratum corneum* zu untersuchen. Die Untersuchungen wurden vergleichend bei einem gesunden Kollektiv, bei experimentell induzierter trockener Haut - soweit es möglich war - auch bei Atopikern durchgeführt. Untersucht wurden zwei Phytoceramide und drei analoge synthetische Ceramide.

D.A. Comes, M.J Dolan, E.J. Fendler, T.K. Turner, R.A. Williams, **Effects of an alcohol Sanitizer (Gel) on Human Skin,** Poster at AAD, San Francisco March 1997

Alcohol has been historically recognised as a safe and topical antiseptic with the undesirable characteristic of skin drying. The formulation of alcohol gels may mitigate or eliminate the drying effect of alcohol. This study was initiated to evaluate the effects of alcohol gels on human skin. This study provides a comprehensive assessment of the effects of alcohol gels on human skin.

D.A. Comes, M.J. Dolan, E.J. Fendler,R..A. Williams, **A Unified Approach to the Evaluation of Occupational Irritant Dermatitis,** American Academy of Dermatology, 55th Annual Meeting March 1997

Occupational irritant dermatitis has historically been evaluated by utilizing visual observation. These clinical observations od skin condition and results from patch testing have limited sensitivity and some degree of variability among trained evaluators. Recent advances in skin bioengineering instrumentation and techniques have reduced the variability among investigators and have increased the sensitivity of evaluation to the detection of subclinical levels of irritation. A software program has been developed by our lab to integrate and automate the operation, data storage, and data analysis of multiple skin bioengineering instrumentation.

P. Clarys, I. Manou, A. Barel, **Relationship Between Anatomical Skin Site And Response To Halcinonide And Methyl Nicotinate Studied By Bioengineering Techniques**. Skin Research and Technology 3/1997

Regional differences in percutaneous penetration and skin properties are well documented. However, only a few studies have investigated the relationship between substance penetration and specific skin characteristics in function of the body region. It was our aim to evaluate the physiological effect of topically applied substances in function of skin parameters determined at different body regions.

P. Clarys, I. Manou, A. Barel, **Relationship Between Anatomical Skin Site And Response To Halcinonide And Methyl Nicotinate Studied By Bioengineering Techniques**. Skin Research and Technology 3/1997

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specific skin characteristics in function of the body region. It was our aim to evaluate the physiological effect of topically applied substances in function of skin parameters determined at different body regions.

L. Rodriges, P. Pinto, N. Galego, L.M. Pereira, **Usefulness of Mathematical Modelling Application To Comparative Testing,** Skin Research and Technology 3/1997

Comparative testing is a crucial issue when efficacy analysis is one of the objectives of studies involving topical formulations, also in cosmetic dermatology.

L. Rodrigues, P. Pinto, N. Galego, M. Fitas, L.M. Pereira, **Skin Permeation Fundamentals-Effects On Skin Physiological Properties Through Electrical Modulation,** Skin Research and Technology 3/1997

Iontophoresis is an important technique based on the effect of electrical current application in skin surface used to modulate skin permeation.

S. Seidenari, **Follow Up of Inflammatory Diseases Using 20 MHz Sonography,** Skin Research and Technology 3/1997

Besides the neccessity of a realistic assessment of spontaneous course of diseases, the evaluation of the cost/benefit ratio of ptentially new treatments is increasingly required.

P. Clarys, R. Lambrecht, A.O Barel, **Does lipid sampling with the Sebutape technique disturb the skin physiology?**, Skin Research and Technology, 1997, 3 p. 169 – 171

Lipid sampling with the Sebutape technique takes at least one hour to obtain a representative follicular pattern.

H. Zhai, H.I. Maibach, N. Poblete, **A Stripped Skin Model to Predict the Irritation Potential of Topicals In Vivo in Man,** American Academy of Dermatology, 55th Annual Meeting March 1997

An in vivo human model was utilized to predict the irritation potential of barrier creams after partial removal of stratum corneum with cellophane tape stripping.

H. Tronnier, **An Irritation-Test for the Evaluation of "Sensitive Skin", Tensides and Barrier-Cremes,** Kosmetische Medizin 1997, 18, 2, p. 124-129

The atopic diathesis in combination with the typical skin condition can be used as a model for the "sensitive" skin.

K. de Paepe, P. van Damme, M.P. Derde, D. Roseeuw, V. Rogiers, **Ceramides/Cholesterol/ Free fatty acids ontaining body lotions: Effect on TEWL of aged and SLS-damaged skin,** Active Ingredients International Conference Paris, November 1996

Thus the basic question still remains unanswered, namely if it is possible, considering the galenic difficulties involved in a correct formulation, to devleop efficient cosmetic products by adding essential barrier lipids. If will be a challenge for the cosmetic industry to look for suitable solutions. One of these could be an increased interest in basic research of the barrier function of the skin leading to products that can either protect the barrier and keep it in good condition or restore a damaged barrier.

U. Griesbach, **High Molecular Weight Chitosan A Multifunctional Biopolymer as an Active Ingredient for Skin and Hair Care,** Active Ingredients International Conference Paris, November 1996

Hydagen CMF as a high molecular hydrocolloid is an excellent active agent for the entire skin care range as well as in decorative cosmetics. However, on account of the cationic character and the high molecular weight, this chitosan product is not compatible with anionic surfactants and can therefore not be used in surfactant skin cleansing products containing anionics.

K.-P. Wilhelm, proDERM institut for applied Dermatological Research GmbH. Schenfeld, Germany. **Client-Server based On-Line Data Acquisition for Skin Bioinstrumentation Devices**.

During dermatological safety and efficacy studies, huge amounts of data- both instrumental data as well as evaluator scores may accumulate. We have developed an integrational data with on-line data acquisition capability. The program runs in a Macintosh network. A graphical interface facilitates data entry. A multilevel password system secures unauthorised use. In order to comply with GCP/GLP requirements all data entries and any possible changes relating to experimental studies- both scores and instrumental values -are secured in a log file together with date, time, and initials of the person entering the data. The program can at present acquire data from: Chromameter (Minolta), Tewameter, Corneometer, pH-Meter, Sebumeter, Mexameter, (all Courage and Khazaka). However, the open architecture would easily allow to incorporate more instruments with a serial interface. Data can be

exported in DOS, windows or Macintosh format for easy import into any spreadsheet or statistics programs. The program has been completely validated and successfully used in a contract research organisation for over 12 months. Automatic data acquisition has proven to be very useful tool to facilitate and speed up data analysis and to enhance the quality and reliability of test results.

K. Paepe, P. Vandamme, M.P. Derde, D. Roseeuw, V. Rogiers, **Ceramides/Cholesterol/ Free Fatty acids containing body lotions: Effect on TEWL of aged and SLS-damaged skin.** Active Ingredients, International Conference Paris, November 1996

Total removal of the sratum corneum or perturbation of the barrier lipids by the use of solvents or tape stripping will lead to a significant increase in water loss through the upper layers of the skin, followed by a cascade of metabolic events in the epidermis, including an immediate secretion of new formed lamellar bodies (Lee et al.,1994) There are several categories of skin conditions or disorders, in which the skin is generally considered to be dry and rough, with an impaired lipid barrier and an increased TEWL (Thestrup- Pederson, 1995). The effect on the barrier function seems to be dependant on the type of lipids affected. It has even been suggested that a linear relationship could exist between the total amount of lipids removed from the stratum corneum and the degree of barrier disruption (TEWL). The TEWL thus seems to be a signal for barrier repair and regulates the recovery by initializing the burst of lipid synthesis. Barrier repair usually occurs over a period of 6 hours to 3 days (Jass and Elias, 1991). Whereas epidermal lipid synthesis is clearly linked to barrier functions, the nature and origin of signals that initiate and propagate the biosynthetic response are still a subject of current studies (Nickhoff & Naidu, 1993; Wood et al., 1994). Transcutaneous water loss itself is not the regulatory signal alone since the removal of barrier lipids also allows a simultaneous, passive loss of extracellular calcium and potassium ions. Under basal conditions these ions inhibit the onset of new lipid synthesis (Lee et al., 1994). In addition to ion depletion which may be one of the stimuli for lipid synthesis, chronic or acute barrier disruption leads to the generation of epidermal and dermal cytokines, growth factors and other interleukines that in turn triggers epidermal hyperplasia and dermal inflammation (Elias, 1994).

U. Griesbach, **High Molecular Weight Chitosan - A Multifunctional Biopolymer as an Active Ingredient for Skin and Hair Care**, Active Ingredients International Conference Paris, November 1996

Hydagen CMF as a high molecular hydrocolloid is an excellent active agent for the entire skin care range as well as in decorative cosmetics. However, on account of the cationic character and the high molecular weight, this chitosan product is not compatible with anionic surfactants and can therefore not be used in surfactant skin cleansing products containing anionics.

