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Literature List
Skin-pH-Meter

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.

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.

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.

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.

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.

P.V. Andrew, A. Pinnock, A. Poyner, K. Brown, J. Chittock, L.J. Kay, M.J. Cork, S.G. Danby, **Maintenance of an Acidic Skin Surface with a Novel Zinc Lactobionate Emollient Preparation Improves Skin Barrier Function in Patients with Atopic Dermatitis**, Dermatol Ther (Heidelb) (2024) 14: p. 391–408

Introduction: The skin of patients with atopic dermatitis (AD) is characterised by elevated pH. As a central homeostatic regulator, an increased pH accelerates desquamation and suppresses lipid processing, resulting in diminished skin barrier function. The aim of this study was to determine whether a novel zinc lactobionate emollient cream can strengthen the skin barrier by lowering skin surface pH.Methods: A double-blind, forearm-controlled cohort study was undertaken in patients with AD. Participants applied the test cream to one forearm and a vehicle cream to the other (randomised allocation) twice daily for 56 days. Skinsurface pH and barrier function (primary outcomes) were assessed at baseline and after 28 days and 56 days of treatment, amongst other tests. Results: A total of 23 adults with AD completed the study. During and after treatment, a sustained difference in skin surface pH was observed between areas treated with the test cream and vehicle (4.50 ± 0.38 versus 5.25 ± 0.54, respectively, p \ 0.0001). This was associated with significantly reduced transepidermal water loss (TEWL) on the test cream treated areas compared with control (9.71 ± 2.47 versus 11.20 ± 3.62 g/m2/h, p = 0.0005). Improvements in skin barrier integrity, skin sensitivity to sodium lauryl sulphate, skin hydration, and chymotrypsin-like protease activity were all observed at sites treated with the test cream compared with thecontrol. Conclusion: Maintenance of an acidic skin surface pH and delivery of physiologic lipids arebeneficial for skin health and may help improve AD control by reducing sensitivity to irritants and allergens.

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.

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.

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.

F. Huang, Y. Zhang, J. Guo, H. Pan, Z. Liao, B. Yang, P. Lu, **Characterization of Epidermal Function in Individuals with Primary Cutaneous Amyloidosis**, Clinical, Cosmetic and Investigational Dermatology 2023:16, p. 3193–3200

Purpose: To compare epidermal biophysical properties, indicators of epidermal function, in

individuals with and without primary cutaneous amyloidosis (PCA). Patients and Methods: This study incorporated 189 patients with PCA and 166 healthy individuals. The GPSkin Barrier was employed to measure transepidermal water loss (TEWL) rates and hydration levels of the stratum corneum. The Sebumeter and the Skin pH Meter were utilized to determine the skin surface's sebum content and pH, respectively. The severity of pruritus inparticipants was evaluated using the visual analog scale (VAS). Results: Compared to the control group without PCA, individuals with PCA displayed a notable increase in skin surface pH and TEWL and a decrease in the hydration levels of the stratum corneum (p<0.0001 for all parameters). Additionally, the sebum content was markedly lower in those with PCA than in the controls (p<0.0001). Of particular note, both TEWL and skin surface pH at the lesion sites on the back and the shin were more elevated in lichenoid amyloidosis (LA) and in macular amyloidosis (MA), whereas hydration levels of the stratum corneum and sebum levels were diminished in LA compared to MA (p<0.05). In conclusion, both hydration levels of the stratum corneum and sebum content exhibited an inverse relationship with pruritus severity, whereas TEWL and skin surface pH demonstrated a positive correlation with pruritus intensity. Conclusion: The function of the epidermis is compromised in individuals diagnosed with PCA. However, the mechanisms underlying these changes await further investigation.

N. Stanek-Wandzel, M. Zarębska, T. Wasilewski, Z. Hordyjewicz-Baran, E. Zajszły-Turko, M. Tomaka, T. Bujak, A. Ziemlewska, Z. Nizioł-Łukaszewska, **Kombucha fermentation as a modern way of processing vineyard by-products into cosmetic raw materials**, Int J Cosmet Sci, 2023 Dec;45(6): p. 834-850

Objective: The wine industry generates large quantities of by-products presenting a remarkably valuable composition in phytochemicals. The process that can significantly increase the content of bioactive compounds is fermentation by yeast and other microorganisms. The current study presents, for the first time, an evaluation of the potential of grape stems extract and its ferments using the Scoby consortium, as a cosmetic raw material for improving the skin care properties of facial cosmetics. Methods: Fermentation of grape stems using Scoby consortium was carried out for 10 and 20 days. Unfermented and fermented extracts were analysed for their antioxidant activity and chemical composition, with a particular emphasis on biologically active substances. Additionally, the influence of the addition of the obtained ferments to the model cosmetic creams on hydration, transepidermal water loss and skin pH were assessed. Results: The obtained results revealed that grape stems extract and its ferments are a rich source of phenolic compounds and show antioxidant activity, with the highest values observed for extracts on the 20th day of fermentation. Furthermore, the addition of the extract, as well as ferment, to the cream has a positive effect on skin hydration and reduces transepidermal water loss. Conclusion: These results suggest that grape stem extracts are a prospective source of active compounds that may be valuable ingredients for the cosmetic industry. Unfermented and fermented extracts can be used in moisturizing cosmetic formulations and also to complement the treatment of dry and sensitive skin.

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.

F. Huang, Y. Zhang, J. Guo, H. Pan, Z. Liao, B. Yang, P. Lu, **Characterization of Epidermal Function in Individuals with Primary Cutaneous Amyloidosis**, Clinical, Cosmetic and Investigational Dermatology 2023:16, p. 3193–3200

Purpose: To compare epidermal biophysical properties, indicators of epidermal function, in individuals with and without primary cutaneous amyloidosis (PCA). Patients and Methods: This study

incorporated 189 patients with PCA and 166 healthy individuals. The GPSkin Barrier was employed to measure transepidermal water loss (TEWL) rates and hydration levels of the stratum corneum. The Sebumeter and the Skin pH Meter were utilized to determine the skin surface's sebum content and pH, respectively. The severity of pruritus in participants was evaluated using the visual analog scale (VAS). Results: Compared to the control group without PCA, individuals with PCA displayed a notable increase in skin surface pH and TEWL and a decrease in the hydration levels of the stratum corneum ($p<0.0001$ for all parameters). Additionally, the sebum content was markedly lower in those with PCA than in the controls ($p<0.0001$). Of particular note, both TEWL and skin surface pH at the lesion sites on the back and the shin were more elevated in lichenoid amyloidosis (LA) and in macular amyloidosis (MA), whereas hydration levels of the stratum corneum and sebum levels were diminished in LA compared to MA ($p<0.05$). In conclusion, both hydration levels of the stratum corneum and sebum content exhibited an inverse relationship with pruritus severity, whereas TEWL and skin surface pH demonstrated a positive correlation with pruritus intensity. Conclusion: The function of the epidermis is compromised in individuals diagnosed with PCA. However, the mechanisms underlying these changes await further investigation.

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.

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.

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.

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.

A. Fitzner, K. Knuhr, M. Brandt, S. Bielfeldt, **Investigating the effect of the pH of foot care product formulations on pedal skin in diabetic and non-diabetic subjects**, Int J Cosmet Sci,.2023 Aug;45(4): p. 524-538

Objective: The use of skin care formulations with acidic pHs is seen as an effective method to maintain the acidic mantel of the skin; however, because the skin pH varies depending on the area of the body and as data are lacking for the skin pH of the feet, there was a need to examine whether this assumption holds true for skin care formulations designed for the foot. Thus, three foot creams formulated with a neutral, acidic or alkaline pH were compared with each other as well as to an untreated control group in order to analyse their impact on skin pH, hydration and general skin condition. Methods: An exploratory clinical investigation with 60 enrolled subjects, half of whom had a diagnosis of diabetes (type 1 or type 2), was undertaken. The investigation followed a randomized, double-blind, balanced incomplete block design (BIBD) including intra-individual comparison (before and after treatment). Evaluations of skin pH and hydration were carried out using a pH meter and a Corneometer respectively. Objective evaluation of skin condition for efficacy assessment was performed by a trained grader. For tolerability evaluation, objective and subjective dermatological assessments were performed. Results: At the end of the treatment period, the skin pH was largely unchanged at five out of six of the test areas, with the mean value for each treatment group using test products showing similar fluctuations as the untreated control group. Furthermore, the skin condition parameters studied all improved by a comparable magnitude for each of the treatment groups using the test products, whereas the untreated control group experienced a worsening of the skin condition parameters. Conclusions: The results of this investigation suggest that where the skin of the foot is concerned, the pH of skin care formulations has no (physiologically) relevant influence on the skin's pH in either diabetic or non-diabetic subjects. Furthermore, the expectation that acidic formulations would be more beneficial for the skin's condition was not found to hold true for the skin of the foot, as no significant difference was observed between the performance of the three test products investigated in this study.

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.

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.

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.

C.-Y. Wu, C.-Y. Ho, Y.-H. Yang, **Developing Biomarkers for the Skin: Biomarkers for the Diagnosis and Prediction of Treatment Outcomes of Alzheimer's Disease**, Int. J. Mol. Sci. 2023, 24

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by memory decline and cognitive impairment. Research on biomarkers can aid in early diagnosis, monitoring disease progression, evaluating treatment efficacy, and advancing fundamental research. We conducted a cross-sectional longitudinal study to see if there is an association between AD patients and age-matched healthy controls for their physiologic skin characteristics, such as pH, hydration, transepidermal water loss (TEWL), elasticity, microcirculation, and ApoE genotyping. The study used the Mini-Mental State Examination (MMSE) and Clinical Dementia Rating-Sum of the Boxes (CDR-SB) scales as references to quantify the presence of disease, if any. Our findings demonstrate that AD patients have a dominantly neutral pH, greater skin hydration, and less elasticity compared to the control subjects. At baseline, the tortuous capillary percentage negatively correlated withMMSE scores in AD patients. However, AD patients who carry the ApoE E4 allele and exhibit a high percentage of tortuous capillaries and capillary tortuous numbers have shown better treatment outcomes at six months. Therefore, we believe that physiologic skin testing is a rapid and effective way to screen, monitor progression, and ultimately guide the most appropriate treatment for AD patients.

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. 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.

S. Laura, S. Veronese, G. Alberti, P.A. Bacci, A. Beatini, E. Fulgione, C. Urbani, A. Sbarbati, **Vacuum and electromagnetic field in synergy for skin rejuvenation: A retrospective study on 217 patients**, J Cosmet Dermatol. 2023;22: p. 2989–2995

Background: There are many aesthetic treatments aimed at combating aging. In the most common and frequently used ones there are often side effects, albeit minor ones. However, sometimes it is necessary to use medications before or after treatments. Objectives: To evaluate the anti-aging

efficacy and application safety of a therapybased on the combination of vacuum and electromagnetic fields (EMFs). Methods: A retrospective study was conducted to evaluate the aesthetic effects of the treatment on 217 subjects. Before treatment (T0) and after the last session (T1), skin hydration levels, the amount of sebum present and the pH were measured. The presence of discomfort during the sessions and side effects at T1 was verified. At T1, the levels of satisfaction of the patients and of the doctors who performed the treatment were assessed. At 3 and 6 months of follow-up the aesthetic results were re-evaluated. Results: For all treated subjects, an evident qualitative improvement was observed in the quality of the skin of the neck and face, with an increase in tone and a reduction in wrinkles. The instrumental tests highlighted a normalization of skin hydration, pH, and sebum values. High levels of satisfaction at T0 and good stability of results up to 6 months of follow-up were reported. No discomfort was referred during the treatment sessions, nor any side effects after the entire treatment. Conclusions: The treatment that exploits the synergy between vacuum and EMFs is very promising given the effectiveness and safety of the technique.

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. 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.

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.

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.

J.-Y. Lee, S. Jeon, S. Han, K.-H. Liu, Y. Cho, K.-P. Kim, **Positive Correlation of Triacylglycerols with Increased Chain Length and Unsaturation with ω-O-Acylceramide and Ceramide-NP as Well as Acidic pH in the Skin Surface of Healthy Korean Adults**, Metabolites 2023, 13, 31

Triacylglycerols (TG) play an important role in skin homeostasis including the synthesis of ω-O-acylceramides (acylCER) required for skin barrier formation by providing linoleic acid (C18:2n6). However, the overall relationships of TG species with various ceramides (CER) including CER-NP, the most abundant CER, ω-O-acylCER, and another acylCER, 1-O-acylCER in human SC, remain unclear. Therefore, we investigated these relationships and their influence on skin health status in healthy Korean adults. Twelve CER subclasses including two ω-O-acylCER and two 1-O-acylCER were identified with CER-NP consisting of approximately half of the total CER. The ω-O-acylCER species exhibited positive relationships with TG 52:4 and TG 54:2 containing C18:2, while interestingly, 1-O-acylCER containing ester-linked C14:0 and C16:0 demonstrated positive relationships with TG 46–50 including C14:0 and C16:0, respectively. In addition, CER-NP and CER-NH showed positive correlations with TG 52–54 containing C18:2 or C18:3. A lipid pattern with higher levels of CER including CER-NP and ω-O-acylCER with TG 54 and TG with 5–6 double bonds was related to good skin health status, especially with acidic skin pH. Collectively, TG with increased chain length and unsaturation seemed to improve CER content, and profiles such as higher acylCER and CER-NP improved skin health status by fortifying skin barrier structure.

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. 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.

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.

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.

K.A. Capone, D.L. Friscia, J. Nikolovski, L.S. Telofski, G.N. Stamatas, **A randomized clinical study on**

the effects of emollient use on the developing infant skin microbiome and metabolome, Experimental Dermatology, October 2022

There is little debate that the microbiome plays an overall role in health; however, there is much to be learned about potential factors influencing the microbiome, particularly that of the skin, since it has the most exposure to the environment. It has been shown that the skin microbiome of newborns evolves to an infant-like profile, after rapid diversification throughout the neonatal period and into infancy. Evidence shows that the presence of certain commensal microbial species limits access to opportunistic pathogens and may play a role in immune modulation.[2] By contrast, an alteration in the relative abundances of bacteria has been shown to be related to certain skin diseases. For example, the diversity of the skin microbiome is decreased in patients with atopic dermatitis (AD).[3] Emollients are frequently used in AD management because of their effects on improving the skin barrier and reversing microbial dysbiosis.[4] Limited information is available on the effects of skin care products on the microbiome of healthy individuals. One study in adults suggested that the microbiome can be altered by skin care products.[5] The current report is the first study to evaluate the impact of baby skin care products on the microbiome in infants. More specifically, we evaluated if the addition of an emollient, which has been shown to enhance the richness and diversity of the microbiome in AD, would have a similar effect in healthy infants when added to the regimen of baby bath wash.

M. Maitre, E. Gravier, M. Leveque, C. Lauze, V. Turlier, M. Froliger, S. Bessou-Touya, H. Duplan, **Comparison of Oily or Dry Dandruff scalp: Clinical, Instrumental and Targeted Metagenomic Data**, 32nd IFSCC Congress London, September 2022

Oily dandruff (OD) is associated to high sebum production and inflammation, yellowish and flakes adherent to the scalp and hair, and dysbiosis microbiota. Dry dandruff (DD) are small, whitish flakes, not adherent to the scalp and can be associated with itching and dry scalp. The aim of this study was to compare DD scalps by clinical, instrumental, and targeted metagenomic data *versus* OD scalps.33 subjects with mild to moderate OD or DD were included. For both populations, the clinical status of dandruff was assessed. Instrumental measurements of hydration, lipid index, pH and trans epidermal water loss were done. Targeted metagenomic analysis and digital droplet PCR were performed on DNA extraction from swab samples. Microbiota population was compared between the two groups. Hydration and lipid index were significantly higher for OD than DD, while TEWL data were significantly higher in DD population. *Cutibacterium* and *Staphylococcus genus* dominate OD and DD bacteria populations. Significant differences were observed on under-represented microorganism communities. Regarding the fungal microbiota, the abundance of the family *Malasseziaceae* and the *genus Filobasidium* was different between OD and DD scalps. Dehydration and low sebum production are characteristic of DD scalps while OD scalps display high sebum production and inflammation. Interestingly, the barrier function of the skin scalp seems to be more impaired in DD scalp. In addition, we have shown here that scalpmicrobiota of these two dandruff states are different. These results highlight the importance to address DD and OD scalps with specific scalp care products.

D. Kocsis, V. Klang, E.-M. Schweige, Z. Varga-Medveczky, A. Mihály, C. Pongor, Z. Révész, Z. Somogyi, F. Erdő, **Characterization and ex vivo evaluation of excised skin samples as substitutes for human dermal barrier in pharmaceutical and dermatological studies,** Skin Reasearch & Technology, Volume 28, Issue 5, September 2022, p. 664-776

Background: Excised animal and human skins are frequently used in permeability testing in pharmaceutical research. Several factors exist that may have influence on the results. In the current study some of the skin parameters that may affect drug permeability were analysed for human, mouse, rat and pig skin. Materials and methods: Classic biophysical skin parameters were measured (e.g. pH, hydration, permittivity, transepidermal water loss). Physiological characteristics of the skins were also analysed by confocal Raman spectroscopy, scanning electron microscopy and two-photon microscopy. Results: Based on biophysical testing, skin barrier function was damaged in psoriatic mouse skin and in marketed pig skin. Hydration and pH values were similar among the species, but freezing and thawing reduced the water content of the skins and shifted the surface pH to acidic. Aging reduced hydration and permittivity, resulting in impaired barrier function. Mechanical sensitization used in permeability studies resulted in proportional thinning of dead epidermis. Discussion: Results indicate that depending on the scientific question it should be considered whether fresh or frozen tissue is used, and for certain purposes rodent skins are well usable. The structure of the skin tissue (ceramide, cholesterol, keratin, natural moisturizing factor or urea) is similar in rats and mice, but due to the higher skin thickness the lipid distribution is different in porcine skin. Psoriasis led to irregular chemical composition of the skin. Conclusion: A comprehensive evaluation of skin samples of four species was performed. The biophysical and microscopic observations should be considered when selecting drug penetration models and experimental conditions.

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. 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.

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.

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.

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, 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.

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.

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.

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.

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.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 µg/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. 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.

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.

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.

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. Tsunemi, H. Nakahigashi, **Clinical study on the effects of the applied volume of moisturizer in patients with asteatosis**, J Dermatol. 2022;49: p. 75–85.

Asteatosis is characterized by decreased stratum corneum water content, and the basictreatment is to keep the skin moisturized. Poor application of moisturizers by patients may reduce treatment efficiency, so it is important to continue application as instructed by dermatologists. Application instructions based on the finger-tip unit are useful for patients, but there is no clear evidence of its efficacy. We investigated the effects of the volume of the moisturizer (Hirudoid® Cream 0.3%) administrated with 1/3 finger-tip unit and 1 finger-tip unit equivalent doses per target lower leg of patients with asteatosis (twice daily, 28 days) on the overall dry skin scores, itch numerical rating scale scores, and skin physiological parameters (stratum corneum water content, transepidermal water loss, and skin pH). Sixty patients were randomized with a 1:1 allocation ratio into two groups: the 1/3 finger-tip unit and 1 finger-tip unit equivalent dose groups. The results showed that 43.3% of the patients in the 1 finger-tip unit equivalent dose group, compared with 13.3% in the 1/3 finger-tip unit equivalent dose group, presented zero overall dry skin scores 1 week later. As the overall dry skin scores improved, the stratum corneum water content also increased. In patients with moderate itching, the itch numerical rating scale scores of the 1 finger-tip unit equivalent dose group decreased significantly compared with those of the 1/3 finger-tip unit equivalent dose group. The results suggested that the application of 1 finger-tip unit equivalent dose of the moisturizer twice daily in clinical practice could induce remission more quickly. With the 1/3 finger-tip unit equivalent dose, prolonged treatment may be necessary to achieve the desired effect; therefore, application adherence is strictly required. In conclusion, the application of a 1 finger-tip unit equivalent dose would be quite reasonable in clinical practice.

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.

C. Uhl, **How does pH impact skin health?,** Cosmetic Business, December 2021

Specific amounts of water and lipids on the skin surface determine the composition of the hydrolipidic film of the skin. Its slightly acidic pH value 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 natural microbiome, while at the same time restricting the growth of pathogenic microbes.

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.

Ł. Rydzik, T. Ambrozy, Z. Obmiński, W. Błach, I. Ouergui, **Evaluation of the Body Composition and Selected Physiological Variables of the Skin Surface Depending on Technical and Tactical Skills of Kickboxing Athletes in K1 Style**, Int. J. Environ. Res. Public Health 2021, 18, 11625

Background: Kickboxing is a combat sport with high demands on fitness and coordination skills. Scientific research shows that kickboxing fights induce substantial physiological stress. Therefore, it is important to determine the body composition of athletes before competitions and to analyze the skin temperature and skin pH during the fight. Methods: This study aimed to determine the body composition, skin temperature, and skin pH in kickboxers during a fight according to K1 rules. A total of 24 kickboxers (age range: 19 to 28 years) competing in a local K1 kickboxing league participated in the present study. Results: Changes in skin temperature and pH were observed and significant correlations were found between body composition and weight category. Conclusions: Changes in skin temperature and pH were demonstrated after each round of the bout. Level of body fat and muscle tissue significantly correlates with technical-tactical skills of the K1 athletes studied.

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.

I. Micek, J. Nawrot, A. Seraszek-Jaros, D. Jenerowicz, G. Schroeder, T. Spizewsk, A. Suchan, M. Pawlaczyk, J. Gornowicz-Porowska, **Taxifolin as a Promising Ingredient of Cosmetics for Adult Skin**, Antioxidants 2021, 10, 1625

Active substances, effective in the reduction in or delay of skin changes caused by aging occurring in natural compounds, are desirable. Taxifolin (TXF), a flavonoid of strong antioxidant activity found in the plant Stizolophus balsamita (S. balsamita), has been tested for its biological effects on adult human skin. The aim of the study was to investigate the effects of two creams: 3% S. balsamita extract and 3% TXF on the function of adult skin. In total, 97 Caucasian women with clinical signs of skin aging were investigated. The biophysical and biomechanical skin parameters were measured before and after applying the creams, using Colorimeter CL400, Mexameter MX16, Skin-pH-Meter PH900, Skin-Thermometer ST 500, Glossymeter GL200, and Cutiscan SC100. Patch tests were performed with the investigated products to assess their potential irritant properties. The percutaneous penetration of creams was examined with the use of electrospray ionization mass spectrometry (ESI-MS) and confocal Raman spectroscopy. The 3% S. balsamita extract cream reduced hyperpigmentation, erythema, and elevated pH. All the tested preparations were proven to be nonirritant. A higher penetration rate was revealed for the 3% TXF cream than for the 3% S. balsamita extract cream. A total of 3% TXF cream improved skin viscoelasticity. The obtained results suggested that S. balsamita extract and TXF may be considered as ingredients of skincare products for adults.

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.

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 significantly higher in the self-assessed sensitive skin group, while TEWL, a* and EI values increased but L* value decreased with significance 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.

A. Pany, M. Wohlgenannt, S. Klopprogge, M. Wolzt, T. Heuser, H. Kotisch, C. Valenta, V. Klang, **Effect of hydroxypropyl-β-cyclodextrin in fluid and semi-solid submicron emulsions on physiological skin parameters during regular in vivo application**, International Journal of Cosmetic Science, 2021, 43, p. 263–268

Objective: The aim of the present study was to evaluate the effect of hydroxypropyl-β-cyclodextrin (HP-β-CD) in cosmetic submicron emulsions and submicron emulsion gels on physiological skin parameters during regular application in a clinical set-up. Methods: Formulation morphology was investigated using cryotransmission electron microscopy. Stability of the employed formulations was determined by photon correlation spectroscopy, measurement of pH and rheological properties. Effect on physiological skin parameters was evaluated during regular application over four weeks in a parallel group study (n = 15, healthy forearm skin) with a Corneometer, Sebumeter, skin-pH-Meter, Aquaflux and an Epsilon sensor. Confocal Raman spectroscopy was employed to monitor urea and NMF levels. Results: Both submicron emulsions and gels showed satisfying storage stability irrespective of cyclodextrin incorporation. No statistically significant effects on skin barrier function and any of the observed parameters were obtained, indicating good skin tolerability of all tested formulations. Conclusion: Results suggest good skin tolerability of the developed cosmetic submicron emulsions and gels with HP-β-CD.

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.J. Vanderwolf, C.J. Kyle, P.A. Faure, D.F. McAlpine, C.M. Davy, **Skin pH varies among bat species and seasons and between wild and captive bats**, Conservation Physiology, Volume 9, 2021

Skin is a key aspect of the immune system in the defence against pathogens. Skin pH regulates the activity of enzymes produced both by hosts and by microbes on host skin, thus implicating pH in disease susceptibility. Skin pH varies inter and intra-specifically and is influenced by a variety of intrinsic and extrinsic variables. Increased skin alkalinity is associated with a predisposition to cutaneous infections in humans and dogs, and inter-specific and inter-individual variation in skin pH is implicated in differential susceptibility to some skin diseases. The cutaneous pH of bats has not been characterized but is postulated to play a role in susceptibility to white-nose syndrome (WNS), a fungal infection that has decimated several Nearctic bat species. We used non-invasive probes to measure the pH of bat flight membranes in five species with differing susceptibility to WNS. Skin pH ranged from 4.67 to 8.59 and varied among bat species, geographic locations, body parts, age classes, sexes and seasons. Wild *Eptesicus fuscus* were consistently more acidic than wild *Myotis lucifugus, Myotis leibii* and *Perimyotis subflavus*. Juvenile bats had more acidic skin than adults during maternity season but did not differ during swarming. Male *M. lucifugus* were more acidic than females during maternity season, yet this trend reversed during swarming. Bat skin was more acidic in summer compared to winter, a pattern also reported in humans. Skin pH was more acidic in captive than wild *E. fuscus*, suggesting environmental impacts on skin pH. The pH of roosting substrates affects skin pH in captive bats and may partially explain seasonal patterns in wild bats that use different roost types across seasons. Future research on the influence of pH on microbial pathogenic factors and skin barrier function may provide valuable insights on new therapeutic targets for treating bat skin conditions.

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.

