

## Literature List Sebumeter®

*P.M.B.G Maia Campos, L. Nakamura, M. Isnard, Association of Licorice Extract, Vitamins B3 and B5 in a cosmetic formulation for skin oiliness control: clinical efficacy, texture and sensory properties*, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Skin oiliness is a condition characterized for the increase of sebaceous glands and influenced by factors such as age, gender, ethnicity, diet and climate. This condition gives a greasy appearance to the skin and negatively affects self esteem, mainly in women. For this reason, the development of effective formulations for skin oiliness control has been a challenge in the cosmetic area. Licorice (*Glycyrrhiza*) extract has a rich composition of licochalcone that helps to control sebaceous glands secretion. Vitamin B3 (Niacinamide) has been used in cosmetics for the hyperpigmentation treatment but also demonstrated an anti-inflammatory effect.

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

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

*J.-H. Shin, J.H. Park, H.-K. Lee, The pattern of skin properties as distinctive facial area*, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Chronically and environmentally stimulated skin turns its appearance. The skin mechanical properties are able to be evaluated through measurement devices such as Primos, Antera 3D CS, Corneometer® CM825, Sebumeter® SM815 and Spectrophotometer CM-700d. Primos is a three-dimensional skin-surface measurement device that uses fringe projection to assess skin topography and can visualize skin texture and wrinkle on the skin surface. Antera takes a photograph for skin topography and color-related skin chromophores and is more sensitive for wrinkle measurement.

*C. Messaraa, R. Thibault, D. McNamee, S. Hurley, L. Doyle, A. Mansfield, Exploratory investigation on the characteristics of Mexican Women’s skin*, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Mexico population stems from a rich mosaic of various ethnic background and ancestries. In skin research, its population has been captured under several terms, some of them not always adequate. “Hispanics” for instance, rather define people of Spanish descendant. “Latin Americans” applies to persons or communities of Latin American geographic origin, which have a heterogeneous ancestry. “Latino”, a shortened term from Spanish “Latino Americano” is applied for both people living in the U.S. who are of Latin American origin and their U.S.-born descendant.

*Y. Ye, Y. Li, A. Liu, L. Jiang, Improvement of conspicuous skin pores with a serum containing supramolecular retinol, pyridoxine, salicyloyl phytosphingosine and lactobionic acid*, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Conspicuous skin pores generate many aesthetic concerns or complaints. Despite the prevalence of conspicuous skin pores, there have been few published articles of topical cosmetics treatment to improve the appearance of conspicuous pores. Generally, pores are considered as conspicuous pores when the opening becomes visible to the naked eye and the facial appearance is compromised.

*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- $\beta$ -cyclodextrin (HP- $\beta$ -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, Aquaflex 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- $\beta$ -CD.

*H. Rajaiah Yogesh, T. Gajjar, N. Patel, R. Kumawat, **Clinical study to assess efficacy and safety of Purifying Neem Face Wash in prevention and reduction of acne in healthy adults**, J Cosmet Dermatol. 2021 Sep 30*

**Background:** Acne vulgaris is a chronic, inflammatory skin condition of pilosebaceous units. The standard treatment involves topical and oral antibiotics, retinoids, benzoyl peroxide, and other synthetic compounds, mostly associated with adverse effects. Hence, herbal skincare products are considered nowadays. **Aim:** To evaluate the safety and efficacy of Purifying Neem Face Wash (PNFW), an herbal skincare product in the prevention and/or reduction of mild-to-moderate acne. **Methods:** An open-label, single-center, single-arm, four-week clinical study was conducted with subjects having either mild-to-moderate acne or oily skin and non-existent acne. The performance of PNFW in the reduction and/or prevention of acne was detected by counting cutaneous inflammatory and non-inflammatory acne lesions in each of the four visits. Sebum level and skin hydration of both cheeks were measured via sebumeter and corneometer, respectively. Self-assessment questionnaires were used to assess the subjects' responses toward PNFW. **Results:** Out of 120 study subjects, 79% and 72% showed either reduction or no new appearance of inflammatory and non-inflammatory acne lesions, respectively, from baseline to Visits 3 and 4. Skin sebum level and skin hydration showed a statistically significant decrease ( $p < 0.001$ ) and increase ( $p < 0.001$ ), respectively, in Visits 3 and 4. Self-assessment surveys showed the satisfaction of the subjects about the product in terms of condition improvement, ease in use, and fragrance. **Conclusion:** The present study indicated the beneficial effect of the herbal ingredients (neem and turmeric) of Himalaya's PNFW in the prevention and reduction of mild-to-moderate acne with no side effects.

*J. Kim, J. Kim, Y.I. Lee, J. Suk, D. Lee, J.H. Lee, **A pilot study evaluating the efficacy and safety of retinaldehyde-loaded niosomes against mild-to-moderate acne**, J Cosmet Dermatol, 2021 Sep 29*

**Background:** Retinoids are the mainstay of topical therapy for acne. To improve the efficacy and minimize the side effects of retinoids, various novel drug delivery mechanisms, including nanoparticles, have been developed. **Aim:** To evaluate the efficacy and safety of a retinaldehyde-loaded niosome (RA-N) nanoemulsion against sebum secretion and keratinization on mild-to-moderate acne. **Patients/methods:** Twenty-three participants exhibiting mild-to-moderate acne with both closed and open comedones were included. They applied a 0.05% RA-N nanoemulsion daily for 4 weeks, did not to use any other emollient or topical pharmaceutical, and were asked to report any symptoms and treatment satisfaction. **Results:** The participants demonstrated significantly fewer closed and open comedones after 2 and 4 weeks of treatment than at baseline ( $*p < 0.05$ ). The mean sebum secretion, measured using Sebumeter®, was  $327.95 \pm 90.20 \mu\text{g cm}^{-2}$  at baseline and reduced to  $282.60 \pm 99.70$  and  $250.65 \pm 97.6 \mu\text{g cm}^{-2}$ , respectively, after 2 and 4 weeks of treatment ( $*p < 0.05$ ). The mean desquamation index, determined using Visioscan®, was  $10.99 \pm 1.69$  at baseline and decreased to  $9.81 \pm 1.10$  and  $8.89 \pm 1.32$ , respectively, after 2 and 4 weeks of treatment ( $*p < 0.05$ ). The application of the RA-N nanoemulsion resulted in a significantly lower desquamation level, suggesting that the RA-N nanoemulsion was well-tolerated without any skin irritation. None of the participants reported a serious adverse event during this study. **Conclusion:** Our findings suggest that the RA-N nanoemulsion was effective in improving comedones in acne-prone skin and safe for long-term application. Further studies are necessary to investigate the long-term effects of the application of the RA-N nanoemulsion in participants with inflammatory acne and acne scars.

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

The male grooming industry is growing at a rapid pace. Entire aisles of drug stores are dedicated

to men's grooming products. Product demand in the skin care, hair care, and fragrance industries has grown dramatically and is expected to keep pace in the coming years. Whether this growth stems from celebrity advertising or social media influence, one thing is clear: men have come a long way from the days of merely using a soap bar as face and body wash. The modern man stands ready and willing to invest in skin and hair products that maintain their health and youth. Globe News Wire reports the men's grooming market worldwide will reach \$183.2 Billion by 2027, with the U.S. market alone estimated at \$38 Billion, and China Forecast to grow at 6.9%.<sup>1</sup> As men continue to open their wallets for new and improved grooming products, brands catering to this market are stepping up to meet those needs by expanding offerings to include anti-ageing, SPF and antiacne products. Customisation of products is proving equally important, such as specialized regimens for every combination of skin and hair.

A. Gripp, C. Abbastante, B. Kernick, **Sulfidal Colloidal™ Sulfur, a mild and effective choice for the treatment of acne and rosacea**, *Cosmetic & Toiletries*, August 2021

Acne is a skin condition affecting up to fifty million Americans per year and more than 90% of the world's population at some time in life. Acne can appear on various areas on the body and when visible on the face it can be difficult to mask.

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

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

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. Puscion-Jakubik, R. Markiewicz-Zukowska, S.K. Naliwajko, K.J. Gromkowska-Kepka, J. Moskwa, M. Grabia, A. Mielech, J. Bielecka, E. Karpinska, K. Mielcarek, P. Nowakowski, K. Socha, **Intake of Antioxidant Vitamins and Minerals in Relation to Body Composition, Skin Hydration and Lubrication in Young Women**, *Antioxidants* 2021, 10, 1110

The aim of this study was to estimate the consumption of selected dietary components with antioxidant properties, undertake body composition analysis, assess skin hydration and lubrication, and

establish the relationships between the above parameters. The study was carried out on 172 young women. The consumption of ingredients (vitamins A, C, D and E, and Cu, Mn, Zn) was assessed using the Diet 6.0 program, body composition was assessed using electrical bioimpedance and skin hydration and lubrication were assessed using the corneometric and sebumetric methods, respectively. About one-third of students showed insufficient consumption of vitamin C, vitamin E and zinc, while about 99% showed insufficient vitamin D levels. The highest degree of hydration was observed in the areas of the eyelids, neckline and chin. The greatest amount of sebum was found in the area of the nose and forehead. Low positive correlations between hydration or lubrication and Cu, vitamin A and vitamin E were observed. In conclusion, to properly moisturize and lubricate the skin, young women should eat products that are rich in ingredients with antioxidant properties, in particular fat-soluble vitamins A and E, but also copper.

*S.-R. Park, J. Han, Y.M. Yeon, N.Y. Kang, E. Kim, Effect of face mask on skin characteristics changes during the COVID-19 pandemic, Skin Research & Technology, Volume 27, Issue 4, July 2021, p. 554-559*

**Background:** Previous studies have demonstrated the possibility of adverse effects of prolonged wearing of personal protective equipment in healthcare workers. However, there are a few studies about the effects on skin characteristics after wearing a mask for non-healthcare workers. In this study, we evaluated the dermatologic effects of wearing a mask on the skin over time. **Materials and Method:** Twenty-one healthy men and women participated in the study. All participants wore masks for 6 hours consecutively. Three measurements were taken (a) before wearing the mask, (b) after wearing the mask for 1 hour, and (c) after wearing the mask for 6 hours. Skin temperature, skin redness, sebum secretion, skin hydration, trans-epidermal water loss, and skin elasticity were measured. **Results:** The skin temperature, redness, hydration, and sebum secretion were changed significantly after 1 and 6 hours of wearing a mask. Skin temperature, redness, and hydration showed significant differences between the mask-wearing area and the non-mask-wearing area. **Conclusion:** Mask-wearing conditions and time can change several skin characteristics. In particular, it is revealed that the perioral area could be most affected.

*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  $25 \pm 4.87$  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 of allergy, infant's sex, birth weight (kg), and delivery mode. Odds ratios (ORs)

and 95% confidence 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 first six postnatal months. Sex differences were significant 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 significantly 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.

*B.C. Sikora, M. Wortzman, D.B. Nelson, J.S. Dover, A pilot study evaluating the efficacy and tolerability of a comprehensive, hydrating topical antioxidant developed specifically for men, J Cosmet Dermatol. 2021; 20: p. 2816–2823*

Introduction: There is growing interest in skincare products designed for men. This pilot study evaluated the efficacy and tolerability of a comprehensive antioxidant product in men. Methods: This 12-week study evaluated improvements from baseline in erythema, lines/wrinkles, skin tone, texture, brightness, dryness/flaking and pores (6-point scale), global improvements (5-point scale), and sebum levels following daily application in males with mild to moderate photodamaged skin. Subject self-assessments and adverse events (AEs) were captured. Results: Twenty-two subjects completed the study. Early mean percent improvements from baseline were demonstrated in all categories at week 4 with visible improvements in skin tone (29%;  $p = .0001$ ) and pores (28%;  $p < .0001$ ). Reductions in skin surface sebum levels (forehead region) from baseline were demonstrated at 8 ( $p < .0001$ ) and 12 ( $p < .0003$ ) weeks. Ninety-six percent of subjects reported overall visible improvement of their skin and that the study product calmed/soothed skin, reducing redness and irritation after shaving. One subject reported mild dryness. Conclusion: Once daily application of a comprehensive topical antioxidant designed for men led to significant improvements in skin appearance, substantial reductions in skin surface sebum levels, and was well tolerated with a high level of subject satisfaction over 12 weeks.

*N. Sampattavanich, N. Chandayani, J. Intarasupht, A. Nakakes, An in vivo study to evaluate the influence of oil blotting paper on the efficacy of sunscreen, Photodermatol Photoimmunol Photomed, 2021 Jul;37(4): p. 324-328*

Background: Ultraviolet radiation (UVR) is a major cause of photoaging and photocarcinogenesis. An appropriate application of sunscreen can effectively protect UV damage but cause unpleasant skin oiliness. Oil blotting paper is commonly used to reduce oiliness in some parts of the world although its influence on the efficacy of sunscreen has not been carefully investigated. Objective: To evaluate the efficacy of sunscreen after applying oil blotting paper. Materials and methods: Measurement of oiliness and sunscreen efficacy was compared before and after the use of oil blotting paper in 11 healthy volunteers, 10 females, and 1 male. Specifically, 3 zones on each subject's back were exposed to UVR from a solar simulator, that is, 1) no sunscreen, 2) sunscreen (organic sunscreen at 2 mg/cm<sup>2</sup> SPF 30) left on for 30 minutes, and 3) sunscreen left on for 30 minutes followed by application of oil blotting paper. Skin oiliness was also compared before and after oil blotting using a sebumeter. All areas were phototested for the comparison of the minimal erythema dose (MED) and sun protection factor (SPF). Results: The averaged MED of our subjects is 4.3 standard erythema doses (SED) in the unprotected area. The averaged MED was decreased after oil blotting from 89.8 SED to 59.8 SED. The SPF was also decreased from 20.70 to 13.99. Conclusions: Application of oil blotting paper significantly reduces the efficacy of organic sunscreen.

*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.

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

Background: The human skin is greatly affected by external factors such as UV radiation (UVR), ambient temperature (T), and air humidity. These factors oscillate during the year giving rise to the seasonal variations in the skin properties. The aim of this study was to evaluate the effect of seasons, environmental T, relative and absolute humidity on the skin parameters of Caucasian women, perform

a literature review and discuss the possible factors lying behind the found changes. **Materials and Methods:** We measured stratum corneum (SC) hydration, transepidermal water loss (TEWL), sebum level, erythema index, and elasticity parameters R2 and R7 on the forehead and the cheek of Caucasian women from the Czech Republic throughout the year. We also performed a non-systematic literature review focused on the seasonal variations in these skin parameters. **Results:** We confirmed a well-documented low SC hydration and sebum production in winter. In spring, we found the lowest TEWL (on the forehead) and the highest SC hydration but also the highest erythema index and the lowest elasticity presumably indicating skin photodamage. For most of the skin parameters, the seasonal variations probably arise due to a complex action of different factors as we extensively discussed. **Conclusion:** The data about the seasonal variations in the skin parameters are still highly inconsistent and further studies are needed for better understanding of the normal skin changes throughout the year.

*J.P. Santos-Caetano, R. Vila, Can pigments in multifunctional cosmetic formulations affect sebumetry evaluation?*, *Skin Research & Technology*, Volume 27, Issue 3, May 2021, p. 464-465

Multifunctional cosmetic products are increasingly popular among time-poor consumers, with new preparations addressing multiple needs (eg for sunscreen, primer, moisturiser, skin treatment, concealer and foundation) in one product.<sup>1</sup> Whereas sun protection factor (SPF) products are oily by nature, other cosmetic ingredients can reduce oiliness. New formulations should be evaluated for their effect on skin oiliness, as excess oiliness can affect the skin's cosmetic appearance.

*A. Pappas, A Look at Lipids - Profiles Across Ethnicity and Age, A Review*, *Cosmetics & Toiletries*, May 2021, p. 34-41

Skin lipids, including those of both sebaceous and keratinocyte origin, cover the surface of skin. Their apparent composition varies and is subject to the chosen method of sampling. Lipids produced by the epidermal cells are a mixture of long chain ceramides, free fatty acids and cholesterol. They represent a minor fraction of the total extractable surface lipids on areas rich in sebaceous glands. Lipids of epidermal origin seal the stratified corneocytes on the stratum corneum in a relationship similar to the "mortar" in the brick-and-mortar skin structure model. Sebaceous lipids, on the other hand, are mainly non-polar triglycerides, wax esters and squalene. They are secreted as sebum due to the holocrine activity of the sebaceous gland and eventually released to the top of the skin, where they coat the surface, as well as hair shafts. The composition of sebaceous lipids is exceptional - e.g., sapienic acid and its metabolites plus the wax esters - and rather intriguing because they are not found anywhere else in the human body. Furthermore, elevated sebum excretion is a major factor involved in the pathophysiology of acne.

*A. Samadi, S. Ahmad Nasrollahi, M. Nateghi Rostami, Z. Rezaghali, 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.

*P. Orzol, I. Doleckova, J. Starigazdova, G. Huerta-Angeles, V. Velebny, Safe and strategic – Hyaluronic and retinoic acid derivate allays aging and acne*, *Cosmetics & Toiletries*, April 2021, p. 61-70

Retinoids are a group of active molecules comprising vitamin A and its natural and synthetic derivatives. Commonly used in cosmetic products, these lipophilic molecules bind to specific nuclear

receptors that modulate the expression of genes involved in cellular proliferation and differentiation, e.g., of keratinocytes, which can normalize desquamation. The topical application of retinoic acid, for one, has been shown to improve clinical features of aged skin by reducing wrinkles and diminishing hyperpigmentation.

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

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

*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.

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

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

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

*M. Majeed, L. Mundkur, S. Majeed, LactoSporin® - A Dream Solution for Acne free Smooth Skin, EURO COSMETICS, 1/2-2021, p. 24-25*

Acne is the most common exasperating skin condition in teenagers and young adults, causing emotional distress. It is characterized by excessive sebum production, inflammation, keratinization of follicles, and overgrowth of the bacteria *Cutibacterium acnes*. Despite being one of the most widespread skin problems, and a hot research topic, the development of new therapeutic agents is still sluggish. Conventional agents like antibiotics, benzoyl peroxide, and retinol can cause antibiotic resistance, skin barrier disruption, leading to dryness and irritation. New treatment options targeting multiple pathologies by calming inflammation, maintaining skin moisture and barrier function along with preserving the skin microbiome with minimal side effects are essential for treating acne.

*E. Öksüm Solak, G. Emel Gökçek, D. Kartal, N. Kalay, S. Levent Çınar, 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.

*J.-Y. Park, S.I. Cho, K. Hur, D.H. Lee, Intradermal Microdroplet Injection of Diluted Incobotulinumtoxin-A for Sebum Control, Face Lifting, and Pore Size Improvement, J Drugs Dermatol Actions, 2021 Jan 1;20(1): p. 49-54*

Background: Intradermal injections of botulinum toxin have been reported to improve sebum secretion, facial skin laxity, and facial pores. However, the effects of Incobotulinumtoxin-A for these indications have not been reported. Objective: To evaluate the efficacy of Incobotulinumtoxin-A for the improvement of sebum secretion, face laxity, and facial pores. Materials and methods: This single-center retrospective study included patients treated with Incobotulinumtoxin-A to improve facial skin laxity, sebum secretion, and facial pores. The microdroplet injection protocol included injection points on the lateral face, anterior medial cheek, mandibular line, depressor anguli oris points, mid-glabella area, and chin. Outcomes were measured using a Sebumeter and three-dimensional scanner and were evaluated by facial laxity ratings and the Global Aesthetic Improvement Scale. Results: Twenty patients were included in the analysis. Sebum secretion, mandibular length, facial pores, and facial laxity ratings were improved at 1 week and results were sustained through 12 weeks. All outcomes showed maximum improvement after 4 weeks. Evaluation using the Global Aesthetic Improvement Scale showed that all subjects reported at least a score of 2 (improved) after 4 weeks. Conclusion: This study showed that intradermal injection with Incobotulinumtoxin-A could be effective for face lifting, reduced sebum production, and improved facial pores.

*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 fizycznie i umysłowo – i wyglądają młodziej – niż kiedyś?

*J.N. Li, S.M. Henning, G. Thames, O. Bari, P.T. Tran, C.-H. Tseng, D. Heber, J. Kim, Z. Li, Almond*

**consumption increased UVB resistance in healthy Asian women**, J Cosmet Dermatol. 2021;20, p. 2975–2980

Background: Almonds are a rich source of phenolic and polyphenolic compounds, which have antioxidant activity. In vitro and in vivo studies have demonstrated that topical application of almond oil and almond skin extract reduces UVB-induced photoaging. Ultraviolet-B (UVB) protection by oral almond consumption has not been previously studied in humans. Objectives: To investigate whether oral almond consumption can increase resistance to UVB radiation and reduce skin aging in healthy Asian women. Methods: Thirty-nine female participants (18-45 years) with Fitzpatrick skin type II-IV were randomly assigned to consume either 1.5 oz of almonds or 1.8 oz of pretzels daily for 12 weeks. Minimal erythema dose (MED) was determined using a standardized protocol, which determined the minimal radiation needed to induce erythema on the inner arm following UVB exposure. Facial skin texture was evaluated by two dermatologists using the Clinician's Erythema Assessment scale and Allergan Roughness scale. Facial melanin index, hydration, sebum, and erythema were determined using a cutometer. Results: The MED was increased in the subjects consuming almonds compared to the control group consuming pretzels. There were no differences noted between the groups consuming almonds versus pretzels in Allergan roughness, melanin, hydration, or sebum on facial skin. Conclusions: Our findings suggest that daily oral almond consumption may lead to enhanced protection from UV photodamage by increasing the MED.

*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.

*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 this study 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.B. Erdur, F. Öktem, E. inci, H.M. Yener, E.D. Gözen, A.Ö. Birben, S. Bayazit, B. Engin, Effect of Nasal Skin Type on Skin Problems following Rhinoplasty*, Facial Plast Surg, 2020 Oct;36(5): p. 643-649

Skin problems following rhinoplasty may cause dissatisfaction concerning the esthetic expectations of the patients. This study was conducted to determine whether nasal skin type has an effect on skin problems after rhinoplasty. Thirty-five patients undergoing rhinoplasty in our tertiary referral center between May 2018 and August 2019 were included in the study. The nasal skin sebum level was measured with Sebumeter preoperatively and patients were divided into two groups according to the median sebum level. Among the 35 patients, half of them with higher nasal skin sebum were categorized as oily skin group ( $n = 17$ ; 14 males, 3 females; mean sebum level:  $200.3 \pm 26.9$ ), and the

other half were categorized as dry skin group ( $n = 18$ ; 10 males, 8 females; mean sebum level:  $101.9 \pm 38$ ). Periorbital edema and ecchymosis were assessed at postoperative days 1, 3, and 7. Acne and seborrhea severity determined with Global Acne Grading System and Seborrheic Dermatitis Area Severity Index the day before operation and postoperative days 7 and 14 and months 1, 3, and 10. Compared with dry skin group, upper eyelid ecchymosis score at postoperative day 7 was statistically higher in oily skin group ( $p = 0.044$ ). There was no significant difference in upper eyelid edema scores between postoperative days 1 and 3 for oily skin group ( $p = 0.020$ ). No statistically significant differences were found for acne and seborrhea severity. Nasal skin sebum levels may affect periorbital edema and ecchymosis after the procedure but no significant effect has been observed for acne and seborrhea. Predicting the effect of nasal skin types on these problems may help the surgeon to inform patients more correctly.