D.A. Comes, E.J. Fendler, M.J. Dolan and R.A. Williams, **Bioengineering Instrumentation: Automation and Use.** Skin Research and Technology,Vol.2, No.4, Nov. 1996

Objective: The increasing complexity and use of bioengineering skin test instrumentation has created a critical need for unified software that controls the instruments, collects and stores data, performs analysis, and generates reports. In this study, user-friendly software programs were developed and applied to perform panel testing on a large number of test subjects utilising bioengineering skin test instrumentation. Methods/Results: Generic software programs were developed to integrate and automate operation, data storage, and data analysis of multiple bioengineering skin instruments. The software was applied to the following instruments:- Courage and Khazaka - Sebumeter SM810, Corneometer CM 820, skin pH-meter 900, Tewameter TM210; Minolta Chromameter CR300, and NOVA DPM 9003. Conclusions: Automation of skin bioengineering instrumentation allows evaluation studies to be performed using a large number of test subjects (with multiple variables). This greatly increases the statistical validity of data and overall efficiency, whilst negating the historical constraints which required a large commitment of resources.

A. Di Nardo, C. Cota, L. Mantovani, S. Seidenari, **Evaluation of Organic Solvent-Induced Damage by Non Invasive Measuring Methods**, Skin Research and Technology,Vol. 2, No.4, Nov 1996.

Aim of the study: to apply the echographic method associated to image analysis procedures to the evaluation of skin damage induced by different organic solvents and to compare the results with those obtained by other non-invasive methods.

D.A. Comes, E.J. Fendler, M.J. Dolan and R.A. Williams, **Bioengineering Instrumentation: Automation and Use.** Skin Research and Technology, Vol. 2, No.4, Nov. 1996

Objective: The increasing complexity and use of bioengineering skin test instrumentation has created a critical need for unified software that controls the instruments, collects and stores data, performs analysis, and generates reports. In this study, user-friendly software programs were developed and applied to perform panel testing on a large number of test subjects utilising

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D.A. Comes, E.J. Fendler, M.J. Dolan, R.A. Williams, **Work Cream Effectiveness with a Heavy Duty Skin Cleanser,** Skin Research and Technology, Vol. 2, No. 4, Nov 1996.

The acceptability and effectiveness of creams is mitigating or improving contact dermatitis of automotive mechanics was studied using multiple bionengineering skin instrumentation techniques, visual skin ebaluation and subject self-evaluation.

D.A. Comes, M.J. Dolan, E.J. Fendler, **Automated Techniques for Determination and Analysis fo TEWL Data,** Skin Research and Technology, Vol. 2, No. 4, Nov 1996.

Transepidermal water loss (TEWL) measurement is an extremely useful technique for the assessment of the skin barrier function. Although many publications in the bioengineering field report TEWL data, few have defined TEWL steady state (stabilisation time) conditions. Theoretically, in measuring TEWL, steady state is the point in time when the rate of water vapour entering the measuring probe is equal to the rate exiting the measuring probe. This time may vary for different subjects and different skin types. Using mathematical formulations, a procedure was developed to establish each subject TEWL steady state condition. This procedure accomodate inter-personal variations as well as instrumental measurement errors. Conclusion: An objective method was developed which allows determination and analysis of steady-state TEWL data. This method can be applied to any time-dependant measurements which approach a steady state value.

J. Effendy, H. Loeffler, R. Happle, **Experiences with Patch Testing with Sodium Laurel Sulphate as a Tool PredictingHuman Skin Susceptibility,** Skin Research and Technology, Vol. 2, No. 4, Nov 1996.

Compared with the alkali resistance test (ART), a widely used method employing sodium hydroxide, a 24h patch testing with 0.5% aqueous sodium lauryl sulphate (SLS) has been tested for predictng human skin susceptibility to an irritant. Forty patients (age range from 20 to 60) with an active irritant contact dermatitis (ICD), 40 patients in whom ICD had cleared, as well as 40 healthy volunteers serving as controls were tested. Skin responses to SLS were assessed both visually and by the measurement of transepidermal water loss (TEWL) as an indicator of stratum corneum integrity. A significant increase in erythema scores and TEWL has been induced by SLS, and the increase in TEWL was even more pominent in patients with active ICD. On the other hand, a decrease in alkali resistance was only found in patients with active ICD, but not in patients with healed ICD. This study suggests that the SLS test, unlike ART, may provide a non-invasive tool predicting a possible consitutional skin susceptibility or indicating a subclinically impaired skin barrier function.

J. Welzel, K.-P. Wilhelm, H.H. Wolff, **Skin permeability barrier and occlusion: no delay of repair in irritated human skin,** Contact Dermatitis, Vol.35 No. 3, September 1996

It has been reportd that occlusive treatment of irritated skin results in a reduction of barrier repair activities in hairless mice. In contrast, the clinically observed benefit of occlusion in the treatment of hand eczema and other chronic skin diseases with a pertubed barrier function is well-known. While the beneficial effect of occlusion has been proven for the treatment of psoriasis there are no controlled clinical studies of the effect of occlusion on irritated human skin. We have therefore evaluated the effect of various occlusive treatments on repair of the human skin permeability barrier under controlled experimental conditions.

A. Teglia and G. Secchi, **Minimizing the Cutaneous Effects of Anionic Detergents** Cosmetics and Toiletries Magazine Vol. 111, August 1996

Evaluating the protective efficacy of proteins and mild surfactants via transepidermal water loss and profilometric measurements.

S. Thoma, **Beziehung zwischen dem gemessenen transepidermalen Wasserverlust und der Messsondentemperatur des Tewameters,** Inauguraldissertation zur Erlangung der Doktorwürde der Medizinischen Universität zu Lübeck, 1996

Die Haut stellt eine wichtige Barriere für den Körper zwischen Umwelt und Körperinnerem dar. Die Barrierefunktion wird im Wesentlichen vom Stratum corneum, der Hornschicht, übernommen. Trotzdem kommt es zu einem Wasserverlust über die Haut, der in zwei verschiedene Anteile, den Wasserverlust durch das Schwitzen und den Wasserverlust über passive Diffusion unterteilt werden kann. Der passive Wasserverlust, der ständig vorhanden ist, wird als transepidermaler Wasserverlust (TEWL) oder auch im Gegensatz zum Schwitzen als „Perspiratio insensibilis“ bezeichnet. Durch das Straum corneum können Wasser und andere Moleküle nur über passive Diffusion gelangen. Die Diffusion erfolgt entlang eines Konzentrationsgradienten und folgt somit im Prinzip dem Fick’schen Diffusionsgesetz.

H. Lautenschläger, **Kühlschmierstoffe - Forderung des modernen Hautschutzes.** Mineralöltechnik 6/96

Skin protection is a large topic in the field of metal working industry basically by use of metal working fluids. Both user, manufacturer, and distributor of lubricants take a strong interest in prophylactic skin protection measures. For that reason, high demands are made on lubricants, its handling and skin protection measure. These demands are followed by newly developed lubricants and skin protection measures concerningits chemical compounds and measuring technique. Today's tendencies and the increasing all-embracing way of personal attitude are clearly demonstrated by the need to furnish evidence of compatibility and effect. Physical and chemical parameters of lubricants and skin protection measures as well as its skin compatibility are specifically taken into account.

S. Seidenari, B. Belletti, G. Pellacani, **Time Course of Skin Changes Induced by Short-term Occlusion with Water: Evaluation by TEWL, Capacitance, and B-scanning Echography**, Skin Research and Technology, Vol. 2 No.1 February 1996.

Application of water under occlusion increases hydration of the stratum corneum, thereby swelling the corneocytes and promoting the uptake of water into intercellular lipid domains. Hydration values, as measured by capacitance, remain higher for 20 min after soaking skin with tap water. Equalisation of water diffusion between the stratum corneum and the ambient air occurs within 20 min. Water, re-emitted from a 24h occlusion site, is recorded as increased TEWL values. B-scanning techniques, based on segmentation, enable the visual observation of the dynamics of changes due to inflammatory processes in the skin and the quantitive assessment of epidermal and dermal components of skin reactions. The effects of simple occlusion with a test chamber are assessable using the echographic evaluation of dermal edema. The aim of our study was to investigate the sonographic aspects of hydration, as documented by measurements of TEWL and capacitance, induced by a short-term occlusion with water.

Kein Aha Erlebnis, Test Gesichtspflegemittel mit Fruchsäuren, Test 10/95

Sind Pflegemittel mit Fruchtsäuren wirklich die Kosmetik der Zukunft, die Wunschträume von ewig jugendlichem Aussehen wahr werden läßt ? Oder reizen die Mittel vor allem die Haut, wie andere Fachleute vermuten ? In neun dieser Tiegelchen und Töpfchen schauten wir genauer hinein.