B. Kyoung Hwang, S. Lee, J.-O. Myoung, S.J. Hwang, J.M. Lim, E.T. Jeong, S.G. Park, S.H. Youn, **Effect of the skincare product on facial skin microbial structure and biophysical parameters: A pilot study**, MicrobiologyOpen. 2021

Daily use of cosmetics is known to affect the skin microbiome. This study aimed to determine the bacterial community structure and skin biophysical parameters following the daily application of a skincare product on the face. Twenty-five Korean women, who used the same skincare product for four weeks participated in the study. During this period, skin hydration, texture, sebum content, and pH were measured, and skin swab samples were collected on the cheeks. The microbiota was analyzedusing the MiSeq system. Through these experiments, bacterial diversity in facial skin increased and the microbial community changed after four weeks of skincare product application. The relative abundance of Cutibacterium and Staphylococcus increased, significant changes in specific bacterial modules of the skin microbial network wereobserved, and skin hydration and texture improved. It was suggested that daily use of skincare products could affect the microbial structure of facial skin as well as the biophysical properties of the facial skin. These findings expand our understanding of the role of skincare products

on the skin environment.

K. Hayashi, I. Mori, K. Takeda, Y. Okada, A. Hayase, T. Mori, Y. Nishioka, K. Manabe, **Analysis of hand environment factors contributing to the hand surface infection barrier imparted by lactic acid**, Skin Research and Technology, Volume 27, Issue 5, September 2021

Background: Organic acids on the surface of human hands contribute to the barrier against transient pathogens. This is the first study to explore the synergistic contribution of lactic acid and other hand environment-related features on the antibacterial properties of the hand surface. Materials and Methods: We estimated the contribution of fingerprint depth, skin pH, stratum corneum water content, skin temperature, and sweat rate of the hands to the infection barrier using an observational survey of 105 subjects. The relationship between each factor and the antibacterial activity of the hands was analyzed using Pearson's correlation coefficient. We performed molecular dynamics simulations to study the interaction between lactic acid and bacterial membranes. Results: The amount of lactic acid on the hands and skin temperature contributed positively to the antimicrobial activity ($r = 0.437$ and $P = 3.18 \times 10\text{-}6$, $r = 0.500$ and $P = 5.66 \times 10\text{-}8$, respectively), while the skin pH contributed negatively ($r = -0.471$, $P = 3.99 \times 10\text{-}7$). The predicted value of the combined antimicrobial effect of these parameters was [antimicrobial activity] = 0.21 × [lactic acid] - 0.25 × [skin pH] + 0.26 × [skin temperature] + 0.98. The coefficient of determination (R2) was 0.50. Conclusion: The increase in the amount of non-ionic lactic acid due to lower pH and improvement in the fluidity of the cell membrane due to higher temperatures enable the efficient transport of lactic acid into cells and subsequent antimicrobial activity. The proposed mechanism could help to develop an effective hand infection barrier technology.

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 might play a role in the physiopathology of AKs and SCCs.

P. Chaturvedi, P.R. Worsley, G. Zanelli, W. Kroon, D.L. Bader, **Quantifying skin sensitivity caused by mechanical insults: A review,** Skin Research & Technology, August 2021

Background: Skin sensitivity (SS) is a commonly occurring response to a range of stimuli, including environmental conditions (e.g., sun exposure), chemical irritants (e.g., soaps and cosmetics), and mechanical forces (e.g., while shaving). From both industry and academia, many efforts have been taken to quantify the characteristics of SS in a standardised manner, but the study is hindered by the

lack of an objective definition. Methods: A review of the scientific literature regarding different parameters attributed to the loss of skin integrity and linked with exhibition of SS was conducted. Articles included were screened for mechanical stimulation of the skin, with objective quantification of tissue responses using biophysical or imaging techniques. Additionally, studies where cohorts of SS and non-SS individuals were reported have been critiqued. Results: The findings identified that the structure and function of the stratum corneum and its effective barrier properties are closely associated with SS. Thus, an array of skin tissue responses has been selected for characterization of SS due to mechanical stimuli, including: transepidermal water loss, hydration, redness, temperature, and sebum index. Additionally, certain imaging tools allow quantification of the superficial skin layers, providing structural characteristics underlying SS. Conclusion: This review proposes a multimodal approach for identification of SS, providing a means to characterise skin tissue responses objectively. Optical coherence tomography (OCT) has been suggested as a suitable tool for dermatological research with clinical applications. Such an approach would enhance the knowledge underlying the multifactorial nature of SS and aid the development of personalised solutions in medical and consumer devices.

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.

P. Si Min Ng, L. Wei Yi Wee, V. Pui Yoong Ho, W.C. Tan, P. Bishnoi, U. Alagappan, S. Mun Yee Wong, E. Yiping Gan, B. Huey Quek, L. Shen, B. Su, J.E.A. Common, M.J. Aan Koh, **Moisturisers from birth in at-risk infants of atopic dermatitis – a pragmatic randomised controlled trial**, Australasian Journal of Dermatology (2021), online, 62, p. 539–545

Background: Atopic dermatitis (AD) is a common, chronic dermatosis, with onset of disease often manifesting in early infancy. Past studies evaluating the early use of moisturisers in the prevention of AD had mixed results. Objectives: To compare the incidence of moderate or severe AD and total incidence of AD in a cohort of 'at-risk' infants treated with moisturisers from the first 2 weeks of life, to a similar group without moisturisers. Methods: We performed a single-centre, prospective, parallel-group, randomised study in infants with at least 2 first-degree relatives with atopy. Subjects were randomised into either a treatment group with moisturisers or a control group without moisturisers. Participants were assessed at 2, 6, and 12 months for AD and if present, the severity was assessed using SCORAD index. We also compared the overall incidence of AD, trans-epidermal water loss (TEWL), stratum corneum (SC) hydration, pH, and incidence of food and environmental sensitisation and allergies between both groups. Genotyping for loss-offunctions mutations in the FLG gene was conducted. Results: A total of 200 subjects were recruited, with 100 subjects in each arm. There was no significant difference in incidence of moderate or severe AD, and total incidence of AD at 12 months between the treatment and control groups. There was a lower mean SCORAD in the treatment group than in the control group, but no significant difference in TEWL, SC hydration, and skin pH. No significant side-effects were reported. Conclusions: The early use of moisturisers in 'atrisk' infants does not reduce the incidence of moderate-to-severe AD and overall incidence of AD in infancy.

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.

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.

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.

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.

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, p: 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.

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.

M.O. Visscher, V. Narendran, **Imaging reveals distinct textures at three infant skin sites and reflects skin barrier status**, Skin Research & Technology, 2021;27: p. 145–152

Background: Infant diaper dermatitis (DD) is a prevalent condition due to multiple, interactive factors including increased skin hydration, irritant exposure, and increased skin pH. We examined diaper dermatitis vs within diaper and non-diaper controls over time and characterized the association of skin color and texture relative to skin barrier integrity, hydration, and pH. Materials and Methods: The prospective study included 46 infants with DD at wellchild visits. Skin integrity was evaluated over 15 days, including visual skin condition, rate of stratum corneum transepidermal water accumulation, hydration, pH, and skin color and texture from high-resolution digital skin surface images. Effects by site and time were evaluated with general linear models. Results: Six distinct texture patterns were observed. All three sites differed significantly for texture class frequency. Normal dermatoglyphics were more frequent for non-diaper vs both within diaper and rash sites. Dermatoglyphics with marked furrows or lines (class 3) were common within diaper vs rash but not for non-diaper vs within diaper. Streaks were highest for DD and lowest for non-diaper. Flat regions were more frequent DD. Barrier integrity, that is, moisture accumulation rate, was lower for normal dermatoglyphics than streaks or flat texture. DD severity decreased over 15 days. Barrier properties of within diaper and non-diaper areas were not well-differentiated. Conclusion: The incidence of streak texture in the within diaper high magnification images was high despite being visually normal. This finding suggests that it is an “early indicator” of skin damage and may be clinically useful for early detection and treatment.

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.

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.

M.-J. Kim, K.-P. Kim, E. Choi, J.-H. Yim, C. Choi, H.-S. Yun, H.-Y. Ahn, J.-Y. Oh, Y. Cho, **Effects of Lactobacillus plantarum CJLP55 on Clinical Improvement, Skin Condition and Urine Bacterial Extracellular Vesicles in Patients with Acne Vulgaris: A Randomized, Double-Blind, Placebo-Controlled Study**, Nutrients 2021, 13, 1368

Lactobacillus plantarum CJLP55 has anti-pathogenic bacterial and anti-inflammatory activities in vitro. We investigated the dietary effect of CJLP55 supplement in patients with acne vulgaris, a prevalent inflammatory skin condition. Subjects ingested CJLP55 or placebo (n = 14 per group) supplements for 12 weeks in this double-blind, placebo-controlled randomized study. Acne lesion count and grade, skin sebum, hydration, pH and surface lipids were assessed. Metagenomic DNA analysis was performed on urine extracellular vesicles (EV), which indirectly reflect systemic bacterial flora. Compared to the placebo supplement, CJLP55 supplement improved acne lesion count and grade, decreased sebum triglycerides (TG), and increased hydration and ceramide 2, the major ceramide species that maintains the epidermal lipid barrier for hydration. In addition, CJLP55 supplement decreased the prevalence of *Proteobacteria* and increased *Firmicutes*, which were correlated with decreased TG, the major skin surface lipid of sebum origin. CJLP55 supplement further decreased the *Bacteroidetes:Firmicutes* ratio, a relevant marker of bacterial dysbiosis. No differences in skin pH, other skin surface lipids or urine bacterial EV phylum were noted between CJLP55 and placebo supplements. Dietary *Lactobacillus plantarum* CJLP55 was beneficial to clinical state, skin sebum, and hydration and urine bacterial EV phylum flora in patients with acne vulgaris.

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.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.

C. Vater, A. Apanovic, C. Riethmüller, B. Litschauer, M. Wolzt, C. Valenta, V. Klang, **Changes in Skin Barrier Function after Repeated Exposition to Phospholipid-Based Surfactants and Sodium Dodecyl Sulfate In Vivo and Corneocyte Surface Analysis by Atomic Force Microscopy**, Pharmaceutics 2021, 13, 436

(1) Background: The aim of the study was to evaluate the effect of pure lecithins in comparison to a conventional surfactant on skin in vivo. (2) Methods: Physiological skin parameters were evaluated at the beginning and the end of the study (day 1 and day 4) (n = 8, healthy forearm skin) with an Aquaflux®, skin-pH-Meter, Corneometer® and an Epsilon® sensor. Confocal Raman spectroscopy was employed to monitor natural moisturizing factor, urea and water content of the participants' skin. Tape strips of treated skin sites were taken and the collected corneocytes were subjected to atomic force microscopy. Circular nano objects were counted, and dermal texture indices were determined. (3) Results: Transepidermal water loss was increased, and skin hydration was decreased after treatment with SDS and LPC80. Natural moisturizing factor and urea concentrations within the outermost 10 µm of the stratum corneum were lower than after treatment with S75 or water. Dermal texture indices of skin treated with SDS were higher than skin treated with water (control). (4) Conclusions: Results suggest very good (S75) or good (LPC80) skin-tolerability of lecithin-based surfactants in comparison to SDS and encourage further investigation

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.

K. Chilicka, A.M. Rogowska, R. Szyguła, **Effects of Topical Hydrogen Purification on Skin Parameters and Acne Vulgaris in Adult Women**, Healthcare 2021, 9, 144

Background: Acne vulgaris is a prevalent dermatological disease characterized by skin eruptions, which may decrease the sufferer's quality of life. Hydrogen purification treatment is a new procedure used in cosmetology to improve the skin parameters of the face. This study examined the effectiveness of hydrogen purification treatment to improve women's skin conditions with regard to acne vulgaris. Methods: In this study, 30 women participated who suffered from a high level of sebum and acne. The control group was comprised of 30 healthy women with a low level of sebum. The Hellgren–Vincent Scale and Derma Unit SSC 3 device were used to assess acne vulgaris severity and skin properties, respectively. Four hydrogen purification sessions were carried out at 7-day intervals, using the Hebe Hydrogenium+ generating alkaline water. Results: At baseline and 7 and 14 days after finishing

the series of treatments, the levels of oiliness, moisture, and skin pH were tested. The main effects of treatment were significant in the following parameters: pH around the bottom lip, moisture between the eyebrows and around the nose, and oily skin in all three face sites. Conclusions: The level of sebum decreased and moisture levels increased during hydrogen purification. Topical hydrogen purification is an effective and safe treatment for acne vulgaris.

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.

*K. Ogai, K. Ogura, N. Ohgi, S. Park, M. Aoki, T. Urai, S. Nagase, S. Okamoto, J. Sugama***, Stability of Skin Microbiome at Sacral Regions of Healthy Young Adults, Ambulatory Older Adults, and Bedridden Older Patients After 2 Years**, Biological Research for Nursing, 2021, Vol. 23(1) p. 82-90

Objective: The sacral skin of bedridden older patients often develops a dysbiotic condition. To clarify whether the condition changes or is sustained over time, we analyzed the skin microbiome and the skin physiological functions of the sacral skin in patients who completed our 2017 study. Methods: In 2019, we collected the microbiome on the sacral region and measured sacral skin hydration, pH, and transepidermal water loss from 7 healthy young adults, 10 ambulatory older adults, and 8 bedridden older patients, all of whom had been recruited for the 2017 study. For microbiome analysis, 16S ribosomal RNA-based metagenomic analysis was used. Results: No significant differences in the microbial compositions or any alpha diversity metrics were found in the bedridden older patients between the 2017 and 2019 studies; the higher gut-related bacteria were still observed on the sacral skin of the bedridden older patients even after 2 years. Only skin pH showed a significant decrease, approaching normal skin condition, in the bedridden older patients over 2 years. Conclusion: This study indicated that gutrelated bacteria stably resided in the sacral skin in bedridden patients, even if the patient had tried to restore skin physiological functions using daily skin care. We propose the importance of skin care that focuses more on bacterial decontamination for the sacral region of bedridden older patients, in order to decrease the chances of skin/wound infection and inflammation.

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.

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?

K. Amano, K. Xiao, S. Wueger, G. Meyer, **A colorimetric comparison of sunless with natural skin tan**, PLoS ONE 15(12), December 2020

The main ingredient of sunless tanning products is dihydroxyacetone (DHA). DHA reacts with the protein and amino acid composition in the surface layers of the skin, producing melanoidins, which changes the skin colour, imitating natural skin tan caused by melanin. The purpose of this study was to characterise DHA-induced skin colour changes and to test whether we can predict the outcome of DHA application on skin tone changes. To assess the DHA-induced skin colour shift quantitatively, colorimetric and spectral measurements of the inner forearm were obtained before, four hours and 24 hours after application of a 7.5% concentration DHA gel in the experimental group (n = 100). In a control group (n = 60), the same measurements were obtained on both the inner forearm (infrequently sun-exposed) and the outer forearm (frequently sun-exposed); the difference between these two areas was defined as the naturally occurring tan. Skin colour shifts caused by DHA tanning and by natural tanning were compared in terms of lightness (L*), redness (a*) and yellowness (b*) in the standard CIELAB colour space. Naturalness of the DHA-induced skin tan was evaluated by comparing the trajectory of the chromaticity distribution in (L*, b*) space with that of naturally occurring tan. Twenty-four hours after DHA application, approximately 20% of the skin colour samples became excessively yellow, with chromaticities outside the natural range in (L*, b*) space. A principal component analysis was used to characterise the tanning pathway. Skin colour shifts induced by DHA were predicted by a multiple regression on the chromaticities and the skin properties. The model explained up to 49% of variance in colorimetric components with a median error of less than 2 ΔE. We conclude that the control of both the magnitude and the direction of the colour shift is a critical factor to achieve a natural appearance.

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.

M. Kepinska-Szyszkowska, A. Misiorek, M. Kapinska-Mrowiecka, J. Tabak, K. Malina, **Assessment of the Influence Systemic Cryotherapy Exerts on Chosen Skin Scores of Patients with Atopic Dermatitis: Pilot Study**, BioMed Research International Volume 2020

Background. One of the most important tasks in the treatment of atopic dermatitis (AD) is alleviation of racking skin dryness and persistent pruritus, because these factors exert a significant influence on worsening patients' quality of life. Cryotherapy being a new form of rehabilitation in AD may supplement and support a long-term process of AD treatment, because it has anti-inflammatory and antipruritic effects and exerts a positive influence on the nervous system. Methods. 14 adults (mean age 32 ± 10:8) with mild tomoderate AD were enrolled. WBC (15 treatments in total) took place in winter 2018/2019. Patient skin parameters (hydration of the epidermis, sebum level, and skin pH level) were measured with probes produced by Courage + Khazaka Electronic GmbH. Results. Changes were observed in the hydration level of the epidermis. The SCORAD index evaluating the AD intensity level also changed (decreased). Conclusion. Due to these properties, hypothesis has been put forward that WBC can be an effective, supporting method in the treatment of AD.

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.

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.

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.

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.

A. Piotrowska, O. Czerwińska-Ledwig, P. Kotarba, **Wybrane Cechy Skóry Dłoni Diagnostów Laboratoryjnych** - **Selected Hand Skin Characteristics of Laboratory Diagnosticians**, Medycyna Pracy 2020;71(6): p. 725–734 (Article in Polish)

Wstęp: Długotrwała ekspozycja skóry na mokre środowisko pracy i środki dezynfekcyjne powoduje uszkodzenie bariery naskórkowej, co zaburza jej funkcje ochronne oraz sprzyja rozwojowi dermatoz. Czynniki te występują w pracy diagnosty laboratoryjnego. Celem niniejszej pracy była analiza wybranych cech skóry i zmian skórnych rąk u diagnostów laboratoryjnych. Materiał i metody: W badaniu wzięło udział 50 diagnostów zatrudnionych w jednym z krakowskich laboratoriów. Z badanymi przeprowadzono wywiad oraz oceniono pH ich skóry i jej nawilżenie. Pomiary wykonano na stronie grzbietowej ręki dominującej za pomocą urządzeń SKIN-ph-Meter® PH 905 i Corneometer® CM 825. Wyniki: Uzyskane wartości nawilżenia skóry odpowiadały skórze suchej lubbardzo suchej, a odczyny pH skóry mieściły się w granicach normy. Nie udało się wskazać korelacji między pH skóry a ocenianymi cechami (stażem pracy, liczbą godzin spędzanych w rękawiczkach ochronnych w ciągu doby, liczbą epizodów mycia rąk w ciągu dnia). Wydaje się, że stan nawilżenia skóry dodatnio koreluje z czasem noszenia rękawiczek. Stosowanie preparatów nawilżających dłonie po każdym umyciu wiązało się z nawilżeniem skóry. Wnioski: W dobie pandemii COVID-19 ta grupa zawodowa została poddana ogromnym wyzwaniom, a stresory psychiczne i fzyczne (w tym mokre środowisko pracy) będą źródłem przyszłych chorób zawodowych w badanej grupie.

Background: Chronic skin exposure to a wet work environment, as well as disinfectants are factors contributing to epidermal barrier damage. Tis disturbs its protective functions and promotes the development of dermatoses. All these factors occur in the work environment of a laboratory diagnostician. Te aim of the paper was to analyze selected skin parameters and skin lesions in the hands of laboratory diagnosticians. Material and Methods: Overall, 50 laboratory diagnosticians employed in a laboratory in Kraków, Poland, took part in the study. Afer the interview, the skin pH and moisture content were examined. Measurements were performed on the dorsal side of the dominant hand using the Skin-ph-Meter Results: Te obtained moisture level values were qualifed as dry or very dry skin, and the skin pH was within the reference range. ®PH 905 and Corneometer® CM 825 devices. No correlation between the skin pH value and the features examined (professional experience, the number of hours spent in protective gloves during the day, the number of hand washing episodes during the day) was not indicated. Te level of skin moisture content seems to positively correlate with the time of wearing gloves. Te use of hand moisturizers afer each hand washing episode correlated with the level of skin moisture content. Conclusions: During the COVID-19 pandemic, this professional group has been facing huge challenges, and mental and physical stressors (including wet work environment) will be the source of future occupational diseases.

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.

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.

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.

L. Binder, V. Klang, S. Sheikh Rezaei, O. Neuer, M. Wolzt, C. Valenta, ***In vivo*** **analysis of physiological skin parameters: Confocal Raman spectroscopy and classical biophysical techniques**, Poster University of Vienna, Department of Pharmaceutical Technology and Biopharmaceutica

New drug delivery systems have to overcome the skin barrier without causing irritation. Thus, knowledge of the skin composition is essential to obtain reliable data about the impact of dermal products. Besides the formulations' physicochemical properties and stability, its influence on skin physiology is an important aspect in the development of new dermal drug delivery systems. We have recently developed novel concentrated water-in-oil (W/O) emulsions based on a non-ionic silicone surfactant. The aim of thisstudy was to assess the effect of these formulations on physiological skin parameters of healthy volunteers after repeated application. To this end, confocal Raman spectroscopy (CRS) and classical biophysical techniques were used.

Z. Chaoshuai, W. Xin, M.Yaqi, X. Ziqian, S. Yue, M. Xingyu, S. Weimin, **Variation of biophysical parameters of the skin with age, gender, and lifestyles,** J Cosmet Dermatol., April 2020

Background: Sweet, spicy or greasy food, staying up late, and using electronic products for a long time are common bad habits nowadays. Their role in skin diseases has been paid much attention. Objective: The aim of this study was to investigate whether unhealthy lifestyles would affect the skin sebum content, SC hydration, and pH and how do they affect. Methods: A total of 300 volunteers were enrolled, and a multifunctional skin physiology monitor measured the three skin biophysical properties on the forehead and dorsal hand. Lifestyle factors were evaluated by a self-administered questionnaire. Results: Eating oily, sweet, spicy food, and staying up late increased the sebum content of the forehead significantly. Dorsal hand SC hydration was higher in people eating more sweet food and oily food, and forehead SC hydration was higher in people eating more sweet food and go to bed earlier. Eating sweet food could increase pH in both forehead and dorsal hand. The forehead pH decreased in using electronic products over 6 hours a day or staying up late. There are significant differences in sebum, hydration, and pH value among different age groups. In males, the pH was lower than females, but the sebum was higher. Conclusion: Sebum content, SC hydration, and pH are affected by unhealthy lifestyles, age, and gender.

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 ($\rho = 0.448$). 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.

***F. Murina, C. Caimi, R. Felice, S. di Francesco, I. Cetin,* Characterization of female intimate hygiene practices and vulvar health: A randomized double-blind controlled trial**, Journal of Cosmetic Dermatology, Apr 2020

Background: Inappropriate feminine hygiene practices are related to vulvar unpleasant symptoms (such as skin changes, lesions, burning, pruritus, fissures, and dyspareunia). Aims: We assessed the daily use effects of intimate cleansers on vulvar skin by comparing two specific products for intimate care: Saugella Hydraserum (SIS), based on natural extracts, and a standard product based on lactic acid, such as Lactacyd Feminine Hygiene (LTC). Forty healthy women were enrolled in this double-blind controlled study. Methods: After randomization, the cleansers were used twice daily for 30 days. The hydration level was determined using the Corneometer® CM 825, the pH using the Skin-pH-Meter PH 905® and the sebum level using the Sebumeter SM815®. Measurements were performed at baseline and on day 30 on the labia majora and labia minora. Results: Both cleansers showed a reduction in the hydration level, but this was much less evident in the SIS group (−6.3% SIS vs −23.7% LTC). The pH values of the SIS group were lower than those of the LTC group, especially on the labia minora (5.27 ± 0.08 and 5.6 ± 0.1, respectively, $P = .025$). The sebum increased in both groups, but in the LTC group, it was higher on the labia majora (+96.2% vs +46.8%, respectively, $P = .003$), while on the labia minora, it was higher in the SIS group (+24.7% vs +17.1%, respectively P = NS). Conclusions: Both cleansers tested showed high performance for safety and tolerability on vulvar skin, but SIS showed better efficacy than LTC on some parameters.

S. Nagase, K. Ogai, T. Urai, K. Shibata, E. Matsubara, K. Mukai, M. Matsue, Y. Mori, M. Aoki, D. Arisandi, J. Sugama, S. Okamoto, **Distinct Skin Microbiome and Skin Physiological Functions Between Bedridden Older Patients and Healthy People: A Single-Center Study in Japan**, Frontiers in Medicine, April 2020, Volume 7, Article 101

With the increase in the older populations, the number of bedridden older patients is becoming a matter of concern. Skin microbiome and skin physiological functions are known to change according to lifestyle and community; however, such changes in case of movement- and cleaning-restricted bedridden older patients have not yet been revealed. To address this issue, we analyzed skin microbiome and skin physiological functions, including pH, hydration, sebum level, and transepidermal water loss (TEWL), of bedridden older patients, compared with those of ambulatory older and young individuals. For this analysis, we enrolled 19 healthy young and 18 ambulatory older individuals from the community and 31 bedridden older patients from a single, long-term care hospital in Japan. The area of interest was set to the sacral (lower back) skin, where pressure injuries (PIs) and subsequent infection frequently occurs in bedridden older patients. We observed a higher number of gut-related bacteria, fewer commensals, higher skin pH, and lower TEWL on the sacral skin of bedridden older patients than on that of young or ambulatory older individuals. In addition, we observed that 4 of the 31 bedridden older patients developed PIs during the research period; a higher abundance of pathogenic skin bacteria were also observed inside the PI wounds. These findings imply distinct skin microbiome and skin physiological functions in bedridden older patients in comparison with healthy individuals and may suggest the need for more stringent cleaning of the skin of bedridden older patients in light of the closeness of skin and wound microbiome.

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.

E. Bruning, Y. Chen, K.A. McCue, J.R. Rubino, J.E. Wilkinson, A.D.G. Brown, **A 28 Day Clinical Assessment of a LacticAcid-containing Antimicrobial Intimate Gel Wash Formulation on Skin Tolerance and Impact on the Vulvar Microbiome**, Antibiotics 2020, 9, 55

While intimate feminine hygiene products are widely used as part of daily cleansing routines, little is known about how these products impact the vulvovaginal area and its microbiome stability. This 4 week clinical study assessed tolerance of a novel gel wash containing lactic acid (pH 4.2) for external daily use when used on the external genital area and its effects on skin moisturization, vulvar skin pH, and the vulvar microbiome. After a 7 day pre-study conditioning period, 36 healthy females in three balanced age groups (18–29, 30–44, and 45–55 years) used the gel wash to cleanse their external genital area (mons pubis and vulva) and entire body at least once per day for 28 days. Skin tolerance of the gel wash was assessed by the gynecologist. Effects of the gel wash on vulvar skin microbiota were studied by performing bacterial 16S rRNA and fungal internal transcribed spacer (ITS) microbial richness and diversity analysis. Based on gynecologic assessment after 28 days of use, the gel wash showed acceptable tolerance, with no signs of increased dryness, redness, edema, itching, stinging, or burning. Use of the gel wash was associated with a significant increase in both short-term (single application) and longer-term (daily use for 28 days) skin moisturization. There was no significant change in vulvar skin pH over time with daily product use, and the gel wash did not significantly affect the natural vulvar microbiome species richness or diversity for bacteria or fungi. Results showed that this gel wash is a mild, moisturizing cleanser that maintains the natural pH and microbial diversity of vulvar skin. To our knowledge, this was the first study to assess the effect of an antimicrobial feminine gel wash on the natural pH and vulvar microbiome habitat of the skin using bacterial 16S rRNA and fungal ITS genetic sequencing techniques.