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

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

*H. van der Hoeven, H. Prade, Catering to the skin of Generation Z, PERSONAL CARE ASIA PACIFIC, September 2020*

Gen Z'ers range roughly between early puberty and 25 years of age, born between 1995 and 2007. They are an interesting and important demographic group, because they behave rather differently from older generations. They are described as "activists" with strong opinions and high demands. They are extremely engaged with the environment, for instance. They experience high rates of anxiety and depression, seemingly higher than other generations. A potentially important reason for this is that the cultural stigma that may have kept earlier generations from openly discussing and seeking help for mental health challenges appears to be much less of an issue for Generation Z. Gen Z'ers are much more willing to talk openly about their problems.

*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 than 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.

*N. Tangkijngamvong, P. Phaiyarin, S. Wanichwecharungruang, C. Kumtornrut, The anti-sebum property of chitosan particles, J Cosm Dermatol, August 2020*

Background: Seborrhea is linked to several medical and mental conditions. Although it is common, effective agents and the standardized sebum level for seborrhea are not elucidated. Aims: To determine the efficacy of chitosan particles (CP) formulation on controlling sebum secretion, its extended effects on skin redness and texture after combining with proretinal nanoparticles (CP-PRN), and a correlation of the clinical grading with sebum levels that affect mental health. Patients/methods: A four-week clinical trial with forty subjects was conducted. Subjects applied either CP formulation or CP-PRN during nighttime. Objective measurements including sebum levels, transepidermal water loss (TEWL), skin corneometry, skin redness, and texture were analyzed. Subjects completed a self-assessment clinical grading of skin oiliness at every visit. Results: Both CP and CP-PRN significantly decreased sebum levels ( $P \leq .01$ ) at week 4 compared to baseline. CP also resulted in significant decreases in TEWL ( $P \leq .05$ ) and skin corneometry ( $P \leq .05$ ) throughout the study. A significant improvement in skin redness was observed with CP-PRN ( $P \leq .01$ ). A moderate correlation between the clinical grading and sebum levels was detected (coefficient of 0.5,  $P \leq .001$ ), with a sebum level of 106  $\mu\text{g cm}$  indicating emotional discomfort. One subject experienced local irritation with the CP-PRN. Mild pruritic symptoms were reported in both groups. Conclusions: Chitosan particles exhibited an interesting anti-sebum effect. It could be combined with PRN to extend benefits without losing the sebum controlling effect. The clinical grading may be useful in practice due to a modest correlation with sebum levels.

*E. Zareie , P. Mansouri , H. Hosseini , O. Sadeghpour , L. Shirbeigi , S. Hejazi , M. Emtiazy, Effect of oral administration of Triphala, a polyphenol-rich prebiotic, on scalp sebum in patients with scalp seborrhea: A Randomized Clinical Trial, J Dermatol Treat, Jul 2020*

Background: Although there are various therapeutic options to control oily skin, they have potential side effects and limitations especially in long-term use. Pre/probiotics may have beneficial effects in atopic dermatitis' acne, dandruff, and seborrhea, demonstrated by some clinical trials. This trial conducted to determine whether herbal prebiotic Triphala is effective in reducing scalp sebum secretion in patients with scalp seborrhea. Methods: In this 8 week patient and outcome assessor-blinded, placebo-controlled trial participants with scalp seborrhea aged 14-50 years were randomized to Triphala or placebo groups. 1 g of Triphala (standardized as  $91.82 \pm 0.5$  mg gallic acid) or placebo (wheat flour) were administered BID. Scalp sebum levels were detected objectively using Sebumeter® sm 815, and treatment satisfaction was measured using a score between 0 and 100. [Registration no. IRCT2014070218332N1]. Results: Eighty patients completed the study (40 in Triphala group and 40 in placebo group). Participants in the Triphala group experienced 25.34 scores (95% CI, 0.39-50.29:  $P = 0.047$ ) more improvement in scalp sebum levels compared with the placebo group. The mean percentage of patients' satisfaction was 37.91 (24.88) in the Triphala group and 17.89 (25.80) in the placebo group ( $P = 0.001$ ). Conclusion: Herbal prebiotic Triphala significantly reduced scalp sebum scores compared to placebo.

*W. Arshad, H.M. Shoaib Khan, N. Akhtar, M. Nawaz, Assessment of changes in biophysical parameters by dermocosmetic emulgel loaded with Cinnamomum tamala extract: A split-faced and placebo-controlled study, J Cosmet Dermatol, 2020 Jul;19(7): p. 1667-1675*

Background: Phenolic and flavonoid compounds found in plants alleviate the photo-damaging skin conditions by playing a major role in skin rejuvenation. Aims: The aim of the study was to explore the cosmeceutical effects of Cinnamomum tamala extract. Objective: Recent research was aimed to quantify phenols and flavonoids in the natural extract of C tamala leaves, to develop its phyto-cosmetic emulgel and to assess effects of emulgel on healthy human skin. Method: Phenols and flavonoids in C tamala (CT) extract were quantified by using ELISA assay. Emulgel formulation loaded with 4% C tamala (CT emulgel) was developed, and its cosmetic effects were evaluated on the cheeks of 13 healthy female test volunteers by comparing with placebo (base). Facial parameters including melanin, erythema, sebum, and visible facial pores (size and area) were studied by using Mexameter, Sebumeter, and VisioFace at regular interval for 90 days. Results: Total phenolic content and total flavonoids content of C tamala leaves extract were found to be  $73.08 \pm 0.0078$  mg GAE/g and  $52.63 \pm 0.0060$  mg QE/g CT extract respectively. As compared to placebo (base), CT emulgel was found to be significantly ( $P \leq .05$ ) effective in minimizing skin photo-damaging effects by reducing the levels of melanin, erythema, and sebum and size and count of both fine and large facial pores. Conclusion: Cinnamomum tamala leaves extract, being a rich source of phenols and flavonoids minimized the photo-damaging effects by reducing skin melanin, erythema, and excess sebum; improving the skin imperfections by reducing facial pore count and area as assessed by advanced imaging and bioengineering techniques.

**Moderne Hautanalyse - Die ungeschminkte Wahrheit, Fit for Fun, Juli 2020**

Ein geschultes Auge sieht der Haut auf Anhieb das Wichtigste an – aber nicht alles. Präzise Informationen über den Hautzustand liefern diese fünf technischen Geräte.

*S. Eisenberg, N. Beyer, J. zur Lage, A. Moschner, H. Driller, Regulator for oily skin and balance of skin's microflora*

In modern life, image matters and consumers around the world have become aware of their appearance. Oily skin is a major issue to some because it affects those areas that are most vulnerable and exposed, like the chin, forehead and nose. Additionally, oily and impure skin causes a real aesthetic problem as it may lead to a higher susceptibility of acne development. Alterations in the pilosebaceous unit, an association of sebaceous glands and hair follicles, are involved in acne development. Causes are increased sebum excretion, induced by e.g. stress and hormonal changes, colonization of the hair follicle by *Propionibacterium acnes*, alterations of lipid composition and its oxidization, and the release of inflammatory mediators into the skin. The skin is a complex ecosystem on its own, about 1.8m<sup>2</sup> in size, providing diverse habitats for a wide range of microorganisms. A balanced microbiota is usually related to healthier skin. Disruptions in microbial populations, therefore, can be linked to cutaneous pathological states such as acne and atopic dermatitis. Modulating unbalanced populations and their interactions, between microbiome and immune system, may prevent the risk of skin disorders, enabling a healthy and refined skin complexion. A new efficient cosmetic active has been designed to counteract oily skin and its consequences by reducing the sebum level and maintaining the skin's beneficial microflora. Consumers could, therefore, benefit from shine-free, clear skin and would be less susceptible to acne development and skin irritation.

*T. Falla, K. Rodan, K. Fields, D. Ong, C. Skobowiat, Safety and efficacy of a novel three-step anti-acne regimen formulated specifically for women, International Journal of Women's Dermatology 6 (2020), p. 419–423*

Background: Due to ambient environmental- and lifestyle-associated stressors, the prevalence of acne in adult women has been increasing. Classical anti-acne treatments using benzoyl peroxide technology are associated with dehydration of the skin, which may accelerate aging and further reduce treatment compliance. The addition of bio-functional actives intended to replenish hydration and improve barrier function may hasten the onset of anti-acne benefits while restoring a healthy appearance and counteracting skin aging effects. Objective: The objective of this study was to test the safety and efficacy of a new three-step topical antiacne regimen designed specifically to improve the overall condition and appearance of the skin in women with acne. Methods: Safety and efficacy were tested in an 8-week study of women ages 22 to 44 years with mild to moderate acne. Skin endpoints were monitored at baseline and weeks 1, 4, and 8 by clinical grading, measurement of sebum secretion using a sebumeter, standardized pictures, and self-validation questionnaires. Results: A total of 31 women completed the study. Acne severity and lesion counts, including comedones and papules, improved gradually starting from week 1 and continued to improve throughout the study period, reaching statistical and clinical relevance at weeks 4 and 8. Moreover, significant improvements in skin roughness, radiance, overall healthy appearance, and oiliness (further confirmed with decreased sebum production) were observed. Compared with baseline responses, participants reported noticeable improvements in acne lesions and overall healthier-looking skin. Participants also noticed overall younger-looking skin at the end of the study period. Conclusion: This three-step regimen provided efficacious anti-acne benefits to the skin that were also gentle, safe, and well tolerated.

*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.

*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.

*S. Laneri, I. Dini, A. Tito, R. di Lorenzo, M. Bimonte, A. Tortora, C. Zappelli, M. Angelillo, A. Bernardi, A. Sacchi, M.G. Colucci, F. Apone, **Plant cell culture extract of Cirsium eriophorum with skin pore refiner activity by modulating sebum production and inflammatory response**, Phytotherapy Research. 2020; p. 1–11*

Facial pore enlargement is considered a significant esthetic and health concern in skincare cosmetics. The pores fulfill the critical function of keeping the skin surface hydrated and protected against microbial infections. The hyperseborrhea, the stress factors, and the hormonal triggers can cause pore size enlargement, causing higher susceptibility of the skin to microbe aggressions and inflammatory reactions. Thus, reducing excessive sebum production and keeping functional pores are two of the most requested activities in skincare cosmetics. A *Cirsium eriophorum* cell culture extract was investigated for its role in sebum regulation, stratum corneum desquamation, and anti-inflammation. The extract was able to regulate essential markers associated with sebum secretion and pore enlargements, such as the enzyme 5 $\alpha$ -reductase, which plays a central role in sebum production, and the trypsin-like serine protease Kallikrein 5, which promotes skin exfoliation and antimicrobial response. Moreover, the extract showed a sebum-normalizing and pore refining activity in individuals having seborrheic or acne-prone skins, suggesting a role of the *C. eriophorum* extract in rebalancing altered skin conditions responsible for pore enlargement.

*S. Yoo, M.-R. Kim, T.-Y. Kim, S.J. Hwang, J.-M. Lim, S.G. Park, **Relationship of transcutaneous oxygen tension with age and skin elasticity in Korean women**, Skin Research & Technology, Volume 26, Issue 3, May 2020, p. 325-328*

Background: Oxygen has several positive effects on the skin, including improving collagen synthesis and accelerating wound healing. However, only a few studies have investigated the relationship between skin oxygenation and skin aging parameters. Therefore, this study aimed to assess the correlation between skin oxygenation and skin aging parameters-elasticity, hydration, sebum, color (lightness, redness), and blood perfusion— in Korean women. Materials and Methods: We evaluated the transcutaneous partial pressure of oxygen, also known as transcutaneous oxygen tension (TcPO<sub>2</sub>), and skin aging parameters, including elasticity, hydration, sebum, color (lightness or redness), and blood perfusion, in the cheek of 34 healthy women (aged 20-69 years) and assessed the correlation between TcPO<sub>2</sub> and other skin aging parameters using IBM SPSS Statistics 25 software (SPSS Inc). Results: Facial TcPO<sub>2</sub> was negatively correlated with age ( $P < .05$ ). There were positive correlations between facial TcPO<sub>2</sub> and elasticity parameters ( $P < .01$ ). We noted no correlation between facial TcPO<sub>2</sub> and skin lightness; however, skin lightness tended to slightly improve with increasing TcPO<sub>2</sub>. Skin aging parameters, including hydration, sebum, skin redness, and blood perfusion, showed no correlations with TcPO<sub>2</sub>. Conclusion: In Korean women, facial TcPO<sub>2</sub> tends to decrease with increasing age and is positively correlated with gross, net, and biological skin elasticity. Therefore, this study demonstrated that oxygen tension of facial skin can be a major causative factor of skin aging.

*M.A. Nilforoushzhadeh, S. Alavi, M. Heidari-Kharaji, A.R. Hanifnia, M. Mahmoudbeyk, Z. Karimi, F. Kahe, **Biometric changes of skin parameters in using of microneedling fractional radiofrequency for skin tightening and rejuvenation facial**, Skin Res Technol., Jun 2020*

Background Fractional radiofrequency (RF) has been used for skin rejuvenation and tightening by dermatologists and cosmetic surgeons in recent years. Methods Twenty female patients (mean age of 51.9 years) with Fitzpatrick III to VI skin phototypes who desired to undergo skin lift/tightening received six sessions of fractional microneedle RF treatment and were assessed at baseline and then 3 months

after the last session for biometric characteristics using a Colorimeter, Visioface 1000D, Tewameter, Cutometer, Mexameter, and Sebumeter and a skin ultrasound imaging system to evaluate the transepidermal water loss (TEWL), skin pores, color, melanin content, erythema, sebaceous content, and thickness and density of the epidermis and dermis. Patient satisfaction with visual analog scale (VAS) was also measured. Results The results showed that skin pores and spots decreased significantly. TEWL also decreased significantly (by 18.44%). Meanwhile, skin density increased significantly (R7, by 44.41%). The ultrasonographic assessments showed that both the density and thickness of the dermis and epidermis were increased. The changes in the other parameters were not significant. Conclusion FR increases the density and thickness of the dermis and thus also increases the collagen content and decreases skin pores and TEWL.

V. Mazzarello, E. Gavini, G. Rasso, 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 communis*L. 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.

I. Montaño, C. Pickel, F. Wandrey, **Rebalancing the Excessive Sebum Production in the Scalp**, SOFW Journal 05/20, Volume 146, May, 2020

An oily scalp is caused by over-reactive sebaceous glands on the scalp. The oil or sebum attracts dirt more easily, produces even dandruff, and makes the hair stick together. To reduce the sebum and enhance the barrier efficacy on oily scalp, Mibelle Biochemistry has developed an active ingredient based on the Chinese medicinal herb *Astragalus membranaceus*. AstraForce is a liposomal preparation of *Astragalus membranaceus* root extract. This plant is one of the most important Chinese medicinal herbs and its roots have been used for more than 2500 years in Chinese medicine to strengthen qi, the body's life force. This liposomal form facilitates the penetration of actives into the sebaceous duct allowing the active components to target the sebaceous gland more straightforwardly. The sebum-reducing effect of AstraForce has been proven on volunteers having oily scalp and hair while maintaining the barrier effectiveness. *In vitro* the active ingredient has reduced the activity of enzymes involved in sebum lipid metabolism. AstraForce thereby has a positive effect on scalp purification and hydration as well as reducing sebum production in the context of oily hair.

A. Rigal, R. Michael-Jubeli, A. Bigouret, A. Nkengne, D. Bertrand, A. Baillet-Guffroy, A. Tfayli, **Skin surface lipid composition in women: increased 2,3-oxidosqualene correlates with older age**, Eur J Dermatol, Apr 2020

The importance of the hydrolipidic film of skin has been well documented, however, few data are available in cases of very old age. Our aim was to characterize the difference in skin surface lipid (SSL) composition between individuals of different age groups. Data were collected from the forehead of 22 young volunteers (18-24 years old) and 18 senior volunteers (70-75 years old). The amount of sebum was obtained by sebumetry. To acquire relevant information about the molecular composition of high complex mixtures, SSLs were analysed in a single run to ensure that the lipid structures remain intact, using high-temperature gas chromatography coupled with mass spectrometry. The major features associated with aged skin were documented. In aged skin, a lower sebum content was observed, together with modification of the relative SSL composition involving a significant reduction in the intensity of many components of the hydrolipidic film. In contrast, the intensity of 2,3-oxidosqualene was shown to increase with an inverse relationship between triglycerides and their hydrolytic products. These adaptations could be related to modifications of enzymatic activity.

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.

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 ( $5.27 \pm 0.08$  and  $5.6 \pm 0.1$ , 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.

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.

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.

*K. Thadanipon, J. Kitsongsermthon, Comparative study into facial sebum level, pore size, and skin hydration between oily-skinned and dry-skinned Thai women*, *Skin Res Technol.*, March 2020, Volume 26, Issue 2, p. 163-168

Background: Subjective facial skin type is most frequently determined by the amount of sebum, which showed trends across subjective skin types in most previous studies while not in some. This study was conducted to evaluate the associations among subjective skin type, amount of sebum, stratum corneum hydration, and pore size in Thai women. Methods: Sixty-two healthy women with either self-described subjective oily or dry skin type were included and casual sebum level (CSL), sebum excretion rate (SER), clinical pore size score, mean pore area, and stratum corneum hydration were measured at several facial sites. Correlation coefficients between amount of sebum and other parameters were estimated. Results: Casual sebum level and sebum excretion rate were significantly higher in oily-skinned than dry-skinned group by 1.6-2.1 times. Mean pore area and clinical pore size score were not different between the 2 groups, nor did they correlate with CSL or SER. Corneometry was shown to be significantly higher in dry-skinned than oily-skinned group. Significant, negative correlations between corneometry and CSL were also found. Conclusion: The subjective facial skin types were consistent with the amount of sebum, but not pore size or corneometry, among Thai women.

*D. Schmid, F. Wandrey, F. Züllli, Treating large pores - Chios mastic to improve oily skin, large pores and acne*, *Household and Personal Care Today - Vol. 15(1) January/February 2020*

Mastic is the resin harvested from the *Pistacia lentiscus* trees from the Greek island of Chios. It has been used as a precious natural remedy against various ailments since ancient times. The water-insoluble oleoresin was made available for skin care application by using special extraction techniques. In this form, mastic inhibits the sebum production enhancing enzyme 5 $\alpha$ -reductase type I and blocked IL-1 $\alpha$  effects in vitro. In clinical studies with volunteers suffering from oily skin, enlarged pores and acne signs it was shown that mastic visibly reduces pore size, shininess and the number of blemishes, which makes mastic an ideal active to treat impure skin.

*N. Tangkijngamvong, P. Phaiyarin, S. Wanichwecharungruang, C. Kumtorrut, The anti-sebum property of chitosan particles*, *J Cosmet Dermatol.*, 2020 January

Background: Seborrhea is linked to several medical and mental conditions. Although it is common, effective agents and the standardized sebum level for seborrhea are not elucidated. Aims: To determine the efficacy of chitosan particles (CP) formulation on controlling sebum secretion, its extended effects on skin redness and texture after combining with proretinal nanoparticles (CP-PRN), and a correlation of the clinical grading with sebum levels that affect mental health. Patients/Methods: A four-week clinical trial with forty subjects was conducted. Subjects applied either CP formulation or CP-PRN during nighttime. Objective measurements including sebum levels, transepidermal water loss (TEWL), skin corneometry, skin redness, and texture were analyzed. Subjects completed a self-assessment clinical grading of skin oiliness at every visit. Results: Both CP and CP-PRN significantly decreased sebum levels ( $P \leq .01$ ) at week 4 compared to baseline. CP also resulted in significant decreases in TEWL ( $P \leq .05$ ) and skin corneometry ( $P \leq .05$ ) throughout the study. A significant improvement in skin redness was observed with CP-PRN ( $P \leq .01$ ). A moderate correlation between the clinical grading and sebum levels was detected (coefficient of 0.5,  $P \leq .001$ ), with a sebum level of 106 $\mu\text{g}/\text{cm}^2$  indicating emotional discomfort. One subject experienced local irritation with the CP-PRN. Mild pruritic symptoms

were reported in both groups. Conclusions: Chitosan particles exhibited an interesting anti-sebum effect. It could be combined with PRN to extend benefits without losing the sebum controlling effect. The clinical grading may be useful in practice due to a modest correlation with sebum levels.

*M.G. Almeida Leite, P.M.B.G. Maia Campos, Correlations between sebaceous glands activity and porphyrins in the oily skin and hair and immediate effects of dermocosmetic formulations, J Cosmet Dermatol. 2020;00: p. 1–7*

Background: Oily skin and hair not only contain a large amount of sebum, but also exhibit other changes that compromise their physiology. The immediate effects of dermocosmetics are very important for adherence to treatment. Aim: The aim of the present study was to characterize oily skin and scalp, to evaluate the correlation of sebum production with porphyrin counts and the immediate effects of topical formulations for sebum control. Patients/Methods: A total of 100 women aged 18-49 years were recruited. Sebaceous gland activity, sebum amount, stratum corneum water content (SCWC) transepidermal water loss (TEWL), skin gloss, amount of porphyrins and pores were determined in the face and SCWC, sebum amount, porphyrin count, and TEWL were also determined in the scalp. The immediate effects of formulations containing a guarana extract were determined after 2 hours of application. Results: A correlation between sebaceous gland activity and presence of porphyrins in the frontal region of the face was detected. Low gloss values and large amounts of pores in the malar region were related to lower skin uniformity. High sebum values and low SCWC and porphyrin count were also observed in the vertex region. The studied formulations reduced the sebum content of face and scalp after 2 hours of application. Conclusion: Oily skin and hair showed high sebum values, which were correlated with porphyrin count and with the activity of sebaceous glands. Finally, the studied formulations had immediate reducing effects on sebum amounts on the skin and scalp.

*J.S. Lee, J. Ha, K. Shin, H. Kim, S. Cho, Different Cosmetic Habits Can Affect the Biophysical Profile of Facial Skin: A Study of Korean and Chinese Women, Ann Dermatol 31(2), p. 175-185, 2019*

Background: Previous studies on the age-, climate, and skin care habit-related changes of biophysical parameters have mainly focused on Caucasians, and studies on Asians are in paucity. Objective: This study was aimed to investigate the variations of cutaneous biophysical parameters in Chinese and Korean women (northeast Asians) and to assess the association between those parameters and age, climate, and cosmetic habits. Methods: A cross-sectional study included 361 healthy Chinese and Korean women between 18 and 49 years of age in 4 cities (Guangzhou, Nanjing, and Shijiazhuang in China, and Suwon in Korea). We measured skin surface temperature, hydration, transepidermal water loss (TEWL), sebum, elasticity, skin pore, wrinkle, and skin tone (brightness) using non-invasive instruments. Demographic profiles and cosmetic habits were assessed using a questionnaire. Results: Skin elasticity and tone decreased, and pore size and wrinkle increased with age. Subjects in Suwon (Korean) showed higher hydration level, lower TEWL and lower sebum, less severe wrinkle and brighter skin than those in the 3 cities in China. After adjusting for age and region, using sunscreen everyday, wearing base makeup daily, and using moisturizers improved hydration, TEWL, and elasticity significantly. Conclusion: Women in Suwon (Korea) were found to have a better profile of biophysical parameters than women in the 3 Chinese cities, which might be attributed to cosmetic habits, besides age and climatic factors. The fact that appropriate cosmetic habits are associated with favorable skin biophysical parameters underscores the importance of daily skin care routine in preserving skin functions.