E. Berardesca, H.I. Maibach, **Racial Differences in Skin Function: An Update,** Cosmetics & Toiletries magazine Vol. 110, October 1995

The most prominent characteristic of racial and ethnic groups is skin color. However, despite the visible color differences, documented anatomical and ultrastructural differences are only minimal. Furthermore, controversy remains as to wether these features also have a functional relevance in skin physiology. Some aspects of skin physiology may indeed have practical implications on the racial incidence and prevalence of some diseases, including skin cancer, acne and pigmentation disorders. In recent years, scientists have devoted much work to further characterizing racial differences and have published reviews of their objective techniques.

H.P. Nissen, H. Biltz, R. Muggli, **Borage Oil,** Cosmetics & Toiletries magazine Vol. 110, October 1995

Researchers have discussed use of polyunsaturated fatty acid supplements to treat atopic dermatitis (AD) for more than half a century. Oil from evening primrose seeds has attracted special attention because it contains ◘-linolenic acid (GLA). Morse et al found that oral administration of this oil significantly reduces the general severity of AD, in a dose-dependant manner. The fatty-acid profile of blood lipids in AD patients shows an increase in the proportion of linoleic acid, with a decrease in arachidonic acid and other metaboilites of linoleic acid. These findings suggest defective functioning of the enzyme ◘-6-desaturase in AD. In a previous communication, we reported that systemic administration of evening primrose oil leads to smoother skin. This evidence has provoked much interest as to wether topical application gives similar results.

W. Schlüter-Wigger, P. Elsner, **Klinische Prüfung der Wirksamkeit von vier kommerziellen Hautschutzpräparaten im repetitiven Irritationstest (RIT),** 2. Poster Preis ICPCD Zürich, 10/1995

Dermatologischer Hautschutz für den Arbeitsplatz beinhaltet präexpositionell applizierte Hautschutzsalben, milde Hautreinigung und postexpositionelle Hautpflege.

L Celleno A Vasselli, M.V. Tolaini, A. Mastroianni, F. Macchia, **Verifica di tollerabilità ed accetabilità cosmetica di detergenti cutanei: confronto di metodiche,** Cosmesi Dermatologica 45, 1995

La detersione cutanea è un atto igienico ma reppresenta altresi un important momento cosmetologico e dermatologico. Infatti solamente se il prodotto utilizzato è cosmetologicamente ben accettato essa risulta un atto gradevole. Inoltre spesso l'uso di tensioattivi o saponi tradizionali si traduce in un'alterazione del film idrolipidico superficiale. Se a questo fa seguito l'esposizione e il danneggiamento della strato corneo, può innescarsi quel meccanismo che conduce alla comparsa della dermatite irritativa da contatto, facilitando anche l'insorgenza della dermatite allergica da contatto (1,2).

A.O. Barel, P. Clarys, **Comparison of Methods for Measurement of Transepidermal Water Loss,** Handbook of Non-Invasive Methods and the Skin, J. Serup G.B.E. Jemec, 1995

The me asurement of transepidermal water loss (TEWL) is an important noninvasive method for assessing the efficiency of the skin as a protective barrier. The stratum corneum forms a barrier against diffusion of water through the epidermis and constitutes the main obstacle to the penetration of molecules coming in contact with the surface of the skin.

G.E. Piérard, **Relevance, Comparison, and Validation of Techniques,** Handbook of Non-Invasive Methods and the Skin, J. Serup G.B.E. Jemec, 1995

Measuring in an objective way is always in need of additional breakthrough. Dermometrology and bioengineering have been and remain closely associated in the search for improvements of quantitative noninvasive assessments. The pre-bioengineering times and the descriptive phase of dermometrology are behind us. Ingenious researches pioneered methods that may now look crude, time-consuming, and sometimes lacking in reproducibility.

Y. Ghane, A. Hüner, M. Fartasch, T.L. Diepgen, **Entwicklung eines Testmodells zum Wirksamkeitsnachweis von Hautschutzpräparaten,** 38. Tagung der Deutschen Dermatologen Gesellschaft, Berlin, 29. April - 03. Mai 1995

Die irritative Wirkung hautbelastender Arbeitsstoffe soll durch das Auftragen von Hautschutzpräparaten reduziert werden. Bisherige, für den Wirksamkeitsnachweis eingesetzte Methoden tragen der Arbeitsplatzsituation nicht genügend Rechnung, in der subtoxisch-kumulative Handekzeme durch den wiederholten Kontakt mit relative gering irritativen Substanzen entstehen.

F. Distante, E. Berardesca, **Transepidermal Water Loss,** Bioengineering of the Skin: Methods and Instrumentation, CRC Press 1995

Measurements of transepidermal water loss (TEWL) is widely used to characterise the water barrier function of skin, both in physiological and pathological treatments on diseased skin. In vivo TEWL can be measured according to three different techniques.

H. Tronnier, **Neues zum Wirkungsnachweis von Körperpflegemitteln**, 38. Tagung der Deutschen Dermatologen Gesellschaft, Berlin, 29. April - 03. Mai 1995

E. Weißhaar, R. Sabel, C. Smith, M. Coißbau, E.-M. Röpke, H. Gollnick, **Does a New Relipidizing Agent in a Medical Soap Prevent Lipid Loss Induced by Repetitive Washing?,** Skin Pharmacology Society: 12th Annual Meeting 1995

Skin care eg choosing a suitable soap is an important factor in preventing skin disease. Various medical soaps claim to minimize the strain put on the skin by repetitive washing. The aim of this study was to determine wether a new relipidising agent in a medical soap which supposedly counteracts lipid loss induced by repetitive washing leads to a significant change in transepidermal waterloss, pH, sebum excretion and 8 epidermal lipids.

T. Heinzelmann, K. Müller-Decker, J.J. Levy, F. Marks, **Proinflammatory Eicosanoids and Interleukin-1α in Suction Blister Fluid from Primary Irritated Human Skin,** Skin Pharmacology Society: 12th Annual Meeting 1995

In order to establish an alternative or supplement to the Draize test, an in vitro skin irritancy test was developed with human keratinocyte-derived proinflammatory interleukin-1□□and eicosanoids as in

vitro parameters. These are currently validated for their relevance and reliability: In a clinical study the eicosanoid
and the IL-1*a* content of a human suction blister fluid (SBF) and skin inflammation (clinical syptoms, transepidermal water loss TEWL) of irritant and vehicle-treated skin are evaluated. Here, the data after application of sodium lauryl sulfate (SLS) are presented.

K. Stephanek, J.J. Levy, A. Kesckés, **The Local Reaction Followed Topical Application of Leukotriene B4 on Healthy Human Skin**, Skin Pharmacology Society: 12th Annual Meeting 1995

The archidonic acid-derived metabolite leukotriene B4 (LTB4) seems to play an important role in the pathogenesis of several skin diseases like psoriasis, leukocytoclastic vasculitis and atopic dermatitis.

A.M. Grunewald, M. Gloor, W. Gehring, P. Kleesz, **Barrier Creams,** Dermatosen 43, Heft 2 - 1995

Repetitive washing with 0.01 mol/l sodium lauryl sulphate solution for one week was followed by a measurable skin function disorder as evaluated by corneometry, laser Doppler flowmetry, and transepidermal water loss (TEWL) measurements. The application of commercially available barrier creams (Marly Skin®, Saniwip®, Tactosan®) as well as the application of well-defined oil-in-water emulsions containing 10% urea or 10% glycerol, respectively, significantly reduced skin function deterioration following repetitive washings. Urea and glycerol containing oil-in-water emulsions were at least as effective as the most effective commercial barrier cream Tactosan and had the additional advantage of better user acceptance.

P. Soto, C. Queille Roussel, B. Soler, A. Clucas, **Evaluation of a New Moisurizing Cream using a Mini Regression Test,** AAD-Congress, New Orleans, February 1995

Xerosis is a very common condition affecting at least 75% of persons over the age of 64 (1) and also a significant number of younger people. Although not associated with significant physical instability, it is uncomfortable and esthetically unacceptable to many patients. Treatment is based on the use of moisturizers, of which a large variety are available commercially.

L. Halkier-Sorensen, K. Thestrup-Pedersen, **Hautschutz bei Reinigungspersonal**, TW Dermatologie Heft 6, November/Dezember 1994

Berufstätige, die an ihrem Arbeitsplatz hautreizenden Substanzen ausgesetzt sind, sollten zum Hautschutz Feuchtigkeitspräparate verwenden. Zur Überprüfung der Wirksamkeit eines solchen Präparates wurde eine Feldstudie mit 111 Arbeitskräften aus dem Reinigungs- und Küchenbereich durchgeführt. Die Ergebnisse zeigen, daß die Probanden generell von der Verwendung des Feuchtigkeitspräparates profitieren. Vor allem aber für jene Personen, die bereits mit Hautirritationen vorbelastet sind, erscheint die Anwendung eines Feuchtigkeitspräparates unverzichtbar.