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.

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.

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.

F. Carlomagno, **Effectiveness of a Biotechnological Active Ingredient for Cosmetics Targeting Skin Microbiota Protection,** presentation at the 25th IFSCC Conference Milan, October 2019

The skin is the largest organ of the human body in surface, mainly serving as a physical barrier which protects the body from external aggression. An adult's skin hosts an average population of 1,000 billion microorganisms among fungi, viruses and bacteria. This fauna lives and moves on the skin surface as well as in the superficial layers of the epidermis to down to the hair follicles and glands. Microorganisms form a complex ecosystem collectively referred to as skin microbiota. This tiny, but important micro-world is essential for the skin to main it healthy and to work as a perfect barrier. A distinctive combination of microorganisms all over our body is peculiar for all of us, although scientists point out that skin microbiome varies a lot during our lives. This variation is linked to age, changes of lifestyle and to the external stressors we are submitted to (4). Different body sites can also have completely different skin microbiota configurations, both inter- and intra-personally, linked to the peculiar characteristics of that precise micro-environment. For example, just focusing on the face, studies show that there are great differences between forehead and cheek skin microbiota, due to the existence of moist, dry and sebaceous skin sites (5). Despite continuous changes in its composition, when the body is healthy, skin microbiota seems to be an equilibrium between protective and pathogens microorganisms. These live together in a complex community and have a number of different symbiotic interactions. If we consider bacteria, the most important and frequent phyla living on human skin are Actinobacteria, Firmicutes, Proteobacteria and Bacteroidetes, without huge differences among ethnicities. Further, looking more deeply into specific taxonomic classification, as class or genus or species, we can find differences among peoples' microbiomes even by looking at subjects with very similar age, lifestyle, and from the same ethnicities. The general truth for everyone's healthy condition seems to be the homeostasis of skin microbiota with its singular peculiarities.

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.

A. Karoglan, B. Paetzold, J. Pereira de Lima, H. Brüggemann, T. Tüting, D. Schanze, M. Güell, H. Gollnick, **Safety and Effcacy of Topically Applied Selected Cutibacterium acnes Strains over Five Weeks in Patients with Acne Vulgaris**: **An Open-label, Pilot Study**, Acta Derm Venereol 2019; 99: p. 1253–1257

Imbalance in skin microflora, particularly related to certain Cutibacterium acnes strains, may trigger acne. Application of non-acne-causing strains to the skinmay modulate the skin microbiome and thereby lead to a reduction in acne. This pilot study evaluates the safety and effcacy of microbiome modulation on acneprone skin. The study had 2 phases: active induction (5% benzoyl peroxide gel, 7 days) and interventional C. acnes strains treatment (5 weeks). Patients wererandomized to either topical skin formulations PT1 (2 strains of C. acnes Single Locus Sequence Typing[SLST] type C3 and K8, 50% each) or PT2 (4 strains of C. acnes SLST type C3 [55%], K8 [5%], A5 [30%] and F4 [10%]). Safety

and effcacy was evaluated in 14 patients (PT1=8/14, PT2=6/14). Skin microbiome composition shifted towards study formulations. No untoward adverse events, visible irritation, or significant flare-up were observed. Non-inflamed lesions and skin pH were reduced. Comedone counts improved clinically with no deterioration in inflammatory lesions.

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.

R. Voegeli, J. Gierschendorf, B. Summers, A.V. Rawlings, **Facial skin mapping: from single point bio-instrumental evaluation to continuous visualization of skin hydration, barrier function, skin surface pH, and sebum in different ethnic skin types**, International Journal of Cosmetic Science, 2019, p. 1–14

Dry skin is one of the most important concerns of consumers worldwide. Despite huge efforts over several decades, the personal care industry still does not offer a perfect solution to satisfy the unmet needs of consumers for moisturising treatments in different ethnic groups. The paucity of data for the underlying cellular and biochemical problems in, and the effects of moisturisers on photodamaged facial skin may partly explain this. Mainly, single point measurements are used to understand the effects of products on skin physiology even on surrogate skin sites such as the non-photodamaged volar forearm. Some groups have developed discontinuous facial maps of skin biophysical properties, however, in 2014 a continuous facial analysis of bio-instrumental evaluations was developed using a heat map approach. These maps enabled a continuous visualization of features that not only revealed an unexpected complexity of facial skin but also indicated that use of surrogate skin sites for facial skin is inappropriate. We have demonstrated that remarkable gradients of skin hydration, TEWL, skin surface pH and sebum exist within short distances across the face and the gradients are distinctive among different ethnic groups. In addition, these studies have demonstrated that darkly-pigmented individuals do not necessarily have a better skin barrier function than their less-pigmented counterparts and that Caucasians have a lower facial skin surface pH compared with more pigmented subjects. Overall, there are no correlations between capacitance, TEWL and skin surface pH including individual topology angle values. Novel 3D camera approaches have also been used to facilitate a more precise assignment of measurement sites and visualisation. The 3D facial colour mappings illustrated precisely the local moisturising effects of a moisturising cream. There were subtle ethnic differences in efficacy that may be related to underlying skin biochemistry and/ or ethnic differences in product application. A placebo-controlled study using conductance measurements in Chinese subjects is also reported. Finally, a new whole face statistical approach has been taken to prove differences in skin parameters but also of moisturiser treatment that adds further to our understanding of the ethnic differences in skin physiology and product application. This paper reviews the background of the development and application of this methodology.

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.

Y. Duan, L. Ma, C. Galzote, F.-Q. Kong, C.-P. Shen, **A Randomized Pilot Clinical Assessment Of Three Skincare Regimens On Skin Conditions In Infants**, Clinical, Cosmetic and Investigational Dermatology 2019:12, p. 895–909

Introduction: Few data are available on the comparison between the effects on infant skin of skin care products and those of water alone. Patients and methods: In this single-center, evaluator-blind, parallel-group pilot study, healthy infants were randomized to near-daily washing for 12 weeks (starting in the summer and finishing in the winter months) with a mild liquid baby wash followed by use of baby lotion (wash+lotion), water followed by baby lotion (water+lotion), or water alone. Clinical and instrumental assessments of skin moisturization and barrier function were made. Results: As expected the skin condition in all groups was affected by the change of the season. The skin of infants in all groups was mildly deteriorated (clinical grading) and with reduced moisture levels and increased barrier function. Instrumental measurements indicated that skin moisture and barrier function were better maintained in the wash+lotion and water +lotion groups than in the water-only group at week 12. Clinical assessment scores increased slightly over 12 weeks in all groups ($P<0.05$). At week 12, the wash+lotion group (n = 44) had significantly less change from baseline in overall skin condition and softness (lower scores) than did the water+lotion (n = 43) or water-only (n = 43) groups. The wash+lotion regimen maintained stable erythema and rash scores with lower mean values over time than in the other groups. Conclusion: A regimen of a liquid baby wash and a baby skin lotion for 12 weeks resulted in less detrimental changes in instrumental and clinical measures of skin than using water and lotion or water alone.

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.

B. Hughes-Formella, O. Wunderlich, R. Williams, J. Fernández, Y.Z. Kim, W. Wigger-Alberti, S. Pecquet, A. Moodycliffe, **Comparison of Skin Structural and Functional Parameters in Well-Nourished and Moderately Undernourished Infants**, Skin Pharmacol Physiol. 2019 Jul; 32(4): p. 212–223

Background: Little is known about the impact of nutrition on the development of skin structure and function in infants. Methods: We investigated epidermal, dermal, and subcutis parameters of aged-matched well-nourished and moderately undernourished infants in this single-center, cross-sectional, noninterventional study using noninvasive methods (skin caliper, 20-MHz sonography, transepidermal water loss, skin pH, and corneometry). Plasma fatty acids were determined as an indicator of nutritional differences. 310 infants from different age groups, i.e., 1 week, 4 weeks, and 6, 9, 12, 24, and 36 months were included. Approximately half of each age group was well-nourished (WHO reference values weight-for-height/length Zscore: $-0.75 \leq Z \leq 0.75$) and the other half was moderately undernourished ($-3 \leq Z < -2$). Results: Structural maturational differences in the deeper dermis and subcutis regions of the skin and subtle functional changes in the epidermis were observed in moderately undernourished infants without notable clinical symptoms. Reduced skin barrier function or skin hydration were not observed in the undernourished infants, and skin pH shifted to more acidic values in this group. Conclusion: These indings reveal a greater impact of moderate undernutrition on the development of

the dermis and subcutis and suggest that critical epidermal functions such as skin barrier and pH are mostly maintained.

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.

S.E. Eskandari, A. Firooz, M. Nassiri-Kashani, M.R. Jaafari, A. Javadi, A. Miramin Mohammadi, A. Khamesipour, **Safety Evaluation of Topical Application of Nano-Liposomal Form of Amphotericin B (SinaAmpholeish) on Healthy Volunteers: Phase I Clinical Trial**, Iran J Parasitol: Vol. 14, No. 2, Apr-Jun 2019, p.197-203

Background: We aimed to evaluate the safety of SinaAmpholeish in a doubleblind, randomized, phase 1 clinical trial in healthy human volunteers. Methods: The study was carried out in DermaLab of Center for Research and Training in Skin Diseases and Leprosy, Tehran University of Medical Sciences, Tehran, Iran in 2012. A topical Nano-liposomal formulation of 0.4% Amphotericin B was developed against Leishmania under trade name of SinaAmpholeish. In this randomized, double-blind, right-left, comparative, phase I clinical trial, in 2 steps; 7 and 20 healthy volunteers were recruited and applied SinaAmpholeish on the right and its vehicle on the left volar side of forearm, twice a day for one week or 3 times a day for two weeks. Seven biophysical skin parameters were measured in standard conditions before and 2 wk after application. Results: There was no adverse effect when SinaAmpholeish and its vehicle were used twice a day for seven days. However, when were used 3 times a day for two weeks, both SinaAmpholeish and its vehicle induced severe local skin reactions in 2 volunteers leading to discontinuation of application. Mild and temporary local reactions were observed in about half of the application sides and there was no significant difference between SinaAmpholeish and its vehicle. Conclusion: The new formulation is safe and worth to be tested in further phase 2 clinical trial and since there was no adverse effect with twice a day application it was decided to use SinaAmpholeish twice a day in phase 2 clinical trial.

H. Azaryan, **Comparative Aanalysis of the Effiencency of the Skin Functional Statement Correction Methodas in Women with 3rd Degree of Photo Aging**, Georgian Med News, 2019 May;(290): p. 100-107

The purpose of this study was to conduct a comparative analysis of the effectiveness of isolated and combined use of intradermal injections of bioreparant (hyaluronic acid modified with vitamin C, glutathione and cysteine) and platelet-rich autologous plasma on functional indicators of the face skin of women with signs of 3-rd degree of photoaging. In this study, 120 women with 3-rd degree of photoaging were examined (mean age 34.5±1.54) and divided into 3 groups in accordance with the applied therapy method (isolated and combined use of plasma therapy and bio reparation). The study of the functional parameters of the skin, including corneometry (determination of the degree of epidermal hydration), sebometry (assessment of the sebum regulating function of the epidermis), cutometry (determination of the deformation and elastic properties of the skin), TEWL (determination of the transepidermal water loss level), mexametry (assessment of skin pigmentation) and pH-metry (assessment of the skin acid-base balance) was performed in all examined patients. The obtained results testify to various shifts in functional parameters, caused by the use of various therapeutic approaches. A comparative analysis of the data obtained has provided a basis for concluding that efficacy of the autologous plasma and modified hyaluronic acid combined implementation is significantly higher compared to the isolated application of these methods.

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.

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. Charpentier, **Soothing effect dedicated to sensitive skin,** PERSONAL CARE EUROPE, April 2019, p. 76-77

The skin plays multiple roles of protection, perception, immunity, regulation of blood and lymphatic reservoir for the whole body. Thanks to several mechanical, chemical or biological (sebum, biofilm...) reactions, the skin ensures its integrity according to the various endogenous or exogenous environmental variations. Today, the increase in the fragile phenomena of skin is a major issue in the development of dermo-cosmetics.

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.

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.

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.

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.

S. Lim, J. Shin, Y. Cho, K.-P. Kim, **Dietary Patterns Associated with Sebum Content, Skin Hydration and pH, and Their Sex-Dependent Differences in Healthy Korean Adults**, Nutrients 2019, 11, 619

Sebum content, skin hydration and acidic skin pH are major factors in maintaining skin health. Various nutrients are reported to influence skin health, but the effect of dietary patterns (DPs) on skin health is unclear. In this study, we considered the DPs associated with these three skin health parameters in 84 healthy adults aged 19–37 years. Dietary intake was assessed using a food frequency questionnaire (FFQ) and skin health parameters were determined on the forehead of each subject. Among the four DPs extracted from the FFQ, DP2, characterized by a high intake of cereals, potatoes and starch, saccharides and fish and shellfish, was negatively associated with skin hydration. DP3, characterized by a high intake of potatoes and starch, seeds and nuts, fruits and eggs, was positively associated with acidic skin pH only before adjusting for potential confounders. On the other hand, DP4, characterized by a low intake of beans, and a high intake of meats, dairy products and beverages and alcohol, was negatively associated with acidic skin pH and positively associated with sebum content. The data stratified by sex revealed a negative association between skin hydration and DP2 in males and a negative association between sebum content and DP3 and a positive association between sebum content and DP4 in females. In conclusion, we demonstrated that specific DPs were associated with sebum content, skin hydration and pH in healthy Korean adults and that those associations were affected by sex.

D. Cobiella, L. Archer, M. Bohannon, D. Santoro, **Pilot study using five methods to evaluate skin barrier function in healthy dogs and in dogs with atopic dermatitis**, Vet. Dermatology, January 2019

Background: Atopic dermatitis is associated with skin barrier defects. In people, noninvasive techniques are used to quantify the skin barrier functionality. In dogs, transepidermal water loss (TEWL), stratum corneum hydration and pH have been used to assess skin barrier function. However, few studies have determined their repeatability. Objective: To assess the repeatability of measurements of skin hydration, TEWL, pH, skin absorbance and erythema in healthy and atopic dogs. Animals: Fifteen healthy and 15 atopic privately owned dogs. Methods and materials: Three repeated measurements using Corneometer®, Skin-pH-Meter®, Colorimeter® and VapoMeter® were obtained from inguinal, axilla, pinna and interdigital space by three investigators. Intra- and interobserver variability (coefficient of variation, correlation coefficients and intraclass correlation coefficients) and difference between the two groups (*t*-test or Mann–Whitney U-test) were determined. Results: High repeatability and low variation were observed both intra- and interobservers for all devices except the VapoMeter®. The most repeatable device was the Skin-pH-Meter®, whereas the VapoMeter® was the device with the highest intra- and interobserver variability. Atopic dogs had a significantly increased pH (inguinal $P = 0.03$; axilla $P = 0.02$) and erythema (inguinal $P = 0.01$; axilla $P = 0.02$) compared to healthy dogs. No differences between the two groups were detected using the Corneometer®, VapoMeter® or Colorimeter® (tartrazine absorption). Conclusion and clinical significance: The results of this pilot study support the use of Corneometer®, Skin-pH-Meter® and Colorimeter® in the assessment of skin barrier function in dogs; further investigations to optimize measurements and confirm these results are needed.

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.

M. Kerscher, A.T. Nurrisyanti,. C. Eiben-Nielson, S. Hartmann, J. Lambert-Baumann, **Clinical and Biophysical Outcomes of Combining Microfocused Ultrasound with Visualization and Calcium Hydroxylapatite Filler for Facial Treatment**, Dermatol Ther (Heidelb) (2019) 9: p. 135–142

Introduction: Combined cosmetic treatments are becoming increasingly popular. The objective of this clinical evaluation was to assess the long-term safety and efficacy of combining microfocused ultrasound with visualization (MFU-V) treatment with a calcium hydroxylapatite (CaHA) dermal filler to tighten skin at the submental region and contour the jawline.Methods: Women with loss of contour and

skin laxity in the lower face received MFU-V treatment. If subjects did not respond satisfactorily after 12 weeks, they received CaHA to the jawline. Evaluations—which were performed by blinded raters at baseline and after 12, 24, and 48 weeks—included live Global Aesthetic Improvement Scale (GAIS) ratings, Merz Aesthetic Scale (MAS) ratings, skin parameters, and tolerability. Results: Of the 22 subjects, 9 received combined treatments. GAIS scores showed that subjects were much and very much improved (50% each) at 48 weeks. The MAS score was decreased by at least one point in 89% of subjects. Skin thickness was significantly improved after 24 weeks (p \ 0.05) and remained above baseline after 48 weeks. Skin firmness was significantly improved after 48 weeks (p \ 0.05). No unexpected adverse events were reported. Conclusion: Combined MFU-V and CaHA treatments for laxity in the lower face did not alter skin barrier function, improved appearance, and slowed visible skin aging processes for at least 48 weeks.

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. 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.

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 $\alpha=0.05$. 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.

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.

J.P. Andrade, T.A.L. Wagemaker, D.G. Mercurio, P.M.B.G. Maia Campos, **Benefits 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.

C. Carrasco, G. Kimmel, L. Mallet, L. Le Mauff, P. Bellon, **How to create a technology to make a fragrance last longer showing improved skin moisture benefit?,** IFSCC Congress, Munich, September 2018

The perfume market is highly competitive and is driven by technological innovations. Market research has shown that among perfume users, consumers are dissatisfied with the impact of perfume performance. In many cases, respondents complained that perfumes fade too quickly or change over time or dehydrate the skin. We believe it is important to develop a technology that can be added to the fragrance to provide functional benefits, such as hydration and durability. This research project raises several questions. What is the impact of skin hydration on the retention of fragrance molecules? Can we say that the addition of moisturizing raw material in a concentrate makes it possible to improve the lasting effect of the perfume on the skin? Can we create an alcoholic scent, both moisturizing and long-lasting? All these questions are part of the challenge of this project to find solutions to improve perfume performance.

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.

Q. Peijin, C. Jianjie, J. Lili, D. Gan, W. Yue, **Composition and diversity of microbial community of Chinese female facial skin from different age and its association with skin characteristics,** IFSCC Congress, Munich, September 2018

Skin is the largest organ of the human body. As the interface between the body and the external environment, skin is the first line to protect the human body against the pathogen invasion. Meanwhile human skin harbors a variety of commensals, including bacteria, fungi and viruses. Each area of human body hosts its unique microbial community. Many factors contribute to the structure and function of skin microbiome, for example the host, their age, genetic variation, hygiene, life style and it shifts according to the characteristics of the micro-environments. The adverse shifts might cause a dysbiosis state and it has been reported to be associated with skin disease, such as atopic dermatitis, acne and dandruff. Therefore, exploration of skin microbiome not only helps us understand the correlation between microorganisms and the skin physiological status, but also provide a new perspective to pathogenic factors and new therapeutic targets. In previous study, skin microbiota was demonstrated that varies from different body sites and individuals. However, the reports mainly focused on the Western people and limited study on Chinese skin microbiome. In preliminary work, researchers paid more attention on skin microbiome associated with skin disorders, especially in AD patients, while the relationship between descriptive skin-related characteristics of individual (like wrinkles, hydration, *etc.*) and skin microbiota is ambiguous. In this work, 34 Chinese female volunteers living in Shanghai were recruited for facial skin microbial community study. Skin samples were collected and Miseq gene sequencing platform was operated. To achieve overall and details of skin appearances, the skin types and characteristics were clinically graded by dermatologist and measured by instruments. The goal of this study is to characterize the composition and variability of the skin microbiota in health people divided into age groups. Moreover, the aim of study is to evaluate the association of the skin microbial distribution with skin physical and physiological properties and the interaction of microorganisms themselves. In our study, it is suggested that *Proteobacterium* is prevalent in elder group together with wrinkles. Additionally, higher trans-epidermal water loss is correlated with *S. aureus* and this may in turn to design a product to recover the skin microbiome balance. In addition, gain more knowledge about microbes interaction with each other is critical to design the skin care products with probiotics and prebiotics. These findings expand our insights in health skin microbiome and will be useful in clinical treatment near the further.

M. Portugal-Cohen, Z. Ma'or, M. Oron, **Full Scale Customization,** Cosmetics & Toiletries, Vol 133, No. 9, September 2018

The drive for personalized consumer products is no longer a passing fad. Personalization stems from deep motivations. The emotional wish to purchase products created "especially for me" comes across with an understanding of diversity between individuals and the prospects for more effective solutions to meet each individuals special needs. However, efforts to introduce personalized skin care—i.e., for unique skin with distinctive characteristics — on an industrial scale means products formulated for generalized needs, which could not be as effective.

M. Batory, P. Namieciński, H. Rotsztejn, **Evaluation of structural damage and pH of nail plates of hands after applying different methods of decorating**, International Journal of Dermatology, September 2018

Background: The purpose of this study was to evaluate the effect of nail polish, gel polish hybrid, gel nail, and acrylic nail powder and the removal of these formulas on the nail plates properties, particularly the influence of different coatings on morphology and pH. Methods: The morphology and structure of nail plates were analyzed with use of scanning electron microscopy. The pH values of the nail plates of hands were measured using the system Courage & Khazaka. Results: The analysis of morphology and structure of the surface of nail plates showed distinct changes caused by decorative coatings. The most common ones include fragility and splitting of the nails. The pH value measured in the whole group ranged from 5.21 to 7.00. Conclusions: The methods used to prepare nails for decoration and all methods of removing the applied preparations damage the healthy nail plates. The most common changes are brittleness and nail splitting. The nail polish remover causes less damage than acetone, and the use of a nail drill machine and nail file causes the greatest destruction of nail plates. The biggest effect on the pH change has the gel polish hybrid, gel nail, and acrylic nail powder, causing the pH value of nail plates to rise above 6.0, whereas after the application of the nail polish, the pH of the plates was on average 5.8 which is closest to the normal value, assumed as physiological.

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.

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.

M. Strunk, T. Heichel, S.M. John, **Regeneration des physiologischen Hautoberflächen-pH nach Anwendung von Hautreinigungsmitteln**, Poster auf dem 13. Dermatologisches Alpenseminar, Grainau, Mai 2018

Der sog. Säureschutzmantel der Haut stellt einen wesentlichen Bestandteil der epidermalen Barriere gegenüber pathogener mikrobieller Besiedelung der Hautoberfläche dar und (Abb. 1). Auch Enzymsysteme, die an der Ausbildung der epidermalen Barriere beteiligt sind, sind auf ein saures Milieu angewiesen. Physiologisch liegt der pH der Hautoberfläche zwischen 4,5 und 5,75 (Abb. 2). Durch Hautwaschungen mit Hautreinigungsmitteln unterschiedlicher pH-Wert-Einstellungen wird der physiologische pH-Wert der Hautoberfläche bei jeder Hautreinigung negativ beeinflusst (erhöht), wobei – bei unzureichender Regenerationszeit – die negativen Effekte kumulieren können (Abb. 3). In der vorliegenden Studie wurden sowohl der Einfluss als auch die Regenerationsdauer einer einmaligen Handreinigung bei Verwendung von vier Hautreinigungsmitteln mit unterschiedlichen pH-Werten evaluiert.

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.

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.

H.-J. Kim, H. Kim, J.J. Kim, N.R. Myeong, T. Kim, T. Park, E. Kim, J.-Y. Choi, J. Lee, S. An, W.J. Sul, **Fragile skin microbiomes in megacities are assembled by a predominantly niche-based process**, Science Advanced 2018; 4

Given the higher incidence of skin diseases in more urbanized populations and its association with the skin microbiome, we questioned how the skin microbiome differed depending on the degree of urbanization. Skin microbiomes of 231 healthy subjects in five large cities in China varied mainly with environment and socioeconomic status of the cities in question. The differences among microbiomes could be explained by the predominantly niche-based assembly of microbial communities, which was supported by a dominance test, b-null deviation, and edge-length abundance distribution. Networks among microbes in larger cities were more fragile, which may contribute to the higher incidence of skin diseases in more urbanized environments. These results suggest that microbial ecological theory can provide a framework for understanding crucial health-associated features of the human microbiome.

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.

S.P. Cannavo, F. Guarneri, R. Giuffrida, E. Aragona, C. Guarneri, **Evaluation of cutaneous surface parameters in psoriatic patients,** Skin Research and Technology 2017; 23: 41-47

Purpose: The purpose of this study was to compare cutaneous surface parameters in lesional and non-lesional skin of psoriaticpatients and in corresponding areas of control subjects.

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.

A. Samadi, S.A. Nasrollahi, M. Shamsipour, A.A. Akhlaghi, A.M. Mohammadi, A. Firooz, **Safety and Efficacy Assessment of a Sanitary Pad Containing Potassium Alum in Comparison to Ordinary Pads: A Cross-Over Trial,** Current Women's Health Reviews, 2017, 13, p. 52-57

Background: The cutaneous effects and suitability of a sanitary pad have been studied globally. Potassium alum has been used in menstrual pads as an antiseptic, astringent, deodorizer and antiperspirants. The aim of this study is to assess safety and suitability of a sanitary pad containing potassium alum (test) in comparison of simple pads (control) on healthy women residing in Iran. Methods: This was a phase III cross-over study design, conducted on 16 healthy women over the course of two menstrual periods. The levels of erythema, fissuring, edema and papule formation as well as burning, and itching sensations have been evaluated based on clinical observations and interviews. Measurement of pH and swabs for bacteria counting of vulvar skin were also performed. The subjects used one type of sanitary pad during their first menstrual period and then used the other type during their subsequent menstrual period. Then the evaluations were repeated and the subjects were asked to complete self-assessment questionnaires about product suitability. *Results*: All the volunteers (age: 18-50, mean: 37.43) completed the study. No signs of irritation werefound in the clinical observations or in the interviews for either product. No significant difference from baseline was found in the number of total bacteria for either product but the vulvar areas were significantly more acidic after using product with potassium alum. The majority of subjects preferred the sanitary pad with potassium alum (p-value = 0.0416). Conclusion: Both types of sanitary pads used in this trial were same, however, the pad with Potassium alum was preferred by the participants for greater suitability.

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.

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.

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.

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.