*L. Nakamura Silva, M.G. Almeida Leite, P.M.B.G. Maia Campos, Development of hair care formulations containing *Spirulina platensis* and *Ascophyllum nodosum* extracts, International Journal of Phytocosmetics and Natural Ingredients 2019;6:13*

Introduction: Considering that oily skin and hair is a constant concern, the search for active substances that helps skin and hair oiliness control it is a challenge in the Research & Development of cosmetics. Seaweeds are much known for its use as foods and microalgae are a type of seaweeds that convert solar light in bioactive compounds attractive for commercial interest. *Spirulina platensis* and *Ascophyllum nodosum* are microalgae present potential to be applied in cosmetic formulations, due to its properties, such as antioxidant activity, skin hydration and skin and hair oiliness control. Thus, the aim of this study was to develop and evaluate the efficacy of hair care formulations containing *Spirulina platensis* and *Ascophyllum nodosum* extract. Methods: Shampoo and conditioner formulations supplement or not (vehicle) with *Spirulina platensis* and *Ascophyllum nodosum* extract were developed. Two hair samples of virgin brown hair with 10 g each were selected to perform the hair characterization tests and were evaluated in terms of Break force, combability and shine. After, 26 study participants were recruited for the clinical efficacy study and the sebum content were evaluated before and after 28

days of use. Results: After 28 days of application of the conditioner containing *Spirulina platensis* and *Ascophyllum nodosum*, a decrease of the combability force for the wet and dry hair sample and an increase of hair shine were observed. Conclusion: The formulation containing microalgae in combination presented benefits to the hair fiber, once the obtained results showed an improvement of hair mechanical properties and fibers surface.

**C. Songsantiphap, P. Asawanonda, The Correlations between Follicular Fluorescence and Casual Sebum Levels in Subjects with Normal Skin**, J Clin Aesthet Dermatol, 2019;12(8): p. 24–27

Oiliness of the skin usually depends upon the balance of skin hydration and the amount of lipids on the skin. Generally, the skin, especially on the face, is classified into three types: dry, normal, and oily. The facial lipid film consists of two parts: the epidermal lipids from keratinocytes and the complex mixture of lipids known as sebum, produced from the sebaceous glands. With available topical and systemic agents that can alter sebum contents within the follicles, it is important that objective measurements are available to evaluate these changes. The Sebumeter® (Courage+Khazaka electronic GmbH, Köln, Germany) is a device that can directly measure the amount of lipids on the skin's surface. This system relies on a direct photometric reading of lipids collected on a probe of plastic strip that turns transparent in proportion to the content of skin lipids. The values are then automatically calculated into micrograms of lipid per square centimeter for the specific area.

**A. Hameed, N. Akhtar, H.M. Shoaib Khan, M.Asrar, Skin sebum and skin elasticity: Major influencing factors for facial pores**, Journal of Cosmetic Science, Volume 18, Issue 6, December 2019, p. 1968-1974

Objective: The current research work was initiated to develop anti-aging phytocosmetic formulation of phytoantioxidant, to evaluate their effect on human skin, and to link R parameters of skin with skin sebum and aging. Methods: According to COLIPA, 10 healthy male volunteers, aged between 20 and 30 years, having no skin infection or other hypersensitivity disorders, were included in the study. The effect of formulation was evaluated on skin pores and skin elasticity on cheeks for 90 days at regular interval. Various parameters of visible facial pores were assessed using the Skin VisioFace®, Cutometer®, Elastometer®, and Sebumeter®. These data were compared and correlated to examine the possible relationship between visible facial pores, skin elasticity, and skin sebum. Results: From R0 to R9, R0, R5, and R9 were negatively correlated with elasticity while R7 shows a positive correlation with elasticity. R7 parameter of Cutometer® was negatively correlated with facial large pores ( $r=-0.337$ ,  $P=0.033$ ). R9 parameter of Cutometer® was significantly positively correlated with facial large pores ( $r=0.54$ ,  $P=0.000$ ). Conclusion: We could assume that the enhancement of skin elasticity would be the fundamental strategies in the prevention of size and count of visible facial pores (fine and large) by the application of formulation containing natural compounds.

**Y. Song, Y. Pan, H. Wang, Q. Liu, H. Zhao, Mapping the face of young population in China: Influence of anatomical sites and gender on biophysical properties of facial skin**, Skin Res Technol. 2019;25: p. 333-338

Background: Facial skin exhibits unique biophysical properties, which are influenced by anatomical regions and genders. The aim of this study was to comprehensively assess the regional and gender differences in facial skin biophysical parameters among Chinese population. Materials and Methods: The 12 skin biophysical parameters at four distinct facial skin sites (forehead, cheek, canthus and chin) were measured in a normal population ( $n = 212$ ) with 42 males and 141 females aged 18-29 years living in Beijing. These parameters consisted of skin hydration, transepidermal water loss, sebum content, erythema/melanin indices,  $L^*a^*b^*$  color, skin gloss and elasticity, all quantifying with non-invasive instruments. Results: The results demonstrated that the characteristics of the facial skin were significantly different between the regions and genders. The forehead had weaker skin barrier function but secreted the most sebum content, while the cheek was the driest and brightest region on the face. The canthus was the most hydrated area and the chin displayed higher sebum secretion, darker skin color and less elastic. The females showed more hydrated, less oil, lighter and more elastic facial skin compared with males. Conclusion: This study indicates that the young Chinese facial skin significantly varies with face anatomical regions and differs between genders.

**T. Sugawara, N. Nakagawa, N. Shimizu, N. Hirai, Y. Saijo, S. Sakai, Gender- and age-related differences in facial sebaceous glands in Asian skin, as observed by non-invasive analysis using three dimensional ultrasound microscopy**, Skin Res Technol. 2019;25: p. 347-354

Background: While determining sebaceous gland morphology is useful in the treatment of skin disorders such as acne, a non-invasive assessment method has not been developed. Since age and gender affect sebum level, differences in sebaceous gland morphology according to these factors were

investigated. Methods: Facial skin was measured using a high-frequency three-dimensional ultrasound microscope. First, the ultrasound images were compared with skin sections. Next, we assessed sebaceous gland morphology. Images of sebaceous gland in the cheeks of young male, young female and elderly female subjects were obtained using ultrasound microscopy, and *en face* images were processed to measure the sebaceous gland area. Results: In the ultrasound images, sebaceous glands and also thin collagen fibers, which surrounded the glands, could be detected as low-intensity regions. We called them sebaceous units. In young male subjects, the sebaceous unit areas 900- $\mu\text{m}$  beneath the skin surface were larger than those at 700  $\mu\text{m}$ . In contrast, depth-dependent differences in sebaceous unit area were not observed in young female subjects, indicating that males had cauliflower-shaped sebaceous glands while young females had somewhat more cylindrical and smaller sebaceous glands than the young males. Regarding age, the areas of sebaceous units at 900  $\mu\text{m}$  were diminished and the depth of maximum area was shallower in elderly female subjects compared to young female subjects. Hence, sebaceous glands are considered to shrink with age. Conclusion: Differences in facial sebaceous unit morphology between genders as well as by age groups could be observed using high-frequency ultrasound microscopy.

*S.-I. Jang, J. Han, M.I. Lee, J. Seo, B.-J. Kim, E. Kim, A study of skin characteristics according to humidity during sleep*, *Skin Res Technol.* 2019; 25: p. 456-460

Introduction: During sleep, the skin is exposed to various environments for example low or high humidity and temperature. And the average of 7-8 hours of sleeping in those situations can affect skin condition. Therefore, the objective of this study was to determine skin characteristics according to humidity during sleep. Method: Eleven healthy women in their ages of 20s and 30s were controlled. They slept more than 7 hours at lower than 30% relative humidity (RH) environment on the first day and at higher than 70% on the second day. The room temperature was controlled to  $22 \pm 5^\circ\text{C}$ . Three measurement points were (a) before for sleep (after wash), (b) after 7 hours sleep (morning), and (c) after wash. Skin hydration, sebum secretion, and trans-epidermal water loss (TEWL) were measured. The statistical significance was determined at  $P < 0.05$ . Result: After 7 hours of sleep in 30% RH condition, skin hydration decreased by 24.23% significantly, but there was no significant difference after sleeping in 70% RH. The sebum level was increased after sleep at 30% RH. The TEWL did not show differences according to the humidity during sleep but significantly increased after facial cleansing in 30% RH sleeping condition. Discussion: In this study, we confirmed that the changes in skin characteristics may be affected by humidity during sleep. When sleeping in dry environment, skin hydration decreases but the amount of sebum increases to compensate for skin dryness. Therefore, this study might suggest how to care the skin before sleep depending on the room humidity.

*C. Cho, E. Cho, N. Kim, J. Shin, S. Woo, E. Lee, J. Hwang, J. Ha, Age-related biophysical changes of the epidermal and dermal skin in Korean women*, *Skin Res Technol.* 2019; 25: p. 504-511

Introduction: The clinical characteristics of skin were investigated to study the interrelationship and changes in the biophysical properties of the epidermal and dermal layers associated with aging using noninvasive methods. Methods: Our study included 100 healthy women aged between the early 20s and late 60s. Biophysical characteristics of skin such as color (brightness and spots), transparency, wrinkle on crow's feet, elasticity, hydration, sebum content, glossiness, and transepidermal water loss measured under controlled conditions. Results: This study performed in a Korean population demonstrated that aging significantly affects human skin in terms of parameters such as wrinkles, skin color, elasticity, and epidermal hydration. Age-related changes in skin hydration showed varying patterns between the epidermis and dermis. Skin color showed heterogeneous characteristics between the upper and lower epidermal layers associated with aging. Skin elasticity and wrinkles were observed to show an inversely proportional relationship in the early 40s. Conclusions: We confirmed the significant influence of aging on the biophysical properties of skin and determined the distinct age-related biophysical changes in the epidermal and dermal layers of skin using noninvasive method. This study indicates the need for further research to investigate the distinctive age-related changes in characteristics of the epidermal and dermal layers of human skin.

*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 ( $p < .001$ ), erythema ( $p < .001$ ), temperature ( $p = .01$ ), thickness of dermis ( $p = .02$ ), and subepidermal low echogenic band ( $p < .001$ ) 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.

*W. Arshad, H.M.S. Khan, N. Akhtar, M. Nawaz, Assessment of changes in biophysical parameters by dermocosmetic emulgel loaded with Cinnamomum tamala extract: A split-faced and placebo-controlled study, J Cosmet Dermatol. 2019 Nov*

Background: Phenolic and flavonoid compounds found in plants alleviate the photo-damaging skin conditions by playing a major role in skin rejuvenation. Aims: The aim of the study was to explore the cosmeceutical effects of *Cinnamomum tamala* extract. Objective: Recent research was aimed to quantify phenols and flavonoids in the natural extract of *C tamala* leaves, to develop its phyto-cosmetic emulgel and to assess effects of emulgel on healthy human skin. Method: Phenols and flavonoids in *C tamala* (CT) extract were quantified by using ELISA assay. Emulgel formulation loaded with 4% *C tamala* (CT emulgel) was developed, and its cosmetic effects were evaluated on the cheeks of 13 healthy female test volunteers by comparing with placebo (base). Facial parameters including melanin, erythema, sebum, and visible facial pores (size and area) were studied by using Mexameter<sup>®</sup>, Sebumeter<sup>®</sup>, and VisioFace<sup>®</sup> at regular interval for 90 days. Results: Total phenolic content and total flavonoids content of *C tamala* leaves extract were found to be  $73.08 \pm 0.0078$  mg GAE/g and  $52.63 \pm 0.006$  mg QE/g CT extract respectively. As compared to placebo (base), CT emulgel was found to be significantly ( $P \leq .05$ ) effective in minimizing skin photo-damaging effects by reducing the levels of melanin, erythema, and sebum and size and count of both fine and large facial pores. Conclusion: *Cinnamomum tamala* leaves extract, being a rich source of phenols and flavonoids minimized the photo-damaging effects by reducing skin melanin, erythema, and excess sebum; improving the skin imperfections by reducing facial pore count and area as assessed by advanced imaging and bioengineering techniques.

*L. Xiao, B. Che, H. Lu, J. Li, G. Zhou, Y. E, Evaluation of a Scalp Essence on Human Scalp Health and Subclinical Conditions Based on Multiple Dimensions Physiological and Biological Approaches, presentation at the 25<sup>th</sup> IFSCC Conference Milan, October 2019*

Varieties of methods have long been considered to evaluate cosmetic efficacies and health benefits on hair care and scalp care products. In general, scalp health and its conditions are normally determined at the following dimensions including scalp hydration level, scalp oil level, dandruff scale, scalp micro organism conditions, and scalp sensations such as itching, stinging, burning, pain, numb, and other related scalp sensational issues. It is believed that scalp health conditions are influenced by hair cleansing habits, scalp microorganism environment, inflammatory lesions such as psoriasis, and hair follicle health status. On the other hand, scalp health and its conditions are also well documented and determined by Traditional Chinese Medicine (TCM) theories and clinical diagnosis. This is because TCM practitioners consider most of the symptoms such as scalp conditions through an integral grading system as Qi-Blood, of which represents functions of vital energy and nutritional supporting mass respectively, range from balance to stagnation and to deficiency including the deficiency of vital energy, stagnation of the circulation of vital energy, weakness of vital energy, deficiency of blood, stasis of Blood, cold in Blood, heat in Blood, to stagnation of vital energy and Blood stasis, and both Qi-Blood deficiency, etc. Here, we considered to measure hair follicle hydrocortisone level one of the TCM Qi-Blood markers. This presented study focused on evaluation of a commercial scalp essence with an integrated quantification methods on human subject scalp moisture, dandruff, redness, acidity, sensations, hair quality, as well as Qi-Blood based on TCM categorized as Blood balance, stagnation and deficiency.

*E. Lee, J.Y. Lee, S. Woo, Y. Noh, J. Shin, P. Ruan, J. Ha, Variation of Biophysical Parameter with Skin Aging from Distinct Geographic Locations in South Korean and Chinese women, presentation at the 25<sup>th</sup> IFSCC Conference Milan, October 2019*

There are the differences of skin properties with aging in various ethnic groups. Within the same ethnic group, it is also important to understand that the change of skin with aging as well as skin characteristics be influenced by external environment, such as climatic condition, UV radiation and

environmental pollution. The purpose of this study was to investigate the alteration of biophysical parameter with aging in different locations.

**A.M. Motta, A new natural and biomimetic detergent concept**, PERSONAL CARE NORTH AMERICA, October 2019, p. 27-30

It is widely recognized that a toned and well moisturized skin can be maintained only if the superficial layers of the epidermis are able to fully accomplish their barrier function, protecting the deepest and delicate areas of the derma from sensitizing agents and controlling permeability and transpiration of the physiological water present in the intercellular spaces. The skin barrier function is continuously exposed to aggressions. The daily use of soaps and potentially aggressive detergents can alter the hydrolipidic skin film and skin barrier integrity, reducing its impermeabilizing action and favoring skin dehydration. Trans Epidermal Water Loss (TEWL) constitutes one of the main indicator to evaluate skin barrier integrity. The ideal detergent must be able to effectively remove dirt, greasiness and pollutants, meanwhile respecting the lipidic and protein fractions of the horny layer and the superficial hydrolipidic film.

**E. Baldaro, V. Placa, A. L'Hermitte, Olive leaf extract delivers skin and sensorial benefits**, PERSONAL CARE NORTH AMERICA, October 2019, p. 37-40

The demand for greener cosmetic products has been steadily growing for the past decade. However, modern consumers are posing new challenges to the industry. They want products that make extensive use of natural, vegetable-derived ingredients, but they rightly expect the formulae to be highly effective and esthetically pleasing as well. Emollients play a major role in delivering sensorial experiences as well as moisturization, a skin benefit that is at the very core of product effectiveness. In this article we describe the first 'active emollient' ever produced in the cosmetic industry: Sensolene® Light ET. This emollient has all the characteristics that every eco-conscious cosmetic formulator could desire to deliver superior products that meet the most demanding consumer's expectations.

**P. Tarka , K. Gutkowska, A. Nitsch-Osuch, Assessment of tolerability and acceptability of an alcohol-based hand rub according to a WHO protocol and using apparatus tests**, Antimicrobial Resistance and Infection Control (2019), 8:191

Background: The effectiveness of alcohol-based hand rubs (ABHRs) depends substantially on their acceptability and tolerability. In this study, we assessed the acceptability and tolerability of a new ABHR (product EU 100.2018.02). Methods: Among physicians, nurses, and cosmetologists who used the ABHR for 30 days, we assessed the product's acceptability and tolerability according to a WHO protocol. Additionally, we used instrumental skin tests. Participants assessed the product's color, smell, texture, irritation, drying effect, ease of use, speed of drying, and application, and they gave an overall evaluation. Moreover, they rated the tolerability, i.e. their skin condition, on the following dimensions: intactness, moisture content, sensation, and integrity of the skin. The tolerability was also assessed by an observer as follows: redness, scaliness, fissures, and overall score for the skin condition. Instrumental skin tests included transepidermal water loss, skin hydration, sebum secretion, and percentage of skin affected by discolorations. All assessments were made at baseline (visit 1), and 3–5 days (visit 2) and 30 days (visit 3) later. Results: We enrolled 126 participants (110 [87%] women) with a mean age of  $34.3 \pm 11.65$  years. Sixty-five participants (52%) were healthcare professionals (physicians, nurses), and 61 (48%) were cosmetologists. During visit 2 and visit 3, about 90% of participants gave responses complying with the WHO's benchmark for acceptability and tolerability. Similarly, the ABHR met the WHO criteria for observer-assessed tolerability: on all visits, in more than 95% of participants, the observer gave scores complying with the WHO benchmark. Transepidermal water loss decreased from baseline to visit 3 ( $p < 0.001$ ), whereas skin hydration, sebum secretion, and the percentage of skin affected by discolorations did not change significantly during the study ( $p \geq 130$ ). Conclusions: The EU 100.2018.02 had both high acceptability and tolerability, meeting the WHO criteria. The WHO protocol proved useful in the analysis of acceptability and tolerability of ABHRs.

**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.

*A. Kotodziejczak, A. Wieczorek, H. Rotsztein, The assessment of the effects of the combination of microdermabrasion and cavitation peeling in the therapy of seborrhoeic skin with visible symptoms of acne punctate, J Cosmet Laser Ther. 2019 Aug;21(5): p. 286-290*

Objective: The aim of this study was to assess objectively the effects of the combination of corundum microdermabrasion and cavitation peeling in the therapy of seborrhoeic skin with visible symptoms of acne punctata. Material and methods: The study involved a group of nine women. A series of six treatments with the combination of microdermabrasion and cavitation peeling were performed within facial skin at 10–14 days intervals. Corneometric measurements examining skin hydration level and sebumetric measurements analyzing skin sebum level were made before the series of treatments and after second, fourth and sixth procedure in five facial areas. Clinical assessment of the efficacy of the therapy was performed on the basis of photographic documentation (Fotomedicus). Anonymous questionnaires were used in order to evaluate patients' satisfaction rate. Results: Statistically significant improvement in skin sebum level was observed in all examined areas (forehead  $p = 0.002$ ; nose  $p = 0.001$ , chin  $p = 0.01$ , left cheek  $p = 0.009$ , right cheek  $p = 0.007$ ). In case of skin hydration, significant improvement was found only in the area of chin ( $p = 0.03$ ). 78% of participants estimated that the improvement was in the range of 55–70%, while 22% of participants of 75–100%. The reduction in the amount and visibility of comedones and pimples were demonstrated on the basis of questionnaire and photographic documentation. Conclusions: Combined microdermabrasion and cavitation peeling treatments improve the condition of seborrhoeic skin.

*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.

*H. Dobrev, Value of non-invasive bioengineering investigations of the human skin in vivo, Dissertation in Dermatology and Venerology at the University of Plodiv, 2019, Bulgaria*

The skin is the largest organ of the human body. It has a surface area of about 2 m<sup>2</sup> and a weight of about 16% of the body weight. Skin is a great visual field. Most of the changes that occur in it are visible and accessible to dermatologists. For centuries, the dermatologist's eyes and fingers have been his main diagnostic tools. Old physicians are known to describe the rash elements with great love, diligence and methodicality, especially with regard to morphological details. Today, this descriptive phase in the evolution of dermatology has lost its dominance. According to Prof. J. Serup, "The dermatologist's eyes and hands are already becoming archaic diagnostic tools." With the introduction of modern skin bioengineering methods, there has been a transition from the "visible" to the "invisible". From the "visual" field, dermatology is increasingly becoming an "instrumental" field. The advantage of the new research methods created is that they enable the detection of invisible changes in skin functions, as well as their objective and quantitative measurement. This dissertation is devoted to the new methods of skin functional diagnostics. It illustrates the practical application of some of them in the field of dermatology and cosmetic science based on the experience of the sector of "Functional diagnostics of the skin" at the Department of Dermatology and Venereology, University Hospital "St. George", Plovdiv, Bulgaria. The literature review part provides an overview of current bioengineering methods for functional skin diagnostics. The apparatus used to carry out the present work is described in detail. Additionally, two little-known aspects of skin bioengineering research are presented - protocol and research ethics. Data on Bulgarian experience in the field of skin functional diagnostics have also been reported.

*M. Ogita, K. Sekiguchi, K. Akahane, R. Ito, C. Haga, S. Arai, Y. Ishida, J. Kawamori, Damage to sebaceous gland and the efficacy of moisturizer after whole breast radiotherapy: a randomized controlled trial, BMC Cancer (2019) 19:125*

Background: We conducted a randomized trial to evaluate the efficacy of heparinoid moisturization for radiation dermatitis. We report the time-course of sebum content after whole breast radiotherapy (WBRT) and the efficacy of heparinoid moisturizer. Methods: Patients receiving adjuvant breast RT were randomly assigned into three groups; prophylaxis, post-WBRT and control groups. Patients used moisturizer on the irradiated breast from the beginning of RT in the prophylaxis group, 2 weeks post-RT in the post-WBRT group, and no moisturizer in the control group. Sebum content of the irradiated and non-irradiated breast was measured to assess sebaceous gland damage. Sebum composition was also analyzed. Results: A total of 76 patients were analyzed; 30 in the post-WBRT group, 32 in the control group, 14 in the prophylaxis group. The sebum content in the irradiated breast

significantly decreased after WBRT in the post-WBRT and control groups. The decrease was sustained in the control group. In the non-irradiated breast, sebum content also decreased after WBRT in the post-WBRT and control groups. After moisturizer application, sebum content by sebumeter returned to pre-RT level in the post-WBRT group, while the decrease was sustained in the control group. Sebum content measured by evaporative light scattering detector and sebumeter was similar in the control group, but the dissociation was observed after moisturizer application in the post-WBRT group. The proportion of wax esters decreased in the irradiated breast after WBRT. Conclusions: Radiotherapy significantly reduced sebum content in both irradiated and non-irradiated breast, indicating that RT caused quantifiably persistent sebaceous gland damage in irradiated sites and the surrounding tissue. Combined with the results from our previous study, heparinoid moisturizer treatment effectively prevents waterloss by retaining oil contents on the skin surface.

*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.

*X. Lin, A. Nomachi, J. Yang, Rise to the top - Decylene Glycol for Scalp Health and Care, Cosmetics & Toiletries, June 2019, p. 64-70*

Scalp care products have, in the past, primarily focused on controlling dandruff and itching. However, a recent trend is moving toward scalp health maintenance and the prevention of inflammation.

*N. Weber, K. Schwabe, C.M. Schempp, U. Wölfle, Effect of a botanical cleansing lotion on skin sebum and erythema of the face: A randomized controlled blinded half-side comparison, J Cosmet Dermatol., 2019 Jun;18(3): p. 821-826*

Background: Elevated levels of skin sebum are associated with the growth of *Propionibacterium acnes*. Intensive degreasing of the skin reduces *Propionibacterium acnes* but also may cause skin irritation. Aims: We assessed the degreasing effect and skin tolerability of a botanical face cleanser with hops and willow bark extract and disodium cocoyl glutamate as mild cleansing agent compared to a standard face cleanser with sodium laureth sulfate (SLES). Materials and Methods: A total of 21 healthy volunteers with normal to oily skin were enrolled in this study. Both cleansers were applied twice a day on the left or right side of the forehead for 15 days in a standardized manner. Bioengineering measurements were performed on day 8 and 15 and on day 17 after an application break of 48 hours. The sebum level was determined using a Sebumeter<sup>®</sup>, and skin redness was measured using a Mexameter<sup>®</sup>. Results: The botanical face cleanser significantly reduced the sebum level ( $P < .01$ ) in the test area on day 17. The SLES containing cleanser showed a statistically relevant degreasing effect

already on day 15, but after the application break the sebum level increased again on day 17. None of the cleansers caused skin irritation as determined by skin redness measurements. Conclusions: In contrast to the SLES containing cleanser, the botanical skin cleanser with hops and willow bark extract had a continuous degreasing effect without reactive seborrhoe after the treatment break. Skin cleansing without SLES might be advantageous for sensitive skin.