P. J. Frosch, A. Kurte, **Efficacy of skin barrier creams (IV). The repetitive irritation test (RIT) with a set of 4 standard irritants**, Contact Dermatitis, 1994, 31, p. 161-168

An improved human model for the quantification of skin barrier creams (BCs) is described. In contrast to the previously published procedure, the back, instead of the forearm, and a total of 4 irritants are used. Due to the larger area, 3 BC formulations can be simultaneously compared to the control field, which receives the irritant only, without BC-pre-treatment. On 10 human volunteers, the irritants 10% sodium lauryl sulfate (SLS), 1% sodium hydroxide (NaOH), 30% lactic acid (LA) and undiluted toluene (TOL) were applied via large Finn Chambers for 30 min, 5 x during the 1st week and 4x during the 2nd week. Taktosan Salbe (water-in-oil emulsion) and RAWI Speerschutzcreme (oil-in-water emulsion) were applied 30 min before contact with the irritants. In order to assess reproducibility and interindividual variation, the BC RAWI was tested in duplicate. Irritant cutaneous reactions were quantified by 4 parameters: erythema score, transepidermal water loss, blood flow volume and stratum corneum hydration by measuring capacitance. The results showed marked differences in efficacy. Taktosan significantly suppressed irritation by SLS. NaOH and LA, which was apparent in nearly all parameters. RAWI caused significant inhibition of SLS irritation, and a positive trend against the NaOH and LA was observed. Both BCs failed against TOL. The results of duplicate testing with RAWI showed good reproducibility. The dogma that oil-in-water emulsions are primarily effective against lipophilic irritants, and water-in-oil emulsions against hydrophilic irritants, needs to be re-evaluated on this basis of our fndings. This model seems to have potential for further studies on BCs and might elucidate the complex interaction of BCs with irritants.

A. Teglia, G.F. Secchi, **Evaluation of the Protective Efficacy of Proteins and Mild Tensides against the adverse Cutaneous Effects of Anionic Detergents by means of TEWL and Profilometric Measurements,** 18th International IFSCC-Congress, Venice, October 1994

The repeated use of anionic-based detergents is reported to induce adverse events on the human skin, such as alteration of the stratum corneum barrier function and increase of roughness. Our investigation focused on quantification and comparison of the protective effects of mild surfactants and protein derivatives in simple and complex tenside systems based on sodium lauryl sulfate, sodium laureth sulfate and sodium C14-16 olefin sulfonate. Cocamidopropyl betaine, cocamidopropylamine oxide and alkyl polyglucoside were used as mild surfactant additives; wheat proteins with different average molecular size were tested. The variations in skin permeability were assessed by TEWL measurements. The changes in skin surface morphology were analysed by three-and two-dimensional roughness parameters of the skin relief. Exposure models were based on the soap chamber test and on standardised washing procedures. Proteins and mild surfactants show comparable efficacy in the one-day occlusion tests, but better results were observed for proteins in the occluded and open repeated exposures.

C. Trullas, J. Coll, C. Pelejero, J. Vilaplana, S. Sirigu, C. Dederen, **Cosmetological Activity of Glycolic Acid Incorporated in a New Topical Delivery System (W/O/W Emulsion),** 18th International IFSCC-Congress, Venice, October 1994

The cosmetological potential of alpha hydroxyacids (AHA'S) is still evolving. The powerful research in physicochemistry has provided a promising new delivery system, the multiple emulsion W/O/W which could permit a controlled and sustained release of AHA'S , modifying their efficiency and safety. The cosmetological activity and safety of a W/O/W multiple emulsion containing 3% of glycolic acid has been assessed by bioengineering methods using several tests. A six-hour test and 30-days study for comparison of the effects of 3% glycolic acid in two delivery systems W/O/W multiple emulsion and O/W emulsion were conducted. The cutaneous biophysical variables evaluated were electrical capacitance of stratum corneum, skin surface lipids, transepidermal water loss, biomechanical properties, blood flow and skin surface topography. The safety of 3% glycolic acid in the two delivery systems was determined using patch testing and assessment of cutaneous responses by visual scoring and biophysical non-invasive methods (evaporimetry, laser doppler flowmetry, reflectance spectophotometry).

S. Sirigu, S. Giogilli, C. Dederen, **Functionality and Mildness of Solid Detergents: A Study of Correlation among Formulative Aspects, Instrumental Data and Sensorial Results,** 18th International IFSCC-Congress, Venice, October 1994

The aim of our study was to find a correlation between chemical and formulative aspects of different solid detergents and their features of functionality, skin mildness and sensorial properties. Eight different products were chosen for the test: five syndets, two combars and one alkaline soap. Several cutaneous parameters were investigated in vivo, by using different techniques of measure. The cutaneous innocuity was evaluated on 15 volunteers by means of an occlusive 48 hours patch test. Skin compatibility (respect of pH physiological values, skin barrier functionality and skin roughness) was evaluated on 12 subjects before and after repeated standard washing with the products. Measurements were taken for TEWL, pH skin colorimetry and image analysis. Sensorial performances were assessed, according to the Quantitative Descriptive Analysis method by a panel of 12 well trained evaluators. Results obtained from different methods were then correlated. As far as the cutaneous compatibility is concerned, correlations were found between visual and colorimetric evaluations of acute irritation, and between acute irritation and composition. No correlation was found between repeated wash test results and acute irritation. A good correlation was evidenced by comparing instrumental dryness and roughness evaluations with the correspondent skin sensorial perceptions. Sensorial foam evaluations were well correlated to the composition.

M. Ghyczy, J. Greiss T. Kovats, **Liposomes from Vegetable Phosphatidylcholine,** Cosmetics & Toiletries, July 1994

The structure of the skin, especially the stratum corneum with its important function as a barrier to minimize transepidermal water loss (TEWL), has been extensively studied and reviewed. During the proliferation of epidermal cells and their migration from the basal layer to the upper layer of the stratum corneum, cell differentiation is accompanied by a tremendous change in metabolic activities.

E. Berardesca, G.P. Vignoli, F. Distante, P. Brizzi, G. Rabbiosi, **Effects of Water Temperature on Surfactant Induced Dermatitis,** The 10th International Symposium on Bioengineering & the Skin, Cincinnati, Ohio, June 13-15, 1994

Surfactants are a common cause of irritant contact dermatitis. Their aggressive action on skin structures is well documented even though the complex meachnisms of skin irritation are not fully understood.

P. Elsner, H.I. Maibach, **Biophysical Properties of Human Male Genital Skin,** The 10th International Symposium on Bioengineering & the Skin, Cincinnati, Ohio, June 13-15, 1994

Since many skin diseases, especially sexually transmitted may be localized in genital skin, information about the physiological properties of this specilized skin is of importance for the dermatologist.

B. Seybold, K. Seidel, K. Beck-Devalle, F. Hevert, K. Klein, T.L. Diepgen, **Distribution and Variation of Basic Physiological Characteristics of Uninvolved Skin in the General Population - a Bioengineering Study,** The 10th International Symposium on Bioengineering & the Skin, Cincinnati, Ohio, June 13-15, 1994

The aim of the study was to data about the distribution and variation of bioengineering parameters in the general population (GP).

T.L. Diepgen, M. Fartasch, A. Huner, U. Funke, **Bioengineering Methods in Occupational Dermatology,** The 10th International Symposium on Bioengineering & the Skin, Cincinnati, Ohio, June 13-15, 1994

We performed two prospective studies to analyse the irritant effects of different water-based cutting fluids (CF) in healthy subjects, atopic and exposed metal industry workes of a German automobile factory.

R.A. Tupker, **Prediction of Irritancy,** Bioengeneering of the Skin: Water and the Stratum Corneum, 1994, Chapter 7

"All substances are damaging to some people under some circumstances." This statement by Kligman stresses the importance of extrinsic and intrinsic factors in skin irritancy. The dichotomy of "extrinsic" and "intrinsic" also appears in the theory concerning the pathogenesis of chronic irritant dermatitis. Wether or not this type of dermatitis will develop depends on the balance between the sum of all harmful influences. (detergents, shampoos, solvents, dry wind, blow heaters, etc.) on the one hand, and the repair capacity of the skin on the other hand. Chronic irritant contact dermatitis is one of the most frequently encountered skin diseases and constitutes the ultimate purpose of performing predictive irritancy testing, division into extrinsic and intrinsic yields two main categories: (1) predictive irritance testing of various substances aimed to select the least irritating substance and (2) predictive irritancy testing with one or more standard irritant(s) aimed to select a population that is at risk for chronic irritant contact dermatitis. This chapter deals with some methodological considerations in predictive irritancy testing. Animal irritancy tests such as the Draize assay are still commonly used. However, it is known that different species exhibit varying reactivity, especially toward agents with low irritant potency. This chapter focuses therefore on human skin testing.