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.

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.

C. Prakash, P. Bhargava, S. Tiwari, B. Majumdar, R. Kumar Bhargava, **Skin Surface pH in Acne Vulgaris: Insights from an Observational Study and Review of the Literature,** Journal of Clinical and Aesthetic Dermatology, July 2017, Volume 10, Number 7

Objective: Recurrent and chronic course of acne vulgaris, despite effect-proven therapies, point to an underfocused aspect in its pathogenesis and management. This study aims to assess in subjects with and without acne, the skin surface pH, a parameter that cumulatively represents functioning of various units of skin, including the barrier. Methods: A total of 200 patients with acne and 200 age- and sexmatched controls were included. Under basal conditions, facial skin pH was derived from five sites using a skin pH-meter. The relation between skin pH and acne was evaluated according to sex. Results:

There were more subjects with normal skin pH in the control group compared to the case group, and the majority of acne occurrences in the case group were related to high skin pH (p=0.000). Mean pH among cases was higher than normal reference value (pH 4.5–5.5 for women, 4–5.5 for men) and that of controls (p<0.001). No significant association was observed between sex and skin pH in either cases or controls (p>0.05). Conclusion: Increased facial skin pH in patients with acneat basal conditions mirrors a chronic state of stratum corneum instability, which could be predisposing individuals to acne occurrence and/or recurrences. It could possibly be a common domain via which the classical pathomechanisms might be acting in acne. Integrating measures that maintain stratum corneum pH during therapy might prove worthwhile.

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.

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.

E. Yenilmez, Y. Yazan, **Formulation, Characterization and in vivo Efficacy of α-Tocopherol limprinted Polymeric System for Cosmetic Application**, European International Journal of Science and Technology, Vol. 6 No. 3, April 2017

The purpose of this study was to formulate an antioxidant topical cosmetic molecularly imprinted system for skin aging and was to evaluate the formulation in vivo on human volunteers. Molecular imprinted cyclodextrins (CDs) were prepared by cross-linking cyclodextrins (CD) in the presence of a vitamin E (VE) as template molecule. Characterization studies were performed on molecularly imprinted polymers (MIP) and non-imprinted polymers (NIP). Antioxidant effects of formulations prepared were investigated by 2,2-diphenyl-1-picrylhydrazyl (DPPH) test. In vivo skin measurements were done on human volunteers including sebum, moisture, pH, net elasticity and roughness parameters. It was seen that temperature increase influced the particle size of imprinted polymers. It was determined that MIP systems have an antioxidant effect. Formulations showed a positive effect on skin roughness parameter was determined statistically ($p \leq 0.01$). The preparation method of MIP is simple and quick and it will provide opportunities in future on specific cosmetic formulations.

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.

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.

R. Rayner, K. Carville, G. Leslie, S.S. Dhaliwal, **Measurement of morphological and physiological skin properties in aged care residents: a test–retest reliability pilot study**, International Wound Journal, 2016

This test–retest pilot study investigated the intra-rater reliability and reproducibility of non-invasive technologies to objectively quantify morphological (colour, thickness and elasticity) and physiological (transepidermal water loss (TEWL), hydration, sebum and pH) skin properties in an aged care population. Three consecutive measurements were taken from fve anatomical skin sites, with the mean of each measurement calculated. The intra-class correlation coeffcient (ICC) and the standard error of measurement (SEM) were used to examine the intra-rater reliability and reproducibility of measurements. Non-invasive technologies in this study showed almost perfect reliability for ultrasound measurements of the subepidermal low echogenicity band (SLEB) (ρ = 0·95–0·99) and skin thickness (ρ = 0·95–0·99) across all sites. The ICC was substantial to almost perfect for pH (ρ = 0·76–0·88) and viscoelasticity (ρ = 0·67–0·91) across all sites. Hydration (ρ = 0·53–0·85) and skin retraction (ρ = 0·57–0·99) measurements ranged from moderate to almost perfect across all sites. TEWL and elasticity were substantial to almost perfect across four sites. Casual sebum levels and most colour parameters showed poor ICC. The use of non-invasive technologies in this study provided an objective and reliable means for quantifying ageing skin and may offer future studies a valuable option for assessing skin tear risk.

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.

H. Gamze Demirdağ, H. Özcan, Ş. Gürsoy, G. Beker Akbulut, **The effects of sebum confguration on Demodex spp. Density**, urk J Med Sci (2016) 46: p. 1415-1421

Background/aim: Demodex spp. are ectoparasites living in the pilosebaceous units, which feed on the host's sebum and cellular proteins. Te protective barrier of the skin consists of sebum secretion, moisture, and the acid mantle. In this study, we aimed to determine the effects of skin sebum, moisture, pH levels, and sebum confguration on Demodex spp. Density Materials and methods: Forty-fve patients who had demodicosis were enrolled in the study group, while the control group consisted of 40 subjects without demodicosis. Body fat percentage, serum triglyceride and cholesterol levels, skin sebum, moisture, and pH levels were measured. Demodex spp. density was determined with a standardized skin surface biopsy. Sebum samples were taken from the forehead and a high-performance thin-layer chromatography (HPTLC) method was performed on these samples. Subsequently, densitometric analyses were applied to the HPTLC plates. Results: Demodex spp. were found on the cheeks and lived in an alkali environment. Skin sebum and moisture levels were low in all groups. Te skin pH levels and cholesterol ester in the sebum confguration were determined to be signifcantly higher in the group with demodicosis. Conclusion: We suggest that Demodex spp. may use cholesterol ester in the sebum as nutriment. In other words, cholesterol ester may be a suitable growth medium for the proliferation of Demodex spp.

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.

M. Lee, Y. Jung, E. Kim, H.K. Lee, **Comparison of skin properties in individuals living in cities at two different altitudes: an investigation of the environmental effect on skin**, J Cosmet Dermatol. 2016 Sep 11

Background: Skin properties vary depending on exogenous factors. Various studies have been used for comparing skin properties between cities for studying environment influence on skin properties. However, for comparison of skin properties between cities, various environmental factors have to be considered. Objectives: The purpose of this study therefore was to compare skin properties in individuals of the same ethnicity and sex (Indonesian women) between different altitudes and to interpret the environmental effect on skin. Methods: In this study, we reanalyzed the data obtained from previous study. The data were for healthy Sundanese Indonesian females [(n = 136) at Jakarta (n = 49) and Bandung (n = 87)], and the data consisted of published data (skin hydration, sebum level, pH, elasticity, and transepidermal water loss) and unpublished data [skin color (L*, a*, and b*)]. The skin parameters were measured on Indonesian females aged 20-34 using C+K devices (corneometer, sebumeter, pH meter, and cutometer), Delfin vapometer, and Minolta spectrophotometer, respectively. Results: Sundanese Jakarta (low-altitude) females had higher sebum level and greater redness (a*) value in the forehead than Sundanese Bandung (high-altitude) females. In contrast, Bandung females had higher skin pH, brighter skin color, and greater forehead skin elasticity than Jakarta females. Conclusions: The skin properties can be influenced by changing altitude because different altitudes have different environments such as air temperature, humidity, UV radiation, and so on, and it is also necessary to investigate the factors which can influence with perceived skin condition such as skin type and skin concerning.

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.

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*.A. Kim, B.R.Kim, M.Y. Chun, S.W. Youn,* **Relation between pH in the Trunk and Face: Truncal pH Can Be Easily Predicted from Facial pH**, Ann Dermatol 28(2) p. 216-221, 2016

Background: The clinical symptoms of facial and truncal acne differ. Skin surface acidity (pH), which is affected by sebum secretions, reflects the different clinical characteristics of the face and trunk. However, no studies have been conducted on truncal sebum production and skin pH. Objective: We evaluated the differences and relationship between pH values of the face and trunk. We also evaluated the relationship between pH and the quantity of sebum produced in the trunk. Methods: A total of 35 female patients clinically diagnosed with truncal acne were included. We measured pH on the face and truncal area using the Skin-pH-Meter PH 905®. We measured truncal sebum secretions using the Sebumeter SM 815®. Statistical analysis was performed to evaluate the correlations and differences between pH and sebum. Results: Facial pH was significantly higher than chest and back pH values. The correlation between pH on the trunk and the face was significant. We used linear regression equations to estimate truncal pH using only measured pH from the chin. There was no significant relationship between truncal sebum secretion and pH. Conclusion: This was the first study that evaluated the differences and correlations between facial and truncal pH. We found that facial pH can predict truncal pH. In addition, we conclude that differences in pH and sebum secretion between the face and trunk are one of the reasons for differences in acne symptom at those sites.

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.

A. Tuzuner, S. Akdagli, T. Sen, et al., **An objective analysis of sebum, pH and moisture levels of the external ear canal skin**, American Journal of Otolaryngology (2015) 424-428

Objective: To determine sebum, pH and moisture levels of external ear canal skin, and compare the patients who complain of ear itching and the normal population for these parameters. And evaluate the improvement subjectively in the ones given dexamethasone sodium phosphate (DSP) cream or placebo-water in oil emulsion type cream, and to determine the changes in sebum, pH and moisture levels after the treatment. Methods: 32 females with the complaint of isolated external ear canal itching and 42 healthy women were included in this randomized prospective controlled study. The sebum, pH and moisture levels of ear skin of the patients and the controls were determined from baseline and following treatment. Patients used DSP in their right and the placebo in their left ears for 15 days. Subjective analysis of itching level was measured at baseline, and on 15th and 30th days using visual analog scale (VAS).

N.Y. Kim, J.S. Cho, H.Y. Lee, **Evaluation of clinical trial of atopic dermatitis by a topical cream containing the extracts from photosynthetic bacteria**, Rhodobacter sphaeroides, AMB Expr (2015) 5:49

The photosynthetic bacteria Rhodobacter sphaeroides has been studied as a functional food source; however, in this clinical study, we report for the frst time its use as a treatment for atopic

dermatitis. Topical cream containing 10% (v/v) extract was demonstrated to have the ability to reduce skin moisture content loss and pruritus by 27.82% in clinical trials for atopic dermatitis compared with controls. In particular, there were statistically signifcant differences in the pH and temperature changes of the skin, skin frmness and general skin appearance. Changes in the skin pH were measured as 4.83, and there was a 3.37% change in temperature after 4 weeks of treatment. It was also found that there were great differences in wrinkle states according to the grading scale of patients before and after treatment with topical cream. Therefore, these results strongly suggest that extracts from photosynthetic bacteria can be employed to soothe atopic irritation as a new cosmetic bioresource.

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.

Y. Koyano, G. Nakagami, S. Lizaka, T. Minematsu, H. Noguchi, N. Tamai, Y. Mugita, A. Kitamura, K. Tabata, M. Abe, R. Murayama, J. Sugama, H. Sanada, **Exploring the prevalence of skin tears and skin properties related to skin tears in elderly patients at a long-term medical facility in Japan**, International Wound Journal 2014

The identifcation of appropriate skin tear prevention guidelines for the elderly requires clinicians to focus on local risk factors such as structural alterations of the epidermis and dermis related to skin tears. The aim of this cross-sectional study is to explore the prevalence of skin tears and to explore skin properties related to skin tears in elderly Japanese patients at a long-term medical facility. After doing the prevalence study, 18 participants with skin tears and 18 without were recruited and an evaluation of their skin properties using 20-MHz ultrasonography, skin blotting and also Corneometer CM-825, Skin-pH-meterPH905, VapoMeter, Moisture Meter-D and CutometerMPA580 was undertaken. A total of 410 patients were examined, the median age was 87 years and 73·2% were women. The prevalence of skin tears was 3·9%, and 50% of skin tears occurred on the dorsal forearm. The changes in skin properties associated with skin tears included increased low-echogenic pixels (LEP) by 20-MHz ultrasonography, decreased type IV collagen and matrix metalloproteinase-2, and increased tumour necrosis factor-α by skin blotting. In conclusion, this study suggests that increased dermal LEP, including solar elastosis, may represent a risk factor for skin tears; this indicates that skin tear risk factors might not only represent chronological ageing but also photoageing.

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, p. 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.

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.

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.

G. Man, T.M. Mauro, P.L. Kim, M. Hupe, Y. Zhai, R. Sun, D. Crumrine, C. Cheung, A. Nuno-Gonzalez, P.M. Elias, M.-Q. Man, **Topical hesperidin prevents glucocorticoid-induced abnormalities in epidermal barrier function in murine skin**, Exp Dermatol. 2014 September; 23(9): p. 645–651

Systemic and topical glucocorticoids (GC) can cause significant adverse effects not only on the dermis, but also on epidermal structure and function. In epidermis, a striking GC-induced alteration in permeability barrier function occurs that can be attributed to an inhibition of epidermal mitogenesis, differentiation and lipid production. As prior studies in normal hairless mice demonstrated that topical applications of a flavonoid ingredient found in citrus, hesperidin, improve epidermal barrier function by stimulating epidermal proliferation and differentiation, we assessed here whether its topical applications could prevent GC-induced changes in epidermal function in murine skin and the basis for such effects. When hairless mice were co-treated topically with GC and 2% hesperidin twice-daily for 9 days, hesperidin co-applications prevented the expected GC-induced impairments of epidermal permeability barrier homoeostasis and stratum corneum (SC) acidification. These preventive effects could be attributed to a significant increase in filaggrin expression, enhanced epidermal β-glucocerebrosidase activity and accelerated lamellar bilayer maturation, the last two likely attributable to a hesperidin-induced reduction in stratum corneum pH. Furthermore, co-applications of hesperidin with GC largely prevented the expected GC-induced inhibition of epidermal proliferation. Finally, topical hesperidin increased epidermal glutathione reductase mRNA expression, which could counteract multiple functional negative effects of GC on epidermis. Together, these results show that topical hesperidin prevents GCinduced epidermal side effects by divergent mechanisms.

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.

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.

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.-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.

J. Bandier, J. Duus Johansen, L. Jelstrup Petersen, B.C. Carlsen, **Skin pH, atopic dermatitis, and filaggrin mutations**, Dermatitis. 2014 May-Jun;25(3): p. 127-129

Background: The acidic pH of the skin plays a role in antimicrobial defense by regulating the bacterial skin flora and aspects of barrier. Filaggrin is a co-factor in maintaining a low skin pH because of its degradation into acidic amino acids. Accordingly, lack of filaggrin due to filaggrin mutations may influence skin pH. Objective: We aimed to determine the epidermal pH in different groups stratified by filaggrin mutations and atopic dermatitis. Further, we investigated the changes in pH according to severity of mutational status among patients with dermatitis, irrespective of skin condition. Methods: pH was measured with a multiprobe system pH probe (PH 905), and the study population was composed of 67 individuals, who had all been genotyped for 3 filaggrin mutations (R501X, 2282del4, R2447X). Results: We found no clear pattern in relation to filaggrin mutation carrier status. Individuals with wild-type filaggrin displayed both the most acidic and most alkaline values independent of concomitant skin disease; however, no statistical differences between the groups were found. Conclusions: The lack of significant diversity in skin pH in relation to filaggrin mutation carrier status suggests that the effect of filaggrin mutations on skin pH is not pronounced.

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

M. Streker, L. Kleine-Börger, M. Kerscher, **Efficacy of a novel formulation for eyelashes revitalization – results of a pilot study,** University of Hamburg

Background: Long lashes are associated with attractiviness. Lash grow has been reported following an accumulation of prostaglandin after application of eye drops. The aim of this single-center, randomized trial was to determine the revitalizing effect of a new lash serum by using a clinical score, a patients‘ satisfaction questionnaire and biophysical measurementsover a study period of 12 weeks (figure 1). Material and methods: 30 adult healthy volunteers (26 woman, 4 men) wishing longer and fuller lashes were enrolled. Study specific exclusion criteria were lash extensions and colored lashes. Primary endpoint was to evaluate the effects of the lashes serum by using a five-point rating scale (figure 2). Both patients and blinded evaluator were asked to rate the effect according to standardized clinical photographs (Fotofinder Systems, Teachscreen Software GmbH, Bad Birnbach, Germany).To evaluate skin tolerance, pH-value, corneometry and lacrimal fluid’s lipid content were measured (all Courage+Khazaka,Cologne, Germany).

E.J. Kim, J.Y. Han, H.K. Lee, Q.Q. He, J.C. Cho, L. Wei, X. Wang, L. Li, L. Wei, H. Liang, X. Gao, B.J. Kim, G.W. Nam, **Effect of the regional environment on the skin properties and the early wrinkles in young Chinese women,** Skin Research and Technology 2014; 20: 498-502

Background: There are ethnic differences in the skin characteristics, also the skin is susceptible to be influenced by the external environment such as UV radiation and the climates. It can be shown that the skin in same race or twins varies by the enviroment. Objectives: This study was designed to investigate the skin characteristics and the early wrinkles of young Chinese women from four different regions, and to identify the correlation among the wrinkles, the other skin characteristics, and environmental conditions. Methods: A total of 441 healthy Chinese women aged between 20 and 35 years participated in the study: 110 from Beijing, 110 from Shanghai, 111 from Wuhan, and 110 from Guangzhou. The skin hydration, sebum contents, TEWL, pH, elasticity, and wrinkles were measured on the cow’s feet area.

G.W. Nam, E.J. Kim, Y.C. Jung, C.B. Jeong, K.H. Shin, H. K. Lee, **Differences in Skin Properties of Korean Women at the Initial Aging Phase,** Journal of Cosmetics, Dermatological Sciences and Applications, 2014, 4, p. 44-52

Many studies on aging have focused on evaluating differences between older and younger people, but only a few have focused on differences in skin properties among subjects from the same age group according to their skin aging status. In this study, we evaluated the facial skin condition and life style factors in 110 Korean women aged 25 to 35 in an attempt to evaluate factors which may affect the skin aging status in the initial aging phase. The facial skin condition of 110 healthy Korean women was assessed over two successive 6-month periods, summer and winter. Using clinical assessments including aging, wrinkles and skin's elasticity values, the subjects were divided into 7 groups. Then, various facial skin conditions and life style factors were examined between a severe aging group and mild aging group. In the severe aging group, the mean value pH was lower and the mean value of water content was slightly lower than that of women in the mild aging group. Also, the seasonal site variation in water content and sebum secretion level were significantly higher in the severe aging group than in the mild aging group. Topical sunscreen using percentage was not significantly different between the two groups. However, the number of cosmetic subject use was slightly higher in the mild aging group than in the severe aging group. The study suggested that there were several differences in skin characteristics between women in the severe aging group and in the mild aging group at the initial aging phase. Seasonal site variation between cheek and forehead was the most dominant differences. We also considered that life style factors such as cosmetic use could affect skin aging status.

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.

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.

D.G. Mercurio, **Clinical scoring and instrumental analysis to evaluate skin types,** Clinical and Experimental Dermatology 2013, 38, 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.

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).

A.B. Stefaniak, J. du Plessis, S.M. John, F. Eloff, T. Agner, T.-C. Chou, R. Nixon, M.F.C. Steiner, I. Kudla, D.L. Holness, **International guidelines fort he in vivo assessment of skin properties in non-clinical settings: part 1. pH,** Skin Research and Technology 2013; 19: 59-68

Background: Skin surface pH is known to influence the dissolution and partitioning of chemicals and may influence exposures that lead to skin diseases. Non-clinical environments (e.g. workplaces) are highly variable, thereby presenting unique measurements challenges that are not typically encountered in clinical settings. Hence, guidelines are needed for consistent measurement of skin surface pH in environments that are difficult to control. Methods: An expert workshop was convened at the 5th International Conference on Occupational and Environmental Exposure of Skin to Chemicals to review available data on factors that could influence the determination of skin surface pH in non-clinical settings with emphasis on the workplace as a worst case scenario.

S.H. Youn, C.W. Choi, J.W. Choi, S.W. Youn, **The skin surface pH and ist different influence on the development of acne lesion according to gender and age,** Skin Research and Technology 2013; 19: 131-136

Background: Skin pH is one of the important physiological parameters of the skin. Changes in the pH play a role in the pathogenesis of several skin diseases, including acne. Purpose: To assess the correlation between the pH and the age, and between the pH and the development of acne lesions, in a large acne patients group. We also evaluated the difference between the genders. Methods: A total of 540 patients clinically diagnosed with acne vulgaris were included. The clinical digital photographs were taken, and the acne lesions counted. The pH was measured, using the skin-pH-meter. Area-weighted pH was calculated and statistical analysis was performed, according to age and gender.

S Ollmar, I Nicander, P Åberg, J Bolinder, **Facts and artefacts regarding correlation between skin electrical impedance spectroscopy (EIS) and blood glucose,** Journal of Physics: Conference Series 434 (2013) 012071

Abstract. Earlier observations on possible co-variation between skin EIS and blood glucose prompted us to map and include other factors at play in the predictive model. Skin pH would be one such factor. A cohort of 20 diabetics was investigated, taking around 30 measurements spread over each of two different days 2-21 days apart. Each measurement comprises skin EIT in the frequency range 1kHz to 2.5MHz, skin pH, and immediately evaluated blood samples. There is a co-variation for some, but not all, test persons. The relationship gets stronger on the group level by adding pH-information, but is still poor or non-existent for some test persons. Non-invasive EIS measurements on skin is influenced by skin hydration, blood glucose, skin pH, body location, season, environmental factors, and variables not yet understood. Since impedance related parameters are used to estimate skin hydration, users of such devices should be aware that skin pH may influence as much as the water content of the stratum corneum.

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.

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.

L. Rigano, A. Bonfigli, S. Cherel, R. Walther, **Quillaja saponin normalises dermal sebaceous imbalance**, Personal Care November 2013

Abstract: Saponin rich extracts of the Chilean soapbark tree Quillaja saponaria were traditionally used by the Mapuche Indians for washing and for medical practices. Intense research in recent decades has further proven the applicability of quillaja extracts in food, feedstock and pharma. Due to their exceptional ability as a non-irritant tensioactive, quillaja extracts are widely used in cosmetics as a cleanser, foaming agent, emulsifier and dispersing agent, but its objective efficacy as a bioactive in skin treatment was never studied. Thus the aim of this study was to confirm the property of quillaja saponins to improve the condition of sensitive, greasy and acne-prone skin.

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, 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.

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.

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.

S.H. Youn, C.W. Choi, J.W. Choi, S.W. Youn, **The skin surface pH and its different influence on the development of acne lesion according to gender and age**, Skin Res Technol. 2013 May;19(2): p. 131-136

Background: Skin pH is one of the important physiological parameters of the skin. Changes in the pH play a role in the pathogenesis of several skin diseases, including acne. Purpose: To assess the correlation between the pH and the age, and between the pH and the development of acne lesions, in a large acne patients group. We also evaluated the difference between the genders. Methods: A total of 540 patients clinically diagnosed with acne vulgaris were included. The clinical digital photographs were taken, and the acne lesions were counted. The pH was measured, using the skin-pH-meter. Area-weighted pH was calculated and statistical analysis was performed, according to age and gender. Results: The female had higher pH than the male acne patients. The T-zone had higher pH than that of the U-zone. In female acne patients, age and the area-weight pH showed a positive correlation. Male acne patients had more inflammatory lesions. And U-zone showed more acne lesions than T-zone. There are negative correlations between the area-weight pH and the number of acne lesions, in the T-zone of the female acne patients and positive correlation at the inflammatory lesions on the T-zone of male acne patients. Conclusions: This is the first study to evaluate the correlations between pH, age, gender, and acne development in a large acne patients group using an objective, bioengineering method within the viewpoint of skin pH. We could expect that there are gender differences in the correlation between pH, age, and acne development. From this result, we could provide a clue to the treatment of acne, that maintaining the pH balance according to the difference of gender and age is an essential consideration.

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.

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).

A. Watabe, T. Sugawara, K. Kikuchi, K. Yamasaki, S. Sakai, S. Aiba, **Sweat constitutes several natural moisturizing factors, lactate, urea, sodium, and potassium**, Journal of Dermatological Science 72 (2013), p. 177–182

Background: Amino acids (AAs) play important roles in maintaining an optimal hydration state of stratum corneum (SC) as a natural moisturizing factor (NMF). Recently, however, we have reported that lactate and potassium significantly affect the hydration state of SC. Objective: To explore the source of lactate and potassium in SC, we compared the concentration of various NMFs such as AAs, pyrrolidone carbonic acid (PCA), lactate, sodium, and potassium in SC between anhidrotic and adjacent hidrotic areas of patients with acquired idiopathic generalized anhidrosis or segmental anhidrosis. Methods: We examined 13 anhidrotic areas and the adjacent hidrotic skin of 10 different patients. Wefirst determined anhidrotic and hidrotic areas of each patient by the iodine starch method and examined the hydration state of SC by measuring the high-frequency conductance. Then we obtained SC by tape stripping and measured the content of AAs, PCA, lactate, urea, sodium, and potassium in SC obtained from the anhidrotic and hidrotic areas. We examined the effect of increased insensible perspiration on

the SC hydration and the concentrations of NMFs. Results: The SC of anhidrotic areas showed significantly low hydration. Among NMFs, lactate, urea, sodium, and potassium were significantly decreased in the SC of anhidrotic areas, while AAs and PCA were not significantly different between hidrotic and anhidrotic areas. Increased insensible perspiration increased SC hydration as well as NMFs other than AAs and PCA. Conclusion: Sweat constitutes lactate, urea, sodium, and potassium in NMFs and plays a crucial role in maintaining the physiological hydration state of SC.

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.

U. Aßmus, B. Banowski, M. Brock, J. Erasmy, A. Fitzner, U. Kortemeier, S. Langer, S. Munke, H. Schmidt-Lewerkühne, D. Segger, G. Springmann, C. Wood, J. Blaak, **Impact of Cleansing Products on the Skin Surface pH,** IFSCC Magazine 1/2013

The physiological acidic skin surface pH (SS-pH) was first described by Heuss [1], and so far many variables values have been reported. Recent multicenter studies determined the normal skin surface pH on the forearm to be below 5 [2-3]. In the stratum corneum the pH ranges from below 5 in the outer layers to approximately 7 at the interface to the viable epidermis [4]. The stratum corneum pH regulates at least three epidermal functions: the antimicrobial barrier. Permeability barrier homeostasis and barrier integrity/cohesion [reviewed in 5]. Alterations of the physiological stratum corneum pH lead to abnormal epidermal barrier function. The relevance of an acidic skin surface pH as an antimicrobial barrier has been demonstrated frequently.