*P. Suchonwanit, K. Triyangkulsri, M. Ploydaeng, K. Leerunyakul, Assessing Biophysical and Physiological Profiles of Scalp Seborrheic Dermatitis in the Thai Population, BioMed Research International, Volume 2019*

Background: Scalp seborrheic dermatitis (SD) is a common and chronic inflammatory skin disease which tends to recur over time. By measuring biophysical properties of the stratum corneum, many studies report abnormal biophysical profiles and their association in various dermatologic diseases. The aim of the study is to analyze the biophysical properties and skin barrier defects of scalp SD compared to healthy controls. Materials and Methods: This study is a cross-sectional study assessing the correlation of various biophysical and physiological profiles in scalp SD. Forty-two Thai participants with scalp SD were enrolled in the study and 40 healthy participants were also enrolled as the control group. Both SD and control group were subjected to a one-time biophysical and physiological properties' measurement of transepidermal water loss (TEWL), stratum corneum hydration (SCH), skin surface pH, skin surface lipid, and skin roughness. Results: The mean TEWL of lesional skin of SD cases were significantly higher than those of control group ( $P < 0.05$ ). Relating to high mean TEWL, the mean SCH was found to be significantly lower in SD cases ( $P < 0.05$ ). Skin surface lipid was also found to be significantly higher in SD group ( $P < 0.05$ ). However, there were no differences in skin surface pH ( $P = 0.104$ ) and roughness ( $P = 0.308$ ) between the two groups. Pairwise comparison of each subgroup found that moderate and severe SD demonstrated significantly higher mean skin surface lipid than that of control group ( $P < 0.05$ ). Conclusion: Scalp SD may be associated with seborrhea in Thai population. Monitoring of SCH, TEWL, and skin surface lipid could be helpful in assessing severity and evaluating the treatment outcome in patients with scalp SD.

*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.

*E. Kotroni, E. Simirioti, S. Kikionis, I. Sfiniadakis, A. Siamidi, V. Karalis, A. Vitsos, M. Vlachou, E. Ioannou, V. Roussis, M. Rallis, In Vivo Evaluation of the Anti-Inflammatory Activity of Electrospun Micro/Nanofibrous Patches Loaded with Pinus halepensis Bark Extract on Hairless Mice Skin, Materials 2019, 12*

Skin inflammation is the most common symptom in dermatological diseases. It is usually treated by topically applied products, such as creams, gels and lotions. Skin dressings offer a promising alternative as they are endowed with more controlled administration conditions. In this study, the anti-inflammatory activity of electrospun alginate micro/nanofibrous dressings loaded with the aqueous extract of *Pinus halepensis* bark (PHBE) was evaluated in vivo in mice. The upper back skin of SKH-1 female hairless mice was exposed to a single dose of ultraviolet radiation (3 MEDs) and the inflamed area was treated daily by the direct application of a nanofibrous patch. The condition of the skin was evaluated primarily on the basis of clinical observation, photo-documentation and histopathological assessment, while measurements of the erythema, hydration, transepidermal water loss (TEWL) and

sebum production were also taken into account. The results showed that the topical application of alginate micro/nanofibrous dressings loaded with PHBE on UV-inflamed skin significantly attenuated inflammation damage, reducing the healing period. Increase of the loading dose of PHBE resulted in a proportional reduction of the extent, the density and the depth of skin inflammation. With the steadily increasing interest of the skin dressing industry towards nanofibrous matrices, electrospun nonwovens could serve as ideal candidates for the development of multifunctional anti-inflammatory care systems.

**I. Montaña, Invisible Yet Indispensable, the Skin Microbiota Needs to be Properly Supported,** SOFW Journal 09/19, Volume 145

Billions of microorganisms colonize the human skin at various sites and constitute the skin microbiota. They form complex communities that function together with the host immune system to defend against pathogens and to maintain skin health. Since having a well-balanced cutaneous microflora is important for a healthy and beautiful skin, protecting its balance and its recovery represents a winning strategy for skin care products. The active ingredient Black BeeOme™ that results from the fermentation of honey from the rare wild dark bee *Apis mellifera mellifera* with the bacteria *Zymomonas mobilis*, has been designed to harmonize the skin microflora after stress to ensure a healthy and pure skin. The fermentation eliminates the basic sugars glucose, fructose and sucrose in the honey. As a result, the carbon source for unwanted bacterial growth on the skin is removed. On the other hand, the ferment of *Zymomonas mobilis* contains factors that may help to control the growth of microorganisms on the skin. Black BeeOme™ has been shown to efficiently exert its prebiotic effect to restore the healthy skin's natural microbiota following daily stress.

**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 Ukrainian), 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.

**H. Azaryan, Comparative Analysis of the Efficiency 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  $34.5 \pm 1.54$ ) 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.

*D. Blasi, C Paratore, A bright 'star' in the anti-acne universe*, PERSONAL CARE EUROPE, April 2019, p. 79-81

Among all the dermatoses, *Acne vulgaris* is the most common multifactorial disease in patients between 11 and 30 years old, as it affects up to 80% of people belonging to this age segment. Moreover, due to its high diffusion in the population and to its significant morbidity, it causes both physically and psychologically side-effects on patients, in terms of scarring, depression, anxiety and low self-esteem.

*H. Lee, Y.-P. Ng, U. Rho-Wan Chong, K.-H. Chong, F.Y. Yeo, H Teah, S.-Y. Tan, Y.-F. Chen, N. Abd-Aziz, K.-L. Ng, M.-S. Toh, From Molecular Characterization to Clinical Validation: unveiling- New Science of Skin Glycation and the Skin Lightening Effect of Dimethylmethoxy Chromanol Mediated via an Anti-Glycation Mechanism*, IFSCC Magazine 3, 2019

Skin glycation is a nonenzymatic reaction of a sugar molecule and the functional group of a protein to form an advanced glycation end product, which is one of the considerable factors involved in accelerating skin aging intrinsically. The aim of this study was to develop an in vitro skin glycation model to characterize the impact of glycation stress on skin physiology and further to be used for identifying potent antiglycation molecules. As a result, a new skin model based on the presence of N-(carboxymethyl)lysine as glycation biomarker in glyoxal-challenged human reconstituted skin was developed. From microarray profiling, skin glycation was found to affect multiple skin biological activities, including epidermis keratinization, skin lipid degradation, dermis extracellular matrix and hemidesmosome disassembly, the trigger point for skin oxidative stress and inflammatory responses. Intriguingly, skin glycation was shown to be highly correlated with skin darkening without involvement of melanocyte activity. We could show that dimethylmethoxy chromanol demonstrated potent antiglycation activity even though it was known for its antioxidant property. However, it is highly reactive and prone to be degraded in formulations. Therefore, a nanoemulsion formulation was designed to improve its stability and its topical anti-glycation activity was validated subsequently. Further, a clinical trial with a dimethylmethoxy chromanol encapsulated nanoemulsion demonstrated significant improvement in skin complexion (ITA°), reduction of skin redness and anti-hyperpigmentation efficacy. In summary, a profound understanding of skin glycation stress at the molecular level was established and it is also highly associated with skin darkening. In addition, dimethylmethoxy chromanol could be used as the lead molecule in cosmeceutical applications to further improve overall skin complexion and hyperpigmentation via its antiglycation effects.

*N. Singh, D. Deflorio, Taking the rough with the smooth: aging effects on tactile surface texture perception*, University of Birmingham, UK

Over the course of the day most of us handle different items. We grasp them and also run our fingers over the surface. Our current project is a collaboration of expertise from academia and industry to understand how information from multiple sources and senses are combined in surface texture perception, and how does it change with age. The current project is a collaboration of University of Birmingham, University of Nottingham and Proctor & Gamble Brussels Innovation Center.

*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/m<sup>2</sup> 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.

C. Uhl, G. Lanzendörfer-Yu, **How effective is your anti-acne product?**, SPC December 2018

For assessing, treatment analysis and documentation, acne has to be either graded or lesion scoring has to be done. Both methods strongly depend on the skills of the examiner and bear high inter-individual deviations. Biophysical measurements using sebumetry, porphyrin fluorescence, and standardized photographic images of the face can overcome these disadvantages. Additionally, they can be used for comprehensive evaluation of the treatment protocol.

M. Emitiazy, E. Zareie, L. Shiribeigi, O. Sadeghpour, P. Mansouri, **Effect of Oral Herbal Medicament on Scalp Seborrhea and Gastrointestinal Symptoms in a Male Patient: A Case Report**, Iran J Public Health, Vol. 47, No.7, Jul 2018, p. 1030-1033

A 32-yr-old man with a 10-yr history of scalp seborrhea referred to Skin and Stem Cell Research Center, Tehran, Iran, in 2015. He suffered from scalp seborrhea. Concurrent gastrointestinal symptoms and the changes in the clinical symptoms after consumption of the polyherbal traditional drug called Triphala are discussed. The scalp sebum was measured with a Sebumeter SM815. Gastrointestinal symptoms were followed using a valid questionnaire. After two months of treatment, scalp sebum secretion had decreased substantially. The patient also experienced remarkable improvement in gastrointestinal symptoms. Considering the positive effect of this known and safe polyherbal drug on skin sebum, it is an appropriate option for detailed large-scale clinical trials.

M.O. deMelo, P.M.B.G. Maia Campos, **Characterization of oily mature skin by biophysical and skin imaging techniques**, Skin Res Technol. 2018; 24: p. 386-395

Background: The skin is a complex biological system and may suffer change according to the environmental factors, as higher temperatures can increase sebum excretion, presenting oiliness and acne. These alterations can persist during the aging and provoke more changes in aged skin. In this study we evaluated the mature oily skin characteristics using biophysical and skin imaging techniques. Material and methods: Sixty healthy female subjects, aged between 39 and 55 years old were recruited and separated into 2 groups according to their skin type: normal/ dry and oily skin. The skin was evaluated in terms of stratum corneum water content, transepidermal water loss (TEWL) sebum content, dermis thickness and echogenicity, skin microrelief, and pores content. Results: The mature oily skin presented no significant differences when compared to the normal/dry skin on the stratum corneum water content and TEWL parameters. The sebum content was significantly higher on the oily skin group. The microrelief analysis showed an increase of skin roughness values in the oily skin and increase of scaliness in the normal/dry skin. The oily skin showed lower dermis echogenicity mainly in the frontal region and higher dermis thickness when compared to normal/ dry skin. Conclusion: The mature oily skin showed different characteristics from normal/dry skin in terms of sebum content, microrelief parameters, and dermis thickness. This way, the characterization of mature oily skin in an objective way is very important to development of dermocosmetic products for more effective treatments focused specially on this type of skin.

H.-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.

A. Desnos, D. Gely, D. Chollet, C. Soleau, **The Skin Balancing Effect of *Polygonum bistorta***, IFSCC Congress, Munich, September 2018

Sebaceous glands produce and secrete sebum that coats and protects the skin against bacteria and keeps it hydrated. Through the pore of the hair follicle, sebum reaches the surface of the skin. It is composed of triglycerides and fatty acid breakdown products (55-60%), wax esters (25%), squalene (12%), cholesterol esters and cholesterol (<5%) (1). However, sebum synthesis can be dysregulated and influenced by multiple molecular pathways and stimulus including oxidation and inflammation (2).

S. Pain, L. Danoux, N. Berthelemy, S. Cadau, D. Herault, V. Andre, A.F. de Bengy, N. Forraz, C.

**McGuckin, Highly efficient plant extract against oily skin determined by 2D and 3D sebaceous models, IFSCC Congress, Munich, September 2018**

People with oily skin often complain that their skin feels unclean and is shiny. Oily skin is not only an aesthetic concern, but can also contribute to acne development. The main origin of oily skin is the hyperactivity of sebocytes, which results in an excessive secretion of sebum from sebaceous glands. Sebaceous glands are mostly found on scalp, face, and trunk in association with hair follicles forming the pilosebaceous unit. The secretion of sebum is carried out through a holocrine breakdown of mature sebocytes characterized by a high density of cytoplasmic lipid droplets. Sebum is a unique complex mixture of lipids with triglycerides (30- 50%), free fatty acids (15-30%), wax esters (26-30%) and squalene (12-20%). However, sebum is beneficial as it helps to protect and moisturize the skin and hair, keeping them healthy. Therefore, managing or treating oily skin is always a challenge to retain an appropriate moisturization. Sebaceous glands also support the growth of facultative anaerobes such as *Propionibacterium acnes* (*P. acnes*), a common skin commensal bacterium. Encoding lipases of *P. acnes* degrade skin lipids of sebum, they especially hydrolyses the triglycerides present in sebum, releasing irritant free fatty acids onto the skin. Managing the lipase activity may contribute to decrease *P. acnes* virulence and related skin impact.

**G. Dell'Acqua, C. Heusele, S. Schnebert, Clinical evaluation of hyperpigmentation on skin phototype IV and V, IFSCC Congress, Munich, September 2018**

Increased production of melanin can lead to pigmentation disorders characterized by hyperpigmentation and uneven melanin distribution, especially in darker skin individuals. This phenomenon can have different causes: inflammation due to a wound, an acne lesion, or a chronic and prolonged sun exposure. These clinical features can be visible for a variable period of time, causing serious psychological discomfort. To identify pigmentation disorders and their manifestation, a clinical study was performed in the United States on 61 healthy women (30 aged 20-30 years old and 31 aged 54-65 years old), phototype Fitzpatrick IV-V, mostly African Americans or Hispanics, presenting nonpathological hyperpigmentation on the cheeks. A board-certified dermatologist classified lesions as post-inflammatory hyperpigmentation (PIH), melasma, solar lentigo/age spot, maturational dyschromia and assigned scores based on lesion's intensity, size and distribution. In particular, PAHPI – Postacne Hyperpigmentation Index and MASI - Melasma Area and Severity Index were scored. Pigmented areas were instrumentally quantified by image analysis (VISIA, Vaestro, Canfield). Pores number and size were also measured (VISIA, Vaestro, Canfield). Sebum output was quantified on the forehead using a Sebumeter (Courage & Khazaka). A Skindex-16 questionnaire was used to evaluate skin-related quality of life. Type and intensity of skin dyspigmentation was studied according to subject's age, phototype, ethnic origin, sebum output, pore size and pore number. Results show that PIH was mostly carried by the younger group with a prevalence in phototype V (African American). Melasma and maturational dyschromia were mostly common in the older group with melasma lesions number more prevalent in phototype V and more evident on the malar region of the face. When analyzed by imaging, the older group presented a statistically significant higher hyperpigmentation than the younger group. The older group also presented more and larger pores than the younger group. The Skindex-16 questionnaire evidenced significant concern and discomfort about the condition specifically in the younger group. This study highlights in details age-related skin pigmentation differences on a specific dark skin phototype targeting an African American and a Hispanic population.

**P. Sewraj, A. Laurent, Kinetics of sebum excretion on the scalps of Black South African Women, IFSCC Congress, Munich, September 2018**

Background: Several studies that include instrumental evaluation of sebum production on the scalp showed that sebum levels on the scalp differ among populations living in different parts of the world. This study completes the picture with data on Black South African women. Methods: Two groups of 15 black women differently aged (18- 35y) and (45- 65y) were enrolled in the study. Inclusion criterion specified that no relaxer was used in the 4 weeks prior to the test. The study was conducted over a 72 hour period (0, 24, 48 and 72h) and measurements were made on the scalp and forehead using a Sebumeter<sup>®</sup> (sebum score). Kinetics of sebum production were studied, in particular the time needed to reach a plateau, as well as the age impact on that kinetics. Results: The basal scalp sebum level of South African women was found of much lower value than that of African American scalps and the lowest of all populations, when referring to a previous work of our Research group (1). For the kinetics of sebum production (Sebum Excretion Rate), black South African women present a much lower sebum production on the scalp. It takes longer to reconstitute the scalp sebum at 48 hours when compared to women of other countries, globally.

*M. Hisama, A. Kishita, N. Yamaguchi, C. Takeuchi, S. Matsuda, K. Yoshio, H. Kanayama, K. Masui, T.*

**Miyazawa, R. Takimi, Age Related Changes of Human Skin Investigated on Biophysical, Physiological and Histological Characteristics, IFSCC Congress, Munich, September 2018**

Japan's life expectancy has increased steadily over the past century, and currently stands as the highest in the world at almost eighty-four years. As life expectancy increases and with it the proportion of the aged in the population appropriate care of elderly skin becomes a medical concern of increasing importance. The skin is the largest multifunctional organ in the body. It functions as a protective physical barrier by absorbing UV radiation, preventing microorganism invasion and chemical penetration, and controlling the passage of water and electrolytes. The skin has a major role in thermoregulation of body, in addition to immunological, sensory, and autonomic functions. As skin ages, the intrinsic structural changes that are a natural consequence of passing time are inevitably followed by subsequent physiological changes that affect the skin's ability to function as the interface between internal and external environments. As numbers of the elderly increase, cosmetic dermatological interventions will be necessary to optimize the quality of life for this segment of the population. It is important to examine the associations between elderly skin condition and aging for development of anti-aging care products for elderly skin. Understanding the physiological, chemical, and biophysical characteristics of the skin helps us to arrange a proper approach to the management of skin diseases. However, it is critical to consider the influence of genetic and environmental factors on most of the skin characteristics. In this study, we investigated the comparison between the elderly skins in five different age groups on biophysical, physiological and histological characteristics by *in vivo* measurements in order to quantify aging processes on human skin.

**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.

**N. Zacula Juárez, A. Galvan, Gerardo, L. Gómez, Evaluation of the recovery of the biomechanical properties in hypertrophic burn scar: Looking for a suitable treatment and Care, IFSCC Congress, Munich, September 2018**

Background: The skin is the largest organ of the human body and serves as physical and chemical barrier to the environment. Burn injuries are one of the most common traumatic wounds, this represents a costly public health problem. Many of burned patients develops a hypertrophic scar that can cause an aesthetic and functional problems. The aim of this research was had a better understanding of the recovery of biomechanical properties in hypertrophic burn scar to find new therapeutic strategies to control adverse scarring. Method: Cutometer MPA 580 is a non-invasive an objective suction device to make measurements of scar components as melanin, erythema, hydration,

sebum, elasticity and viscoelasticity. Nine patients on the upper extremities with hypertrophic burn scars were evaluated with Cutometer MPA 580 to determine the recovery of the biomechanical properties respect a counterpart without burn injury. The analysis of the different biomechanical parameter was performed with a 2 mm aperture probe and a negative pressure of 450 mbar with 2 seconds of suction and 2 seconds to relaxation in a series 10 suction/relaxation, by triplicate. Also were evaluated *stratum corneum* hydration values by Corneometer, the presence of melanin and erythema by Mexameter and sebum production by Sebumeter probe. Nine patients with an age range between 26-37 years, a skin phototype III, IV and V, a mean value 30.6% of the Total Body Surface Area (TBSA), second and third degree burns were treated with autograft. For this study, approval from the Ethics Committee of the Instituto Nacional de Rehabilitación in Mexico City was obtained (26/15) and Informed consent was obtained from all patients. Results: The results are presented as a percentage (%). In the melanin Index of hypertrophic scars, there is an increase of 13.8 % respect a counterpart without injury or hyperpigmentation in autograft. The results of the erythema index rise with 29.5% of scars, the hydration value of *stratum corneum* decreased a 19 % and the sebum production decreased a 68 % on hypertrophic scar. The relative biomechanical parameters R0 (Maximal deformation), R5 (Net elasticity) and R6 (indicates a relative contribution of viscoelastic, viscous and elastic deformation "viscoelasticity"). The maximal deformation (R0) in hypertrophic scar decreased by 49%, there is a reduction of 33% in net elasticity (R5) and was observed a increase of 5.6% in R6 "viscoelasticity". The biomechanical properties (R0, R5 and R6) and hydration, sebum, melanin and erythema in hypertrophic burn scar was altered. Conclusion: This data can be useful for a better diagnosis and find new strategies suitable for the treatment of hypertrophic burn scars and contribute to outpatient burn care.

*V.H. Pacagnelli Infante, J. Migliati, P.M.B.G. Maia Campos, Why should I use sunscreen? The impact of lifestyle on the hydro-lipidic, structural and morphological characteristics of young men skin, IFSCC Congress, Munich, September 2018*

The consumption of cosmetics among men has grown in the last years. However there is some resistance to the use of these products due to the culture, sensory, perception and access for this audience to consume cosmetic products. Considering that the use of sunscreens is a public health issue and directly affects the quality of life, the objective of this study is to show the skin differences between two groups, one that uses sunscreen regularly and one that does not use, using biophysics and skin imaging techniques. Sixty men between 18 and 28 years old, phototypes II, III and IV were randomly selected and questioned about their photoprotection habits. Hydration, integrity of the stratum corneum (TEWL, Corneometer and VisioScan), amount of sebum (Sebumeter) and activity of the sebaceous glands (Sebifix) were made. We analyzed the amount of pores (Visioface), formation of erythema (Mexameter), ultrasound of the dermis (DermaScan C) in the frontal and malar regions and we obtained reflectance confocal microscopy images (RCM) for analysis of the quality of the epidermis and papillary dermis at the cellular level in the frontal region. Of the 60 participants, 24 regularly uses sunscreens (group A) and 36 were not (group B). When questioned about the reasons for not using sunscreen, group B mentioned that did not obtain family incentive and /or sunscreens was sticky or oily. Changes in the integrity of the stratum corneum were observed, with thickening of this layer of the epidermis and impairment of the barrier function with increase of TEWL and decrease of the hydration for group B. The granular layer of the epidermis is also thicker for this group. There was an increase in microrelief roughness for the same group. Moreover, there is also a higher activity of the sebaceous glands, with consequent greater number of pores for group B. Also, a decrease in the echogenicity ratio of the group B were observed, evidenced by the decrease of the dermoepidermal junction layer (related to the depth of the papillae), increase in pore diameter and worst collagen quality. We observed a disruption of the honeycomb pattern of the epidermis and the presence of polycyclic papillae for group B. This same group showed dilatation in the veins in the basal layer of the epidermis and a significant increase in erythema, evidencing signs of possible inflammation. The presented damages evidences the necessity of UVB photoprotection (more related to the damages in the integrity of the barrier) and UVA, too (damages in the region of the papillary dermis). The lifestyle influences the choices and their consequences, showing that sun exposure can cause damage even early, especially in groups that present a certain cultural resistance to the use of cosmetics such as the male. Furthermore, we have shown that the damages of unprotected sun exposure happen in different layers of the skin, which increases the need to develop suitable sunscreens with UVA and UVB protection and with a good sensorial improving the adhesion of photoprotection among men.

*M. Fak, H. Rotsztein, A. Erkiert-Polguj, The early effect of microdermabrasion on hydration and sebum level, Skin Res Technol. 2018; 24, p. 650-855*

Background: Microdermabrasion is a popular form of mechanical peel, used for many aesthetic purposes. Because it removes the superficial epidermal layer, it has an impact on hydro-lipid skin coat.