D.R. Wilson, H.I. Maibach, **TEWL and the Newborn**, Bioengeneering of the Skin: Water and the Stratum Corneum, 1994, Chapter 11

Dermatological science made great strides in the 19th century utilizing man`s own tools-a history, visual inspection, and palpitation. However, some areas of investigation defy such evaluation; for example, historical, visual, or palpatory changes defy discernment. Practical examples include nonerythematuous irritation and subclinical forms of disease. It is in this area that measurement of transdermal water loss (TEWL) find strong advocates and provides information not otherwise obtainable. In addition, TEWL is an easily measured, noninvasive estimate of the integrity of the skin`s water barrier, which has proven its usefulness in many related academic and commercial fields. The noninvasive nature of TEWL measurement makes it an especially attractive technique for neonatal studies where research ethics is of great concern. The TEWL techniques employed in neonatal research originate from successful applications on adult human and animal models. Historically, dermatoxicology and pharmacology investigations have used TEWL to assess the local effects of drugs, occlusive materials, and other substances applied to the skin.TEWL has played a valuable part in identifying the function of strateum corneum (SC) lipids. The cosmetic industry employs TEWL to evaluate moisturizer efficacy and to evaluate the irritation and barrier destruction potentials of soaps and solvents. The measurement is also useful in monitoring the recovery processes of wound healing and SC rejuvenation. The transdermal patch industry uses TEWL to help predict the permeability of cadaver skin for drug diffusion studies in vitro. In the clothing industry, TEWL is useful in examining fabric irritation mechanisms and

occlusive effects. TEWL has also helped characterize types of dermatitis. This chapter focuses specifically on TEWL as it is applied to investigating the barrier function of neonatal skin.

A. Teglia, G.F. Secchi, **New protein ingredients for skin detergency: native wheat protein-surfactant complexes**, Int.Journal of Cosmetic Science 16, p. 235-246, 1994

The cutaneous tolerability of detergent formulations can be improved by means of suitable additives. Exogenous proteins, for example, are able to reduce the skin irritation potential of surfactants according to a double mechanism: they complex the surfactant molecules lowering the concentration of their free monomeric species; they link to the skin keratin forming a protective colloidal layer that shields the denaturing attack of surfactants. Protein derivatives used as additives for detergency are usually prepared by partial hydrolysis of animal sclero-proteins or plant reserve proteins. The main purpose of the hydrolytic cleavage is to make them water soluble and suitable for liquid products. Native, non hydrolysed wheat proteins have been recently introduced as active ingredients for detergents. Water solubility and stability are obtained by means of complexion with surfactants which also increases their actual hydrophobicity, an important parameter affecting cosmetic properties of proteins.

S.R. Hartmann, H. Pietsch, G. Sauermann, R. Neubert, **Untersuchungen zur Hautverträglichkeit von alkoholischen Händedesinfektionsmitteln,** Dermatosen 42, 6, p. 241-245, 1994

Ziel der vorliegenden Arbeit war die Untersuchung der Wirkung von alkoholischen Händedesinfektionsmitteln auf die menschliche Hautoberfläche hautgesunder, volarer Unterarme. Die Untersuchung erfolgte im Rahmen einer Cross-over Studie über einen Beobachtungszeitraum von acht Monaten an 56 randomisiert ermittelten Probanden unter praxisrelevanten Bedingungen. Die Studie fand von September 1992 bis April 1993 statt. Die 56 Probanden waren Mitarbeiter einer pharmazeutischen Firma. Ein Unterarm aller Mitarbeiter wurde volar im Durchschnitt sieben mal pro Arbeitstag im Rahmen der Vorschriften über die hygienische Händedesinfektion behandelt. Der andere Kontrollunterarm blieb während des gesamten Beobachtungszeitraums unbehandelt. Behandelte Areale konnten mit den unbehandelten Arealen verglichen werden. Die Erfassung und Beurteilung möglicher Hautzustandsveränderungen erfolgte durch dermatologische Bewertung und durch sechs weitere Untersuchungsmethoden. Bestimmt wurden: Grad der Schuppung der Haut (Abschuppungsrate), Hautfeuchtigkeit, Haut-pH-Werte, transepidermaler Wasserverlust (TEWL), Hauttemperatur und Hautmikrotopographie. Der Einfluß saisonaler Gegebenheiten wie Außentemperatur und Luftfeuchtigkeit auf unbehandelte wie behandelte Areale konnte durch die vergleichende Versuchsanordnung berücksichtigt werden. Die Abschuppungsrate lag an den behandelten Arealen an den meisten Meßzeitpunkten unter dem Niveau der unbehandelten Areale. Der TEWL lag an den behandelten Arealen zu jedem Meßzeitpunkt hochsignifikant über dem Niveau der unbehandelten Areale.

J. D. Johansen, D. Ramsing, G.Vejlsgaard, T. Agner, **Skin barrier properties in patients with recessive x-linked ichthyosis**, Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

Recessive X-linked ichthyosis (RXLI) is scaling disorder of the skin with the biochemical abnormality known to be steroid sulphate deficiency. In epidermis levels of cholesterol are decreased and levels of cholesterol sulphate increased. The influence of this disturbed lipid composition of the epidermis with respect to skin barrier function was examined in the present study. Skin response to patch testing with sodium lauryl sulphate (SLS) 0.5% for 24 hours was evaluated in 13 patients with RXLI and 15 age- and sex-matched controls. Basal skin properties and skin response to SLS were studied by measurement of transepidermal water loss (TEWL), skin hydration (electrical capacitance), and erythema index. No statistically significant difference in basal TEWL was found between RXLI patients and controls. Skin hydration, as reflected by electrical capacitance of the skin, was significantly decreased in patients with RXLI. After exposure to SLS TEWL was significantly increased in control subjects as compared to ichthyosis patients ($p=0.047$). Increase in TEWL after SLS-exposure was statistically less for RXLI patients than for controls ($p=0.0049$). No statistically significant difference in erythema index was found between the two groups in basal values or in values obtained after SLS-exposure. The implication of the study is a better understanding of the skin barrier function in scaly disorders.

A.M. Grunewald, M.Gloor, **Value of barrier creams against skin damage due to repeated washings,** Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

The aim of our study was to evaluate the protective effect of barrier creams onto irritant contact dermatitis. Therefore the following skin function parameters were evaluated: corneal lipids (sebumetry), water content of the corneal layer (corneometry), transepidermal water loss (TEWL), pH of the skin, skin

reddening (colorimetry) and skin blood flow (laser doppler flow). We did standardized washings of both arms on the first and the 8th day. The subjects were asked to wash 5 times daily for one week. In a first study we evaluated the irritating effect of repeated washings with 0.01 mol/l sodium lauryl sulphate solution on 20 subjects. We were able to show that there is a more than 12 hours lasting change in skin function parameters after one week of repeated washings. Concerning corneometry, corneal lipids, tewl, pH and laser doppler flow there were highly significant differences before and after repeated washings ($p<0.01$). In a second study we evaluated the irritation reducing effect of 3 barrier creams on 15 subjects for each cream. Using the same method as in our first study, one selected arm was additionally treated with a barrier cream 5 times daily. Barrier creams had a highly significant ($p<0.01$) effect on laser doppler flow, corneometry and tewl. Nevertheless they were not able to offer complete protection. The different barrier creams showed significant differently positive effects onto skin function parameters.

A. Kurte, P.J. Frosch, **What is the optimal time course of application for barrier creams?,** Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

There is no scientific data on the optimal timing of barrier creams (BC) regarding the contact with the irritant. Most of all it is totally unclear whether the application before contact with the irritant is more effective than afterwards. Therefore we studied a popular BC (Atrix Handcreme, Beiersdorf) in our recently described Repetitive Irritation Test on human volunteers with four standard irritants and changed the mode of BC application as follows: 30 min before the irritant, 30 min before and 30 min after the irritant, and 30 min after the irritant only. On normal back skin of 10 volunteers the 4 irritants were applied via large Finn chambers for 30 min: 10% sodium lauryl sulphate (SLS) 1%, sodium hydroxide (NaOH), 30% lactic acid and undiluted toluene. Control fields received the irritant only. Cutaneous irritation was quantified by use of non-invasive bioengineering techniques (TEWL), blood flow volume, capacitance for stratum corneum hydration) and a clinical score for erythema. The results showed marked differences regarding the 3 types of application of BC. Overall, best protection was observed when the BC was applied before and after the irritants; significant differences vs control were found for nearly all parameters. The application before the irritant was almost as effective as before and after for SLS and NaOH, but markedly less effective for lactic acid. For the latter irritant the third mode of BC application (only afterwards) showed striking efficacy, but was least efficacious for the other irritants. The results demonstrate that the degree of inhibition of irritancy depends on the time sequence of BC application. Usage before and after the irritant may be more effective than only one application. For some irritants the application after the irritant may be just as effective as the application before. This observation may have important implications for work places where BC cannot be used before or during working hours.