M. Estanqueiro, G. Bossolani, M.H. Amaral, J. Conceicao, D. Santos, J.M. Sousa Lobo, J.B. Silva, C.S.F. Gomes, **Characterizing and Evaluating the Effectiveness of Volcanic Pumice Exfoliants,** Cosmetics & Toiletries magazine Vol. 127, No. 11 November 2012

Human skin, more specifically facial skin, periodically needs a deep cleansing to remove not only the oily particles resulting from secretions, but also dead skin caused by desquamation of the epidermis. Cleansers are designed to remove dirt, sewat, sebum and oils from the skin, which helps to promote normal exfoliation and thereby rejuvenates the skin. However, the use of cleansers can lead to a reduction in the level of the natural moisturizing factor (NMF) of skin. Factors that reduce the water content can lead to changes in skin's viscoelasticity. Further, harsh cleansers such as soaps can induce dryness, leading to scaly and rough skin. These effects may be much more severe during winter months when the air is cold and dry.

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.

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.

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.

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.

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)*

S.H. Bailey, G. Oni, S.A. Brown, N. Kashefi, S. Cheriyan, M. Max-ted, C. Stewart, C. Jones, P. Maluso, A.M. Kenkel, M.M. Kenkel, J. Hoopman, F. Barton Jr, J. M. Kenkel, **The use of non-invasive instruments in characterizing human facial and abdominal skin**, Lasers Surg Med. 2012 Feb;44(2): p. 131-142

Background and objective: The skin is highly variable. This variation, although helpful for function, causes inconsistencies when assessed using subjective scales. The purpose of this study is to measure differences in skin on the face and abdomen using non-invasive, objective devices as a method to eliminate subjective error and help reduce intra- and inter-observer variability in clinical analysis. Study design/materials and methods: Eighty-eight subjects between the ages of 18 and 61 were enrolled in this study. These subjects varied in age, ethnicity, and Fitzpatrick score. Facial analysis was performed by clinical evaluation and utilizing non-invasive objective devices which included the DermaScan C 20 MHz HFUS (Cyberderm, Broomall, PA), Tru Vu (Johnson and Johnson), BTC 2000 (SRLI Technologies, Nashville, TN), Derma Unit SSC3 (CK Electronic, Köln, Germany), and the Chromometer. Results: Non-invasive devices were shown to be consistent and accurate through repeated measurement at each of the anatomical points with error rates of less than 5%. Chromometer measurements were able to categorize patients into Fitzpatrick level. DermaScan measurements demonstrated decreasing skin thicknesses associated with increasing age, smoking, and female gender. Derma Unit SSC 3 showed gender and sun exposure related differences in sebum concentration, pH, and moisture content. The Derma Unit SSC 3 sebum concentration also showed correlation with Tru Vu readings for clogged pores and bacterial activity.Conclusion: The skin assessment scales that are in use today are often prone to variability and inaccuracy due to their subjectivity. Use of the described objective non-invasive facial analysis method provides an accurate, objective analysis of human skin which can be used to measure changes preand post-operatively, or even screen patients prior to procedure to identify non-responders or those prone to adverse events. Utilization of these devices introduces a foundation on which a strong evidence-based approach to aesthetic medicine can be built.

A. Costa, L. Lindmark, L.H. Fávaro Arruda, E. Cancio Assumpção, F. Sayuri Ota, M. de Oliveira Pereira, S.S. Barros Langen, **Clinical, biometric and ultrasound assessment of the effects of daily use of a nutraceutical composed of lycopene, acerola extract, grape seed extract and Biomarine Complex in photoaged human skin,** An Bras Dermatol. 2012; 87(1): p. 52-61

Background: The use of nutraceuticals has become frequent in the cutaneous approach to photoaging. Objectives: To assess the clinical efficacy of a nutraceutical product composed of lycopene, acerola extract, grape seed extract and Biomarine ComplexT in photoaged human skin. Methods: 50 women, from 35 to 60 years of age, phototypes I to III, were assessed. For 120 days, they associated the nutraceutical product with the use of a sunscreen FPS15. On days 0 (D0), 30 (D30), 60 (D60), 90 (D90) and 120 (D120) they were evaluated and underwent Medical Assessments and Self-Assessment and cutaneous biometric analyses (corneometry, sebumetry and pH-metry) in the skin of the left zygomatic region and the upper medial side region of the left arm; on days 0 (D0), 30 (D30) and 120 (D120) the skin of the same regions was analyzed by ultrasound. On days 0 (D0) and 120 (D120) skin biopsies were performed in the areas where instrumental evaluation was performed (to evaluate collagen and elastic fibers). Results: There was an improvement of the general status of the skin of all volunteers by the Medical and Volunteer Self- Assessments; increased parameters of cutaneous hydration, reduction of pH, increasing of ultrasound density and a histological increment of collagen and elastic fibers (both on the face and arm); there was a reduction of seborrhea (only on the face) .Conclusions: The daily use of a nutraceutical product containing lycopene, acerola extract, grape seed extract and Biomarine ComplexT showed an important adjuvant effect to counteract skin photoaging.

T. Sugawara, K. Kikuchi, H. Tagami, S. Aiba, S. Sakai, **Decreased lactate and potassium levels in natural moisturizing factor from the stratum corneum of mild atopic dermatitis patients are involved with the reduced hydration state**, Journal of Dermatological Science 66 (2012), p. 154–159

Background: Atopic dermatitis (AD) shows dry skin. Water-soluble, low molecular weight components, collectively known as natural moisturizing factor (NMF), play an important role in maintaining the stratum corneum (SC) hydration. Previous studies focused on reduced levels of free amino acids (FAAs) in NMF from AD skin. It remains unknown, however, whether other NMF components are also altered in AD. Objective: To characterize the levels of various NMF components in the SC of healthy subjects and in mild AD adult patients. Methods: NMF components were extracted from three sequential tape-stripped SC samples obtained from the volar forearm. NMF components which were decreased in AD skin were topically applied to examine their contribution to SC moisturization in AD skin. Results: We found that although FAAs levels were not remarkably reduced,

levels of pyrrolidone carboxylic acid (PCA), lactate, urea, sodium and potassium were significantly decreased in NMF from mild AD skin. Among those components, only the topical application of potassium lactate effectively increased skin surface hydration indicating that reductions of lactate and potassium influence dry skin in mild AD patients. Unlike the distribution of filaggrin-derived FAAs and PCA, lactate, urea, potassium and sodium were abundant in the surface layer of the SC compared with the inner layer of the SC. Such findings strongly suggest that those components are supplied from outside the SC, i.e. they originate from sweat. Conclusion: The reduced levels of sweat-derived NMF components in mild AD patients suggests that impaired sweat function might in part result in the SC dryness.

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.

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).

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.

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, 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.

D.S. Bernardi, T.A. Pereira, N.R. Maciel, J. Bortoloto, G.S. Viera, G.C. Oliveira, P.A. Rocha-Filho, **Formation and stability of oil-in-water nanoemulsions containing rice bran oil: in vitro and in vivo assessments**, Journal of Nanobiotechnology 2011, 9:44

Background: Nanoemulsions have practical application in a multitude of commercial areas, such as the chemical, pharmaceutical and cosmetic industries. Cosmetic industries use rice bran oil in sunscreen formulations, anti ageing products and in treatments for skin diseases. The aim of this study was to create rice bran oil nanoemulsions using low energy emulsification methods and to evaluate their physical stability, irritation potential and moisturizing activity on volunteers with normal and diseased skin types. Results: The nanoemulsion developed by this phase diagram method was composed of 10% rice bran oil, 10% surfactants sorbitan oleate/PEG-30 castor oil, 0.05% antioxidant and 0.50% preservatives formulated in distilled water. The nanoemulsion was stable over the time course of this study. In vitro assays showed that this formulation has a low irritation potential, and when applied to human skin during in vivo studies, the nanoemulsion improved the skin's moisture and maintained normal skin pH values. Conclusion: The results of irritation potential studies and in vivo assessments indicate that this nanoemulsion has potential to be a useful tool to treat skin diseases, such as atopic dermatitis and psoriasis.

J. Herfs, **Sinn und Zweck der kosmetischen Hautanalyse; Manuell oder apparativ?,** Beauty Forum 09/2011 p. 68-70

Was ist Diagnose? Aus dem Griechischen übersetzt, bedeutet das Wort „Beurteilung". Der ebenfalls griechische Begriff Analyse bedeutet: Bestimmung, Untersuchung, Zergliederung und Auflösung – man möchte also den Dingen auf den Grund gehen. Der sich daraus ergebende Befund ist die Arbeitsgrundlage für die Kosmetikerin. Doch was ist für eine erfolgreiche und nutzbringende Hautanalyse wichtig? Sind es die vielen kostspieligen Geräte, die notwendig sind, um eine professionelle Beurteilung durchzuführen? Oder ist es das geschulte Auge oder gar die feinfühlige Hand der Kosmetikerin, die vieles über das Hautgeschehen wahrnimmt? Auf keinen Fall fehlen dürfen Erfahrung und kompetentes Wissen, um negative Hautveränderungen detektivisch aufzuspüren.

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).

S. Murdan, G. Milcovich, G.S. Goriparthi, **An assessment of the human nail plate pH**, Skin Pharmacol Physiol, 2011;24(4): p. 175-181

Purpose of Study: To measure the pH of the surface of healthy nail plates. Procedures: The surface pH of human fingernails and big toenails was measured in vivo using a skin pH meter. The influence of washing, anatomical site (fingers/toes), side (left/right), digit (digits 1-5) and gender was determined. The pH of the nail interior was also measured. Results: The pH of the nail plate surface was around 5, with toenails having a significantly higher pH than fingernails. Immediately after hand washing, the nail surface pH increased significantly, from pH 5.1 ± 0.4 to 5.3 ± 0.5. However, this was not sustained with time, and the pH returned to prewashing levels within 20 min. Gender had an influence on unwashed, but not washed, nail plate pH. The pH of the nail plate interior was lower than that of its surface. Conclusions: It was possible to measure nail plate pH, and baseline values are provided.

T. Knor, A. Meholjić-Fetahović, A. Mehmedagić, **Stratum corneum hydration and skin surface pH in patients with atopic dermatitis,** Acta Dermatovenerol Croat. 2011;19(4): p. 242-247

Atopic dermatitis (AD) is a chronically relapsing skin disease with genetic predisposition, which occurs most frequently in preschool children. It is considered that dryness and pruritus, which are always present in AD, are in correlation with degradation of the skin barrier function. Measurement of hydration and pH value of the stratum corneum is one of the noninvasive methods for evaluation of skin barrier function. The aim of the study was to assess skin barrier function by measuring stratum corneum hydration and skin surface pH of the skin with lesions, perilesional skin and uninvolved skin in AD patients, and skin in a healthy control group. Forty-two patients were included in the study: 21 young and adult AD patients and 21 age-matched healthy controls. Capacitance, which is correlated with hydration of stratum corneum and skin surface pH were measured on the forearm in the above areas by SM810/CM820/pH900 combined units (Courage AND Khazaka, Germany). The mean value of water capacitance measured in AD patients was 44.1 ± 11.6 AU (arbitrary units) on the lesions, 60.2 ± 12.4 AU on perilesional skin and 67.2 ± 8.8 AU on uninvolved skin. In healthy controls, the mean value was 74.1 ± 9.2 AU. The mean pH value measured in AD patients was 6.13 ± 0.52 on the lesions, 5.80 ± 0.41 on perilesional skin, and 5.54 ± 0.49 on uninvolved skin. In control group, the mean pH of the skin surface was 5.24 ± 0.40. The values of both parameters measured on lesional skin were significantly different (capacitance decreased and pH increased) from the values recorded on perilesional skin and uninvolved skin. The same held for the relation between perilesional and uninvolved skin. According to study results, the uninvolved skin of AD patients had significantly worse values of the measured parameters as compared with control group. The results of this study suggested the skin barrier function to be degraded in AD patients, which is specifically expressed in lesional skin.

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, p. 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.

J. Viyoch, I. Tengamnuay, K. Phetdee, P. Tuntijarukorn, N. Waranuch, **Effects of Trans-4-(Aminomethyl) Cyclohexanecarboxylic Acid/Potassium Azeloyl Diglycinate/Niacinamide Topical Emulsion in Thai Adults With Melasma: A Single-Center, Randomized, Double-Blind, Controlled Study**, Current Therapeutic Research, Volume 71, Number 6, December 2010; p. 345–359

Background: Melasma is an acquired hyperpigmentary disorder characterized by dark patches or macules located on the cheeks, forehead, upper lip, chin, and neck. Treatment of melasma involves the use of topical hypopigmenting agents such as hydroquinone, tretinoin, and azelaic acid and its derivatives. Objective: The purpose of this study was to assess the efficacy of a formulation containing a combination of trans-4-(aminomethyl) cyclohexanecarboxylic acid/potassium azeloyl

diglycinate/niacinamide compared with an emulsion-based control in the treatment of melasma in Thai adults. Methods: In this single-center, randomized, double-blind, controlled study, Thai patients with mild to moderate facial melasma (relative melanin value [RMV] in range of 20–120) were randomized for the application of either the test or the emulsionbased (control) product in the morning and before bedtime for 8 weeks. The supplemental sunscreen product with sun protection factor 30 was distributed to all patients. Subjects were assessed for the intensity of their hyperpigmented skin area by measuring the difference in the absolute melanin value between hyperpigmented skin and normal skin (RMV). This parameter was used as a primary outcome of this study. Additionally, the severity of melasma was determined visually using the Melasma Area and Severity Index (MASI) scored independently by 3 investigators. The assessments of melasma intensity and other skin properties were performed before administration (week 0) and every 2 weeks thereafter for up to 8 weeks. Other skin properties, including moisture content, pH, and redness (erythema value), were measured. Adverse events (AEs), including erythema, scaling, and edema, were also assessed by a dermatologist using the visual grading scale of Frosch and Kligman and COLIPA. Results: The resulting primary intent-to-treat (ITT) population included 33 patients in the test group and 34 patients in the control group. Sixty patients completed all 8 weeks of the study (on-treatment [OT] population): 91% (30) of the 33 patients in the test group, and 88% (30) of the 34 patients in the control group. Betweengroup differences in mean RMV were statistically significant at week 6 in both the primary ITT (P = 0.005) and OT (P = 0.006) populations. The significant differences in mean MASI scores between the test and the control groups were initially observed at weeks 4 (P = 0.005) and 8 (P = 0.027) in the OT and primary ITT populations, respectively. Other parameters, including skin pH, erythema, and moisture content did not significantly change from baseline at any time point of study. The incidence of AEs was not different between the test (4/33 [12%]) and control (5/34 [15%]) groups. Conclusions: The significant differences in RMVs between the test and control groups were observed after 6 weeks of treatment, both in the primary ITT and OT populations. The incidence of patients with AEs was not significantly different between the test and control groups.

Y. Shigeta, G. Nakagami, H. Sanada, C. Konya, J. Sugama, **Factors Influencing Intact Skin in Women with Incontinence Using Absorbent Products: Results of a Cross-sectional, Comparative Study**, Ostomy Wound Management 2010;56(12): p. 26–33

Incontinence-associated dermatitis (IAD) is a common problem in elderly incontinent people. A comparative cross-sectional study was conducted to examine and compare properties of intact skin on the buttocks and subumbilicus area in elderly people wearing absorbent products and to identify pad environment factors that affect skin properties. Study participants included 45 elderly (age range: 68 to 103 years) female residents of one nursing home who were incontinent of feces and urine (dual incontinence group — DIG, n = 35) or feces only (fecal incontinence group – FIG, n= 10). Skin pH and hydration were measured and factors believed to affect the perineal environment and contribute to the development of IAD were assessed. In both DIG and FIG, skin hydration levels and pH were higher in the coccygeal than in the subumbilical area. Skin hydration of the sacral region in the DIG was significantly higher than in the FIG (P = 0.019) and skin pH on the coccygeal region and sacral region in the DIG was significantly higher than in the FIG (coccygeal region, P = 0.013; sacral region, P = 0.023). Absorbent pad surface pH (P <0.01) and excessive sweating (P = 0.006) were significantly related to skin pH. Results show that properties of perineal skin in elderly women with incontinence are affected by occlusion with pads, increasing the risk of IAD. Studies comparing the effect of various types of pads and pad-change frequencies on skin properties are needed.

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

einemHaushaltsklebeband 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,** 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.

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 significantly decreased after the first post-treatment evaluation. Regarding comparison of the biophysical properties of the skin, there was no statistically significant difference in the assessments, except for the increase determined during the second week in the erythema index in the laser-treated areas. Conclusion: The findings of this study showed that the diode laser can perform a significant reduction in the hair amount without significant epidermal damage, at least for a short period.

T. Lihoreau, C. Vidal, A. Jeudy, A. Elkhyat, S. Mac-Mary, J.M. Sainthillier, J. Iung, H. Bourdin, P. Humbert, **Skin Sebum Excretion and Sleep Apnea**, ISBS 2010 Buenos Aires, Argentina

The sleeping apnea syndrome is a common disorder that affects 5% of the population, but its diagnosis is underestimated because physicians forget to ask key questions, and the establishment of polysomnography is cumbersome. But given the relationship between excretion of sweat and some brain dysfunctions (eg Parkinson's disease ...), we wanted to evaluate sebaceous excretion in a population suffering from sleeping troubles, particularly sleep apnea, compared to a control group. Methodology: A preliminary study was then carried out on 26 volunteers (11 women, 15 men, average age = 46.2 years +/-14.8, average Body Mass Index (BMI) = 26.4 kg/m^3+/-5.6); they were sorted in two different populations (apnea versus, n=14, and no apnea syndrom, n=12). Skin and apnea parameters were compared between both groups: a polysomnographic record was done during the night; concerning the skin parameters, the records -realized on the wakening of the patient- concerned sebum excretion (Sebumeter SM 810, Courage & Khazaka), hydration index (Corneometer CM820, Courage & Khazaka), pH (Skin-pH-meter pH900, Courage & Khazaka).

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.

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).

W. Siyu, L. Li, **Effect of sweating by exercise on *stratum corneum* hydration, skin surface sebum content and pH value,** Skin Research and Technology 2010, 16; p. 489

The physiological indexes of skin include stratum corneum hydration, skin surface sebum content and pH value, which could reflect physiological state of the local and systematic organism, and also could be affected by many factors from internal or external changes. Many studies have been put on these physiological indexes, but there is no report of studying on effect of sweating by exercise on sebum, hydration and pH value of face skin. To observe the effect of sweating by exercise on stratum corneum hydration, skin surface sebum content and pH value of forehead and pars zygomatica of healthy indivuduals of different ages in order to collect the numerical data as the reference for exterior use drugs and before/after sports' cosmetics.

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.

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.

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.

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 Stratum corneum-Hydratation sowie die Tatsache, dass die Anwendung der Pflegeprodukte keine irritativen Hautveränderungen induzierte, lassen die Schlussfolgerung zu, dass empfehlenswert 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 dem Multiphotonen-Lasertomograph sollen im Rahmen dieser Studie lediglich als Pilotuntersuchungen für Folgestudien dienen, da eine zu geringe Probandenanzahl untersucht wurde.

W.-S. Oh, T.-H. Oh, **Mapping of the dog skin based on biophysical measurements**, Veterinary Dermatology, December 2009

Trans epidermal water loss (TEWL), skin hydration status and pH were determined in 14 skin regions of five healthy male Beagle dogs (2–4 years) both before and after anaesthesia. Transepidermal water loss was highest for the footpad and head and lowest forthe inguinal region. Skin hydration status was higher in the ear but did not vary significantly in other regions. Skin pH was usually alkaline with the highest values on the lower back and tail. Following anaesthesia, TEWL and skin hydration were significantly lower on the head, upper back and footpad, and upper back and elbow respectively, while skin pH was unaffected by this procedure. While measurement of pH would seem to be valid anywhere on the body in anaesthetized dogs, regional factors should be considered when interpreting TEWL and skin hydration values and when treating regional skin diseases in veterinary practice.

J. K. Kim, J. H. Cho, **Change of external auditory canal pH in acute otitis externa,** Annals of Otology, Rhinology & Laryngology 118 (11); 769-772, 2009

Abstract: Objectives: We investigated (1) the correlation between the degree of acute otitis externa (AOE) and a change of pH and (2) the recovery of pH after acidification compared to an antibiotic otic solution in AOE. A change of pH in the external auditory canal (EAC) is very important for the pathogenesis of otitis externa. Therefore, not only an antibiotic otic solution, but also acidification, is known to be a good treatment for AOE. However, pH has only been investigated in chronic otitis externa, and not in AOE. Methods: This was a prospective randomized control study. Forty adult patients (56 ears) with AOE and 40 normal control subjects (80 ears) participated in this study. The severity of disease was graded as mild, moderate, or severe. The pH of each EAC was then measured. The patients were randomly assigned into 2 groups: one for vinegar irrigation and the other for topical antibiotics. The pH of the diseased ears was measured at 1 and 2 weeks after the treatment.

A. Helmke, D. Hoffmeister, N- Mertens, S. Emmert, J. Schuette, W. Vioel, **The acidification of lipid film surfaces by non-thermal DBD at atmospheric pressure in air,** New Journal of Physics 11 (2009) 115025

We studied the acidifying efficiency of a cold atmospheric pressure plasma treatment and ambient air as a working gas on lipid films. Acidification of a thin water film could be observed on plasma-treated surfaces of wool wax, pork sebum and human lipids. This pH shift was partly attributable to NO*x* species and to the formation of nitric acid in the upper layers of the substrates. The acidic compounds on the lipid surfaces resulted in pH shifts for up to 2 h after plasma exposure, which might be beneficial for pH-targeted therapies in dermatology.

S. Gong, C. Lv, K.R. Feingold, X. Zhang, S. Xin, C. Tu, L. Dui, P.M. Elias, M. Man, **Variation of skin surface pH, sebum content and stratum corneum hydration with age and gender in Chinese population,** Journal of Investigative Dermatology (2009), Volume 129

Evidence suggests the importance of skin biophysical properties in predicting diseases and in developing appropriate skin care. The results to date of studies on skin surface pH, stratum corneum (SC) hydration, and sebum content in various gender and ages have been inconclusive in part due to small sample size. Additionally, little is known about skin physical properties of Asian, especially Chinese, subjects.

M. Yamaguchi, Y. Tahare, T. Makino, T. Shimizu, A. Date, **Comparison of Cathepsin L activity in cheek and forearm stratum corneum in young female adults,** Skin Research and Technology 2009; 15; 370-375

Noninvasive determination of skin surface proteolytic anctivity may be useful for the diagnosis of human disease and the potential of skin. The cathepsin family is one of the metabolizing enzymes of the skin cell and it includes aspartic protease cathepsin D and cysteine proteases cathepsin B, H, and L. Cathepsin L is a lysosomal cysteine protease with a major role in intercellular protein catabolism.

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.

R. Adam, B. Schnetz, P. Mathey, M. Pericoi, Y. de Prost, **Clinical Demonstration of Skin Mildness and Suitability for Sensitive Infant Skin of a New Baby Wipe,** Pediatric Dermatology 1-8; 2009

Over the past decade, baby wipes have become established as leading cleansing devices for the diaper area. Despite this fact, few publications have reported clinical data on the dermatologic effects of baby wipes. Although basic performance requirements of a moist tissue, such as cleaning and removal of fecal matter from the skin, are largely met by current products, modern baby wipes can address further aspects of skin care in the diaper area via usage of effective cosmetic product application.

N. Krueger, S. Luebberding, M. Oltmer, M. Streker, M. Kerscher, **Age-related changes in skin mechanical properties. Quantitative evaluation of 120 female subjects in a trial with a strict design,** ISBS Besancon, 2009

The most commonly used method to determine the mechanical ability of skin is the creep test using suction chamber devices. Until now there is no scientific consensus upon which skin deformation parameters are particularly suitable to describe age related changes in human skin mechanics The aim of this study was to examine common mechanical skin parameters to find those best representing the influence of aging.

A. Elkhyat, Y. Afifi, B. Hassam, P. Humbert, **Human skin wettability cartography,** ISBS Besancon, 2009

For decades the surface hydrophobicity has been reported to play an important role in many biological processes, such as cellular adhesion, contact inhibition, elasticity, functionality of tissue membranes, functioning of intracellular structures, and adhesion of infectious microorganisms. The skin affinity with water is estimated by measuring of its water contact angle. To establish a cartography of skin's wettablility by Ow measuring at nine sites. The hydration and lipidic index (HI, LI) and the skin pH are measured.

W. Siyu, L. Li, **Effect of sweating by exercise on stratum corneum hydration, skin surface sebum content and pH value,** ISBS Besancon, 2009

The physiological indexes of skin include stratum corneum hydration, skin surface sebum content and pH value, which could reflect physiological state of the local and systematic organism, and also could be affected by many factors from internal or external changes. Many studies have ben put on these physiological indexes, but there is no report of studying on effect of sweating by exercise on sebum, hydration and pH value of face skin. To observe the effect of sweating by exercise on stratum corneum hydration, skin surface sebum content and pH value of forehead and pars zygomatica of healthy individuals of different ages in order to collect the numerical data as the reference for exterior use drugs and before / after sports' cosmetics.

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 simple 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.

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.

S.W. Youn, J.H. Kim, J.E. Lee, S.O. Kim, K.C. Park, **The facial red fluorescence of ultraviolet photography: is this color due to Propionibacterium acnes or the unknown content of secreted sebum?,** Skin Research and Technology 2009; 15; p. 230-236

Red fluorescence of the face induced by ultraviolet light is thought to be due to Propionibacterium acnes. However, recently there are reports correlating this red fluorescence with the amount of facial sebum secretion. This study was performed to investigate the relationship between the areas of facial red fluorescence with culture results of P. acnes and the amount of sebum secretion. Nineteen patients with acne were included. P. acnes cultures were done on speciments obtained from areas with red fluorescence.

H. Zhai, H.P. Chan, S. Farahmand, H.I. Maibach, **Measuring human skin buffering capacity: an in vitro model,** Skin Research and Technology 2009; 15: p. 470-475

It has been thought that skin possesses buffering capacity. This study measured the skin buffering capacity against two model solutions off acid and base at three concentrations with an in vitro system. Ten microliters of model base (sodium hydroxide – NaOH) and acid (Hydrochloric acid – HCl)

solutions at concentrations of 0.025, 0.05 and 0.1 N was applied to human cadaver skin placed onto glass duffision cells.

L.-C. Gerhardt, A. Lenz, N.D. Spencer, T. Münzer, S. Derler, **Skin-textile friction and skin elasticity in young and aged persons,** Skin Research and Technology 2009; 15, p. 288-298

The mechanical properties of human skin are known to change with ageing, rendering skin less resistant to friction and shear forces, as well as more vulnerable to wounds. Until now, only few and contradictory results on the age-dependent friction properties of skin have been reported. This study has investigated in detail the influence of age on the friction of human skin against textiles. In vivo skin-friction measurements on a force plate were combined with skin analyses concerning elasticity, hydration, pH value and sebum content.