**Objective:** The aim of the study was to examine the changes taking place in the hydrolipid coat of the skin after microdermabrasion measured by skin hydration and sebum level. **Methods:** Sixteen healthy women were included in the study, and the aluminium oxide crystal microdermabrasion device was used over the entire face of each patient. Measurements of stratum corneum hydration and sebum level were taken at baseline, just after the treatment, and 30 and 60 minutes later. **Results:** A statistically significant difference in stratum corneum hydration was found on the cheeks 30 minutes after treatment and in the T-zone immediately after the procedure. Sebum reduction was observed immediately after the procedure irrespective of skin type and face area. In addition, sebum value was found to return to baseline 1 hour after the procedure. **Conclusions:** The observed changes in epidermal barrier function may be responsible for the clinical improvement following microdermabrasion.

*D. Blasi, C. Paratore, A bright 'star' in the anti-acne universe, PERSONAL CARE ASIA PACIFIC, September 2018, p. 69 – 71*

Among all the dermatoses, *Acne vulgaris* is the most common multifactorial disease in patients between 11 and 30 years old, as it affects up to 80% of people belonging to this age segment. Moreover, due to its high diffusion in the population and to its significant morbidity, it causes both physically and psychologically side-effects on patients, in terms of scarring, depression, anxiety and low self-esteem. *Acne vulgaris* is an inflammatory disorder in which many agents can act as triggers: androgens, drugs, genetic factors, regulating neuropeptides and environmental factors, such as pollution and UV radiation.

*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 these 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.

*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.

*P.E.J. van Erp, M. Peppelman, D. Falcone, Noninvasive analysis and minimally invasive in vivo experimental challenges of the skin barrier, Experimental Dermatology, 2018;27: p. 867–875*

In this review, we aim to give a concise and selective overview of noninvasive biophysical analysis techniques for skin barrier analysis (transepidermal water loss, electrical methods, confocal Raman microspectroscopy, sebumeter, reflectance spectrophotometry, tristimulus colorimetry, diffuse reflectance spectroscopy and reflectance confocal microscopy), including advantages and limitations.

Rather than giving an exhaustive description of the many techniques currently available, we show the usefulness of a representative selection of techniques in the functional and morphological evaluation of the skin barrier. Furthermore, we introduce human minimally invasive skin challenging models as a means to study the mechanisms regulating skin homeostasis and disease and subsequently show how biophysical analysis techniques can be combined with these *in vivo* skin challenging models in the functional and morphological evaluation of the skin barrier in healthy human skin. We are convinced that the widespread application of biophysical analysis techniques in dermatological practice and in cosmetic sciences will prove invaluable in offering personalized and noninvasive skin treatment solutions. Furthermore, combining the human *in vivo* challenging models with these novel noninvasive techniques will provide valuable methodology and tools for detailed characterization of the skin barrier in health and disease.

*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 efficacy, 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 efficacy 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.

*A. Rigal, R. Michael-Jubeli, A. Bigouret, A. Nkengne, A. Baillet-Guffroy1, A. Tfayli, Lipides: Systèmes Analytiques et Biologiques*, ISBS Conference San Diego, May 2018

Introduction: Clinical manifestations of skin aging like xerosis, wrinkles and slackness are related to underlying complex molecular phenomena in the different layers of the skin. The combinations of classical biometric measurements with more complex and informative techniques like *in vivo* Raman spectroscopy can provide interesting information on the organization of lipids in the *Stratum Corneum* (SC), their barrier function and on water content and mobility, in order to better characterize the skin aging. Methodology: Biometric information (TEWL, corneometry, sebumetry, skin pH, mechanical stress) and Raman spectra and in-depth profiles were collected from the forehead of twenty-two young women (18- 24 years old) and eighteen elderly women (70-75 years old). Results and Conclusions: Important modifications on biometric skin parameters, structure of the SC and water mobility can be observed for elderly. Our results show a good association between biometric parameters and *in vivo* Raman descriptors. Interestingly, higher compacity of lipids, higher total water content and lower unbound water content are observed for elderly.

*V. Hourblin, S. Nouveau Stéphanie, J. Faugère, C. Gomes, I. Tardy, L. Aguilar, Characterization and Statistical Modeling of Facial Skin Radiance in Senior Women*, ISBS Conference San Diego, May 2018

Introduction: Dull skin is a major concern for senior women but even though some parameters such as optical parameters seem to be involved in the perception of skin radiance, there is a lack of objective assessments, and it remains difficult to assess. A typological study was conducted in order to characterize the drivers of lack of facial skin radiance in senior women using a holistic and cartographic approach. Knowing this, the change level required for each key driver was determined to improve overall skin radiance then confirmed through a validation study. Methodology: In a first step, a typological study was carried out on 150 French women, phototype II or III, aged over 55 years, and distributed in two groups according to their lack of radiance as scored by a dermatologist (severe versus light to moderate). A large number of parameters including skin type and texture, skin aging signs, wrinkles, pigmentary disorders and dark circles were assessed by a dermatologist and by self-assessments. Instrumental measurements were also performed, skin color using the L\*a\*b\* system (Spectrophotometer® CM-700d), skin shininess (Lightcam®), backscattered light (Translucymeter®

TLS850), current level of sebum (Sebumeter® SM815), skin conductance (Corneometer® CM810), and skin density by ultrasounds (DUB®SkinScanner 75). Qualitative and quantitative Bayesian Belief Networks were designed to characterize the lack of radiance and to set a predictive model of radiance improvement for both women and dermatologist. In a second step, a 10 validation study was carried out on 90 women with a similar profile, and presenting a lack of radiance according to the key features. The predictive model was used to define the expected change range of each feature; this prediction was validated with a combined cosmetic routine. Results and Conclusions: Bayesian statistical approach was effective for identifying and ranking the key drivers of facial skin radiance. The first striking result was that lack of radiance as assessed by the expert was driven by dark circles, skin shininess, pigmentary disorders, backscattered light and skin density, but usual aging signs such as wrinkles did not contribute to it. Interestingly, these key drivers were also perceived as such by the women enrolled in the study. According to the statistical model, improvement of facial skin radiance in senior women can be reached by decreasing dark circles and skin tone unevenness and by increasing the skin shininess. For each of the key features, we were able to define target values (clinical scores or instrumental measurements) in order to improve the overall radiance. These targets have been validated through the second study, by clinical and self-assessments of radiance after combined skin care and make up applications. These two clinical studies allow us to have now, a tool based on objective clinical targets, in order to get more radiant skin in senior population.

*M.O. Melo, L. Kakuda, P.M.B.G Maia Campos, **Clinical Efficacy of a Multifunctional Cosmetic Formulation for Mature Oily Skin***, Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: The skin may change due to factors as high temperatures, increasing sebum excretion and presenting oiliness and acne. These alterations can persist during the aging and provoke more changes that influence the use of cosmetics. The objective of this study was to evaluate the clinical efficacy of a cosmetic product developed for the mature oily skin. Methodology: The clinical efficacy was evaluated on 30 participants aged between 39 to 55 years old with oily skin. The analyzed parameters were: stratum corneum water content, TEWL, sebum content and percentage, microrelief and dermis echogenicity. The analyses were performed on different regions of the face. A placebo formulation was also tested. Results and Conclusions: The developed formulation improved the sebum content and percentage, skin microrelief in terms of skin roughness and desquamation and dermis echogenicity. The biophysical and skin imaging techniques utilized in this study were useful to test the clinical efficacy of an effective formulation for mature oily skin.

*M. Mendes Fossa Shirata, P.M. Berardo Gonçalves Maia Campos, **Evaluation of Young Skin Photoaging Using Biophysical and Imaging Techniques***, Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: Photoaging is associated to an intense solar exposure, thus the photoaging signs can be observed also in the young skin, mainly in countries with high UV incidence, like Brazil. The aim of this study was to evaluate the skin changes resulted from photoaging in Brazilian young skin in comparison to photoaged mature skin. Methodology: Thirty participants were divided in two groups: the first between 18 to 35 years old and the second, 40 to 60 years old. Analyzes were performed on the randomized facial malar region. TEWL, stratum corneum water content, sebum content, high resolution imaging, echogenicity and dermis thickness, skin color and elasticity parameters were analyzed. Results and Conclusions: The obtained results showed that sun exposure can cause changes even in the young skin, with the appearance of spots and the reduction of the echogenicity of the dermis, besides there were no significant differences between young skin and mature skin in most parameters. In conclusion, signs of photoaging may be frequent even in young skin.

*M. Gabarra Almeida Leite, P.M. Berardo Gonçalves Maia Campos, **Evaluation of Oily Hair and Skin: Comparison between Self Perception and Clinical Analysis Using Biophysical and Imaging Techniques***, Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: Excess of oiliness can cause skin changes such as acne and compromise the cutaneous physiology, affecting of both skin and hair. Thus, the aim of this study was to evaluate skin and hair alterations due to excessive amount of sebum using biophysical and imaging techniques. Methodology: 100 participants (18 - 49 years), with oily skin and hair, were recruited. Skin was evaluated in terms of stratum corneum water content, TEWL, activity of the sebaceous glands, amount of porphyrins and pores. Scalp was evaluated in terms of sebum content. Results and Conclusions: Participants were divided 4 groups: 1- Oily skin and hair (45,23%), 2- Oily skin and normal hair (10,71%), 3- Normal skin and oily hair (34,52%) and 4- Normal skin and hair (9,52%). The participants with oily skin presented activity of the sebaceous glands of  $9.1 \pm 1.1$  surface (%), high amount of pores and presence of porphyrins, and scalp amount of sebum of  $330,6 \pm 9,8$   $\mu\text{g}/\text{cm}^2$ . Although all the panelists

considered their hair and skin oily, they were classified differently, showing that the tropical weather can influence the self-perception and lead to a wrong treatment without the correct evaluation.

*J. Attia-Vigneau, M. Shortt, R. Seguin, I. Lacasse, E. Loing, **Safeguarding Squalene: Lemon Myrtle Antioxidant for Pollution Protection and Oleostasis**, C & T online May 2018*

Sebum, the lipid film produced by sebaceous glands in the skin, has important functions including reducing water loss from the skin surface, serving as a vehicle for lipophilic antioxidants, protecting against harmful microorganisms and shielding against environmental aggressors.<sup>1</sup> Human sebum is a complex mixture of lipids consisting of triglycerides, diacylglycerols and fatty acids (50–60% altogether); wax esters (20–30%); squalene (10–16%); and cholesterol esters (2–4%).

*A. Ezerskaia, N.E. Uzunbajakva, G.J. Puppels, J. de Sterke, P.J. Caspers, H.P. Urbach, B. Varghese, **Potential of short-wave infrared spectroscopy for quantitative depth profiling of stratum corneum lipids and water in dermatology**, Biomedical Optics Express 2436, May 2018, Vol. 9, No. 5*

We demonstrate the feasibility of short wave infrared (SWIR) spectroscopy combined with tape stripping for depth profiling of lipids and water in the stratum corneum of human skin. The proposed spectroscopic technique relies on differential detection at three wavelengths of 1720, 1750, and 1770 nm, with varying ratio of the lipid-to-water absorption coefficient and an 'isosbestic point'. Comparison of the data acquired using SWIR spectroscopy with that obtained by a gold standard for non-invasive quantitative molecular-specific skin measurements, namely confocal Raman spectroscopy (CRS), revealed specificity of the proposed modality for water and lipid quantification. At the same time, we provide evidence showing aberrant sensitivity of Corneometer hydration read-outs to the presence of skin surface lipids, and a lack of sensitivity of the Sebumeter when attempting to measure the lipids of the cornified lipid envelope and intracellular lipid layers. We conclude that a spectroscopic SWIR-based spectroscopic method combined with tape stripping has the potential for depth profiling of the stratum corneum water and lipids, due to superior measurement sensitivity and specificity compared to the Corneometer and Sebumeter.

*M.L. Vazquez-Gonzalez, M. Cocerra, J. Nestor, G. Rodriguez, R. Saldana, L. Barbosa-Barros, **Innovative approach to control acne-prone skin**, PERSONAL CARE EUROPE, April 2018, p. 153-156*

Excessive sebum production can give rise to oily skin, shiny appearance, enlarged pores and favour the development of acne lesions. The care of acne-prone skin involves the use of harsh molecules, wash out and multi-step products that irritate the skin and limit user compliance. This study describes the development of a bicosome system that targets the epidermis and follicles to effectively deliver a sebostatic active compound and potentiate its effects on sebum production and acne lesion prevention. This is an alternative approach to that offered by current products, which can be included in the daily care of acne-prone skin.

*B. Walzel, B. Senti, S. Banziger, U. Batz, **The natural solution to pollution**, PERSONAL CARE EUROPE, April 2018, p. 83-88*

Exposure to air pollutants is one of the major threats to skin health. Contaminants attack the skin on several levels: they induce oxidative stress, they stimulate inflammatory pathways, and they accelerate the ageing process of skin. As a consequence, consumers demand functional cosmetics that prevent and repair pollution-induced skin damage. In this respect, the most promising approach is using the body's endogenous detoxification machinery, which is composed of a multitude of cell-protective and detoxifying mechanisms. These powerful systems are capable of neutralising thousands of toxic molecules per second, whereas the mere application of antioxidants is much less efficient, as one antioxidant molecule is capable of neutralising only one free radical. HerbaShield URB addresses these concerns. The COSMOS-approved multicomponent active ingredient targets three mechanisms to naturally reduce pollution-induced skin damage: (1) It strengthens the skin's barrier through hydrogenated lecithin; (2) it protects from radical oxygen species through natural antioxidants; and (3) it enhances the endogenous detoxification machinery through natural activators of detoxifying enzymes. The presented anti-pollution ingredient is a perfect fit for anti-ageing cosmetics and to be formulated in skin care applications, such as face care, body care, and cleansing products.

*S. Léglise, **Rebalancing for lighter, less oily hair**, PERSONAL CARE ASIA PACIFIC, March 2018 and PERSONAL CARE EUROPE, April 2018, p. 158-159*

Because oily hair comes from a functional imbalance in the hair bulb, this needs to be corrected through targeted action on the production of oily substances, and also on the general protection of the hair.

*B. Walzel, B. Senti, S. Banziger, U. Batz, The natural solution to pollution, PERSONAL CARE ASIA PACIFIC, January 2018*

Exposure to air pollutants is one of the major threats to skin health. Contaminants attack the skin on several levels: they induce oxidative stress, they stimulate inflammatory pathways, and they accelerate the ageing process of skin. As a consequence, consumers demand functional cosmetics that prevent and repair pollution-induced skin damage. In this respect, the most promising approach is using the body's endogenous detoxification machinery, which is composed of a multitude of cell-protective and detoxifying mechanisms. These powerful systems are capable of neutralising thousands of toxic molecules per second, whereas the mere application of antioxidants is much less efficient, as one antioxidant molecule is capable of neutralising only one free radical. HerbaShield URB addresses these concerns. The COSMOS-approved multicomponent active ingredient targets three mechanisms to naturally reduce pollution-induced skin damage: (1) It strengthens the skin's barrier through hydrogenated lecithin; (2) it protects from radical oxygen species through natural antioxidants; and (3) it enhances the endogenous detoxification machinery through natural activators of detoxifying enzymes. The presented anti-pollution ingredient is a perfect fit for anti-ageing cosmetics and to be formulated in skin care applications, such as face care, body care, and cleansing products.

*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 psoriatic patients and in corresponding areas of control subjects.

*C. J. Borzdynski, W. McGuinness, C. Miller, Comparing visual and objective skin assessment with pressure injury risk, International Wound Journal ISSN 1742-4801*

Contemporary approaches to pressure injury (PI) risk identification rely on the use of risk assessment tools and visual skin assessment. Objective biophysical measures that assess skin hydration, melanin, erythema and lipids have not been traditionally used in PI risk; however, these may prove useful as a risk assessment tool. The relationship between subjective visual assessments of skin condition, biophysical measures and PI risk warrants investigation. This study used a descriptive correlational design to examine the relationship between measures of skin hydration, colour (melanin and erythema) and lipids at PI-prone areas amongst geriatric persons ( $n = 38$ ), obtained using biophysical skin measures and visual skin assessment.

*C. J. Borzdynski, W. McGuinness, C. Miller, Emerging Technology for Enhanced Assessment of Skin Status, J Wound Ostomy Continence Nurs. 2017; 44(1): p.48-54*

Pressure injury (PI) prevention has become a key nursing priority that requires clear identification of visual cues representative of PI risk. There is generalized agreement that erythema and skin wetness and/or maceration should be routinely examined by the clinician as part of PI risk assessment. Such an assessment is largely qualitative, deeply reliant on the perception and interpretation of the clinician. Consequently, skin parameters may be misinterpreted, underestimated, or even missed completely. Objective techniques are needed to augment accurate assessment of erythema and skin wetness and/or maceration. Biophysical skin analysis devices have been widely used in the cosmetic industry and clinical research to measure certain skin parameters for the purpose of skin health evaluation. This article describes 3 devices that enable noninvasive digital measurements of epidermal hydration, erythema, and epidermal lipids, respectively. The clinical application of biophysical skin analysis instruments in the assessment PI-related skin parameters could provide a feasible alternative to subjective assessment.

*F. Tabri, I. Patellongi, S. Wahab, K. Djawad, Analysis of Nutritional Status and Levels of Sebum on Various Age Groups, American Journal of Clinical and Experimental Medicine, 2017; 5(1): 26-29*

The effects of aging on skin physiology have been reported previously. In this study we tried to elucidate the correlation of skin types with age and nutritional status. There is a correlation between the age groups with nutritional status, correlation between age groups with the sebum levels on the forehead, and also there is a correlation between nutritional status and sebum level on forehead.

*F. Pouradier, C. Liu, J. Wares, E. Yokoyama, C. Collaudin, S. Panhard, D. Saint-Léger, G. Loussouarn, The worldwide diversity of scalp seborrhoea, as daily experienced by seven human ethnic groups, Int J Cosmet Sci, 2017 Dec;39(6): p. 629-636*

Objective: The re-greasing process and kinetics of the human scalp, post-shampooing, have been previously documented, in vivo, on a few Caucasian subjects. The objective of the presented research was to extend such knowledge over seven different ethnic groups. Methods: The post-shampooing re-greasing kinetics of the scalp was studied on 1325 subjects (women and men of two distinct age classes) from seven different ethnic groups in their residential and native country. Sebum amounts were determined onto small shaved scalp areas at various times post-shampooing, using the Sebumeter® technique. Results: As previously published on Caucasian subjects, scalp re-greasing process follows a hyperbolic-like kinetics over days. However, amounts of collected sebum highly vary with ethnicity. As recorded through the casual level (CL) at the equilibrium phase, 2-3 days post-shampooing, the highest amount of sebum was found in African American subjects, followed in descending order by Caucasian American, Japanese, Chinese, Thai, Caucasian European and Indian subjects, the latter showing very low values. Lower amounts of sebum were recorded in the older age class in all ethnics, as compared to the younger one, and male subjects were found higher sebum producers than women, irrespective of ethnicity. Conclusion: The kinetics and slopes of the re-greasing process of the human scalp appear similar in all ethnic groups studied. However, striking quantitative differences are found between the seven ethnic groups, resulting from different sebaceous production levels and scalp hygiene routines.

*J. Kitsongsermthon, K. Duangweang, J. Kleepoke, A. Tansirikongkol, In vivo cleansing efficacy of biodegradable exfoliating beads assessed by skin bioengineering techniques, Skin Research and Technology 2017; 23: p. 525-530*

Background/purpose: The plastic microbeads, used in many cleansers, will be banned in cosmetic and personal care products within 2017 since they are non-degradable and can disturb the living organisms in water reservoirs. Various choices of biodegradable beads are commercially available, but their efficacy has not been proven yet. This study aimed to compare the cleansing efficacy in dirt and sebum removal aspects of three types of exfoliating beads. Methods: The gel scrubs with polyethylene (PE) beads, mannan beads or wax beads, were formulated and evaluated for their stability. The in vivo evaluation was done in 38 healthy volunteers and the skin irritation, efficacy for dirt and sebum removal were measured by Mexameter®, Colorimeter®, and Sebumeter®, respectively. Results: The selected gel scrubs did not cause an irritation in any volunteers. The differences in dirt residues between before and after scrubbing were not statistically significant among three gel scrubs and the similar result was also reported in the sebum removal study. Conclusion: All gel scrubs demonstrated the comparable cleansing efficacy in term of dirt and sebum removal. Thus, mannan beads and wax beads may be replaced nonbiodegradable PE beads to achieve the similar cleansing effect.

*J. Novoseletsky, A Hint of Peppermint for the Hair and Scalp (Abstract), www.cosmeticsandtoiletries.com, November 2017*

During SCS Formulate 2017, Naolys launched EtHAIReal Peppermint (INCI: *Mentha Piperita* (Peppermint) Leaf Cell Extract), a new active plant cell developed to rebalance and enhance the appearance of oily hair and improve the overall scalp. Tests were carried at concentrations of 0.5% (20% cells; 80% glycerin). The clinical study showed, after 28 days of treatment: A 44% decrease in sebum via Sebumeter measurements; A 71% decrease in irritation, reported by self-scoring of subjects; and An increase in hair shine, as indicated by a 62% reduction in dullness (also self-scored by subjects). These results complement the outcome of the in vitro test, which showed a reduction of the enzyme 5 $\alpha$ -reductase combined with a reduction in the release of inflammation mediators and in the development of free radicals at the level of hair bulb and scalp. EtHAIReal Peppermint is not allergenic, is preservative free and can be used in any type of hair care formulation, including shampoos, masks, serums and long-term hair treatments.

*B. Algiert-Zielińska, M. Batory, J. Skubalski, H. Rotsztein, Evaluation of the relation between lipid coat, transepidermal water loss, and skin pH, International Journal of Dermatology, Volume 56, Issue 11, November 2017, p. 1192-1197*

Objective: The epidermis is an epidermal barrier which accumulates lipid substances and participates in skin moisturizing. An evaluation of the epidermal barrier efficiency can be made, among others, by the measurement of the following values: the lipid coat, the transepidermal water loss (TEWL) index, and pH. Materials: The study involved 50 Caucasian, healthy women aged 19–35 years (mean 20.56). Methods: Measurements were made using Courage & Khazaka Multi Probe Adapter MPA 580: Tewameter TM 300, pH-Meter PH 905, Sebumeter SM 815. The areas of measurements included forehead, nose, left cheek, right cheek, chin, and thigh. Results: In the T-zone, the lipid coat was in the range between 0 and 270  $\mu\text{g}/\text{cm}^2$  (mean 128  $\mu\text{g}/\text{cm}^2$ ), TEWL between 1 and 55  $\text{g}/\text{m}^2/\text{h}$  (mean 11.1  $\text{g}/\text{m}^2/\text{h}$ ), and pH 4.0–5.6 (mean 5.39). Lower values of the lipid coat up to 100  $\mu\text{g}/\text{cm}^2$  were accompanied

by TEWL greater than 30 g/m<sup>2</sup>/h and less acidic pH of 5.6–9.0. In the U-zone the range of lipid coat was up to 200 µg/cm<sup>2</sup> (mean 65.2 µg/cm<sup>2</sup>), the skin pH remained 4.0–5.6 (mean 5.47), and TEWL was in the range between 1 and 20 g/m<sup>2</sup>/h (mean 8.7 g/m<sup>2</sup>/h). Lower values of the lipid coat up to 100 µg/cm<sup>2</sup> were accompanied by TEWL between 1 and 20 g/m<sup>2</sup>/h and less acidic pH of 5.6–9.0. High values of the lipid coat between 180 and 200 µg/cm<sup>2</sup> were connected with TEWL of 1–15 g/m<sup>2</sup>/h. On the skin of the thigh, we observed a very thin lipid coat – 35 µg/cm<sup>2</sup> (mean 5.6 µg/cm<sup>2</sup>), pH (mean 5.37), and TEWL (mean 8.5 g/m<sup>2</sup>/h) were considered by us to be within regular limits. Conclusions: In the T-zone, a thinner lipid coat resulted in relatively high TEWL and pH levels changing toward alkaline. In the U-zone, thinner lipid coat was accompanied by lower TEWL and pH changing toward alkaline. We also observed that lower values of lipid coat up to 100 µg/cm<sup>2</sup> were associated with higher pH values ranging toward the basic character pH 5.6–9.0).