C. Münzberger, U.F. Haustein, U. Elefant, **Effects of UVA- and UVB-radiation on transepidermal water loss, water content of the horny layer and skin surface lipids**, Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

In the last year many studies have provided important new knowledge concerning the benefits and risks of skin exposure to sunlight and ultraviolet radiation, among them the acute and chronic effects on damage of the skin barrier. We examined the transepidermal water loss, the water content of the horny layer and the amount of skin surface lipids in relation to low dose UV-radiation. The transepidermal water loss was measured with the TEWAMETER TM 210 , the water content of the horny layer with the CORNEOMETER CM 820 and the skin surface lipids with the SEBUMETER SM 810 PC (all from Courage and Khazaka GmbH). The ultraviolet radiation of 25 healthy adults was performed with UVA (Philips TL-K 40W/09N) and UVB (Philips TL 20W/01). One time radiation with UVA as well as with UVB did not show significant changes on all measured biophysical parameters. Transepidermal water loss, the water content of the horny layer and the amount of skin surface lipids were not different before radiation and 5 minutes, 1, 2 and 24 hours after radiation. On the contrary cumulative radiations 4 times per week resulted in damage of the skin barrier and showed changes of the biophysical parameters measured.

E. Tur, Z. Eshkol, S. Brenner, H.I. Maibach, **The cumulative effect of subthreshold concentrations of irritants**, Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

The aim of the present study was to assess the cutaneous response to repetitive applications of subthreshold concentrations of the same irritant or a combination of irritants, using objective non-invasive measurements as well as visual scoring. Ten subjects were patch-tested to determine the minimal irritant dose (MID) to dilutions of aqueous sodium lauryl sulphate and lactic acid. Each subject was then patch-tested for a period of 24 h with half of MID of each chemical (10 patches of each). At 25 h additional patches were applied over the same sites, containing five successive twofold dilutions of

each irritant, starting with half of MID. Each chemical was thus applied onto itself and onto the other chemicals as well. In addition, combinations of half the MID of each substance and twofold dilutions of the other were also applied for two consecutive periods of 24 h. At 25 and 49 h the cutaneous changes were monitored by using the non-invasive methods of laser Doppler flowmetry and reflectance spectrophotometry, in addition to visual scoring. No visual changes were detected, whereas significant differences between the various patch-testing combinations were detected by the instrumentation. Cutaneous blood flow over sites treated with half the MID of one substance increased upon an additional 24 h period of occlusion with half the MID of the other substance ($p<0.05$), and in several occasions even with a quarter of the MID. Repeated application of certain combinations of the substances resulted in an elevated blood flow as well. Reflectance spectrophotometric measurements gave similar results, with the additional finding of an elevation upon reapplication of the same substance ($p<0.05$).These results may provide initial insight into the interaction between the skin and irritants. Although no visual alterations could be detected, the noninvasive instruments were able to detect cutaneous responses to consecutive applications of subthreshold concentrations of various combinations of two chemical irritants. The detectable changes obtained with the addition of a quarter of the MID on top of half of it suggest an augmentation of the response.

G. Zeller, N.Y. Schürer and G. Goerz, **Patch testing of dental alloys**, Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

Complaints about "allergies to dental alloys" encounter frequently the dermatologists or dentists office. "Standardised patch tests" may then be performed on the patients back. However, the stratum corneum provides a barrier against transepidermal waterloss (TEWL) as well as unlimited penetration of chemicals. The quality of the barrier varies between the different regions of the body (oral, back, arm). In this context, we posed the question, whether the current standardised patch test procedure of dental alloys on the back is optimal. Therefore, we performed triplicate patch tests on 30 patients with "oral complaints to dental alloys". Patch tests were applied on the back and the insides of both upper arms. The skin surface of one arm was pre-treated with acetone wipes in order to disturb the stratum corneum barrier prior to the application of the patch test. The individual TEWL was measured prior and after to the acetone wipes. The patch test procedure was performed according to the recommendations of the German contact dermatitis group. Of the 30 patients tested, 15 patients revealed reactions to dental alloys. Thereof, 5 (33%) patients reacted in triplicate, 8 (53%) reacted only on their arms (duplicate) and 2 (13%) reacted only on the acetone-pre-treated arm. Reactions to benzoylperoxide (7), cadmiumchloride (6), sodiumthiosulfatoaurate (4) and zincchloride (4) were observed. We conclude, that patchtesting of dental alloys may better be performed on the upper arm, where the physiological stratum corneum is thinner, yet disruption of the epidermal barrier with acetone wipes in general, is not necessary to prevent false negative results on the back.

V. Rogiers, D. Roseeuw, **TEWL measurements in patch test assessment: The need for standardisation,** Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

When soap, shower and shampoo formulations are brought in contact with skin, irritation may occur which can be assessed by TEWL measurements. Of utmost importance is that the methods involved are well standardised. The aim of this study was to develop such standardised conditions for TEWL measurements and patch testing. For TEWL measurements the TEWA-meter was used. Several of the factors studied play an important role: the measuring probe should be warmed up to body temperature (30.9 ± 1.0°C) before measurements are carried out; the pressure on the measuring probe must be kept constant; a shielding box should only be used when excessive air turbulence can occur; the location of the measurements site on the body is a variable. Corresponding places on the right left forearm exhibit the same TEWL; the environmental temperature and relative humidity must be kept constant; cleaning procedures of the skin may affect TEWL measurements. Factors of minor importance seem to be age and sex of the volunteers. Under standardised conditions the reproducibility of the TEWL measurements on the forearm of 20 female volunteers between 23-27 years old during one month was high: CV = 5% at the individual level and 10% at the group level. For patch testing different methods were compared taking into account the factors that affect TEWL measurements. When aqueous detergent solutions (1% sodium laurylsulfate (SLS) in desionised water was taken as a reference) were patch tested, factors affecting TEWL measurements were found to be the volume of the detergent solution on the patch, the occlusiveness of the dressing, the use of an appropriate blank, the occlusion time and the reading time after air exposure. When under these standardised conditions the irritancy potential of two new non-ionic surfactants, caprilyl/capryl glucoside and decyl glucoside, was measured on the forearm of 13 volunteers (female between 20-29 years old) versus the amphoteric surfactant

cocoamidopropylbetaine and the anionic SLS, the following ranking was found: water < alkyl glucosides < betaine < SLS.

S.M. John, U. Gödecke, H.J. Schwanitz, **Bioengineering of the skin as a tool for primary prevention of occupational skin disease? A nine-months experience,** Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

Introduction: Which factors influence individual susceptibility to develop dermatitis in wetwork? Little is known so far, even less has been incorporated in legal requirements. To date, in Germany, youths at risk are presently - if at all - screened for irrelevant disorders like acne. An objective instrumentary for efficient pre-employment counselling in wetwork is needed. Methods: Prospective studies are the only valid study design when the role of endogenous factors such as "skin sensitivity" is to be investigated. A prospective cohort study in hairdressers' apprentices was designed correlating anamnestic and clinical findings (e.g. Erlangen atopy score) with bioengineering methods (transepidermal water loss [TEWL], microcirculation [LDF], pH, sebum, temperature). The intended observation period is to be three years (full educational cycle), the observation intervals were 3 months in the first year of training, and will then be 6 months. Results: The results of the first nine months of the study are now available, including 4 investigations in 3-months-intervals in the first year of training, and will then be 6 months. Results: The results of the first nine months of the study are now available, including 4 investigations in 3-months-intervals. So far 92 junior apprentices were investigated, 62 within the first 20 days of professional training. Within the observation period 25 (27%) developed moderate or severe occupational dermatitits at any one stage, 39 (43%) developed mild dermatitis, 28 (30%) apprentices did not develop dermatitis (yet). 6 of 92 left the profession for reasons other than the skin, 7 (8%) had to give up for occupational skin disease. Clinical parameters (Erlangen atopy-score) so far do not significantly correlate the development of contact dermatitis, nor do the investigated bioengineering parameters (including TWL) compared to unaffected controls. However, there was a significant increase of RWL within the first six months of training in "cases" and controls, which afterwards normalized in unaffected individuals. Conclusion: The aim of this study is to develop a skin sensitivity score (SSS) as an objective and predictive parameter in wetwork by combination of (a) clinical and (b) non-invasive bioengineering parameters. This aim has not yet been reached. More epidemiological data is needed. Work-related monitoring using bioengineering methods may become of importance for early diagnosis of occupational contact dermatitis.

P.G.M. van der Valk, G. Zarafonitis, **Horny layer thickness as assessed functionally by sellotape stripping and transepidermal water loss does not predict sodium lauryl sulphate skin irritations,** Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

To elicit an irritant or allergic skin reaction a chemical has to penetrate the skin. The horny layer plays an important role as a barrier for most chemicals. Therefore, it seems likely that horny layer barrier function is important in preventing allergic and irritant contact dermatitis. Differences in horny layer barrier function may account for differences in susceptibility to irritants. The thickness of the horny layer may be an important factor in barrier function. If it is assumed that by sellotape stripping a layer of corneocytes is removed with a constant thickness both between subjects and within subjects and permeability constants do not vary the thickness of the horny layer can be estimated according to Fick's law by the number of strips needed to increase permeability. Transepidermal water loss (TEWL) has been suggested as an indicator for horny layer barrier function. Stripping the skin with sellotape increases transepidermal water loss according to Fick's law. We studied the correlation between the number of sellotape strips needed to remove a constant functional part of the horny layer as assessed by transepidermal water loss with the response of the skin to a standardised irritant stimulus. In 20 subjects a site on the volar side of the forearm was tapestripped until TEWL was 40 g/m²/h. On the contralateral side of the other forearms skin was patch tested 48 hours to sodium lauryl sulphate (SLS) 3%. Redness of the exposed skin was read semi-quantitatively on a 0-4 scale after the exposure.