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.

D. Khazaka, C. Uhl, **More than 2 decades of bioengineering for efficacy testing and product recommendation,** Household and Personal Care TODAY, No. 1/2009

Due to high competition in the cosmetic and growing customer expectations, in the past two decades there has been a continuousdevelopment of new cosmetic products with more efficient ingredients covering new effects on the skin. Simultaneously to this, there was an increasing demand for new measuring techniques to substantiate the new product claims. The field of skin bioengineering has consequently been immensely enriched in the last years by inventing new physical and optical measurement methods for all kind of skin parameters.

J.W. Wiechers, **Formulating at pH 4-5: How Lower pH Benefits the Skin and Formulations,** Cosmetics and Toiletries magazine; Vol. 123, No. 12/December 2008

Most skin products are formulated around pH 6 but the latest research in skin biology suggests the skin is significantly more acidic – around 4,7. Here, the author shows how formulating for this natural pH can enhance the skin penetration of actives, reduce the amount of preservatives required, and increase chemical stability.

R. Voegeli, A.V. Rawlings, S. Doppler, T. Schreier, **Increased basal transepidermal water loss leads to elevation of some but not all stratum corneum serine proteases**, Int J Cosmet Sci. 2008 Dec;30(6): p. 435-42

There are indications of elevation of some inflammatory serine proteases in barrier damaged skin (e.g. plasmin and urokinase). Moreover, many other serine protease activities are present such as desquamatory enzymes as well as a newly detected tryptase-like serine protease. However, the activities of these proteases have never been correlated with stratum corneum (SC) barrier function. The activity of extractable key serine proteases (SC trypsin-like kallikreins, SC chymotrypsin-like kallikreins, SC tryptase-like serine protease, urokinase and plasmin) was measured from the outermost layers of SC obtained from facial tape strippings in clinically normal subjects. The protein content of the tape strippings was quantified by absorption measurements with the novel infrared densitometer SquameScan 850A and the protease activities by the use of fluorogenic peptide substrates. SC barrier function, SC hydration and skin surface pH were measured using AquaFlux, NOVA dermal phase meter and Skin-pH-Meter, respectively. As expected, SC hydration was reduced with increased transepidermal water loss (TEWL) values indicative of barrier impairment. Surprisingly, SC

chymotrypsin-like activity showed no correlation with hydration or TEWL, whereas all other enzymes positively correlated with impaired barrier function and some were statistically significant: SC trypsin-like kallikreins ($R(2)=0.66$, $P < 0.01$), SC tryptase-like enzyme ($R(2)=0.95$, $P < 0.001$), plasmin ($R(2)=0.86$, $P < 0.001$) and urokinase ($R(2)=0.50$, $P < 0.05$). All enzymes except urokinase also negatively correlated with SC hydration. Elevated levels of SC serine proteases have been associated with some dermatological disorders, such as atopic dermatitis, psoriasis and rosacea but these results indicate that these enzymes are also elevated with milder forms of barrier disruption, which is not clinically evident as irritated skin. As these proteases are elevated in the SC, they will also be elevated in the epidermis where they can be involved in neurogenic inflammation and epidermal barrier impairment via activation of the protease-activated receptors. These results highlight the need for using serine protease inhibitors especially for urokinase and plasmin, SC tryptase-like serine protease and possibly SC trypsin-like kallikreins even in milder forms of barrier damage.

M.O. Ferreira, M.H. Amaral, P.C. Costa, M.F. Bahia, **Assessment of Age-Related Differences in Skin Surface, Hydration, Sebum and pH,** IFSCC Barcelona 2008

Skin is the body's largest organ and constitutes a formidable physical barrier that protects us from the environment [1]. It is composed of two main layers: the epidermis and the dermis. The stratum corneum is the outermost layer of the epidermis and is the most important in terms of protection against damage and aesthetic appearance of the skin. The hydrolipidic film of the stratum corneum, which consists mainly of sebum excreted by the sebaceous glands and moisture components excreted with sweat, protects the skin from drying out, keeps it supple and due to the natural acid protection barrier it prevents the penetration of harmful external substances.

M.O. Ferreira, M.H. Amaral, P.C. Costa, M.F. Bahia, **Study of the Inter-Relations between Skin Surface Parameters, Hydration, Sebum and pH***,* IFSCC Barcelona 2008

Skin is the body's largest organ and constitutes a formidable physical barrier that protects us from the environment. Several biophysical techniques are commonly used to study the skin properties and to measure the in vivo skin effects of cosmetics, topical medicaments and chemical irritants. The Corneometer® (a capacitance method) measures skin hydration, the Sebumeter® (a photometric method) measures the sebum of the skin and the Skin-pH Meter® (a potenciometric method) measures the pH of the skin. The Visioscan® VC98 connected to the software SELS (Surface Evaluation of the Living Skin) can measure several skin surface parameters. This apparatus consists of a special b/w video sensor chip with very high resolution, an objective and an UVA-light source.

R. Voegeli, A.V. Rawlings, J.W. Fluhr, S- Doppler, T. Schreier, **Serine Proteases, Skin Function and Homeostasis**, IFSCC Barcelona 2008

Several proteases were shown to be present in the epidermis and especially in the stratum corneum (SC). Among these enzymes the serine proteases have a wide spectrum of specificities and functions and play important roles in numerous physiological and pathological processes [1]. In skin they are involved in epidermal proliferation, differentiation, lipid barrier homeostasis and tissue remodeling. Most importantly, kallikreins, together with other enzymes, are involved in the proteolysis of corneodesmosomal proteins, a crucial event prior to desquamation [2].

E. Kim, S. Kim, H. Lee, S. Moon, I. Chang, **The alkaline pH-adapted skin barrier is disrupted severely by SLS-induced irritation,** IFSCC Barcelona 2008

Human stratum corneum is a multilayer barrier composed of corneocytes and specialized intercellular lipids rendering the skin poorly permeable to water and other polar compounds. The horny layer assists in maintain a constant internal milieu with a pH of 7.4 in viable epidermis that contrasts with the pH of 4-6 found on most parts of human skin[1]. The 'acid mantle' of the stratum corneum first described by Schade & Marchionini in 1928[2], was originally thought of as a thin film composed of fatty acids, amino acids, and other organic acids deposited on the skin surface.

S.H. Pérez Damonte, C.L. Selem, C. Groisman, **Bi-Functional Study of Ion Calcium in the Skin,** IFSCC Barcelona 2008

The Calcium ion has an important function in the skin. Its gradient plays a role in regulating epidermal growth and differentiation *in-vivo*. In the intact epidermis, the extra cellular calcium content is low in both, malpighi and spinosum strata, but increases from the inner to the outer layer of the stratum granulosum [1]. Also, the calcium ion participates in the formation of the epidermal desmosomes, fibroblasts and keratinocytes, which provide the integrity and firmness of the skin [2]. All of these factors are important for the correct function of the epidermal barrier.

S.H Pérez Damonte, A.M. Martín, M. E. Daraio, **Safety Assessment for Nickel in Cosmetics,** IFSCC Barcelona 2008

Many environmental chemicals produce contact hypersensitivity or local inflammatory responses in the skin. Nickel released from metal objects is well known as a sensitizing agent in humans. Since the initial damage caused by nickel remains to be the leading cause of skin disorders such as allergic contact dermatitis worldwide, the aim of this study is to investigate if the content of nickel in cosmetics could produce such reactions.

P. Davari, F. Gorouhi, S. Jafarian, Y. Dowlati, A. Firooz, **A randomized investigator-blind trial of different passes of microdermabrasion therapy and their effects on skin biophysical characteristics,** International Journal of Dermatology 2008, 47, p. 508-513

Microdermabrasion (MDA) was developed in 1980s, and rapidly became a popular modality in superficial skin resurfacing. Its safety, simplicity, no need for anesthesia, prompt recovery and modest equipment costs hold a wide appeal for both physicians and patients. This non-invasive mechanical technique is used in management of fine rhytides, mottled pigmentation, clogged pores, acne, acne scars, and stretch marks.

E. Houben, R.Adam, J.-P. Hachem, Di. 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.

H. Hariry, **Untersuchung zum postpartalen Verlauf des Hautoberflächen-pH-Wertes von Säuglingen atopischer und nicht atopischer Familien zur Beurteilung des pH-Wertes als Prädiktor und pathogenetischen Faktors bei der atopischen Dermatitis**; Gütersloh 2008

Einleitung: 1.1 Defintion und Epidemiologie der atopischen Dermatitis: Der Begriff Atopie bezeichnet eine genetisch determinierte Disposition gegen harmlose exogene und auch vermutlich endogene Substanzen ohne klar ersichtlichen Grund sensibilisiert zu werden. In dessen Folge entwickeln sich die als atopische Trias bekannten Krankheitsbilder: die allergische Rhinokonjunktivitis, das allergische Asthma bronchiale und die atopische Dermatitis. Atopische Erkrankungen haben in den letzten Jahrzehnten signifikant zugenommen und betreffen gegenwärtig weltweit etwa 20% der Bevölkerung in den Industrienationen (114). Zwillingsstudien und Familienstudien haben gezeigt, dass die Disposition zu atopischen Erkrankungen erblich ist (269). Die atopische Dermatitis ist eine der wichtigsten Erkrankungen im Fachgebiet der Dermatologie und Berufsdermatologie und gilt als ein wesentlicher Kofaktor berufsbedingter Handekzeme (58,276). Die Erkrankung erfasst 15% bis 20% der Kinder in Industrieländern und stellt eine enorme Belastung für die Betroffenen und das Gesundheitssystem dar. Die atopische Dermatitis ist durch ihren besonderen Verlauf, typische klinische Merkmale wie extremen Juckreiz und weitere assoziierte Zeichen von übrigen Ekzemen unterscheidbar (276).

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.

P. Davari, F. Gorouhi, S. Jafarian, Y. Dowlati, Yahya, A. Firooz, **A randomized investigator-blind trial of different passes of microdermabrasion therapy and their effects on skin biophysical characteristics,** International Journal of Dermatology, Volume 47, Number 5, May 2008, p. 508-513

Background: Microdermabrasion (MDA) is a safe, simple, and beneficial technique for superficial skin resurfacing. Despite its popular usage, few studies have assessed the efficacy of different MDA protocols applied at the present time. Objectives: To assess the effects of MDA generally,

as well as to compare the effects of two vs. three passes of MDA in each session for a total number of six therapeutic sessions on skin biophysical characteristics.

J. Dissemond, **pH-Wert und chronische Wunden,** derm (14) 2008, S. 486-490

Der pH-Wert beschreibt logarithmisch die reziproke Konzentration von freien Wasserstoffionen und ist somit ein Maß für die Stärke der sauren bez. basischen Wirkung einer wässrigen Lösung. Der Begriff pH-Wert leitet sich von den lateinischen Wörtern potentia (Kraft) und hydrogenium (Wasserstoff) ab. Die Skala der pH-Werte reicht von 0 bis 14, wobei der Mittelwert von 7 als neutral bezeichnet wird.

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 conventional gentle rubbing as it leaves the skin significantly wetter and at greater risk of frictional damage.

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.

H.M.D.R. Gunathilake, G.M.P. Sirimanna, N.Y. Schürer, **The pH of commercially available rinse-off products in Sri Lanka and their effect on skin pH**, Ceylon Med J. 2007 Dec;52(4): p. 125-129

Introduction: Initially linked to antimicrobial function, the acidic skin pH plays a key role in permeability barrier homeostasis and integrity of the stratum corneum. Barrier recovery is delayed when acutely perturbed skin sites are exposed to a neutral pH. Objective: To evaluate the pH of commercially available rinse-off products in Sri Lanka, and the effect of detergent rinses on skin pH and its recovery rate. Methods: The pH of 18 rinse-off products was determined using pH indicator paper and a pH meter. The effect of an alkaline (pH 9) and an acid (pH 5.5) rinse-off product on the hand skin pH was compared in 48 healthy volunteers after single and multiple applications. The skin pH of the dorsum of hands was measured in nurses before (n = 131) and during (n = 40) a duty shift that involved frequent hand washing using alkaline soap. Results: Soaps available in Sri Lanka have a pH of 9.1-10.5. The pH of syndets and cleansers range from 5.5-7.0. Five minutes after hand washing, the mean skin pH increased by 1.7 +/- SD 0.5 pH units with alkaline soap, and by 0.8 +/- SD 0.4 pH units with acidic cleanser ($p < 0.0001$). Recovery of pH was slower when alkaline soap was used. The increase in skin pH was significantly greater when hands were repetitively washed with alkaline soap ($p < 0.0001$). The mean skin pH values of nurses before (4.9 +/- SD 0.4) and during (5.7 +/- SD 0.7) the work shift were significantly different ($p < 0.0001$). Conclusions: Alkalinisation with rinse-off products increases the skin pH with potential functional and clinical implications.

*A. Firooz, F. Gorouhi, P. Davari, M. Atarod, S. Hekmat, M. Rashighi-Firoozabadi, A. Solhpour***, Comparison of hydration, sebum and pH values in clinically normal skin of patients with atopic dermatitis and healthy controls,** 2007, Clincal and Experimental Dermatology 32, Journal compilation, p. 320-334

The water content of the stratum corneum and skin surface lipids forms a balance that is important for the appearance and function of the skin. An impaired balance may lead to the clinical manifestations known as “dry skin”, which is particularly seen in patients with atopic dermatitis (AD).

H. Lambers, S. Piessens, A. Bloem, H. Pronk, P. Finkel, **Natural skin surface pH is on average below 5, which is beneficial for its resident flora**, IFSCC Magazine, Vol. 10, No. 1/2007, p. 84

Variable skin pH values are being reported in literature, all in the acidic range but with a broad range from pH 4,0 to 7,0. In a multic centre study (N=330), we have assessed the skin surface pH of the volar forearm before and after refraining from showering and cosmetic product application for 24h.

L. Ambroisine, K. Ezzedine, A. Elfakir, S. Gardinier, J. Latreille, E. Mauger, M. Tenenhaus, C. Guinot, **Relationships between visual and tactile features and biophysical parameters in human facial skin**, Skin Research Technology 2007; 13: p. 176-183

Skin properties, such as colour, hydration and texture, can be studied on a qualitative basis by a clinical assessment or on a quantitative basis using techniques that measure biophysical properties of the skin. The aim of this study was to explore the links between facial skin features and a range of skin biophysical parameters using multivariate method.

W. Pratchyapruit, K. Kikuchi, P. Gritiyrangasan, S. Aiba, H. Tagami, **Functional analyses of the eyelid skin constituting the most soft and smooth area on the face: contribution of ist remarkably large superficial corneocytes to effective water-holding capacity of the stratum corneum**, Skin Research and Technology 2007; 13; p. 169-175

The eyelid constitutes a unique area on the face because of its soft, smooth and thin skin distinct from that of other facial portions. Its softness facilitates their easy compliance to blinking movement, which is indispensable to protect the wet surface of the eyeball. Moreover, the skin of the eyelid does not show any prominent follicular orifices of any oily aapearance even in adults.

R. Voegeli, J. Heiland, S. Doppler, A.V. Rawlings, T. Schreier, **Efficient and simple quantification of stratum corneum proteins on tape strippings by infrared densitometry,** Skin Research and Technology 2007, 13; p. 242-251

The analysis of stratum (SC) components is a widely accepted method to determine “skin health” status or to follow the effects of topical treatments. These analytes are normally corrected to the amount of SC removed which can be determined gravimetrically or by extraction of SC proteins and their subsequent analysis.

A. Firooz, F. Gorouhi, P. Davari, S. Hekmat, M. Atarod, M. Rashighi Firoozabadi, A. Solhpour, **Comparison of hydration, sebum and pH values in clinically normal skin of patients with atopic dermatitis and healthy controls,** Clinical and Experimental Dermatology 2007; 32, p. 321-322

The water content of the stratum corneum and skin surface lipids forms a balance that is important for the appearance and function of the skin. An impaired balance may lead to the clinical manifestations known as “dry skin”, which is particularly seen in patients with atopic dermatitis (AD).

S. Marrakchi, H.I. Maibach, **Biophysical parameters of skin: map of human face, regional, and age-related differences,** Contact Dermatitis 2007; 57, p. 28-34

The face showed anatomical variation on reaction to chemicals, which could be related to differences in biophysical parameters. 10 young human volunteers (24-34 years) and 10 old volunteers (66-83 years) were studied to prepare a map of the human face based on regional variations and age-related differences by measuring various biophysical parameters.

*S. An, E. Lee, S. Kim, G. Nam, H. Lee, S. Moon, I. Chang***, Comparison and correlation between stinging responses to lactic acid and bioengineering parameters**, Contact Dermatitis 2007; 57; p. 158-162

Sensitive skin has been described as a skin type showing higher reactivity than normal skin. By our consumer surveys, approximately 30% of the subjects believe that they have sensitive skin. However, consumer-perceived cutaneous reactions are usually scientifically unconfirmed.

C. Bayerl, T. Walker, M. Arens-Corell, **Dermatologically controlled in-use test of sebamed soap-free washing bar in a daily care unit,** 21st World Congress of Dermatology, Buenos Aires, Argentina

Suitability and tolerability of a soap-free washing bar for cleansing was evaluated in patients with skin diseases. Recruitment of volunteers included consecutive patiens of an outpatient, daily care unit of a dermatological hospital.

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

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).

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.

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.

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.

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

D. Segger, U. Aßmus, M. Brock, J. Erasmy, P. Finkel, A. Fitzner, H. Heuss, U. Kortemeier, S. Munke, T. Rheinländer, H. Schmidt-Lewerkühne, **Multicenter Study on Measurement of the Natural pH of the Skin Surface**, IFSCC Magazine, Vol. 10, No. 2/2007, p. 107-110

Characterization of the skin's natural state is very important for understanding skin functions and describing disturbances of skin function. In the field of cosmetics and dermatologicals the natural pH of the skin surface plays an important role in the development of products with a skin neutral pH.

G. Nakahami, H. Sanada, C. Konya, A. Kitagawa, E. Tadaka, Y. Matsuyama, **Evaluation of a new pressure ulcer preventive dressing containing ceramide 2 with low frictional outer layer,** JAN Journal Compilation 2007

Aim: This paper is a report of an evaluation of the effectiveness of a newly developed dressing for preveting persistent erythema and pressure ulcer development and improving the water-holding capacity without increasing the skin pH in bedridden older patients. Background: Shear forces and skin dryness play important roles in persistent erythema and pressure ulcer development. To eliminate these risks, we developed a dressing to reduce shear forces and improve the water-holding capacity. However, the effects of this dressing in clinical settings remain unknown. Method: An experimental bilateral comparison study was conducted at a hospital in Japan 2004 with 37 bedridden older patients at risk of pressure ulcer development.

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

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).

H. Lambers, S. Piessens, A. Bloem, H. Pronk, P. Finkel, E. Voss, J. Fluhr, **Natural skin surface pH is on average below 5, which is beneficial for its resident flora,** International Journal of Cosmetic Science, October 2006, Volume 28, Issue 5, Pages 311–387

The acidic surface pH as well as the pH 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 *(refs. 1, 2).* The acidic surface pH is also an important determinant for the growth conditions of both resident (normally found on the skin) as well as transient (opportunistic, potentially pathogenic) microflora. Staphylococcus epidermidis (S. epidermis) is a typical example of the resident flora, representing more than 80% of total microflora of "dry" body areas like arms, legs and lower torso; Staphylococcus aureus (S. aureus) is a typical example of the potentially pathogenic transient flora *(ref. 3).*

R. Voegeli, A.V. Rawlings, S. Doppler, T. Schreier, **Profiling of Serine Protease Activities in Human Stratum Corneum**, Oral Presentation on the 24th IFSCC Congress, Osaka, Oct. 2006

Epidermal serine proteases are involved in numerous physiological and pathological reactions in cells and tissues such as proliferation, differentiation, lipid barrier homeostasis and tissue remodeling. Most importantly proteolysis of corneodesmosomes is a crucial event prior to desquamation. Reduced expression of kallikrein 7 (stratum corneum chymotryptic enzyme or SCCE) and kallikrein 5 (stratum corneum tryptic enzymes or SCTE) has been observed in the outer layers of the stratum corneum (SC) in dry skin whereas increased total SC activities are reported following a challenge to the skin with ultraviolet radiation or surfactants.

D. Khazaka, **Objective Measurement at all Stages of the treatment**, 5th Asia Pacific Conference on Antiaging Medicine, Bali, September 2006

The days are over when a dermatologist only looked at the skin to make a diagnosis and to decide about the following treatments and to recommend skin care products to use. For almost 20 years now there is scientific equipment available to measure different parameters on the skin, such as hydration and sebum level, pH, elasticity, pigmentation skin texture and wrinkles and many more.

M.K. Kim, S.Y. Choi, H.J. Byun, C.H. Huh, K.C. Park, R.A. Patel, A.H. Shinn, S.W. Youn, **Comparison of sebum secretion, skin type, pH in humans with and without acne**, Arch Dermatol Res. 2006 Aug;298(3): p. 113-9

Differences of skin type and pH between subjects with and without acne have not been investigated. In addition, the relationship between sebum secretion and pH in these populations has not been determined. This study assessed the differences in objective and subjective skin types between these two groups. Secondly, this study evaluated the difference in pH on five facial areas (forehead, nose, chin, right and left cheeks) between the two populations. Lastly, the relationship between pH and sebum secretion was analyzed in each population. Sebum casual levels (CL) of the five facial areas in 36 Koreans with acne and 47 Koreans without acne were measured by using a Sebumeter SM 815 and subjects were classified into objective skin types by CL. Subjects reported the type of skin they believed they had, which determined the subjective skin type. The pH levels of the five facial areas were measured by the Skin-pH-Meter PH 905. Data were assessed with adequate statistical tests depending on data type and distribution. Among the five areas, the nose of the subjects with acne showed a significantly higher CL, compared to the subjects without acne. This difference in CL on the nose resulted in the difference in CL on the T-zone and mean facial sebum excretions (MFSE). Although CL differed, objective skin types did not differ between the two groups ($P > 0.05$), but the subjective skin types differed significantly ($P = 0.001$). In addition, the objective skin types were significantly different than the subjective skin types in subjects with acne ($P = 0.001$), whereas the two skin types did not differ in subjects without acne. Subjects with acne actually overestimated their skin types and stated their skin types were "oilier" than they were. In respect to pH, none of the five areas differed significantly between the two groups. Among the five sites in subjects with acne, CL showed a significant negative correlation

with pH on the left (r (2)=0.12) and right (r (2)=0.15) cheeks, which resulted in a significant negative correlation on the U-zone (r (2)=0.14). In contrast, in subjects without acne, there was a significant negative correlation between CL and pH on the forehead (r (2)=0.10) and chin (r (2)=0.16), which led to a significant negative correlation on the T-zone (r (2)=0.14).

F. Rou, Y.-S. Park, **Comparison of determined skin types by different factors of facial skin hydration, sebum content and surface pH levels** (study in Korean), Korean Journal of Skin Beauty Education

Objective: We studied to find suitable spots to measure facial oil and water status for identifying the skin-type. This study was performed with 131 female students in juniors and seniors in collage at a city from 23th May to 3rd June 2003. Their age averaged 19.9±3.1 years. Design: We measured the sebum content and the hydration status of 4 facial spots as the brow, the chin, the eye rims, and the cheek, after 1 hour, 2 hours and 12 hours after washing their faces by Sebum-meter and Corneo-meter, and also measured the pH of their cheek by Skin-pH-meter after 12 hours after washing. We assumed the whole face skin, as the average of 4 facial spots. The questionnaires for skin type classification were also performed as well as a single question of self-perceived skin types. The statistical analysis were done by using SPSS11.0 for Win like average, t-test, ANOVA, X2, and Pearson's correlation coefficient. Results: We observed that the skin types based on the sebum content of whole face skin(4 spots) showed signigicant low correlations with the self-perceived skin types(r=0.287, p=0.016) or the skin types based on the questionnaires(r=0.393, p=0.000). The self-perceived skin types and questionnaires skin types were very highly related(r=0.709, p=0.000). There were remarkably the positive correlations between skin types by the sebum contents of whole face skin and T-Zone(r=0.812, p=0.000). Especially skin types by T-zone sebum showed significant low correlations with the self-perceived skin types(r=0.373, p=0.001) or with the skin types based on the questionnaires(r=0.403, p=0.000). Sebum creation rate is very important element for skin condition (type), so measuring sebum content of the whole face skin seemed to be very much resonable for identifying skin type. Especially only T-Zone measurement could be compatible. This results can be used for skin type identification before cosmetic material selections or facial makeups.

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.

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 DFG Graduiertenkollegs „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.

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.

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.

S. Son, S. Park, S. Ha, G. Park, G. Lee, C. Oh, **Analysis of the skin hydration states using high resolution magnetic resonance microscope,** Presentation on the ISBS Meeting 2005 in Philadelphia and Skin Research and Technology 2005, 11 (abstract)

Magnetic Resonance (MR) technique have been rapidly developed, and Magnetic Resonance Image (MRI) is now the most versatile non-invasive diagnostic tool with a much higher resolution than other imaging modalities such as conventional X-ray, or Computed Tomography (CT).

R. Voegeli, J. Heiland, S. Doppler, T. Schreier, **Efficient and Simple Quantification of Stratum Corneum Proteins on Tape Strippings,** Presentation on the ISBS Meeting 2005 in Philadelphia and Skin Research and Technology 2005, 11 (abstract)

Tape stripping is established as a common technique in dermatological research and is used in a broad range of applications. However, a concurrent colorimetrical determination of protein content and enzyme activity on the same tape is circumstantial.

S. Williams, M. Davids, Ti. Reuther, D. Kraus, M. Kerscher, **Gender Difference of in vivo Skin Surface pH in the Axilla and the Effect of a Standardized Washing Procedure with Tap Water,** Skin Pharmacol Physiol. 2005; 18: p. 247-252

The purpose of our study was to evaluate the axillary skin surface pH and explore potential gender-related differences together with the influence of a washing procedure iin healthy subjcts. After a run-in period, the skin surface pH was measured in vivo in 10 men and 10 women under standardized conditions in three distinct locations of each axilla (at baseline and up to 6 h after washing). Potential interfering influences were thoroughly excluded.

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.

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.

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, p. 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.

I. Arsic, S. Tamburic, S. Bulatovic, I. Homsek, G. Vuleta, **Exploring moisturising potential of naturals: The cases of St. John´s wort, chamomile and blackthorn**, Euro Cosmetics 3-2005, p. 14-21

The application of plant extracts in cosmetics and toiletries has been a distinct trend over the last decade and, given consumers´ interests in naturals, will probably continue. Both cosmetic and dermatological practices have benefited from the use of new and re-discovered plants, as well as plant biotechnology extracts.