*U. Wölfle, B. Haarhaus, J. Seiwert, A. Cawelius, K. Schwabe, K.-W. Quirin, C.M. Schempp, The Herbal Bitter Drug Gentiana lutea Modulates Lipid Synthesis in Human Keratinocytes In Vitro and In Vivo*, Int. J. Mol. Sci, 2017, 18, 1814

*Gentiana lutea* is a herbal bitter drug that is used to enhance gastrointestinal motility and secretion. Recently we have shown that amarogentin, a characteristic bitter compound of *Gentiana lutea* extract (GE), binds to the bitter taste receptors TAS2R1 and TAS2R38 in human keratinocytes, and stimulates the synthesis of epidermal barrier proteins. Here, we wondered if GE also modulates lipid synthesis in human keratinocytes. To address this issue, human primary keratinocytes were incubated for 6 days with GE. Nile Red labeling revealed that GE significantly increased lipid synthesis in keratinocytes. Similarly, gas chromatography with flame ionization detector indicated that GE increases the amount of triglycerides in keratinocytes. GE induced the expression of epidermal ceramide synthase 3, but not sphingomyelinase. Lipid synthesis, as well as ceramide synthase 3 expression, could be specifically blocked by inhibitors of the p38 MAPK and PPAR $\gamma$  signaling pathway. To assess if GE also modulates lipid synthesis in vivo, we performed a proof of concept half side comparison on the volar forearms of 33 volunteers. In comparison to placebo, GE significantly increased the lipid content of the treated skin areas, as measured with a sebumeter. Thus, GE enhances lipid synthesis in human keratinocytes that is essential for building an intact epidermal barrier. Therefore, GE might be used to improve skin disorders with an impaired epidermal barrier, e.g., very dry skin and atopic eczema.

*E. Yenilmez, Y. Yazan, Formulation, Characterization and in vivo Efficacy of  $\alpha$ -Tocopherol Imprinted 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. Molecularly 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 influenced 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.

*V. Bicard-Benhamou, J. zur Lage, L. Heider, D. Kleefeld, S. Eisenberg, F. Pfluecker, Evaluation of the potential of a cyclohexyloxy derivative targeting impure skins*, 42<sup>th</sup> SICCC National Congress & 1<sup>st</sup> IPCE Conference June 2017, Stresa, Italy

Butyl hydroxycyclohexane carboxylate (BHCC, structure shown on Figure 1, a cyclohexyloxy derivative is an adequate innovative solution to an issue well-known from our teenage years and yet more rarely associated with adulthood: oily skin and its impact on the appearance of acne formation. At all ages impure skin issues may lead to a real aesthetic problem considering that in nowadays life, image resulting from own appearance matters more and more and because it appears on body parts most exposed to view like for instance forehead, nose and chin. Oily skin may result in skin especially prone to open pores, blackheads, spots and pimples, skin appearing greasy and coarse and skin looking uneven. Most people associate oily skin with teenage years, but oily skin can persist long beyond adolescence and for some people it might last a lifetime. Nevertheless, acne most often begins in puberty when androgens level increases causing sebaceous glands to become more active resulting in increased sebum production. *Propionibacterium acnes* (*P. acnes*), mainly colonized in the pilosebaceous unit, plays a crucial role in the development of acne. Acne patients demonstrate marked

increases of this microorganism (1), *P. acnes* and its metabolites, the porphyrins, are also associated with inflammation processes in the skin. The perception of the skin as an ecosystem can advance our understanding of the delicate balance between host and microorganism. Disruptions in the balance on either side of the equation can result in skin disorders or infections (2) and non-beneficial bacteria are associated with them. On the other way beneficial bacteria helps preventing pathogenic microorganisms from colonizing the surface of the skin and preserving them is essential. A healthy and balanced microflora is therefore crucial. BHCC helps relieving skin from susceptibility to acne development and supporting skin health. BHCC provides a triple effect: it Regulates Sebum, it Reduces inflammation, and finally it Rebalances skin's microflora and all the results shown here provide a scientific demonstration of these claims.

*C. Uhl, D. Khazaka, Test equipment supports anti-pollution claims, PERSONAL CARE ASIA PACIFIC, May 2017, p. 27-29 and PERSONAL CARE EUROPE, September 2017, p. 74-76*

Pollution and its impact on the skin have recently become the main topic at all important cosmetic events, and products claiming to protect the skin from pollution effects are a major trend in the cosmetic and personal care industry.

*E. Loing, E. Lamarque, M. Borel, New targets in the battle against dandruff, J Cosmet Sci, 2017 Jan/Feb;68(1): p. 107-113*

Dandruff is a scalp disorder characterized by flaking skin and itch of an excessive oily scalp skin. It affects 55% of the global youth and adult population. Seborrheic dermatitis is a similar scalp skin disorder with aggravated itchy rashes and flaking. Different factors are identified in the dandruff development: increased sebum production, uncontrolled fungal growth of *Malassezia* strains and individual reaction to pro-inflammatory environment, and the susceptibility to trigger an immunological response. Using *in vitro* and *ex vivo* models, we show that an *Epilobium angustifolium* extract dose dependently reduces lipid synthesis in sebocytes to a maximum of -43% (1% extract), and protects the epidermis from *Malassezia*-induced morphological changes. *Epilobium angustifolium* extract also acts through innovative mechanisms involving regulations of defensins (human beta-defensins [hBD2] and hBD3) and toll-like receptor 2 involved in the immunological response of the skin. The anti-dandruff and sebum-regulating efficacy of *E. angustifolium* extract (1.5%) was confirmed in a clinical study that mobilized 24 volunteers with dandruff and greasy scalp for 30 days. At the end of the study, nonadherent and adherent dandruffs were significantly ( $p < 0.0001$ ) reduced in average by -54% and -48%, respectively. Using Sebumeter® measurements, scalp sebum production was inhibited by -67% ( $p < 0.0001$ ) in average over baseline. In conclusion, *E. angustifolium* extract offers a new innovative approach to dandruff reduction through immunomodulation of the skin response to *Malassezia* invasion.

*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 ( $39.6 \pm 11.9$  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,  $\beta$ -defensins [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.

*M. Mangier, D. Boudier, L. Mariaud, M. Rouy, M. Quillet, L. Marchand, M. LeGuillou, S. Bordes, B. Closs, Natural anti-seborrhoea active for multi-ethnic skin, PERSONAL CARE ASIA PACIFIC, January 2017, p. 41-43*

The cosmetics industry continually seeks innovation and effective molecules to treat oily skin and hair regardless of ethnicity. This cosmetic problem results from excessive sebum secretion. Based on recent progress in sebocyte biology, silab is now proposing its sebum regulating cosmetic active

ingredient that can improve the comfort of Caucasian, South American and Asian skins. Sebocytine® is rich in flavonoids from wild rose berries and returns sebum in facial skin and the scalp to normal levels. The skin is matte rather than shiny, radiant and refined, and hair regains its lost suppleness and shine.

*E.O. Okoro, N. Gadzama Bulus, C.C. Zouboulis, Study of Facial Sebum Levels and Follicular Red Fluorescence in Patients with Acne Vulgaris in Nigeria, Dermatology 2016; 232: p. 156–161*

Background: Increased sebum levels are triggering factors of acne vulgaris. No studies on sebum levels exist among acne patients in Africa. Aims/Methods: Cross-sectional study to determine facial sebum levels, acne lesions and red fluorescence among adolescents (n = 80) with acne vulgaris in Nigeria, who were interviewed and clinically examined. Results: Facial sebum levels were higher among adolescents with acne than among those without. There was a positive correlation between sebum levels and acne lesions in the U zone but not in the T zone. There was also a positive correlation between the size of red fluorescence and acne lesions and mean sebum levels. Both correlations were highly significant in the U zone but not in the T zone. Conclusion: Facial sebum levels are higher among black African acne patients. Sebum is responsible for facial red fluorescence. The U zone may serve as a more reliable site than the T zone for measurements of sebum levels in black African acne patients.

*S. Eisenberg, H. Hanau, D. Kleefeld, V. Bicard-Benhamou, H. Driller, 3R regulation of oily skin and microflora balance, Personal Care April 2016*

There is something many of us remember from our teenage years but only a few associate with adulthood: oily skin. Oily skin is a major issue, because it affects those areas that are the most exposed, like the chin, forehead and nose. Oily and impure skin causes a real aesthetic problem and may lead to higher acne susceptibility. Even in adults, a healthy facial skin and complexion play an important role. Consumers around the world have become very self-conscious of their appearance.

*C. Richter, C. Trojahn, G. Dobos, U. Blume-Peytavi, J. Kottner, Follicular fluorescence quantity to characterize acne severity: a validation study, Skin Research and Technology 2016; 0: 1-9*

Background: Porphyrins are native fluorophores in the follicle openings, visible under ultraviolet-A light. Acne severity might be associated with increased Propionibacterium acnes colonization and porphyrin production. Aim of this study was to investigate whether the parameter fluorescence quantity can be used to measure acne severity. Methods: A validation study was conducted in 24 patients with acne using split-face design. Acne severity was measured using Investigator Static Global Assessment scores and lesion counts. Reliability, construct validity and sensitivity to change in fluorescence quantity were investigated. Results: Mean baseline Investigator Static Global Assessment score was 2.7 (SD 0.1). Mean baseline fluorescence quantities were 24.8 (SD 4.0) on the cheek and 20.3 (SD 4.6) on the chin. On day 25, values ranged from 6.0 (SD 6.0) to 18.1 (SD 18.4) on the cheek and from 2.6 (SD 4.4) to 14.7 (SD 16.2) on the chin. The intraclass correlation coefficients of fluorescence quantity ranged from 0.513 to 0.987. Effect sizes for fluorescence measurements were highest on the chin and cheek ranging from 0.24 to 0.77 and 0.32 to 0.75, respectively. Conclusion: Fluorescence quantity indicates acne severity, especially on the inner cheek and chin areas. Fluorescence quantity is reliable but is not as sensitive as manual lesion counting.

*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 physiologic function. 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 physiology during 180 min after exposure to the cleanser.

*J.H. Baek, S.M. Ahn, K.M. Choi, M.K. Jung, M.K. Shin, J.S. Koh, Analysis of comedone, sebum and porphyrin on the face and body for comedogenicity assay, Skin Research and Technology 2016; 22: 164-169*

Background/Purpose: Many ingredients used in cosmetics evoke a comedogenic response. Rabbit ear model (REM) is a useful method that can replace human in examining materials and products in early developmental stage. However, a number of studies pointed out its disadvantage that it overreacts to comedogenic materials. The purpose of this study was to find the most appropriate region for evaluating comedogenicity in human skin.

*B. Moncada, C. Castillo-Martinez, E. Arenas, F. Leon-Bejarano, M. G. Ramirez-Elias, F. J. Gonzalez, Raman spectroscopy analysis of the skin of patients with melasma before standard treatment*

**with topical corticosteroids, retinoic acid, and hydroquinone mixture**, Skin Research and Technology 2016; 22: 170-173

Background: Melasma is an abnormal acquired hyperpigmentation of the face of unknown origin, it is considered a single disease and very little has been found regarding its pathogenesis. It is usually assumed that melasma is due to excessive melanin production, but previous work using Raman spectroscopy showed degraded molecules of melanin in some melasma subjects, which may help to explain the success or failure of the standard therapy.

*L. Agren, E. Nilsson, The effect of Nordic seed oil on dry, irritated scalp*, PERSONAL CARE EUROPE, September 2016, p. 32-34

Many experience difficulty finding something that helps to reduce scalp problems even though there is a wide range of products available on the market - shampoos, creams, gels and liniment. The unique combination of valuable nutrients and fatty acid composition make blackcurrant seed oil and sea buckthorn oil interesting for an irritated scalp. We aimed to investigate whether Q for Skin's concept based on blackcurrant seed oil and sea buckthorn pulp/seed oil can help people with a dry, irritated scalp.

*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. Zhou, H. Xie, L. Cheng, J. Li, Clinical characteristics and epidermal barrier function of papulopustular rosacea: A comparison study with acne vulgaris*, Pak J Med Sci 2016 Vol. 32 No. 6

Objective: To evaluate the clinical characteristics and epidermal barrier function of papulopustular rosacea by comparing with acne vulgaris. Methods: Four hundred and sixty-three papulopustular rosacea patients and four hundred and twelve acne vulgaris patients were selected for the study in Xiangya Hospital of Central South University from March 2015 to May 2016. They were analyzed for major facial lesions, self-conscious symptoms and epidermal barrier function. Results: Erythema, burning, dryness and itching presented in papulopustular rosacea patients were significantly higher than that in acne vulgaris patients ( $P < 0.001$ ). The clinical scores of erythema, burning, dryness and itching in papulopustular rosacea patients were significantly higher than those in acne vulgaris patients ( $P < 0.001$ ). The water content of the stratum corneum and skin surface lipid level were both significantly lower in papulopustular rosacea patients than that of the acne vulgaris patients ( $P < 0.001$ ) and healthy subjects ( $P < 0.001$ ); Water content of the stratum corneum and skin surface lipid level were higher in acne vulgaris patients in comparison with that of healthy subjects ( $P > 0.05$ ,  $P < 0.001$ ; respectively). Transepidermal water loss was significantly higher in papulopustular rosacea patients than that of acne vulgaris patients and healthy subjects ( $P < 0.001$ ); transepidermal water loss was lower in skin of acne vulgaris patients than that of healthy subjects ( $P < 0.001$ ). Conclusion: Erythema, burning, dryness and itching are the characteristics of papulopustular rosacea, which makes it different from acne vulgaris. The epidermal barrier function was damaged in papulopustular rosacea patients while not impaired in that of acne vulgaris patients.

*H.J. Youn, S.Y. Kim, M. Park, W.H. Jung, Y.W. Lee, Y.B. Choe, K.J. Ahn, Efficacy and Safety of Cream Containing Climbazole/Piroctone Olamine for Facial Seborrheic Dermatitis: A Single-Center, Open-Label Split-Face Clinical Study*, Ann Dermatol Vol. 28, No. 6, 2016, p. 733-739

Background: Seborrheic dermatitis (SD) is a multifactorial disease; Malassezia species play an important role in its pathogenesis. Objective: We aimed to determine whether a cream containing climbazole/piroctone olamine (C/P cream), antifungal agents with expected efficacy against Malassezia species, could improve SD symptoms. Methods: We instructed 24 patients with mild-to-moderate SD to apply the C/P cream and emollient cream on the right and left sides of the face, respectively, every morning and evening for 4 weeks. The casual sebum level (measured with Sebumeter®; Courage & Khazaka Electronic GmbH, Germany) and the extent of erythema (measured with Mexameter®; Courage & Khazaka Electronic GmbH) on the face were measured at baseline and after 4 weeks. The minimal inhibitory concentration (MIC) was determined to demonstrate the antifungal activity of the C/P cream. Results: The casual sebum level and erythema were measured at week 4, and the median values demonstrated a quantitative improvement on the C/P cream-treated right side of the face compared to the emollient cream-treated left side. For the C/P cream, the MICs were 0.625, 5, 0.625, and 2.5 mg/ml for Malassezia restricta, M. globosa, M. sympodialis, and M. slooffiae, respectively. Conclusion: Based on the reduced casual sebum level and extent of erythema, the antifungal activity of C/P cream against Malassezia species seems useful for the treatment of mild to moderate SD.

*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 significantly 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. ( $175.42 \pm 13.92$ ) and 4 p.m. ( $164.44 \pm 13.72$ ,  $P = 0.025$ ), between the pH at 8 a.m. ( $5.72 \pm 0.48$ ) and 4 p.m. ( $5.33 \pm 0.55$ ,  $P = 0.001$ ) and pH at 12 p.m. ( $5.60 \pm 0.48$ ) and 4 p.m. ( $5.33 \pm 0.55$ ,  $P = 0.001$ ). Other comparisons between the means of these parameters at different time points resulted in nonsignificant  $P$  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. Khan, N. Akhtar, A. Ali, Assessment of Combined Ascorbyl Palmitate (AP) and Sodium Ascorbyl Phosphate (SAP) on Facial Skin Sebum Control in Female Healthy Volunteers*, Drug Res (Stuttg) 2016 Oct 18

The skin is fortified with a setup of lipophilic and hydrophilic, enzymatic and non-enzymatic antioxidant systems. Ascorbyl palmitate (AP) and sodium ascorbyl phosphate (SAP) are reported as lipophilic and hydrophilic antioxidants, respectively used for skin care. Present study was aimed to assess the combined AP (in oil phase) and SAP (in aqueous phase) via multiple emulsion (MEi) for controlling sebum secretions in healthy human females. FTIR analysis of AP and SAP was performed for identification. Multiple emulsions (MEi and control) were prepared and analyzed for physical stability. Antioxidant activities of AP, SAP as well as MEi (with combination of these compounds) were determined by DPPH method. 11 female volunteers were included in a single-blinded, placebo-controlled, split-face comparative study. Volunteers were instructed to apply MEi on left cheek while control (without AP and SAP) on right cheek, for a period of 90 days. A non-invasive photometric device (Sebumeter) was used for the measurement of sebum secretions on both sides of the face with subsequent time intervals. A good antioxidant activity of MEi was observed. MEi treatments reduced significant facial sebum secretions as compared with control/placebo treatments. It was concluded that combined AP and SAP supplementations to skin proved a promising choice for controlling facial sebum secretions and could be evaluated for undesired oily skin and acne reductions for beautifying the facial appearance.

*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<sup>®</sup>. We measured truncal sebum secretions using the Sebumeter SM 815<sup>®</sup>. 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.

Z. Xu, Z. Wang, C. Yuan, X. Liu, F. Yang, T. Wang, J. Wang, K.i Manabe, O. Qin, X. Wang, Y. Zhang, M. Zhang, **Dandruff is associated with the conjoined interactions between host and microorganisms**, Scientific Reports, 6:24877, 2016

Dandruff is an unpleasant scalp disorder common to human populations. In this study, we systematically investigated the intra- and inter-associations among dandruff, physiological conditions such as sebum of the scalp, host demographics such as gender, age and the region of the scalp, and the microorganisms on the scalp. We found that the physiological conditions were highly relevant to the host age and varied in different regions of the same scalp. The sebum quantity and water content were negatively correlated with the formation of dandruff and had significant relationships with the two dominant but reciprocally inhibited bacteria on the scalp (*Propionibacterium* and *Staphylococcus*). The dominant fungus (*Malassezia* species) displayed contrary roles in its contribution to the healthy scalp micro-environment. Bacteria and fungi didn't show a close association with each other, but the intramembers were tightly linked. Bacteria had a stronger relationship with the severity of dandruff than fungi. Our results indicated that the severity of dandruff was closely associated with the interactions between the host and microorganisms. This study suggests that adjusting the balance of the bacteria on the scalp, particularly by enhancing *Propionibacterium* and suppressing *Staphylococcus*, might be a potential solution to lessen dandruff.

G. Stinco, F. Piccirillo, F. Valent, E. Errichetti, N. Di Meo, G. Trevisan, P. Patrone, **Efficacy, tolerability, impact on quality of life and sebostatic activity of three topical preparations for the treatment of mild to moderate facial acne vulgaris**, G Ital Dermatol Venereol, 2016 Jun;151(3): p. 230-238

Background: Acne is treated according to the clinical observations and pathophysiologically relevant mechanisms, such as hyper-keratinization, seborrhea and bacterial proliferation. In mild and moderate forms of inflammatory acne, topical antimicrobials are recommended as a monotherapy or in combination with topical retinoids. The aim of this study was to compare the clinical effectiveness, tolerability, impact on quality of life and effect on sebum excretion of three antimicrobial preparations: clindamycin phosphate, benzoyl peroxide and a combination of clindamycin phosphate plus benzoyl peroxide. Methods: In total, 240 patients were randomized into treatment groups for an 8-week study. Every two weeks the patients were evaluated using the following methods: photography, the Global Acne Grading System, sebumetric evaluation, and the Acne-Specific Quality of Life questionnaire. In addition, 80 healthy controls were enrolled for the sebumetric evaluation. Results: A significant improvement in acne and the quality of life was observed for all three therapies at the end of the study. The sebum excretion results for the three treatment groups displayed significant and unpredictable variation, whereas the controls groups exhibited no significant variation. The three treatments were well tolerated. Conclusions: The efficacy of the three antimicrobial preparations likely results from their anti-inflammatory and bacteriostatic activities. In contrast, seborrhoea seems to be minimally impacted.

A. Ezerskaia, F. Pereira, H.P. Urbach, R. Verhagen, B. Varghese, **Quantitative and simultaneous non-invasive measurement of skin hydration and sebum levels**, Biomedical Optics Express 2311, June 2016, Vol. 7, No. 6

We report a method on quantitative and simultaneous noncontact in-vivo hydration and sebum measurements of the skin using an infrared optical spectroscopic set-up. The method utilizes differential detection with three wavelengths 1720, 1750, and 1770 nm, corresponding to the lipid vibrational bands that lay "in between" the prominent water absorption bands. We have used an emulsifier containing hydro- and lipophilic components to mix water and sebum in various volume fractions which was applied

to the skin to mimic different oily-dry skin conditions. We also measured the skin sebum and hydration values on the forehead under natural conditions and its variations to external stimuli. Good agreement was found between our experimental results and reference values measured using conventional biophysical methods such as Corneometer and Sebumeter.

*C. Nualsri, N. Lourith, M. Kanlayavattanakul, Development and clinical evaluation of green tea hair tonic for greasy scalp treatment, J Cosmet Sci, 2016 May-Jun;67(3): p. 161-166*

Green tea has cosmetic benefits that include activities against androgen disorders. A hair tonic containing green tea for reduction of scalp sebum was developed and clinically evaluated. Stable green tea hair tonics were closed-patch tested and clinically evaluated in 20 volunteers for 28 days by using a Sebumeter®. Hair tonic base with glycerin and butylene glycol (total 4%) gained the highest consumers' preference was incorporated with green tea extract. All of the products were stable and none caused skin irritation. Green tea hair tonic (2%) significantly ( $p \leq 0.024$ ) lowered scalp sebum for 21 and 28 days following the application, suggesting that this topical therapy of scalp greasiness is safe and efficient.

*A.C. da Silva Marques, Biometrologic Evaluation of Cosmetic Products, Dissertation in pharmaceutical sciences at the University of Coimbra, Portugal, 2016*

Given the growing importance that cosmetic products have on human's health and in our daily life, it is important to increase the control of these products, both in terms of safety and effectiveness. Taking into account that conducting animal tests for the production and validation of cosmetic products is prohibited by law, producers of these products have to resort to alternative methods. Biophysical methods have gained an important highlight in the scientific community, in particular the non-invasive methods. They allow a safe and faster evaluation of cosmetics. The purpose of this work is to describe some methods and equipments used at national and European level to test the effectiveness of cosmetic products and correlate the parameters evaluated with the alleged properties in the products. The methods include evaluation tests of the following skin properties: hydration, elasticity, coloring, sebum production and perspiration.