A. Hannuksela, M. Hannuksela, **Irritant effects of a liquid detergent in wash and chamber tests,** Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

Irritant properties of a detergent can be tested by using patch and chamber tests and various kinds of use tests. The aim of the present study was to compare the results of use and 12 mm Finn Chamber tests. The study subjects (10 atopic and 11 non-atopic medical students) washed the outer aspects of their upper arm with a liquid detergent for one minute twice daily for one week. 48 h chamber tests with five concentrations of the same detergent in water were concurrently applied to the upper back skin. Transepidermal water loss (TEWL), electrical capacitance and skin blood flow were measured to quantify the reactions on day 0, 2, 5 and 7. Irritant dermatitis developed equally in the atopics and

non-atopics in the wash test, whereas in the chamber in the TEWL was significantly higher in the atopics than in the non-atopics. The chamber test results thus predicted poorly the results of the wash test.

P. Treffel, B. Gabard, E. Bieli, **Stratum corneum (SC) dynamical function measurements after irritant and moisturizer application,** Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

This study was conducted on the ventral forearm of 6 healthy volunteers. Sorption-Desorpiton Test (SDT) and Moisture Accumulation Test (MAT) were performed with a Nova ™ DPM 9003. Each test was quantified by 3 parameters. SDT: Pre-Hydration State (PHS), Hygroscopicity (H), Water Holding Capacity (WHC). MAT:PHS, Water Accumulation Velocity (WAV), Water Accumulation (WA).

W. Matthies, **Assessment of skin compatibility of consumer products - Current strategy and methods in industry (exemplified on a dishwashing liquid),** Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

Improvement of skin compatibility is a priority task in formulating consumer products. Experience shows, that control of typical skin diseases like desiccation eczema of the hands may be reached by adequate protection and skin care, but these proportions being not always followed by the consumer. Therefore, it is a special task for industry to optimize products with respect to skin compatibility using milder surfactants, refattening agents, or other caring substances, whenever possible. Decisive instruments for improvement of formulations are standardised test models, which help comparing characterising and quantifying effects of formulations for their differentiation, and generating use related data. Modern laboratories work with in vitro secreening, e.g. cell culture techniques, skin explants or physiologic membranes in order to evaluate toxic effects of substances and formulations (Neutreal red test, skin culture, HET-CAM Model on the Chorioallantoic membrane of hen's eggs). After generating those screening data, further investigation can be performed directly in human volunteers, if general toxicity for man can be assessed as negligible and local tolerance is foreseeable good. In humans maximal short term exposition (contact with undiluted product) can be tested in an open epicutaneous test after Burckhardt. This model is suitable for classification of products according to their irritation potential, but also for assessment of use conditions, when the product is intended to be used for short time contact with the skin, only. Occlusive patch test techniques are useful for comparison of numerous variants in the same individual regarding primary irritation and kinetics of local toxic effects. Besides primary irritation mainly chapping and dryness reactions give hints for different mechanisms of action of substances on or in the stratum corneum. Assessment of the in-use situation needs test methods, which reflect the foreseeable overuse/misuse or the real home use condition. Measurements of physiologic function with physical methods (Laser Doppler Flow, TEWL, Capacity, pH-value measurement, image analysis etc) enable the investigator to objectify results and to survey studies with larger numbers of participants who are using products under real use conditions. As an example results with a new dishwashing liquid show, that this procedure is suitable to demonstrate improvement of products towards better compatibility which also can be experienced by the consumer condition.

B. Gabard, P. Treffel, F. Charton-Picard, R. Eloy, **Irritant reactions on hairless micropig skin: A model for testing barrier creams,** Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

Occupational dermatoses are most numerous among recognized occupational diseases and their frequency is increasing. Skin barrier creams (SBC) are designed to prevent or reduce the irritancy or hazardous materials in the working and/or home environment. Used repeatedly, detergents, organic solvents or cutting oils presumed to be responsible for the development of numerous chronic irritant dermatitis. Many methods have been used to identify the potential protective efficacy of SBC but up to now, there is no widely accepted model. Main difficulties reside in the wide range of possible irritants and in the obvious need to reproduce the frequent repetition of a low-grade exposure. We looked for an animal model that would present the following characteristics: - pharmacological reactions similar to the ones of human skin, allowing a meaningful comparison of the irritant reactions to be made; - possibility of easily repeating applications of various concentrations of the irritants; - possibility of quantifying the irritation with non-invasive skin measurements techniques. For these purposes, we chose the Yucatan hairless micropig (YHP), the skin of which is known to be very close to human skin, at least morphologically. In a first preliminary stage, the following experiments were conducted: 1. Physiologic characterisation of the normal YHP skin with repeated measurements on different sites of skin colour (Minolta Chromameter), skin hydration (Courage + Khazaka Corneometer) and transepidermal water loss (TEWL; Servomed evaporimeter); 2. Measurements of the skin reactions to histamine (Pricktest), aqueous methylnicotinate, NaOH, aqueous Na-lauryl sulfate (NaLS) and toluene; 3. Occlusive application of different cutting oils. The results show the following similarities and differences with known

properties of human skin: 1. YHP skin showed lower L*- and b*-, but similar a*-values, skin hydration slightly lower but TEWL similar compared to known Caucasian skin data. Site differences were detected. 2. Reactions to histamine, toluene and NaOH were well characterised and took place in a concentration range similar to the one used in corresponding experiments on human skin. This was also the case for NaLS, although the reaction showed a strong erythema, a decrease of hydration changes but little barrier impairment as measured with TEWL. YHP skin proved very insensitive to Methylnicotinate. 3. It was also shown that some cutting oils could provoke a measurable irritation after a single occlusive patch application. In conclusion, these experiments to be completed to better characterise the properties of the YHP skin but these preliminary results appear to support the use of this animal model in thinking about a near-practise test system for SBC.

G. Marti-Mestres, J. Passet, H. Maillols, V. van Sam, J.J. Guilhous, J.P. Mestres, B. Guillot, **Evaluation expérimentale de l'hydratation et du pouvoir occlusif in vivo et in vitro d'excipients lipophiles et de leurs émulsions phase huile continue,** Int. Journal of Cosmetic Science 16, p. 161-170, 1994

Une étude a été réalisée sur trois émulsions eau dans huile et leurs phases grasses respectives, vaseline, huile de paraffine et huile d'amande douce, en vue de comparer luers propriétiés occlusives et par voie de conséquence leur influence sure l'hydratation cutanée. Une méthode in vitro utilisant des cellules de type 'Patel' a permis dans un premier temps de classer les différentes émulsions et leurs phases grasses en fonction de leur perméabilité à la vapeur d'eau, ce qui conduit par ordre croissant de degré d'occulsion à: huile d'amande douce, huile de paraffine et vaseline. Pour les études in vivo chez l'homme, l'influence de l'application des mémes substances sur la petere insensible d'eau (PIE) et l'hydratation cutanée a été mesurée avec un évaporimètre et un cornéomètre. Les différentes pahses grasses, utilisées pures, augmentent l'hydratation par effet occlusif, ce phénomène étant objectivè par les mesures de PIE. Par contre pour les èmulsions correspondantes, il semblerait que l'augmentations de l'hydratation ne fasse pas intervenir de mécanisme occlusif.

A.O. Barel, *P. Clarys*, **Study of the Stratum Corneum barrier function by Transepidermal water loss (TEWL) measurements. Comparison between two commercial instruments: Evaporimeter® and Tewameter®**, (Studio sulla funzione barriera dello strato corneo per mezzo della perdita di umidita´per traspirazione cutanea (TEWL). Confronto tra due strumenti: Evaporimeter® e Tewameter®), Cosmetics & Toiletries Ed.It.n. 1/94

The measurement of Trans Epidermal Water Loss (TEWL) is an important non-invasive method for assessing the efficiency of the skin as a protective barrier. As a consequence, the measurement of TEWL provides information concerning the integrity of the epidermis in normal, irritated and diseased skin situations, concerning the effects of chemicals on the surface of the skin and concerning the objective evaluation of occlusive pharmaceutical and cosmetic preparations. In the past different non-invasive methods and instruments have been developed to measure TEWL. Until recently, the only commercially available TEWL instrument was the Evaporimeter® made by Servomed, Sweden, based on the open chamber evaporation gradient method. This widely used instrument, measures the water evaporation gradient developed from the skin surface in an open chamber system. Hygrosensors coupled with thermistors measure at two different distances from the skin surface, the water evaporation at the skin surface. Recently a new instrument based on the same principle of measurement of the water evaporation gradient in an open chamber, was developed and became commercially available: Tewameter TM 210® made by Courage+Khazaka, Germany. It is the purpose of this chapter to compare the two commercial instruments under identical experimental conditions. The following parameters will be comparatively analyzed and described: general technical description of the probes and the instruments, evaluation of the accuracy, reproducibility and range of TEWL measurements and a comparative study of some typical applications of TEWL measurements in dermato-cosmetic research. TEWL-measurements were carried out with both instruments after stripping, occlusion and the treatment with irritant detergents.