A. Elkhyat, C. Courderot-Masuyer, S. Mac-Mary, S. Courau, T. Gharbi, P. Humbert, **Assessment of spray application of Saint GERVAIS water effects on skin wettability by contact angle measurement comparison with bidistilled water**, Skin Research and Technology 10, p. 283-286, 2004

The skin is responsible for protecting the body from physical, chemical and microbial injuries. The stratum corneum is the top layer of the epidermis and it plays a key role in helping to contain moisture. When the skin becomes damaged, it's ability to perform these functions is compromised. Dry skin is a common form of skin damage. Contact angle 0 between a surface and water is a good indicator of hydrophobic or hydrophilic tendency of surfaces.

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.

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

Background: 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. Objective: 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. Methods: 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. Results: 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. Conclusion: Coconut oil is as effective and safe as mineral oil when used as a moisturizer.

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).

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 Erlangen, Dezember 2003**

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. 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.

E. Hernandez, **Bioengineering in Dermatology and Cosmetology: Methods, Studies and Prospects**, SÖFW-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.

P. M. Devesa, C. M. Willis, J. W. R. Capper, **External auditory canal pH in chronic otitis externa,** Clin. Otoaryngol. 2003, 28, 320-324

Abstract**:** Several risk factors have been postulated to play a part in the progression of acute into chronic otitis externa, including changes towards alkalinity of the skin pH of the external auditory canal. These changes have been previously reported to occur in the acute stage, and their persistence may predispose to a chronic status of this condition. This prospective control study was designed to look at this possible relationship in more depth, by comparing the external auditory canal pH of individuals with chronic otitis externa, but with no current exacerbation, with an age-/sex-matched control group. Analysis of the data revealed a significantly higher external auditory canal pH in the chronic otitis externa group ($P < 0.004$) when compared with the controls, with no concomitant difference in body skin pH. Within this chronic otitis externa cohort, a statistically significant correlation was found between external auditory canal pH and the severity of the condition, as assessed using a multiparameter scoring system ($r = 0.562$; $P < 0.02$). Importantly, the pH was not related to the length of time since the last exacerbation. There was a significant age relationship present within our sample. Younger patients displayed more severe chronic otitis externa($r = -0.813$; $P < 0.001$), with correspondingly higher external auditory canal pH values ($r = -0.550$; $P < 0.02$). The results suggest that alkaline ear canal skin is a local risk factor for the progression into chronic otitis externa, occurring, in this study, with greater severity in younger individuals.

H. Ranc, A. Elkhyat, C. Servais, B. Launay, P. Humbert, **Coefficient de friction et mouillabilité de la muqueuse linguale : influence d'une couche de mucus salivaire**, Nestlé Research Center, Nestec Ltd., Lausanne, Suisse

Les aliments, une fois en bouche, sont cisaillés et comprimés entre la langue et des surfaces telles que les dents et le palais. La tribologie appliquée aux surfaces interagissant en bouche devrait permettre d`expliquer certains phénomènes physio-chimique qui régissent la perception orale de la structure des aliments.

P-A. Wendling, G. Dell'Acqua, **Skin biophysical properties of a population living in Valais, Switzerland,** Skin Research and Technology 2003, 9, 306-311

On average we observed low values of skin capacitance that identify subjects with dry skin. Measures of skin visco-elasticity ratios were also particulary low, while skin pH and sebum content were in the normal range. Age was correlated with a decrease of skin elasticity and sebum content, but there was no correlation with hydration or pH.

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.P.L. van de Vijver, E. Boelsma, R.A. Bausch-Goldbohm, L. Roza, **Subjective skin condition and its association with objective skin measurements**, Cosmetics & Toiletries, Vol. 118, No. 7, July 2003

From a group of 302 volunteers, the authors obtained both selfreported subjective evaluations of skin condition and objective measurements of skin conditions, and then looked for correlations between the subjective and objective kin measures.

M. Setaro, A. Sparavigna, **It is possible to define a "biological age"of the skin?**, Skin Research and Technology, Vol. 9, No. 2, May 2003

The evaluation of global skin performance as compared to anagraphical age of the subject is until today dependent on clinical evaluation. By doing so, “pre-clinic” alterations of skin aging, are often missed, loosing the possibility to set up adequate strategies of prevention and treatment. Non-invasiev evaluations based on the measurements of skin parameters allow to monitor functional alterations of the skin with age in objective, sensitive specific and reproducible way.

G. Yosipovitch, J. Hu, **The Importance of Skin pH,** Skin & Aging, March 2003, p. 89

It’s well known that the skin is the first line of defense against all elements, such as microorganisms, wind and pollutants. And it’s the acid mantle, a fine film with a slightly acidic pH on the surface of the skin, which provides a protection for the skin. It plays a very important role as an integral part of the barrier function of the stratum corneum.

E. Boelsma, L.P.L van de Vijver, R.A. Goldbohm, I.A.A. Klöpping-Ketelaars, H.F.J. Hendriks, .L. Roza, **Human skin condition and its associations with nutrient concentrations in serum and diet**, Am J Clin Nutr 2003;77: p. 348–355

Background: Nutritional factors exert promising actions on the skin, but only scant information is available on the modulating effects of physiologic concentrations of nutrients on the skin condition of humans. Objective: The objective was to evaluate whether nutrient concentrations in serum and diet are associated with the skin condition of humans. Design: A cross-sectional study was conducted in which data on serum concentrations of nutrients, dietary intake of nutrients, and the hydration, sebum content, and surface pH of skin were obtained from 302 healthy men and women. Skin condition was measured with the use of noninvasive techniques. Dietary intake was assessed with 2 complementary food-frequency questionnaires. Multiple regression analysis was used to evaluate associations of serum vitamins and carotenoids and of dietary micro- and macronutrients with skin condition. Results: After adjustment for potential confounders, including sex, age, and smoking, statistically significant associations were shown in the total population between serum vitamin A and skin sebum content and surface pH and between the dietary intake of total fat, saturated fat, monounsaturated fat, and skin hydration. Monounsaturated fat intake was also associated with surface pH. Associations between serum -cryptoxanthin and skin hydrationm and between surface pH and fluid and calcium intakes were observed in men only. Conclusion: Several associations between nutrients in serum and diet and skin condition were observed, indicating that changes in baseline nutritional status may affect skin condition.

R. Huei Chen, W. Yuu Chen, **Skin hydration 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.

S. Hansen, **Influence of environmental and pulsation factors on teat skin condition and teat tissue with regard to mastitis**, Dissertation Tierärztliche Hochschule Hannover, 2002

Milking and non-milking influences on teat skin and tissue parameters were examined in a series of trials in New Zealand at theDairying Research Corporation, Hamilton and on farms within a 100 km radius of Hanover, in Germany. In New Zealand, identicaltwins were available for six short-term trials and one long-term trial, involving 10 twin sets. In Germany, one main trial was carried out, with 304 unrelated cows located on five participating dairy farms. The determination of the teat skin parameters pH and moisture waspossible, with the Corneometer CM 820Ò and Skin-pH-Meter PH 900Ò (Courage and Khazaka electronic GmbH, Cologne, Germany). The teat skin moisture was determined in arbitrary units. The test of repeatability resulted in a coefficient of variation (cv) of 25.6 per cent for moisture and 6.07 per cent for pH. The reproducibility over time resulted in similar cvs. Teat skin moisture and pH were not significantly correlated. The average teat skin pH of New Zealand cows varied from 6.44 to 6.88 for lactating cows and from 7.06 to 7.26 for dry cows. German lactating cows had a mean teat skin pH of 7.19 to 7.26. In New Zealand, the teat skin moisture of lactating cows fluctuated between 23.9 and 39.8, and between 23.0 to 57.5 for dry cows. The average teat skin moisture of German lactating cows ranged from 46.6 to 47.8. The teat skin moisture was correlated with the environmental temperature on a low level. The teat skin pH correlated with the environmental temperature and the relative humidity. The milking interval did not have any influence on teat skin moisture or pH. The application of a post milking teat sanitiser, containing iodine and a mixture of glycerine and sorbitol, increased the moisture of teat skin significantly. This increase was observable up to 16 h, but after 24

h, the effect had deteriorated. The low pH of the sanitiser solution (3.3) had a very strong, decreasing influence on the teat skin pH. Six different teat sanitiser formulations were tested regarding their teat conditioning properties. The level of glycerine in the sanitiser influenced the moisture level on the skin. Products without emollient did not moisturise the teat skin as well as products with emollient. Disinfectant solutions with a pH around neutral did not change the teat skin pH whilst treatments with the same pH (3.5) resulted in approximately the same decrease in teat skin pH. The influence of the treatments on the teat skin flora was tested, taking rinsing samples. The teat skin flora observed on untreated skin was similar to the microflora reported in the literature. However, no effect of the sanitiser treatment on the number of teats colonised with a particular group or genus of bacteria could be found. Ten twin sets were used to compare two different pulsation modes in a long-term trial. The group, treated with the 'fast' milking mode exhibited significantly higher teat thickness changes than the 'slow' group. Yet, the pulsation treatment had no significant effect on teat skin moisture or pH. The udder health of 253 German cowswas compared with teat skin moisture and pH. No significant correlation of these parameters was observed. Analysis of the data indicated that time, farm and individual cow factors influenced the teat skin parameters to a greater extent than the udder health on quarter basis.

T. Sato, W. Sakamoto, W. Odanaka, K. Yoshida,O. Urishibata, **Clinical effects of dietary hyaluronic acid on dry, rough skin**, Aesthetic Dermatology Vol . 12: p. 109-120, 2002

A double-blind feeding study was carried out wherein 35 subjects who frequently suffer from dry, rough skin were given either a dietary hyaluronic acid supplement (120 mg/day) or a placebo for comparison for a 4-week period. The results have clarified the following: (1) Measurements of skin moisture showed that ingested hyaluronic acid acted to increase moisture content. (2) Microscopic skin surface analysis showed that ingested hyaluronic acid acted to increase skin smoothness and to ameliorate wrinkles. (3) Significant increases in blood hyaluronic acid concentration were found in both the hyaluronic acid and placebo ingestion groups, but the percentage increase was higher in the hyaluronic acid group. Other clinical laboratory test results indicated no clinically significant changes. It has been shown from the above that ingestion of hyaluronic acid is effective at increasing moisture retention and smoothness in the skin, and there are also no safety problems.

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.

J.W. Fluhr, A.J. Fowler, J.-P. Hachem, D. Crumrine, P.M. Elias, K.R. Feingold, **Stratum corneum acidification in neonates: impact on permeability barrier homeostasis and integrity/cohesion,** Symposium of the International Society for Bioengineering and the Skin, Baltimore Oct. 24-26, 2002

Mammalian newborn stratum corneum (SC) displays a near-neutral surface pH, whichdeclines during the early post-natal period to adult levels. We developed a model to study the mechanisms and consequences of SC acidification in the neonatal period. In newborn rats the surface pH, measured with a flat glass electrode (pH-Meter, Courage+Khazaka) declined from an almost neutral pH (6.8) after birth to physiologic levels (5.6) over 5 days.

M.-H. Lee, S-J. Hong, J-H. Park, H-C. Kim, H-S. Oh, C-H. Oh, **Quantitative evaluation of patch test results – comparing the studies between new skin color analysis technique and other bioengineerin tools,** Symposium of the International Society for Bioengineering and the Skin, Baltimore Oct. 24-26, 2002

Contact dermatitis is a common problem occurring in the field of dermatology and patch test is the only reliable procedure for the detection of the causative agent. In evaluation of patch test result, visual scoring system is wide being used as a objective method. However, it is well known that variations exist even in the interpretations by experienced dermatologist.

I. Le Fur, S. Lopez, F. Morizot, J. Latreille, C. Guinot, E. Tschachler, **Age-related reference ranges for skin biophysical parameters in healthy women**, Posters of the 22nd IFSCC Congress, Edinburgh 23.-26. Sep. 2002

The aim of this study was to establish age-related reference ranges in healthy Caucasian women for some widely used skin biological parameters on different body areas.

L. Ambroisine, C. Guinot, J. Latreille, E. Mauger, M. Tenenhaus, I. Le Fur, S. Lopez, F. Morizot, E. Tschachler, **Relationship between visual and tactile skin characteristics and skin biophysical parameters**, Posters of the 22nd IFSCC Congress, Edinburgh 23.-26. Sep. 2002

G. Ricci Leonardi, L. Rigo Gaspar, P.M.B.G. Maia Campos, **Estudo da variação do pH da pele humana exposta à formulação cosmética acrescida ou não das vitaminas A, E ou de ceramida, por metodologia não invasiva* - Study of pH variation on the skin using cosmetic formulation s with and without vitamins A, E or ceramide: by a non-invasive method**, An bras Dermatol, Rio de Janeiro, 77(5): p. 563-569, set./out. 2002

Fundamentos - Os cosméticos hidratantes melhoram a pele, aproximando-a de suas condições ideais, pois aumentam a quantidade de água no estrato córneo. As vitaminas A e E, bem como as ceramidas, são substâncias ativas que vêm sendo muito empregadas em hidratantes, os quais constituem uma das mais importantes classes de produtos cosméticos e de higiene corporal. Objetivo - O objetivo deste trabalho foi avaliar o efeito no pH cutâneo da pele humana de uma emulsão O/A (constituída de base auto-emulsionante não iônica) acrescida, ou não, de vitamina A palmitato ou vitamina E acetato ou ceramida III, por metodologia não invasiva. Método - O estudo foi realizado em 40 mulheres com idade entre 30 e 45 anos, empregando-se o equipamento Skin pHmeter PH 900 PC. As medidas foram efetuadas no antebraço das voluntárias nos tempos de sete e 30 dias após auto-aplicação diária (duas vezes ao dia), dos produtos envolvidos no estudo. Resultados e Conclusão - A presença das vitaminas A ou E, ou da ceramida não alterou de maneira significativa o pH da pele, o que mostra que as formulações estudadas são adequadas para o uso cosmético. Palavras-chave: lipídios; vitamina A; vitamina E.

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

Purpose: The aim of this study was to establish age-related reference ranges in healthy Caucasian women for some widely used skin biophysical parameters.

I. Le Fur, A. Reinberg, S. Lopez, F. Morizot, E. Tschachler, **Facial Skin Circadian Rhythms of Healthy Women Investigated Using Non-Invasive Methods,** 20th World Congress of Dermatology, Paris

Purpose: The aim of this study was to document around the clock changes in a set of skin biophysical parameters.

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.

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).

S. Haug, **Feuchtigkeit, Fettgehalt und pH-Wert der Haut im Gesicht – Eine Untersuchung zur Festlegung von Normalwerten an definierten Punkten im Gesicht und am Hals,** Dissertation an der Technischen Universität München 2002

Das größte Organ des menschlichen Körpers, die Haut, besitzt eine Gesamtfläche von 1,5-2,0 m², die von Körpergröße und Gewicht abhängig ist [1]. Die Haut ist in mehreren Schichten aufgebaut. Das 6-20µm, an Handinnenfläche und Fußsohle zwischen 200-600 µm [54,86], dicke kernlose Stratum corneum (Hornhaut) ist die oberste Schicht der Haut. Es besteht aus 13 Zellschichten [76]. Der Aufbau des Stratum corneum ist dabei ähnlich einer Mauer aus Ziegelsteinen und Mörtel (bricks and motar-Modell). Die Ziegelsteine entsprechen in dieser Modellvorstellung proteinreichen Korneozyten, die hauptsächlich aus seiner starren Zellhülle [6], Keratinfilamenten [107] und dem interfilamentären Matrixprotein [28] bestehen.

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.

D. Swatschek, W. Schatton, J. Kellermann, W.E. Müller, J. Kreuter, **Marine sponge collagen: isolation, characterization and effects on the skin parameters surface-pH, moisture and sebum**, Eur J Pharm Biopharm, 2002 Jan;53(1): p. 107-113

A previously described isolation procedure for collagen of the marine sponge Chondrosia reniformis Nardo was modified for scaling-up reasons yielding 30% of collagen (freeze-dried collagen in relation to freeze-dried sponge). Light microscope observations showed fibrous structures. Transmission electron microscopy studies proved the collagenous nature of this material: high magnifications showed the typical periodic banding-pattern of collagen fibres. However, the results of the amino acid analysis differed from most publications, presumably due to impurities that still were present. In agreement with earlier studies, sponge collagen was insoluble in dilute acid mediums and all solvents investigated. Dispersion of collagen was facilitated when dilute basic mediums were employed. The acid-base properties of the material were investigated by titration. Furthermore, a sponge extract was incorporated in two different formulations and compared with their extract-free analogues and a commercially available collagen containing product with respect to their effects on biophysical skin parameters. None of the preparations had a noticeable influence on the physiological skin surface pH. Skin hydration increased only slightly. However, all tested formulations showed a significant increase of lipids measured by sebumetry.

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 and The Essential Stratum Corneum, chapter 60, edited by R. Marks, J.-L. Lévêque, R. Voegeli, Martin Danitz Ltd., London, 2002

The human skin surface has to adapt constantly to changing environmental conditions, such as temperature and relative humidity. Several studies have demonstrated the detrimental effects of winter weather in our countries on the skin and seasonal changes in certain biophysical parameters. The work presented here examines seasonal variations of biophysical parameters on facial skin in Caucasian women in France.

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.

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.

J.W. Fluhr, J. Kao, M. Jain, S. K. Ahn, K. R. Feingold, P. M. Elias, **Generation of Free Fatty Acids from Phospholipids Regulates Stratum Corneum Acidification and Integrity,** 2001 by The Society for Investigative Dermatology, p. 44-62

There is evidence that the “acid mantle” of the stratum corneum is important for both permeability barrier formation and cutaneous antimicrobial defense. The origin of the acidic pH of the stratum corneum remains conjectural, however. Both passive (e.g. eccrine/sebaceous secretions, proteolytic) and active (e.g. proton pumps) mechanisms have been proposed. We assessed here whether the free fatty acid pool, which is derived from phospholipase-mediated hydrolysis of phospholipids during cornification, contributes to stratum corneum acidification and function.

G.G. Hillebrand, M.J. Levine, K. Miyamoto, **The Age-Dependent Changes in Skin Condition in African Americans, Asian Indians, Caucasians, East Asians, and Latinos,** IFSCC Magazine, October/December 2001, Vol. 4, No. 4

Understanding the similarities and differences in skin characteristics as a function of age, race and geography should aid in the development of skin care products that better meet consumers’ skin care needs around the world.

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. Fox, **Literature and Patent Review: Analytical and Test Methodologies,** 1990-2000, Part I. Cosmetics & Toiletries, Vol. 116, No. 4, April 2001-05-21

This article reviews some of the important methodologies published during the past ten years on the subject of cosmetics and toiletries.

C. Fox, **Literature and Patent Review: Analytical and Test Methodologies,** 1990-2000, Part I. Cosmetics & Toiletries, Vol. 116, No. 4, April 2001-05-21

This article reviews some of the important methodologies published during the past ten years on the subject of cosmtics and toiletries.

D. Iliev, U. Hinnen, P. Elsner, **Skin Bioengineering Methods in Occupational Dermatology**, Skin Bioengineering Vol. 26, March 2001

Measruing 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.

T. Reuther, S.C. Behrens-Williams, M. Kerscher, **Untersuchungen zur Wirkung von Mometasonfuroat-Fettcreme auf die epidermale Barriere**. H+G, Supplement 2/2001

T. Ajito, K. Suzuki, J. Okumura, N. Hatano, **Skin pH of Domestic Animals** (study in Japanese), J.pn J. Large Anim. Clinics 24(1): p. 9-12, 2001

Skin pH was examined using skin sebumeter, corneometer and pH-meter…

*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.

N. Vidakovic, M. Primorac, M. Stupar, G. Vuleta, **In Vivo Study: Influence of Polyacrylic Anticellulite Gels on Hydration and pH-Value of the Skin**, SÖFW-Journal 11-2000

The effect on hydration and pH-value of the skin has been investigated on 22 female subjects during the thirty-day treatment. The following formulations have been tested: polyacrylic gel with 2% of caffeine, ployacrylic gel with propylene-glycol plant extract of Ivy – 2%, Horse Chestnut – 2%, Seaweed – 1,5%, as well as ployacrylic gel with caffeine and above-mentioned plant extracts.

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.

*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

D. Schmid, A. Lang, T. Allgäuer, C. Bayerl, E.G. Jung, **Beurteilung der Veränderung der Hautbeschaffenheit durch die Heilpflanzensäfte Brennnessel und Löwenzahn**, Akt. Dermatol. 2000

Wir führten eine Anwendungsbeobachtung über die Beeinflussung von objektiven und subjektiven Parametern der Hautbeschaffenheit durch die Kombination der Heilpflanzensäfte Brennnessel und Löwenzahn bei gesunden Probandinnen durch. Zehn Probandinnen (Versuchsgruppe) nahmen über 6 Wochen die Kombination der Heilpflanzensäfte oral ein, gleichzeitig erhielten sie eine standardisierte Körperpflege mit Basiscreme DAC, weitere 10 Probandinnen (Kontrollgruppe) benutzten lediglich die standardisierte Körperpflege mit Basiscreme DAC.

I. Gemende, M. Fisher, **Begleitende Hauterkrankungen bei Morbus Parkinson - Besonderheiten in der Hautpflege** (nur Anfang des Kapitels), in Horst Przuntek & Thomas Müller (Editors), Adjuvante nichtmedikamentöse Therapieansätze bei Morbus Parkinson, Springer, 2000, p. 21-27

Das Erscheinungsbild der vegetativen Störungen bei der Parkinsonerkrankung ist vielgestaltig. Als Zeichen der Hautbeteiligung sind Hyperhidrose und Seborrhoe regelmäßig angeführt, die Frage der veränderten Sebumproduktion wird jedoch sehr selten untersucht. Bei der Beschreibung der Parkinsonerkrankung ist das Salbengesicht ein prägnantes Zeichen.

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 Tewameter, 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. Conclusions: 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.

S. Stenzaly-Achtert, A. Schölermann, J. Schreiber, K.H. Diec, F. Rippke, S. Bielfeld, **Axillary pH and influence of deodorants,** Skin Research and Technology 2000;6: p. 87-91

A significant pH reduction was shown during the treatment period when compared to the run-in phase. The Deodorant Roll-on induced a reduction of the mean pH values from 6.1 to 5.3, the Deodorant Balsam Spray from 6.5 to 5.7 and the Deodorant Cream from 6.2 to 5.3. During the wash-out period all pH values returned to baseline.

V. Lambert, I. Le Fur, C. Guinot, F. Morizot, S. Lopez, E. Tschachler, **Comparaison des Parametres Biophysiques Cutanés en Hiver et en Été chez des Femmes Caucasiennes,** IIième Congrès de la Société D'Ingénierie Cutanée, Juin 2000

Les modifications environmentales au cour des saisons fávorisant la survenue de pathologies cutanée mais sont aussi citées par les femmes comme fávorisant l'apparition des signes de sensinilité cutanée.

H. Dobrev, **Immediate effects of cosmetic series for men "Karo Royal" on the skin water content and pH**, 7th National Congress of Dermatology and Venereology, May 2000

Six products of cosmetic series for men "Karo Royal" (Alen Mak, Plodiv) were studied.

I. Le Fur, C. Guinot, S. Lopez, F. Morizot, V. Lambert, E. Tschachler, **Age-Related Reference Ranges for Skin Biophysical Parameters in Healthy Caucasian Women**, 13th ISBS Jerusalem, March 2000 and 13th ISBS Jerusalem, March 2000 and Skin Research and Technology, Vol. 6, No. 3, August 2000

Knowledge about the variations of skin biophysical parameters is a prerequisite for the interpretation of results of the skin bioengineering studies.

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.

M.O. Visscher, S. Maganti, K.A. Munson, D.E. Bare, S.B. Hoath, **Early adaptation of human skin following birth: a biophysical assessment,** Skin Research and Technology, Vol. 5, No. 4, November 1999.

Successful adapation to postnatal life requires rapid physiological transitions in multiple organ systems. Mechanisms regulating stratum corneum water interactions and evaporative heat loss, for example, are pivotal in making the transition from the warm, aqueous prenatal state to a cold, dry postnatal environment. Understanding these mechanisms is important in formulating skin care guidelines in early infancy.

J.S. Guffey, M.J. Rutherford, W. Payne, C. Phillips, **Skin pH changes associated with iontophoresis**,

J Orthop Sports Phys Ther. 1999 Nov;29(11): p. 656-60.

Study design: Randomized controlled trial. The researcher measuring skin pH was blinded to group assignment. Objectives: To compare the skin surface pH changes associated with iontophoresis. The investigation was designed to address the question of whether significant skin pH changes occur under the cathode on the skin surface when performing iontophoresis and assessed the influence of different electrode-buffering systems intended to stabilize skin pH (surface). Background: Whether buffers are needed to stabilize skin pH during iontophoresis has not been thoroughly addressed in the literature. The effectiveness of immobile resins versus simple phosphate buffers is also unclear. Methods and measures: Sixty volunteer subjects were administered iontophoresis of normal saline using buffered or nonbuffered electrode systems. Each subject participated in 1 of the 12 doses by electrode conditions (i.e., 5 subjects per group). Surface skin pH was measured before and after iontophoresis with a flat-surface pH electrode in concert with an analog pH meter. The independent variables were electrode type (4 levels) and dosage (3 levels). The dependent variable was the change in skin surface pH. Results: A significant change in skin pH was found only when the treatment dose was 80 mA/minute with a nonbuffered electrode (x = 3.14 +/- 1.09). Conclusions: The skin pH changes that occur during a properly delivered iontophoresis treatment at dosages of 20 and 40 mA/min were small and not significantly different with or without the addition of buffers. Those pH changes associated with 80 mA/min doses were significantly greater when no buffer was employed but were stabilized by each of the buffers used in the study (preloaded immobile resins or simple phosphates added at point of treatment).

A. Fendl, **Einzelheiten der Hautdiagnose**. Natürlich schön/Grundlagten der Ganzheitskosmetik, Handwerk und Technik – 1999

Wie ein Mantel schützt der eigene fettige Film die Haut gegen negative Einflüsse von aussen und Wasserverluste von innen.

S. Tamburic, **Changing the Skin Surface**, Parfümerie & Kosmetik 11/12, 1999

As shown in this article personal care products exert different changes of skin surface pH, depending on their composition and pH status. The alteration in skin pH by soaps and detergents are not seen as a source of irritancy per se, but may be a contributing factor to skin malfunctioning. Skin pre-treatment with an anionic polymer-based lotion has proven to be non-efficient in terms of pH protection. The same lotion used after the washing with loap has shown an insant and profound effect in reducing the skin pH changes.