*J. M. Crowther, Method for quantification of oils and sebum levels on skin using the Sebumeter, International Journal of Cosmetic Science, 2016, Volume 38, Issue 2, p. 210-216*

Objective: The Sebumeter® is widely used in both cosmetic and medical research, for measuring changes in sebum levels on skin. It is commonly reported that the units correlated to a mass of sebum on the skin in  $\mu\text{g cm}^{-2}$ ; however, validation for this has not been published. Also, its use for assessing the presence of other oily materials which are widely utilized in topical skincare products on skin has not been widely discussed. Determining a calibration scale and whether the response of the device is linear with the level of oils present enables quantification of the output of the device, and would validate the device for claims substantiation. Methods: Different doses of a variety of oily materials (paraffin oil, white soft paraffin, capric-caprylic triglyceride, 350cSt silicone fluid and synthetic sebum) were applied to skin, and the Sebumeter used to collect and quantify them. The mass per square centimetre of the oily material delivered to the skin was then compared to the Sebumeter output to develop calibration curves for the different materials. Measurements were carried out on a single volunteer as this work was to verify the concept of quantitative oil assessment using the device. Results: A linear correlation between the mass of the oily material and the Sebumeter output was seen for all the materials tested. However, the absolute response of the device was different for each material, and the output values did not directly give the mass of material on the skin in  $\mu\text{g cm}^{-2}$ . As part of the calibration, it was also demonstrated that to remove all the oily material from a given area of the skin required multiple 30-s applications of the Sebumeter cartridge. Conclusion: The Sebumeter is a precise analytical instrument capable of quantitative measurement of deposition of oily materials onto skin from topical products (down to the  $\mu\text{g cm}^{-2}$  level), as well as its traditional use of measuring sebum levels. However, the output values do not directly correlate with the mass of oil present, and generation of a calibration curve is necessary for any ingredient of interest to produce quantitative data for claim support and formulation development.

*A. Ezerskaia, S.F. Pereira, Infrared spectroscopic measurement of skin hydration and sebum levels and comparison to corneometer and sebumeter, in J. Popp et al. (Editor): Biophotonics: Photonic Solutions for Better Health Care V*

Skin health characterized by a system of water and lipids in Stratum Corneum provide protection from harmful external elements and prevent trans-epidermal water loss. Skin hydration (moisture) and sebum (skin surface lipids) are considered to be important factors in skin health; a right balance between these components is an indication of skin health and plays a central role in protecting and preserving skin integrity. In this manuscript we present an infrared spectroscopic method for simultaneous and quantitative measurement of skin hydration and sebum levels utilizing differential detection with three

wavelengths 1720, 1750, and 1770 nm, corresponding to the lipid vibrational bands that lie “in between” the prominent water absorption bands. The skin sebum and hydration values on the forehead under natural conditions and its variations to external stimuli were measured using our experimental set-up. The experimental results obtained with the optical set-up show good correlation with the results obtained with the commercially available instruments Corneometer and Sebumeter.

*A.I. Arshad, S.H. Khan, N. Akhtar, A. Mahmood, R.M. Sarfraz, In vivo evaluation of skin irritation potential, melasma and sebum content following long-term application of skin care cream in healthy adults using non-invasive biometrological techniques, Acta Pol Pharm. 2016 Jan-Feb;73(1): p. 219-27*

The present investigation was conducted to evaluate non-invasively, various functional skin parameters i.e. irritation potential, melasma and sebum contents following long term application of topical cream (w/o) loaded with 2% methanolic extract of *Ananas comosus* L. versus placebo control (base) in healthy adults. Healthy human volunteers (n = 11, aged 20-30 years) were recruited for investigation and written informed consent was taken from each volunteer. In this single blinded study every volunteer applied formulation on one side of face and placebo on the other side of face twice daily for a period of 12 weeks (three months). Different skin parameters i.e., skin irritancy, melasma, and sebum contents were measured on both sides of face at baseline and after two weeks interval, using photometric device Mexameter and Sebumeter in a draught free room with modulated conditions of temperature (22-25°C) and humidity (55-60%). It was evident from the results that no primary skin irritancy was observed with patch test. Besides, statistical interpretation indicates that treatment with formulation is superior to placebo because it significantly ( $p < 0.05$ ) reduced the skin irritancy, melasma and sebum secretions throughout the study and reaching maximum  $-20.76 \pm 0.89$ ,  $-54.2 \pm 0.37$  and  $-40.71 \pm 0.75\%$ , respectively, at the end of study period. Antioxidant activity of extract was 92% compared to standard antioxidant. Conclusively, active cream loaded with fruit extract was well tolerated by all the volunteers and suitable to treat contact dermatitis, greasy skin, acne and seborrheic dermatitis and augmenting beauty and attraction by depigmentation of human skin. So, in the future, there is need to clinically evaluate these formulations in patients with compromised skin functions i.e., contact dermatitis, melasma, and acne vulgaris in order to explore the actual potential of this fruit.

*G.W. Nam, J.H. Baek, J.S. Koh, J.K. Hwang, The seasonal variation in skin hydration, sebum, scaliness, brightness and elasticity in Korean females, Skin Research and Technology 2015; 21: 1-8*

Background/purpose: Age, gender, regional, and ethnic differences influence skin conditions. The purpose of this study was to observe the effects of environments, especially the air temperature, relative humidity, air pressure, duration of sunshine, and precipitation on skin and the seasonal variation in skin hydration, sebum, scales, brightness, and elasticity in Korean females.

*K. Isoda, Y. Takagi, K. Endo, M. Miyaki, K. Matsuo, K. Umeda, K. Umeda-Togami, H. Mizutani, Effects of washing of the face with a mild facial cleanser formulated with sodium laureth carboxylate and alkyl carboxylates on acne in Japanese adult males, Skin Research and Technology 2015; 21: 247-253*

Background/purpose: Washing the face with a mild cleanser is generally recommended for acne care. Occasionally, the general public has the misconception that acne is exacerbated by cleansers and furthermore it has concerns about inducing skin irritation and xerosis by intensive washing. Recently, we developed a new cleanser based on sodium laureth carboxylate and alkyl carboxylates (AEC/soap) that cleans sebum well without penetrating the stratum corneum.

*M. Schultz, Charakterisierung der Hautbarrierefunktion von Früh- und Reifgeborenen innerhalb der ersten Lebensjahre unter Berücksichtigung angewandter Pflegekonzepte in der Neonatalperiode, Dissertation Charité - Universitätsmedizin Berlin, Germany, September 2015*

Die Reifungsprozesse der Hautbarriere dauern vermutlich bis ins Kleinkindalter hinein an und führen zu einer erhöhten Vulnerabilität der Hautbarriere gegenüber externen Einflüssen. Deshalb ist es wichtig, den Einfluss von Hautpflege auf die kindliche Hautbarriere wissenschaftlich zu untersuchen. Ziel dieser Studie war die Charakterisierung der kindlichen Hautbarriere in ihrer postnatalen Entwicklung unter Berücksichtigung standardisierter postnataler Pflegekonzepte und weiterer Faktoren.

*H. Chajra, F. Lefevre, P. Salmassinia, Multifunctional actives for oily skin and scalp disorders, Personal Care, May 2015*

Though the conventional hair care market is a mature one, there are still many opportunities to innovative and radicalise this sector. As the needs of consumers are becoming more complex, the

corresponding products evolve towards more sophisticated and solution-oriented concepts by default. Just in the first half of 2014, 72% of global hair care launched had a “beauty enhancing” claim. Between 2009 and 2014, there were almost 10,000 product launches that addressed oily skin and oily hair concerns.

*Y. Takagi, N. Tanaka, M. Miyaki, K. Takeuchi, K. Matsuo, An effective novel facial cleanser for mild acne: Cleanser formulated with Sodium Laureth Sulfate and Alkyl Ether Carboxylates, H&PC Vol. 10 (2) March/April 2015*

**Abstract:** Many people suffer from acne. Washing the face with cleansers is generally recommended for acne care and cleansers containing salicylic acid are frequently used in the United States. However, salicylic acid has many side effects such as inducing dryness and irritation. Here we demonstrate that a facial cleanser based on alkyl ether carboxylates (AEC) and sodium laureth sulfate (SLES), which does not contain anti-acne ingredients including salicylic acid, improved the acne more quickly than general cleansers containing salicylic acid ( $\approx 1.5\%$ ). No side effects were observed and a favorability rating was obtained from the subjects in a questionnaire. These results suggest that the skin cleanser formulated with AEC and SLES is an effective cleanser for the care of mild acne.

*C. Uhl, D. Khazaka, Claims and measurement methods for hair and scalp, Personal Care March 2015*

Hair diversity (style, shape, growth pattern or colour) is one of the most important features to define us physically. Therefore it is no surprise that the market of hair care products with a value of US\$39 billion is one of the most important sectors in the complete area of cosmetic products. Hair care products for women are the most frequently bought and used cosmetic products of all. Shampoos and conditioners are leading in the field. For men, hair care is the most important and favoured sector of all cosmetics.

*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*

**Abstract:** 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).

*O. Bilaic, C. Altinvazar, H. Hira, M. Doadu, Investigation of the Association of the Second-to-Fourth Digit Ratio with Skin Sebum Levels in Females with Acne Vulgaris, Am J Clin Dermatol. 2015 Dec; 16 (6): p. 559~64*

**Background:** A relationship between acne vulgaris (AV) and the masculinized (lower) second-to-fourth digit (2D:4D) ratio in females was demonstrated in our previous study. Development of the digits and the sebaceous glands both occur during the same gestational period; therefore, the association between the 2D:4D ratios and AV may result from the effects of the prenatal endocrine environment on the sebaceous glands. **Objective:** The aim of this study was to evaluate the relationship between the 2D:4D ratio and sebum levels in the skin of females with AV. **Methods:** In total, 215 female AV patients and 92 healthy controls, aged 18-35 years, were enrolled in this study. Finger-length measurements were made using a digital Vernier caliper, and the sebum levels of five facial areas were measured using a Sebumeter SM 815. Acne severity was assessed using the International Consensus Conference on Acne Classification System. **Results:** The 2D:4D ratios of the AV patients were significantly lower than those of the controls, for both hands. The mean sebum levels in the T-zone, U-zone and whole face were significantly higher for AV patients compared with controls. The 2D:4D ratio in the left hand showed significant negative correlations with the sebum levels in the U-zone; however, no association was found between the 2D:4D ratios and sebum levels in the T-zone and whole face. While acne severity was positively correlated with skin sebum levels, no correlation between acne severity and 2D:4D ratios was observed. **Conclusions:** This study provides preliminary evidence regarding the association between lower 2D:4D ratios and higher rates of sebum secretion in the U-zone for females with AV. The 2D:4D ratio might be a predictor of sebum levels, as well as acne development, in females.

*T. Nakahara, Y. Moroi, K. Takayama, E. Itoh, M. Kido-Nakahara, Y. Nakanishi, M. Furue, **Changes in sebum levels and the development of acneiform rash in patients with non-small cell lung cancer after treatment with egFr inhibitors**, OncoTargets and Therapy 2015:8 p. 259–263*

Background: It has recently been shown that patients treated with epidermal growth factor receptor (EGFR) inhibitors often develop various cutaneous adverse events. While the pathogenesis underlying these events remains unclear, the relationship between skin toxicity induced by EGFR inhibitors and the sebaceous glands that express EGFR has been previously reported. Objectives: The primary aim of this study was to determine the relationship between cutaneous sebum levels and acneiform rash, a typical skin toxicity of EGFR inhibitors, by measuring the sebum levels before and after EGFR inhibitor treatment. Methods: Eight patients diagnosed with non-small cell lung cancer (NSCLC) (three men and five women with an average age of 69.3 years) who were initiated on treatment with EGFR inhibitors (either gefitinib [Iressa®] or erlotinib [Tarceva®]) were enrolled. Using a Sebumeter®, sebum levels in the face, chest, and back of each patient were measured before and after EGFR inhibitor treatment. The development of acneiform rash in each skin region was also assessed. Results: Changes in sebum level along with the development of an acneiform rash were observed after patients were started on EGFR inhibitor treatment. Patients who developed an EGFR inhibitor-induced acneiform rash tended to have higher pretreatment sebum levels (baseline) than did patients who did not experience an acneiform rash. At each time point measurement, sebum levels were found to be significantly higher in patients who had developed an acneiform rash at that time. Patients who developed rash during treatment showed greater differences in sebum level compared with pretreatment baseline. Conclusion: Patients who had increased levels of sebum or whose sebum levels showed greater change from pretreatment baseline developed an acneiform rash, suggesting that sebaceous gland activity may be involved in the mechanism underlying the development of acneiform rash, in patients treated with EGFR inhibitors.

*C.S.C. Pereira, A. R. Baby, MV R. Velasco, M.T. Scotti, **Correlação Instrumental e Sensorial de Composição Aromática no Ciclo Menstrual**, Cosmetics & Toiletries (Brasil) Vol 27, set-out 2015, (Article in Portuguese)*

In order to know the variables that may influence the fragrance-substrate interface and consumer perception in the menstrual cycle, and contribute to the development of fragrances, there was a study correlating the sensory analysis and instrumental (biochemical and chromatographic measurements) as a function of the cycle menstrual.

*M. Mehrbani, R. Choopani, A. Fekri, M. Mehrbani, M. Mosaddegh, M. Mehrbani, **The efficacy of whey associated with dodder seed extract on moderate-to-severe atopic dermatitis in adults: A randomized, double-blind, placebo-controlled clinical trial**, J Ethnopharmacol, 2015 Aug 22;172: p. 325-32*

Ethnopharmacological Relevance: Atopic dermatitis is a common chronic inflammatory skin condition that is on the rise and adversely affects quality of life of the affected individual. Dry skin and pruritus, major characteristics of this disease, are associated with the dysfunction of the skin barrier. Though mild cases of the disease can be controlled with antihistamines and topical corticosteroids, moderate-to-severe cases often require treatment with immunomodulatory drugs, which have many side effects. It is now more common to use complementary and alternative medicines in the treatment of atopic dermatitis. In traditional Iranian medicine, the use of whey with the aqueous extract of field dodder (*Cuscuta campestris* Yunck.) seeds in severe and refractory cases of atopic dermatitis is common and has no side effects. The aim of this study was to assess the efficacy and safety of whey associated with dodder seed extract in the treatment of moderate-to-severe atopic dermatitis in adults. Materials and Methods: The study was a randomized, double-blind placebo control trial that was conducted on 52 patients with moderate-to-severe atopic dermatitis for 30 days. In this study patients received freeze dried whey powder with spray dried water extract of field dodder or the placebo for 15 days. At baseline (week zero), after the end of the 15 day treatment period (week three) and 15 days after stopping the drug or placebo (follow-up/week five), patients were evaluated in terms of skin moisture, elasticity, pigmentation, surface pH and sebum content on the forearm with Multi Skin Test Center® MC1000 (Courage & Khazaka, Germany) and the degree of pruritus and sleep disturbance in patients were also recorded. Results: 42 patients completed 30 days of treatment with the medicine and the follow-up period. At the end of the follow-up period a significant increase in skin moisture and elasticity in the group receiving whey with dodder was observed compared with the placebo group ( $p < 0.001$ ). There was a significant difference between the two groups regarding the pruritus after 15 days of receiving treatment or the placebo ( $p < 0.05$ ), and at the end of the 30-day study period the difference was clearly significant ( $p < 0.001$ ). Sleep disturbance showed significant changes at the end of follow-up period

( $p < 0.05$ ). There was no significant difference between the two groups concerning changes in skin pigmentation, however, a significant decrease was observed in the group receiving whey associated with dodder seed extract over time ( $p < 0.001$ ). There were no significant alterations in skin surface pH and the amount of sebum between the two groups. Temporary side effects were reported including anorexia and mild gastrointestinal problems in drug use. It is noteworthy that in this study despite the fact that patients received whey with dodder for just 15 days, moisture and elasticity of the skin continued to increase in the second half of the study (follow-up period). This shows that the effect of whey with dodder is not transient and this drug really helped skin barrier reconstruction and accelerated the healing process of skin. This positively influenced the skin parameters and consequently the improvement of pruritus and sleep disturbance. Conclusions: The results indicate that whey associated with dodder seed extract can serve as a promising alternative for the treatment of moderate-to-severe atopic dermatitis.

*L. Pouran, M. Masoud, R.M. Seyed, Y. Hadis, M. Akram, S. Golmohammadzadeh, M. Balali-Mood, Epidermal hydration and skin surface lipids in patients with long-term complications of sulfur mustard poisoning, J Res Med Sci. 2015 Jul; 20(7): p. 640-645*

Background: Despite almost the three decades passed since the chemical attacks of Iraqi's army against the Iranian troops, some veterans are still suffering from long-term complications of sulfur mustard (SM) poisoning, including certain skin complaints specially dryness, burning, and pruritus. We thus aimed to evaluate the skin's water and lipid content in patients with a disability of  $>25\%$  due to complications of SM poisoning and compare them with a matched control group. Materials and Methods: Sixty-nine male participants were included in this study; 43 SM-exposed patients, and 26 normal controls from their close relatives. The water and lipid content was measured in four different locations: Extensor and flexor sides of forearms and lateral and medial sides of legs by the Comeometer CM 820/Sebumeter SM 810. Collected data was analyzed and  $P < 0.05$  was considered as statistically significant. Results: The mean age of the patients and controls was  $49.53 \pm 11.34$  (ranges: 40-71) and  $29.08 \pm 8.836$  (ranges: 15- 49 years), respectively. In the veterans group, the main cutaneous complaint was itching and skin dryness. Cherry angioma, dry skin, and pruritus were significantly more common in the SM-exposed cases than in the controls. ( $P = 0.01, 0.05, \text{ and } 0.04$ , respectively). The moisture and lipid content of all areas were lower in the SM-exposed group, but it was only significant in skin sebum of lateral sides of legs ( $P = 0.02$ ). Conclusion: Exposure to SM could decrease the function of stratum comeum and lipid production as a barrier, even after several years of its exposure.

*P. Min, W. Xi, L. Grasseti, A. Trisliana Perdanasari, M. Torresetti, S. Feng, W. Su, Z. Pu, Y. Zhang, S. Han, Y.X. Zhang, G. Di Benedetto, D. Lazzeri, Sebum Production Alteration after Botulinum Toxin Type A Injections for the Treatment of Forehead Rhytides. A Prospective Randomized Double-Blind Dose-Comparative Clinical Investigation, Aesthet Surg J, 2015 Jul, 35(5): p. 600-610*

Background: Research has investigated the decrease in human skin sebum after the application of botulinum toxin. Few studies of the mechanism and objective assessments of this phenomenon have been conducted and the correlation between the sebum production and injection dosages or techniques remains unclear. Objectives: We prospectively investigated the sebum regulation and its gradient around the injection site in patients who received intramuscular injections of botulinum toxin A (BTX-A) for forehead rhytides, comparing two injection doses. Methods: Forty-two female volunteers with rhytides on the forehead region were randomly assigned to receive 10 or 20 units of BTX-A, which was administered in five standard injection sites. The baseline and post-treatment sebum production was measured using a Sebumeter. Results: Treatment with BTX-A exhibited significant sebum alteration at the injection site of both groups, with a sebum gradient surrounding the injection point. The efficacy did not improve at higher injection doses, with the four-unit regimen generally not being more potent than the two-unit regimen. The sebum production recovered to normal levels at the 16 week follow-up for both treatment groups, indicating that a higher dosage (four units) did not result in a longer duration until relapse compared with the two-unit dose. Conclusions: We determined that the sebum production has a positive correlation with the distance away from the injection point. Intramuscular injection of BTX-A significantly reduces sebum production at the injection site but increases the sebum production of the surrounding skin at a radius of 2.5 cm at the 2, 4, and 8 week follow-ups.

*B.R. Kim, M.Y. Chun, S.A. Kim, S.W. Youn, Sebum Secretion of the Trunk and the Development of Truncal Acne in Women: Do Truncal Acne and Sebum Affect Each Other?, Dermatology, 2015;231(1): p. 87-93*

Background: There are few published data on truncal acne because most studies have focused on facial acne. Aims: The objective of this study was to investigate truncal sebum secretion levels in patients with acne vulgaris and to evaluate the relationship between sebum secretion and the development of acne lesions. Methods: The sebum casual levels at five different facial sites and ten

truncal sites were measured in 35 Korean females with acne using a Sebumeter®. We performed an analysis of the correlation between sebum excretion and acne lesion number. Results: We found that all of the truncal sites analyzed had lower sebum secretion levels than the facial sites. There was no significant correlation between sebum secretion and acne lesions on the trunk. Conclusion: Pathogenic factors other than sebum may have a predominant role in the development of truncal acne.

**A. Ali, N. Akhtar, The safety and efficacy of 3% Cannabis seeds extract cream for reduction of human cheek skin sebum and erythema content, Pak J Pharm Sci, 2015 Jul;28(4): p. 1389-1395**

Escalated sebum fabrication is seen with an unattractive look and adds to the growth of acne. We aimed to investigate the efficacy and safety of 3% Cannabis seeds extract cream on human cheek skin sebum and erythema content. For this purpose, base plus 3% Cannabis seeds extract and base (control) were prepared for single blinded and comparative study. Healthy males were instructed to apply the base plus 3% Cannabis seeds extract and base twice a day to their cheeks for 12 weeks. Adverse events were observed to determine skin irritation. Measurements for sebum and erythema content were recorded at baseline, 2nd, 4th, 6th, 8th, 10th and 12th week in a control room with Sebumeter and Mexameter. Base plus 3% Cannabis seeds extract was found to be safe in volunteers. Measurements demonstrated that skin sebum and erythema content of base plus 3% Cannabis seeds extract treated side showed significant decrease ( $p < 0.05$ ) compared with base treated side. Base plus 3% Cannabis seeds extract showed safety. It was well tolerated for the reduction of skin sebum and erythema content. Its improved efficacy could be suggested for treatment of acne vulgaris, seborrhea, papules and pustules to get attractive facial appearance.

**A. Wójcik, E. Bartnicka, P. Namieciński, H. Rotsztein, Influence of the complex of retinol-vitamin C on skin surface lipids, J Cosmet Dermatol, 2015 Jun;14(2): p. 92-99**

Background: Retinol is used to reduce symptoms of skin aging. It affects surface lipids and increases skin regeneration ability. Aim: The aim of our study was to investigate the effect of retinol peel on the face and neck skin lipids in women, aged 50-69. Materials and Methods: The level of secreted sebum was measured using Sebumeter SM15 (Courage & Khazaka, Germany) on the forehead, cheeks, nose, chin, and neck. The measurements were carried out before each of the 3 retinol peel treatments applied at 3-week interval and 3 weeks after the last treatment. Results: A statistically significant increase of lipid film in both U-zone and T-zone and on the neck was observed in the study group. Conclusion: Retinol peel treatments can help to increase the amount of skin surface lipids in women during menopause.

**D. Mahrhauser, C. Nagelreiter, A. Baierl, J. Skipiol, C. Valenta, Influence of a multiple emulsion, liposomes and a microemulsion gel on sebum, skin hydration and TEWL, Int J Cosmet Sci. 2015 Apr;37(2): p. 181-6**

Objective: In this study, the influence of three cosmetically relevant, priorly characterized vehicles on skin hydration, sebum content and transepidermal water loss was investigated. Methods; The chosen vehicles included a liposomal pre-formulation, a multiple W/O/W emulsion and a microemulsion gel. The in vivo effects of these vehicles were demonstrated and compared among them. The stability of the prepared vehicles was determined visually, microscopically, rheologically by pH measurements and particle size. Interactions with skin were assessed by non-invasive biophysical techniques using the Corneometer®, Aqua Flux® and Sebumeter, measuring skin hydration, TEWL and skin sebum content, respectively. Results: All vehicles remained stable over an observation period of 6 weeks. The multiple emulsion increased sebum content and skin hydration. In case of the liposomes, each monitored parameter remained almost constant. In contrast, the microemulsion gel lowered skin hydration and increased TEWL values, but even 1 week after termination of the treatment TEWL decreased almost close to control levels. Conclusion: All produced vehicles were proven to remain physically stable over the duration of this study. The used multiple emulsion showed very skin-friendly properties by increasing sebum and skin hydration. Likewise, the liposomal pre-formulation exhibited no negative effects. On the contrary, the investigated microemulsion gel seemed to have skin dehydrating and TEWL increasing features. However, the multiple emulsion as well as liposomes was identified to be well-tolerated vehicles for skin which might qualify them for the use in cosmetic formulations.