P.J. Frosch, A. Schulze-Dierks, M. Hoffmann, I. Anselm, **Efficacy of Skin Barrier Creams,** Contact Dermatitis, 1993

An improved human model for the quantification of skin barrier creme (BC) is described. In contrast to the previously published procedure the back instead of the forearm and a total of 4 irritants are used. Due to the larger area 3 BC formulations can be simulaneously compared to the control field which received the irritant only without BC-pretreatment. On 10 human volunteers the irritants 10% sodium lauryl sulfate (SLS), 1% sodium hydroxide (NaOH), 30% lactic acid (LA) and undiluted toluene (TOL) were applied via large Finn chambers for 30min, 5x during the first week and 4x during the second one. Taktosan Salbe (water-in-oil emulsion) and RAWI speerschutzcreme (oil-in-water emulsion) had been applied 30 min before contact with the irritants. In order to assess reproducibility and interindividual

variation the BC RAWI was tested in duplicate. Irritant cutaneous reactions were quantified by 4 parameters: erythema score, transepidermal water loss, blood flow volume and stratum corneum hydration by measuring capacitance. The results showed marked differences in efficacy. Taktosan suppressed significantly the irritation of SLS, NaOH and LA, apparent in nearly all parameters. RAWI caused significant inhibition of the SLS irritation and a positive trend against NaOH and LA was observed. Both BC failed against TOL. The results of the suplicate testing with RAWI showed a good reproducibility. The dogma that oil-in-water emulsions are primarily effective against lipophilic irritants and water-in-oil emulsions against hydrophilic ones needs to be re-evaluated on the basis of our findings.
This model seems to have potential for further studies on BC and might elucidate the complex interaction of BC with irritants.

R. Nöring, J. Stork, B. Born, B. Labrot, H. Mann, P. Saake, M. Spallek, **Transepidermaler Wasserverlust bei Atopie,** Dermatosen 41, Heft 3, 1993

Bei 279 Meitarbeitern wurde der Atopie-Score bestimmt, an vier verschiedenen Körperstellen (Unterarmstreckseite, Unterarmbeugeseite, Handrücken und Handfläche) wurde der Transepidermale Wasserverlust (TEWL) gemessen. Es zeigt sich, daß der Atopie-Score und der TEWL unabhängige Größen sind.

A. Krebs, **Prüfung der irritativen Wirkung von hydrophilen und lipophilen Irritantien im repetitiven Irritationstest,** Dissertation der Medizinischen Fakultät der Friedrich-Schiller-Universität Jena

A. Teglia, G. Mazzola, *G.F. Secchi*, **Relationship between Chemical Characteristics and Cosmetic Properties of Protein Hydrolysates**, 17th IFSCC Congress, Yokohama/Japan, 10/92

More than 20 protein hydrolysates, taken from the market or especially prepared for the test, of animal and vegetable origin and with significantly different molecular characteristics were tested and compared with respect to three cosmetic properties: substantivity to hair, reduction of sodium laurylsulfate (SLS) irritation and foaming. Peptide adsorption on hair was evaluated on virgin and damaged tresses after incubation with 2.5% hydrolysate solutions, re-extraction with 50°C hot water and high ionic strength solution and quantification after fluorescamine reaction. Inhibition of induced SLS skin and eye irritation was evaluated by visual scoring, moisture content of the horny layer (Electric Capacitance, EC) and transepidermal water loss (TEWL) measurements after skin chamber application and by Eytex methodology. Foaming properties were evaluated by standard Ross-Miles method. Molecular size, net charge and hydrophobicity were studied as important parameters affecting these cosmetic properties and were related to the origin of hydrolysates and the characteristics of the manufacturing process.

D. van Neste, **In-vivo evaluation of unbound water accumulation in stratum corneum. The influence of accute skin irritation induced by sodium laurylsulfate,** Catholic University of Louvain 1990

In a series of previous experiments, we showed that the inflammatory response associated with skin barrier function damage induced by sodium laurylsulfate (SLS) was correlated with the concentration of SLS and with the duration of application under occlusion of the surfactant.

J. Pinnagoda, R.A. Tupker, P.J. Coenraads, J.P. Nater, **Transepidermal water loss with and without sweat gland inactivation,** Contact Dermatitis 1989, Juli 21, p. 16-22

The influence of eccrine sweating on transepidermal water loss (TEWL) was investigated. TEWL was simultaneously measured on both forearms, with and without topical inactivation of the eccrine sweat glands by 0,3 ml of 0,5 % aqueous scopolamine hydrobromide (HBr), applied under 1 h occlusive patches. The degree of sweat inhibition, after exercise was measured at 2,3 and 4 h after patch removal. In 42 out of 44 subjects, complete sweat inhibition (on exercise) was achieved only at 4 h after removal. After a 15-min rest in a room at 20 degrees C, the pre-exercise TEWL values (at 4 h) on the treated and untreated sites were not different (Pgreater than 0,05), in 38 out of 44 subjects.

J.L. Antoine, *J.L. Contreras*, *D. van Neste*, **PH Influence on surfactant-induced skin irritation,** Dermatosen in Beruf und Umwelt, Band 37, 1989, 3, p. 96-100

Even though various experimental methods have been proposed for in vitro testing of detergents such as SLS (sodium laurylsulfate) no absolutely relevant clinical information can be inferred from them as to the irritancy of a given compound. In particular the relative importance of pH needs further assessment. This study reports on in vivo evaluation of skin function changes under given experimental conditions with SLS applied at 3 different pH values. There is a dramatic increase of transepidermal

water loss (TEWL), i.e. a substantial reduction in the barrier function of the skin, when SLS is applied under occlusion for 48 H. The alkaline control solution (NaOH pH 9) induced low-grade, but significant TEWL increases, as compared to the other controls (distilled water pH7; HCl pH5), which had no influence on TEWL. The changes obtained with the controls were much lower than those observed with SLS. The barrier-function changes induced by the surfactant SLS could, however, promote transepidermal passage of acid and/or alkaline molecules, hence increasing toxic damage of the skin; yet no such effects could be observed, indicating that the main effects are due to detergency. Assessment of cutaneous blood flow values (CBFV) by laser Doppler velocimetry showed increased values after SLS. When pH-adjusted SLS solutions were compared, there was neither a difference in relation to pH nor did the control solutions induce any significant CBFV change. This study reveals that TEWL and CBFV are probably the most reliable methods to investigate acute irritancy by SLS. Accordingly, pH cannot be considered as a major contributive factor of irritancy when SLS solutions are applied under occlusion (48H). The current level of sebaceous secretion and the electrical properties of the skin surface were not parameters to evaluate acute SLS-induced skin damage, but longitudinal studies are presently being conducted in order to assess their significance in monitoring epidermal repair after SLS insults.

E. Beradesca, *H.I. Maibach*, **Racial Differences in Sodium Lauryl Sulphate induced cutaneous irritation: black and white,** Contact Dermatitis 18: 65-70, 1988

The different reactivity of black and white skin after exposure to sodium lauryl sulphate (SLS) has been investigated. 9 white and 10 black male volunteers entered the study. The tests were performed on the back at 3 sites: untreated skin, skin pre-treated with occlusion and skin pre-delipidized. Irritant reactions were elicited applying 0.5% and 2.0% SLS via Finn chamber patch tests and monitored by means of laser Doppler velocimetry (LDV), transepidermal water loss (TEWL) and stratum corneum water content (WS). Higher TEWL, LDV, and WC values were recorded for 2.0% SLS when compared to 0.5% SLS and baselines. Pre-treatment with short-term occlusion generally increased values, while delipidization produced flattening of the data more detectable in whites than in blacks. Significant TEWL differences for two concentrations were recorded in whites for the occluded site ($P<0.02$) while in blacks in the untreated ($P<0.04$) and delipidized ($P<0.03$) sites. LDV revealed significant changes in the untreated and pre-occluded white skin ($P<0.05$ and 0.01, respectively). In blacks, the values were significantly different only in the pre-occluded skin ($P<0.01$). Water content correlated with the visual score and was greatly increased in sites with strongly positive reactions ($P<0.01$). It appears that there are significant differences in the modulation of irritation, in the behaviour of water barrier function and of the erythematous response between blacks and whites. Clinical correlations are discussed.