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.

S.H. Perez Damonte, G.M. Cuomo, R.L. Galimberti, **Evaluacion Instrumental de la Piel Sensible**, IFSCC Chile May 1999

Numerosos patientes se haceran a la consulta cosmética…

M. Maruno, F.C. Facco, P.A. Rocha Filho, **Hydration, Oily and PH of Skin In Vivo Evaluation After Application of Both Simple and Complex Emulsions Containing Hydrolyzed Proteins**, IFSCC Chile May 1999

Cosmetic industry considers skin treatment as a market which is increasing and spreading throughcosmteic products as well.

B. Gabard, **Dry Skin and the Cosmetic Benefit of Moisturization**, 12th ISBS, Boston, 06/98 and Skin Research and Technology, Vol.5 No. 2, May 1999

The importance of water for the functional integrity of skin in general and of the horny layer in particular has been recognized for a long time and is underlined by the wealth of literature published on this subject.

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.

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

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.

R. Ward, **The Human Factor** - SPC March 1998

With the proposed ban on animal testing on the horizon, Dr. Rachel Ward looks at the ethical aspects of human volunteer testing.

M. Arens-Corell, J. Welzel, H.H. 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.

U. Bornschein, **Der Schuß ins Waschwasser...** Die Schwester/Der Pfleger 12/98

Die Ganzkörperwaschung der Patienten durch Pflegende ist im Krankenhaus eine täglich wiederkehrende Verrichtung. In vielen Einrichtungen ist dafür ein Pflegestandard geschaffen worden. Dabei kommt es oft zu einer Diskussion um en Waschwasserwechsel, und dies nicht nur aus hygienischen Gesichtspunkten.

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.

F.Morizot, I. Le Fur, E. Tschachler, **Sensitive Skin,** Cosmetics & Toiletries Vol. 113, November 1998

Studies on skin reactions to irritant substances and topical preparations have a long history. Clinical signs and symptoms of irritant reactions in the dermatological sense are well defined and are synonymous with skin inflammatory reactions.

D.S. Orth, J. Widjaja, L. Ly, N. Cao, **Stability and Skin Persistence of Topical Products,** Cosmetics & Toiletries, October 1998

Using sevel commercially available cosmetic and OTC-drug products, the authors determined the chemical stability of selected topical ingredients in a hydroalcoholic vehicle with 2% hydroquinone.

Y. Yazan, M. Seiller, S. Avcier, M. Demirel, **Comparison of Glycolic, Lactic and Glycolic + Lactic Acids in Multiple Emulsion Systems,** 20th IFSCC Congress Cannes, 09/1998

S.B. Hoath, D.E. Bare, K.A. Munson, M.O. Visscher, R.R. Wickett, **Changes in Stratum corneum Hydration, Acidity, And Optical Properties in Newborn Infants During The First Hours of Life**, 12th ISBS, Boston, 06/98

Successful adaption following birth in humans require mechanisms for coupling between the infacnt and the tereestrial environment.

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.

J. Gottfreund, T. Meyer, **Die Bedeutung des pH-Wertes 5,5 in Emulsionen.** Kosmetische Medizin Nr. 3, 1998.

Es wird die Bedeutung des pH-Wertes 5.5 in Emulsionen dargestellt. In einer W/O-Emulsion wurde der pH-Wert der Wasserphase auf einen Wert von 5,5 eingestellt. Es ließ sich zeigen, daß der durch Umwelteinflüsse tiefe pH-Wert der Haut sich an 5,5 anpaßt. Bei der Auswahl der Rohsteoffe für den Fettkörper einer Emulsion müssen die speziellen Bedingungen, die durch den pH-Wert bedingt sind, berücksichtigt werden.

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 variablesdidnot.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.

M. Arens-Corell, **Einfluss des pH-Wertes von Kosmetika**. Kosmetische Praxis, Sonderdruck 2/98

Der saure Oberflächen-pH-Wert der Haut erfüllt wichtige Schutzfunktionen. Über die Einwirkung von Reinigungsprodukten auf die Residentflora, die Barierefunktion und die Regeneration der Haut liegen umfassende Untersuchungen vor. Wie aber sieht es beim pH-Wert von Hautpflegepräparaten aus, die auf der Haut verbleiben?

Sauer und alkalisch, Kosmetische Praxis 2/98

Der pH-Wert der Hautoberfläche schwankt zwischen 5,0 und 6,0. Da Lösungen mit einem pH-Wert kleiner als 7 sauer reagieren, zeigt die Haut demnach eine saure Reaktion. Dieser Säuremantel hemmt die Aktivität krankmachender Bakterien und Pilze. Mit ein wichtiger Grund diesen Säureschutzmantel nicht zu zerstören.

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

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.

E.J. Fendler, M.J. Dolan, and R.A. Williams, **Characterization and Treatment of Occupational Contact Dermatitis,** GOJO Industries 1997

N. Issachar, Y. Gall, M.T. Borell, M.C. Poelman, **pH measurements during lactic acid stinging test in normal and sensitive skin.** Contact Dermatitis, 1997

Within the last few years, the term “sensitive skin” has been used with greater frequency, because many individuals complain of a peculiar susceptibility when applying commonly used skin care products, such as cosmetics, soaps and sunscreens.

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. 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 …

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. Arens-Corell, **Reinigung und Pflege der Babyhaut**, Kosmetische Medizin 1997 18, 2

Baby skin is highly sensitive concerning dehydration and irritation. Mild cleansing agents with maximum skin compatibility and adaptation of the pH of the cleansing product to 5.5 in accordance with the developing acid mantle of the skin are necessary. For skin care water-in-oil emulsions with a strong protective effect are predominantly used. Occlusion has to be avoided. Skin compatibility and care effect should be examined by Dermatologists. The diaper region must be protected from urine and feces by mild cleansing and special creams.

G. Yosipovitch, H. I. Maibach MD, **Skin Surface pH: A Protective Acid Mantle.** Cosmetics & Toiletries Magazine Dec 1996

The skin’s surface pH is acidic. Its pH ranges between 4 and 6.

N. Issachar, I. Gall, C. Gall, C. Carduner, M.C. Poelman, **The Behaviour of Sensitive Skin Against Lactic Acid Aggression,** Proceedings of the 19th IFSCC Conference, Sydney.10/96

There is an important need for screening methods which can detect and distinguish the relative discomfort caused by cosmetic formulations for an increasing part of the population. Indeed when certain materials are applied to the skin, some persons report subjective complaints such as burning, stinging, itching, tight feeling, and sometimes, exhibit signs of irritation. This peculiar susceptibility is not hardly documented. The aim of our study was to find a quantitive test to identify subjects who present this unusual susceptibility to cosmetic products, using lactic acid as a stinging reagent. A preselection of reactive subjects "stingers" among volunteers was firstly carried out by application of a 10% aqueous solution of lactic acid on the nasolabial fold. The stinging effect is scored each minute during 10 minutes, over a range from 0 (no stinging) to 3 (severe stinging). The mean values allow to select 15 "stinger" and 15 "stinger" volunteers. The kinetic of skin pH of the stingers and non stingers after lactic acid application under the same conditions was checked. The data pointed out that the kinetic of the pH-sensitive skin is significantly different from normal skin: pH increases faster on sensitive skin than on normal skin. These findings support the suggestions that individuals who behave as stingers may have an enhanced buffering ability, or a more permeable stratum corneum, compared to people with normal skin. The measurement of the recovery of the cutaneous pH in subjects with sensitive skin versus normal skin could be a useful tool for a better understanding of this phenomenon.

J. Woodruff, **Testing time,** Cosmetics, June 1996

In his continuing series on impending EC cosmetics-legislation, John Woodruff looks at the requirements for proof of efficacy, and takes a trawl around available testing facilities.

F.L. Ruedisueli, N.J. Eastwood, N.K. Gunn, T.G.D. Watson, **Skin pH in Dogs of Different Breeds,** Skin Research and Technology, Vol. 2, No. 1, February 1996

Normal skin pH in humans ranges from pH 5.4-5.9, but can vary between anatomical sites. No such pH data are known for dogs. In this study skin pH was measured in dogs of diffrent breeds, demonstrating variation between measuring sites, breeds, sex, and coat colour. All animals were fed the same commercial dry dog food. Skin pH was measured with a flat membrane skin pH meter (Courage and Khazaka, Germany) on the head, pinna, flank, axillar and inguinal region. All sites were clipped except head amd pinna. The mean pH for 12 Labradors, measured over 5 days, for flank, head, and pinna were (mean ± SE) 7.48 ± 0.04, 8.10 ± 0.06 and 6.11 ± 0.03, respectively. Inguinal and axillar measurements showed day-to-day variability. For interbreed comparison skin, pH on the flank was measured on three male and three female Miniature schnauzers 7.25 ± 0.17, Springer spaniels 6.65 ± 0.08, Yorkshire terriers 7.71 ± 0.13, and Labrador retrievers 7.13 ± 0.10. The overall data showed effects of site ($p<0.001$), sex ($p<0.001$; males>females<9, neutering ($p<0.01$; neutered>entire), colour ($p<0.01$; black>yellow) and breed($p<0.01$) and a sex effect within breeds. These findings demonstrate that skin pH measurements are possible in dogs and that the variability due to site, sex, breed, and cost may be important in the aetiology and management of dermatalogical disorders in relation to susceptibility, hypersensitivity, and treatment response.

K.P. Wilhelm, **Client-Server based On-Line Data Acquisition for Skin Bioinstrumentation Devices**, proDERM Institut for applied Dermatological Research GmbH. Schenfeld, Germany

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.

S. Dikstein, I. Oreper, **Liquid Make-up and Skin Surface pH,** Skin Research and Technology,Vol. 2, No. 4, Nov 1996

It was suggested that, if a cosmetic agent changes the skin surface pH outside its normal range for more than 3 hours, then a chronic study is indicated to show lack of undesirable side effects (Biogeng.and Skin 1, 57-58, 1985), since it is desirable to keep any skin parameter within its „representative" or „desired" range.

M.A. Francomano, K. Mantovani, P. Pepe, A. Di Nardo and S. Seidenari, **Baseline Biophysical Skin Parameters in Subjects with Sensitive Skin,** Skin Research and Technology, Vol. 2, No. 4, Nov 1996.

Aim of the study: to assess the baseline biophysical parameters in subjects with sensitive skin.

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.

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).

H.C. Korting, **Rationale der Hautreinigung mit sauren Syndets,** 38. Tagung der Deutschen Dermatologen Gesellschaft, Berlin, 29. April - 03. Mai 1995

Seit Jahrzenten sind Seigfen zur Hautreinigung eingesetzt worden. Seit Ende der 40ger Jahre diesen Jahrhunderts stehen aus andersartigen Netzmitteln, Tensiden, aufgebaute Hautreinigungsmittel zur Verfügung.

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.

J. Welzel, **pH and Ions**, Biogeninering of the Skin: Methods and Instrumentation, CRC Press 1995

In the early part of the century skin pH was investigated using colorimetric methods. pH indication showed changes in different pH ranges. A large area of skin was required for the use of several indicators. A simplification of this method was the foil colorimetry in which indicator-impregnated sheets of adsorbing strips were placed on the skin with a drop of water.

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.

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).

S.R. Hartmann, H.Pietsch, G. Sauermann,R. Neubert, **Untersuchungen zur Hautverträglichkeit von alkoholischen Händedesinfektionsmitteln,** Dermatosen 42, 6, 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.

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.

R. Marks, C. Edwards, **Methods to aid the coice of shade from a range of colour disguise cosmetics, University of Wales** College of Medicine, 26 May 1993

The range of cosmetic camouflage products for major disfiguring skin conditions are well known, and are available in a wide range of shades. They require considerable skill and training for their blending and application which also needs a finishing layer of powder for best effect. These products are admirably suited to their use on major blemishes, but would be difficult to apply by a consumer at home for minor blemishes.

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.

A.M. Grunewald and 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.

G. Yosipovitch, E. Tur, O. Cohen, Y. Rusecki, **Skin Surface pH in Intertriginous Areas in NIDDM Patients,** Diabetes Care, Volume 16, No. 4, April 1993

We measured the skin surface pH and moisture in the axillary, inframammary, inguinal, and forearm skin with a pH meter with a flat-glass electrode and skin corneometer. The subjects were 50 NIDDM patients from the diabetic outpatient clinic at Bellinson Medical Center, Petah Tiquva, Israel, and 40 healthy control subjects from hospital personnel. The main outcome measures were skin surface pH, skin moisture, and skin culture for Candida.

G. Yosipovitch , E. Tur, G. Morduchowicz, G. Boner, **Skin surface pH, moisture, and pruritus in haemodialysis patients**, Nephrol Dial Transplant. 1993; 8(10): p. 1129-32

Pruritus is one of the most common complaints of haemodialysed patients. However, its pathogenesis remains unclear. Dryness of the skin and the effects of pH changes on the nerve endings in the skin have been suggested as related factors. In the present study we measured skin pH using a skin pH meter and skin moisture using a corneometer at four different sites in 41 haemodialysis patients, before and after dialysis, and in 40 healthy controls. Thirty patients (73%) complained of pruritus, six severe constant, 12 moderate and 12 mild. Skin surface pH was higher in patients than in controls in the upper back (5.54 +/- 0.14 versus 5.22 +/- 0.08, $P < 0.02$), forearm (5.5 +/- 0.1 versus 5.13 +/- 0.1, $P < 0.01$) and forehead (5.35 +/- 0.08 versus 5.04 +/- 0.07, $P < 0.004$), whereas there was no difference in the axilla. Haemodialysis had no effect on skin pH, and there was no correlation with blood pH, blood bicarbonate and serum electrolytes. There was no correlation between skin surface pH and pruritus. Skin moisture was lower in haemodialysis patients than in controls in the forehead and axilla. There was no correlation with pruritus. Skin surface pH is higher in haemodialysed patients than in healthy controls in most areas of the body, despite the fact that these patients have a decreased blood pH. Thus, the skin pH is not related to systemic acid-base balance. It is possible that the uraemic state affects the

ability of the dermal cells to secrete acid, making the skin more susceptible to bacterial and fungal infections.

D. Wilhelm, P. Elsner, H.I. Maibach, **Standardized Trauma (Tape Stripping) in Human Vulvar and Forearm Skin**, Acta Derm Venereol (Stockh) 1991; 71: 123-126

Mechanical trauma to genital skin may favor the transmission of sexually transmitted diseases. To study differences between vulvar and forearm skin in epidermal repair after standardized trauma, transepidermal water loss, capacitance and pH of forearm and vulvar skin in 10 healthy premenopausal women were monitored for 7 days after a standardized trauma induced by tape stripping to glistening. Vulvar and forearm skin showed similar responses immediately after tape stripping: a sudden increase in transepidermal water loss and capacitance. Forearm skin, however, reacted more intensely than vulvar skin; forearm skin readings remained significantly higher than normal values for 2 days after tape stripping, whereas vulvar skin readings were not significantly different from normal. Thus, vulvar skin did not respond as extensively as forearm skin, presumably because it is a less complete barrier against excess body water loss. On the other hand, vulvar skin seemed to recover faster from skin damage than forearm skin, probably because of its higher epidermal cell turnover.

A. del Pozo, *C. Cosa*, **Dispensacion dermofarmaceutica: Apoyo technologico al rol del Farmaceutico**, Departemento de farmacia, Unitad docente de Farmacia Galenica, Universidad de Barcelona, 1991

El concepto “dermofarmacia” resulta en ocasiones, poco preciso, resultando a veces difficil delimitar su contenido y ámbito de actuación en relación, por un lado, al de la “dermatologia”, y por estrictame el extremo opuesto, al dela “comotòlogia”.

Vittel continue d’innover: création d’un Espace Beauté et d’une Centre de Dermo-Cosmétologie, Vittel Magazine, N° 29, 1991

Sous la galene thermale à quelques pas griffon de la Grande Source dans le prolongement des Thermes dont la restructuration a été réalisée.

P. Elsner, *H.I. Maibach*, **AT-based Data Aquisition and Analysis System for the Skin Bioengineering Laboratory**, Dermatosen 39, Heft 4 1991

In recent years, bioengineering instruments have found wide application for the non-invasive evaluation of functional properties of human skin. These devices measure transepidermal water loss (evaporimetry), skin hydration (methods based on conduction, impedance, and capacitance), skin blood flow (laser Doppler velocimetry, photoplethysmography), friction (friction meter), and mechanical properties (e.g. twistometer, suction devices), and allow the investigator to generate considerable data which requires documentation and analysis. Although some instruments meanwhile offer interfaces for the transfer of data into personal computers, integrated data acquisition systems supporting the whole spectrum of instruments used in the laboratory are lacking. We have developed an inexpensive data acquisition and analysis system for our skin bioengineering laboratory which allows the acquisition of data from several instruments simultaneously or in sequence. The data are fed into a spreadsheet on a personal computer and conversions and basic statistics are computed automatically. The system consists of an AT-compatible PC with two serial interfaces and an analog-digital conversion board. The software is an industry-standard spreadsheet (Lotus 1-2-3) with an instrument set (Lotus Measure). Using this system, we considerably improved the precision of our measurements and the scientific productivity in our skin bioengineering laboratory.

W.O. Seiler, **Rückfettung: Balsam für die Altershaut**, Moderne Geriatrie, 03/91

Ältere Patienten schätzen oft Wasser und Seife wenig. Sie ahnen vielleicht besser als wir Ärtzte: Wasser, Scheuern und waschaktive Substanzen (Seife, Tenside) zur Hautreinigung entfernen die physiologischen Hautoberflächentenside.

E. Saling, **Vaginale pH-Messung gibt rechtzeitig Alarm**. Medical Tribune Nr. 9 – 03/90

Eine weitere Senkung der Sauglingssterblichkeit kann nur erreicht werden, wenn es gelingt, „die Katastrophe des Zu-friih-geboren-Werdens zu verhindern ' so Professor Dr. Erich Saling, Institut fur Perinatale Medizin der Universitat Berlin und Abteilung fur Geburtsmedizin der Frauenklinik Berlin-Neukolln, auf dem 14. Deutschen KongreS fiir Perinatale Medizin.

W. Gehring, *M. Gloor* **Die Bedeutung des pH-Wertes bei der Hautreinigung (The importance of the pH in skin cleansing),** Parfümerie + Kosmetik, 04/90

The irritant potential of the pH was determined according to morphological criteria by using frozen sections of human skin. In vivo the dehydrating effect on the cornea was analysed by means of corneometry and infrared spectroscopy after washing the skin with a surfactant solution adjusted to different pH values. No morphological changes were produced in the range of pH 4-pH 8. The least dehydration of the cornea was caused by surfactant solutions which were adjusted to an acidic pH.

P. Elsner, *H. Maibach*, **Ein PC/AT - gestütztes Datenerfassungssystem für das Hautphysiologielabor,** Workshop "Computer in der Dermatologie", 6.10.1989

Für die quantitative Untersuchung physiologischer Parameter des Hautorgans wurde eine Reihe nichtinvasiver Methoden entwickelt, die Anwendung v.a in der Dermatopharmakologie und der Dermatotoxikologie gefunden haben. Zu diesen Methoden zählen die Evaporimetrie zur Messung des transepidermalen Wasserverlustes, konduktive und kapazitative Verfahren zur Messung des epidermalen Wassergehaltes und die Messung der Hautdurchblutung mittels des Laser-Doppler-Verfahrens. Die Reproduzierbarkeit von Evaporimeter- und Laser-Doppler-Messungen wird durch dynamische Veränderungen der Meßgrößen beeinträchtigt. Ferner fallen bei experimentellen Studien mit den genannten Geräten erhebliche Datenmengen an, deren manuelle Erfassung unökonomisch ist. Wir haben daher ein Datenerfassungssystem emtwickelt, mit dem die Meßwerte von Hautoberflächen-Thermistor, Evaporimeter, Kapazitometer, pH-Meter und Laser-Doppler direkt in ein Spreadsheet auf einem PC eingelesen und sofort statistisch ausgewertet werden können. Hardwareseitig besteht das System aus einem AT-kompatiblen Computer mit 2 seriellen Schnittstellen und einem Metrabyte DAS-16-A/D-Board, das die simultane Erfassung von bis zu 16 Datenkanälen erlaubt. An Software werden Lotus 1-2-3 und Lotus Measure eingesetzt. Der Aufbau des Systems und Einsatzmöglichkeiten werden erläutert.

G. Neumann, H-P. Harke, **New Aspects for then use of antiseptics in gynecology and obstetrics**, Practice of Gynecology and Obtetrics, Hamburg & Schülke & Mayr, Norderstedt

The vaginal microflora represents an etiologically essential factor for the incidence of very different infectuos complications.

K. Klein, H.-W. Voss, M. Voss, **Untersuchungen zur Oberflächencharakteristik der menschlichen Haut – Teil 1**, Umwelt & Gesundheit aktuell

In der Kosmetik begnügt man sich häufig bei der Beurteilung des Charakters der menschlichen Haut bzw. der Zuordnung zu bestimmten Hauttypen zumeist nur mit einer (subjektiven) visuellen Begutachtung.

U. Zeidler, **Einfluß des pH-Werts von Körperreinigungsmitteln auf die Hautquellung,** Forschung Klinik Praxis, 1989

The epidermis, especially the horny layer, frequently comes into contact with cosmetic cleansing agents containing surfactants. Interactions are characterized among other things by swelling processes. Swelling was investigated on isolated pig epidermis which had been treated with different surfactants at varying pH-values. With increasing pH-value, anionic surfactants increased epidermal swelling, whereas it decreased by treatment with cationic surfactants. Amphoteric surfactants increased swelling in both acid and basic solution and formed a minimum in the neutral range. The degree of ethoxylation, the chain lengh and the type of anionic group changed the swelling behaviour characteristically at varying pH value. The results obtained show that swelling, as an osmotic process, is primarily attributable to ionic interactions between the surfactant ions and the amphoteric protein structure, but it is also influenced by hydrophobic interactions. Increased swelling of the superficial skin layer can favor the extraction of lipids and moisturizing factors, thereby promoting dryness and roughness of the skin. Therefore, the knowledge of the swelling behaviour can contribute to the development of improved cleansing agents leading to minimal swelling.

M. Gehse, **pH-Wert der jungen und der reifen Haut und seine Beeinflussung durch waschaktive Substanzen,** Kosmetik International 08/89

Der mittlere pH-Wert der Haut liegt zwischen pH 5.4 – 5.9. Aufgrund der großen Schwankungen zwischen den einzelnen Körperregionen, bezieht man sich hier auf die Beuge der Unterarme.

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, 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.

Zlotogorski, **Distribution of skin surface pH on the forehead and cheek of adults,** Arch Derm Res, 1987

The skin surface pH on the forehead and cheek of 574 men and women aged 18/95 was measured. No differences were found between men and women regarding forehead and cheek pH distribution. The group over the age of 80 showed higher pH values on both the forehead and the cheek. In 89% of the subjects measured, the skin surface pH on the cheek was higher than on the forehead. The central 90%, i.e., the "representative range", for the population below the age of 80 is between 4.0 - 5.5 on the forehead and between 4.2 - 5.9 on the cheek.

H.C. Korting, A. Bau, P. Baldauf, **pH-Abhängigkeit des Wachstumsverhaltens von Staphylococcus aureus und Propionibacterium acnes,** Ärztliche Kosmetologie, 01/02/1987

Five different cutaneous isolates of staphylococcus aureus and seven of propionibacterium acnes were investigated in a buffered liquid medium with respects to the dependence of their growth on different pH-values kept constant. With both species a strong dependence of the growth rate on the pH-value was found. The S. aureus strains showed a distinct value of optimum of growth at pH 7.5 with P. acnes a range of optimum growth could be determined between pH 6.0 and 6.5. The conclusion can be drawn that even minor shifts of the skin pH from its normal value of 5.5 towards more alkaline values- as they result from washings with soaps- remarkably enhance the growth of P. acnes while a similar phenomenon could only be expected from major shifts with respects to S. aureus.

S. Dikstein, **Instrumental Analysis in Individual Cosmetic Consultation,** Cosmetics & Toiletries, Vol. 98, Nov. 1983

Satisfaction from the the medical service is a complex phenomenon involving the art of skin care (i.e., skill of the provider), assessibility (convenience), cost, the physical environment in which the care is given, availability, continuity, and last but not least, the efficacy of the care.

S. Dikstein, **The normal range of the skin's parameters**

In order to define the normal values of any measurement, we have to study its variation in the population according to age, sex, etc. We wish to present the normal biological variation and the age dependency of the following parameters on the forehead skin of women: Indentation, as measured by low-pressure indentometry; Elastic recovery (rebound), as measured by low-pressure indentometry; Skin slackness, as measured by levarometry, and Skin surface pH, as measured a by pH meter equipped with a planar surface electrode. Statistical analysis showed age dependence of these parameters. The mean values at the ages of 20 and 70, were respectively; low pressure indentation: 0.043-0.054 cm, elastic recovery: 80.5%;-65.5%; levarometry (slackness). 0.037-0.068 cm; and skin surface pH: 5.25-5.61. The correlation coefficient was low but significant at $p<0.05$ for indentometry, elastic recovery and skin surface pH (0.21- 0.32-0.16) and good for levarometry (0.57). The above measurements and calculations allowed us to decide on the "normal" versus "desired" range. In analogy, for an antipyretic drug we need to know at what body temperature to start using it and what the desired normal temperature is. Such analysis is very important if we wish to develop skin care products with scientifically proven value to combat aging aspects of the skin.

H. Tronnier, **Meßmethoden zur Prüfung kosmetischer Präparate und Grundstoffe,** Parfümerie + Kosmetik 61, 1980, p. 421 - 433

Unsere Kenntnisse über Reaktionsabläufe in der menschlichen Haut, insbesondere auch über die, die Schutz- und Abwehrfunktionen des Hautorgans bedingen, sind dem Dermatologen zum Teil aus pathologischen Störungen, also dermatologischen Krankheitsbildern, geläufig.

H. Tronnier, H. Kuhn-Bussius, **Zur Brauchbarkeit optischer Methoden für die Bestimmung des Hautoberflächenfettes,** Hautklinik Dortmund, Kosmetologie 06/1974

Im Rahmen hautphysiologischer Untersuchungen und bei der Überprüfung therapeutischer und kosmetischer Anwendungen wird mit unterschiedlichen Methoden versucht, den Lipidgehalt der Haut zu bestimmen.