**N. Srivastava, S. Gehlot, S. Singh, B.M. Singh, Application of different parameters for selecting normal and abnormal skin characteristics in determination of Prakriti in infants, Int. J. Res. Ayurveda Pharm. 6(2), Mar - Apr 2015**

Prakriti (Basic physical constitution) of an individual is decided at the time of conception and subsequently during intra-uterine life, as a result of overall effect of dominant Dosha of Shukra (Sperm),

Shonit (Ovum), Ahara (diet) and Vihara (regimen) of Garbhini (pregnant women), Kaalgarbhashaya (in-utero duration and condition of uterus) and Mahabhautic components. Assessment of Prakriti and Vikriti in children is essential and enables the pediatrician to evaluate metabolic imprinting, individual physiology and susceptibility to specific disease, its diagnosis, prevention, treatment as well as the prognosis after illness. There are many subjective criteria to determine the Prakriti in adults, but as far as infants are concerned, no detail description is available in Ayurvedic classics. Individual Prakriti can be determined as per the characteristics specified in Brihatrayi and Laghutrayi, which include the examination of skin, hair, nails, eyes, palm, sole and other physical and psychological features, and may be used in children for Prakriti determination. However, it can be better understood and differentiated each other by considering various methods and modern technology. Out of various characteristics of body parts, skin characteristics such as texture (roughness or smoothness, elasticity and thickness), color and temperature of skin significantly contribute in Prakriti determination. Use of objective parameters such as RGB and HSV method, Fitzpatrick Scale method and derma spectrometer for the skin color differentiation; skin-pH, stratum corneum hydration, TEWL, sebum content, cutometer and ultrasonography for skin texture as well as thermometer, thermister via pulse oxymeter for skin temperature may be very useful tools to differentiate individual Prakriti under controlled conditions. The aim of this conceptual study was to explore importance of various methodologies for differentiating Prakriti skin characteristics from the Vaikrita skin characteristics more precisely and scientifically in infants.

*J. Kottner, L. Ludriksone, N.G. Bartels, U. Blume-Peytavi, Do Repeated Skin Barrier Measurements Influence Each Other's Results? An Explorative Study, Skin Pharmacology and Physiology 2014; 27:90-96*

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  $32.9 \pm 7.2$  years) and 12 elderly (mean age  $68.3 \pm 2.5$  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. 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*

*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- $\gamma$ -Cyclodextrin, Molecules 2014, 19, 4924-4940*

Abstract: Oleanolic and ursolic acids are natural triterpenic compounds with pentacyclic cholesterol-like structures which gives them very low water solubility, a significant disadvantage in terms of bioavailability. We previously reported the synthesis of inclusion complexes between these acids and cyclodextrins, as well as their in vivo evaluation on chemically induced skin cancer experimental models. In this study the synergistic activity of the acid mixture included inside hydroxypropyl-gamma-cyclodextrin (HPGCD) was monitored using in vitro tests and in vivo skin cancer models. The coefficient of drug interaction (CDI) was used to characterize the interactions as synergism, additivity or antagonism. Our results revealed an increased antitumor activity for the mixture of the two triterpenic acids, both single and in complex with cyclodextrin, thus proving their complementary biologic activities.

*B. Gabard, A.O. Barel, P. Clarys, Sebumentry and Sebumentape, Non Invasive Diagnostic Techniques in Clinical Dermatology; Springer Berlin Heidelberg 2014; ISBN 978-3-642-32108-5*

Introduction: Sebum is the general term defining the lipids excreted by the sebaceous glands and spreading on the surface of the skin. These skin surface lipids (SSL) are in fact a mixture of the epidermal lipids and lipids from the sebaceous glands (sebaceous lipids). The quantity and the composition of SSL are not the same on different areas of the human body. Epidermal lipids are found on the whole body and are the sole component of SSL in anatomical regions where no or only few sebaceous glands are present. High quantities of SSL are present on cutaneous areas with many sebaceous glands such as the face (forehead, nose and cheeks), the scalp and the upper parts of the trunk and of the back. Here the proportion of sebaceous lipids may be important (up to 95-97%) and the one of epidermal lipids negligible (3-5%).

*X. Li, C. Galzote, X. Yan, L. Li, X. Wang, Characterization of Chinese body skin through in vivo instrument assessments, visual evaluations, and questionnaire: influences of body area, inter-generation, season, sex, and skin care habits, Skin Research and Technology 2014; 20: 14-22*

Background/Purpose: The varying influence of multiple factors (e.g., aging, sex, season, skin care habits) on skin structure and function necessitates study within ethnic groups to fully characterize their skin. Methods: Men and women aged 40-50 years (n=43) and their consanguineous same sex-children, aged 18-25 years (n=43), living in Chengdu, China were enrolled in this single center, non-interventional study. Volunteers attended two study visits (summer, 2010 and winter, 2011) at which dermatologists measured transepidermal water loss (TEWL), skin hydration, sebum secretion, fine lines/roughness, melanin/erythema, temperature, and color, and clinically graded participants' skin.

*S.H. Youn, C.W. Choi, J.W. Choi, B.R. Kim, S.Y. Byun, S.W. Youn, Novel facial cosmetic area 'O zone' shows unique characteristics in sebum excretion and acne lesion distribution, Skin Research and Technology 2014; 20: 164-169*

Background: We usually divided cosmetic facial zone into the T zone and U zone by the level of sebum secretion. Our recent studies suggested that the perioral area showed different characteristics in the aspect of acne development. Objective: To investigate the unique characteristics of the O zone (perioral area) among the three facial areas. Methods: A total of 102 patients clinically diagnosed as acne vulgaris were included. The acne lesions were counted from the clinical digital photographs by facial areas. The sebum level was measured using Sebumeter. Area-weighted (AW) sebum and AW density of three areas of face were calculated. Statistical analysis was performed according to age and gender.

*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;27:9-17*

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 forehead. Skin surface pH significantly increases with aging in the face.

*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 environment. 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.

*K. Shingaki, S. Kawaguchiya, Y. Hasegawa, M. Sumitani, Y. Yamamoto, K. Torii, Analysis of environmental factors and related molecular mechanisms that reduce cutaneous sensation and the development of cosmetics to prevent and improve functional decline of cutaneous sensation, IFSCC 2014 Paris*

Summary: The beneficial effects of touch have been well investigated in infant psychological and physiological development and adult homeostasis. Cutaneous sensation, which facilitates the beneficial effects of touch, alters under the influence of disease and aging. However, the environmental factors that affect cutaneous sensation, their related molecular mechanisms, and the possibility of cosmetics against decline have not been well studied. In this study, we showed a significant positive correlation between age and the perception threshold of a 2000-Hz current which stimulates A $\beta$ -fibres

and a significant negative correlation between a 2000-Hz current perception threshold (CPT) and the skin's physiological parameters. In addition, ultraviolet (UV) radiation significantly increased the 2000-Hz CPT in the skin, decreased the expression of neuroprotective growth factors, and altered the expression of matrix components which are the scaffoldings of nerve fibres in the normal human dermal fibroblasts. Furthermore, we showed a significant 2000-Hz CPT decrease 1 month after treatment with cosmetics that included moisturizing ingredients and vitamins. From these results, it is suggested that chronic UV exposure induces the functional decline of cutaneous sensation by decreasing the neuroprotective functional components of the skin and that cosmetics are useful for preventing and improving the decline of cutaneous sensation.

*Y.S. Cho, J.H. Jeon, A. Hong, H.T. Yang, H. Yim, Y.S. Cho, D.H. Kim, J. Hur, J.H. Kim, W. Chun, B.C. Lee, C.H. Seo, **The effect of burn rehabilitation massage therapy on hypertrophic scar after burn: a randomized controlled trial**, Burns. 2014 Dec;40(8): p. 1513-20*

Background: To evaluate the effect of burn rehabilitation massage therapy on hypertrophic scar after burn. Method: One hundred and forty-six burn patients with hypertrophic scar(s) were randomly divided into an experimental group and a control group. All patients received standard rehabilitation therapy for hypertrophic scars and 76 patients (massage group) additionally received burn scar rehabilitation massage therapy. Both before and after the treatment, we determined the scores of visual analog scale (VAS) and itching scale and assessed the scar characteristics of thickness, melanin, erythema, transepidermal water loss (TEWL), sebum, and elasticity by using ultrasonography, Mexameter<sup>®</sup>, Tewameter<sup>®</sup>, Sebumeter<sup>®</sup>, and Cutometer<sup>®</sup>, respectively. Results: The scores of both VAS and itching scale decreased significantly in both groups, indicating a significant intragroup difference. With regard to the scar characteristics, the massage group showed a significant decrease after treatment in scar thickness, melanin, erythema, TEWL and a significant intergroup difference. In terms of scar elasticity, a significant intergroup difference was noted in immediate distension and gross skin elasticity, while the massage group significant improvement in skin distensibility, immediate distension, immediate retraction, and delayed distension. Conclusion: Our results suggest that burn rehabilitation massage therapy is effective in improving pain, pruritus, and scar characteristics in hypertrophic scars after burn.

*W. Henschel, **Prospektive Pilotstudie zum dermatologischen Nutzen der Einführung von Hautschutz- und Hautpflegecreme in ein chirurgisches Team**, Dissertation der Universitätsmedizin der Ernst-Moritz-Arndt Universität Greifswald, Germany, Oktober 2014*

Das Wort Chirurgie setzt sich aus dem altgriechischen Wort χείρ (kheir) für „Hand“ und ἔργον (ergon) für „Arbeit“, „Werk“, „Tat“ zusammen. Das bedeutet, dass ein Chirurg im wörtlichen Sinn ein Handarbeiter ist. Diese Übersetzung aus dem Altgriechischen rückt die Tatsache in den Mittelpunkt, dass der Chirurg täglich mit seinen Händen arbeitet. Ein altes Sprichwort - „Der Mann, der zu beschäftigt ist, sich um seine Gesundheit zu kümmern, ist wie ein Handwerker, der keine Zeit hat, seine Werkzeuge zu pflegen.“ - nimmt Bezug darauf, dass man sowohl für seine Gesundheit als auch für sein Werkzeug Sorge tragen sollte. Dieses Sprichwort ist für Chirurgen von besonderer Bedeutung, da ihre Hände einerseits im Rahmen ihrer allgemeinen Gesundheit gepflegt werden müssen und ihnen ihre Hände andererseits als Werkzeug dienen. Die besondere Gewichtung, die dem Hautschutz und der Hautpflege zukommen sollte, spiegelt sich jedoch nicht nur in Volksweisheiten wider.

*L. Gallego, **Pore refining and control of sebum production**, Household and Personal Care Today, Vol. 9 No. 3 May/June 2014*

Introduction: Oily skin is a prevalent problem affecting men and women of all ages and ethnic groups. Although, generally speaking, an oily skin does not have serious consequences on body functions, a chronically oily skin can lead to obvious aesthetic problems (a greasy shiny skin with enlarged pores, acne...) and it can cause negative psychological effects (1). Several studies claim that between 66 percent and 75 percent of young people from 15 to 20 years are affected by this problem. However, it does not affect only young people, since it has been seen that half of women between 20 and 30 years old and also 70 percent of Asiatic women from 40 to 60 years complain about problems related to oily skin such as enlarged pores (2). Pores are conically shaped holes, full of nucleated cells, located in the skin furrows. Nowadays, pore size is known to be related to the size and activity of sebaceous gland, thus if we reduce this activity we will also obtain narrower pores (3).

*O. Freis, G.Perie, A. Rathjens, **Correlating Aging with Skin's Mechanical and Optical Properties**, www.cosmeticsandtoiletries.com, April 2014*

The evolution of skin's biomechanical and optical properties as a function of aging and/or photoaging is one of the main targets of cosmetic and dermatological research. Many noninvasive

devices to measure skin's biomechanical properties have been developed using alternative methods such as stretching, torsion, indentation and suction. Measurements of skin deformation after suction or torsion are the most widely used techniques in cosmetic research.

**B.A. Khan, N. Akhtar, Clinical and sebumetric evaluation of topical emulsions in the treatment of acne vulgaris**, *Postep Derm Alergol* 2014; XXXI, 4: p. 229–234

Introduction: Numerous plant products described in the scientific literature show distinct activities on the skin, such as moisturizing, antioxidant, sunscreen, anti-acne and depigmentation. Aim: The main objective of this study was to compare the effectiveness of emulsion formulations containing plant extracts (*Hippophae rhamnoides* and *Cassia fistula*) and placebo (without plant extracts) on acne patients. Material and methods: A single-blind, randomized, placebo-controlled, split-face study was designed. Two groups of 25 patients each (aged 18–37 years) with grade I and grade II acne vulgaris received active formulations on the left side of their cheeks and placebo on the right side of their cheeks twice daily for 12 weeks. Prior to the study, signed consent was obtained from each patient. The antibacterial activity of the extracts and formulations was tested *in vitro*. The skin sebum contents of patients were evaluated by the sebumeter® and subjectively using a clinical evaluation before and after treatment of 12 weeks. One way ANOVA and Kruskal-Wallis tests were used in the statistical analysis. Results: A significant ( $p \leq 0.05$ ) decrease in the level of sebum contents was observed in both groups who used formulations (F1 and F2) containing the plant extract. The difference between pre- and post-treatment levels of sebum contents was statistically significant ( $p \leq 0.05$ ). Formulations containing plant extracts were found effective in the reduction of skin sebum contents (anti-acne effects) sebumetrically as well as clinically when compared to placebo (F3). Conclusions: Formulations with 5% plant extracts could be effective, safe, and well-tolerated topical medications for grade I and grade II acne vulgaris.

**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.

**B. Marczyk, P. Mucha, E. Budzisz, H. Rotsztejn, Comparative study of the effect of 50% pyruvic and 30% salicylic peels on the skin lipid film in patients with acne vulgaris**, *J Cosmet Dermatol*, 2014 Mar; 13(1): p. 15-21

Pyruvic (alpha-keto acid) and salicylic (beta-hydroxy acid) acids are superficial peels frequently used in patients with acne vulgaris. Aim: The aim of the study was to compare the effect of 50% pyruvic and 30% salicylic peels on facial sebum secretion in patients with acne vulgaris, aged 13-30. Material and Methods: The level of secreted sebum was determined in 20 men and women. Ten patients were treated with 50% pyruvic acid and the remaining 10 with 30% salicylic acid. Each peel was applied five times at 2-week intervals. The sebum measurements were taken in the T- and U-zones using a Sebumeter SM 815 (Courage & Khazaka, Germany). The last, sixth measurement was taken 2 weeks after the treatment. Results: A statistically significant decrease in the level of secreted sebum in both U- and T- zones was observed in the patients studied after the third application of 50% pyruvic peel and the second application of 30% salicylic peel. Two weeks following the completion of therapy, sebumetric measurements demonstrated a greater reduction in the facial skin lipid film among the patients treated with salicylic peel. Conclusions: Peels with 50% pyruvic acid and 30% salicylic acid are the procedures that significantly contributed to a decrease in the level of secreted sebum on the facial skin surface in

the group of patients studied. A greater therapeutic effect was observed following 30% salicylic peel, which might be associated with its high lipophilic properties and easier penetration through the lipid barriers of the epidermis.

*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 for the 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 measurement 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 5<sup>th</sup> 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.

*K. Mizukoshi, H. Akamatsu, The investigation of the skin characteristics of males focusing on gender differences, skin perception, and skin care habits*, Skin Research and Technology 2013; 19: 91-99

Background/purpose: Various studies have examined the properties of male skin. However, because these studies mostly involved simple measurement with non-invasive devices, a lack of understanding of the properties of male skin remains. Methods: In this study, we focused and investigated not only on simple instrumental measurements but also on gender differences and men's subjective perceptions of skin and daily skin care habits.

*C.W. Choi, J.W. Choi, S.W. Youn, Subjective facial skin type, based on the sebum related symptoms, can reflect the objective casual sebum level in acne patients*, Skin Research and Technology 2013; 19: 176-182

Background: The relationship between the subjective skin type and the casual sebum level was not fully clarified. Objectives: To investigate the characteristics of subjective skin type and to find the relationship between the subjective skin types and the skin type-related symptoms, casual sebum level, along with the objective skin type. Methods: Seven hundred and nine patients, clinically diagnosed with acne, were included. The questionnaire and the casual sebum level measurement were performed. The determining symptoms of each subjective skin type were investigated. The 95% confidence interval of casual sebum level of each subjective skin type was calculated.

*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 the 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.

*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.

*T. Sugawara, N. Nakagawa, N. Shimizu, N. Hirai, Y. Saijo, S. Sakai, Non-invasive analysis using three-dimensional ultrasound tomography demonstrates gender- and age-wise differences in facial sebaceous glands*, ISBS, Milan 15-16.10.2013

Summary Facial skin is rich in large sebaceous glands (SGs). Although age and gender related differences in SG activity and sebum levels have been reported, changes in SG morphology remain inconclusive. Three dimensional ultrasound microscopy with a central frequency of 120 MHz allows, with a spatial resolution of 20  $\mu\text{m}$ , non-invasive visualization of the structure of skin appendages such as SGs. To explore the differences in SG morphology by age or gender, we measured facial skin using a high-frequency 3D ultrasound microscope. SG images of the cheek of young male, young female and elderly female subjects were obtained using 3D ultrasound microscopy over an area of 4.8 mm  $\times$  4.8 mm and to a depth of 1.5 mm. Then, 150 consecutive B mode images were reconstructed to obtain volume data, and en face images were processed at 700 or 900- $\mu\text{m}$  beneath the skin surface to measure the SG area. In young male subjects, the areas of the low-intensity circular regions, which represent SG morphology, at 900- $\mu\text{m}$  beneath the skin surface were significantly larger than at 700  $\mu\text{m}$ . In contrast to the male subjects, in young female subjects the areas of low-density circular regions at 900  $\mu\text{m}$  did not differ from those at 700  $\mu\text{m}$ .

*H. Ohno, N. Nishimura, K. Yamada, Y. Shimizu, S. Iwase, J. Sugeno, M. Sato, Effects of water nanodroplets on skin moisture and viscoelasticity during air-conditioning*, Skin Research and Technology 2013;19;375-383

Background/purpose: In air-conditioned rooms, dry air exacerbates some skin diseases, for example, senile xerosis, atopic dermatitis, and surface roughness. Humidifiers are used to improve air dryness, which often induces excess humidity and thermal discomfort. To address this issue, we investigated the effects of water nanodroplets (mist) on skin hydration, which may increase skin hydration by penetrating into the interstitial spaces between corneocytes of the stratum corneum (SC) without increasing air humidity. Methods: We examined biophysical parameters, including skin conductance and transepidermal water loss (TEWL), and biomechanical parameters of skin distension/retraction before and after suction at the forehead, lateral canthus, and cheek, with or without mist, in a testing environment (24°C, 35% relative humidity) for 120 min.

*F. Pouradier, C. Cornillon, M.F. D'arras, F. Flament, S. Panhard, S. Diridollou, G. Loussouarn, Functional and structural age-related changes in the scalp skin of Caucasian women*, Skin Research and Technology 2013;19;384-393

Background: Ageing of the skin, being chronological or sun induced is highly documented. Scalp, as a specific skin site, has, however, received little attention. This work attempted to describe functional and structural alterations that occur in scalp skin with ageing. Methods: Two different age groups (N=15 each; 30  $\pm$  3 and 62  $\pm$  2 y.o. respectively) of Caucasian women participated in the study. Some functional parameters (TEWL, Sebum level, Hydration, T°) were recorded on the vertex part of the scalp, after having cut the hair flat on the scalp surface. Imaging of some structural criteria was carried out using high-frequency ultrasound technique and optical coherence tomography on the same scalp site and on the mid-forehead, as a close control skin site.

*C. Galzote, R. Estanislao, M.O. Suero, A. Khaiat, M.I. Mangubat, R. Moideen, H. Tagami, X. Wang, Characterization of facial skin of various Asian populations through visual and non-invasive instrumental evaluations: influence of age and skincare habits*, Skin Research and Technology 2013;19; 454-465

Background/purpose: We aimed to evaluate the impact of age and skincare habits on facial skin of different Asian ethnicities by comparing skin properties and skincare habits among various Asian populations of varying age groups. Methods: We evaluated approximately 100 female subjects each from a total of eight Asian cities in China, Indian, South Korea, Japan and the Philippines grouped according to age ranging from 14 to 75 years during a summer season. Facial skin was characterized using dermatological examinations of the cheek. Information regarding personal skincare habits was collected using a questionnaire.

*Y. Wu, Y. Niu, S. Zhong, H. liu, Y. Zhen, D. Saint-Leger, M. Verschoore, A preliminary investigation of the impact of oily skin on quality of life and concordance of self-perceived skin oiliness and skin surface lipids (sebum)*, Abstracts from the Member Society Journals, IFSCC Magazine Volume 16, Number 4 2013

Objectives: This preliminary study investigated both the impact of oily skin on quality of life (QoL) and the agreement between subjective oily skin self-assessment and objective skin surface sebum measurement in young to middle-aged Chinese women in Beijing. Methods: A 18-item Chinese version

of the Oily Skin Self-Image Questionnaire (QSSIQ) was used to assess the impact of oily skin on QoL in 300 healthy female subjects (age groups: 20-25; 26-30; 31-35). The subjects were divided equally into the oily skin group and the non-oily skin group based on their self-perception of skin oiliness. The level of skin surface lipids (SSL) was measured on the middle of the forehead, and both cheeks using the Sebumeter. In order to assess the agreement between self-perceived skin oiliness and measured SSL, we tentatively used the SSL median value as a dividing point to regroup all subjects.

*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 changes over lifetime.

*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, décolleté, 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 women, TEWL and stratum corneum hydration show only minor variations with ageing.

*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 confirmed 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 confirmed by biophysical skin parameter measurements. Changes in the hair growth parameters showed telogen effluvium hair loss.

*T. Mahmood, N. Akhtar, C. Moldovan, A comparison of the effects of topical green tea and lotus on facial sebum control in healthy humans*, Hippokratia 2013, 17, 1: p. 64-67

Background and aim: Green tea and lotus hold several synergistic antioxidant compounds. This investigation aimed to assess the efficacy of green tea and green tea plus lotus vs. placebo multiple emulsions in healthy adults for controlling casual sebum secretions. Participants and Methods: After signing informed consents, twenty-two participants were registered in a single-blinded, placebo-controlled, split-face comparative study. Group 1 participants applied a multiple emulsion formulation with green tea extract while group 2 applied a multiple emulsion with green tea plus lotus extract in a 60 days treatment course. A non-invasive photometric device (Sebumeter®) has been used for the measurement of casual sebum secretions on both sides of the face. Results: Steady and statistically significant reductions in sebum secretions were noted for mono (green tea) and combined treatments (green tea plus lotus) compared to placebo treatment. However, irrespective of the concentration of extracts in active formulations, green tea plus lotus combined treatment produced statistically more sound results (two-tailed p value = 0.0002) than green tea alone (two-tailed p value = 0.0060) in a 60-days treatment course. Conclusions: Results suggest that synergistic compounds in green tea and lotus could be a promising choice for cutaneous disorders where elevated sebum levels are involved in the pathophysiology of these disorders.

*A. Wójcik, M. Kubiak, H. Rotsztejn, Influence of azelaic and mandelic acid peels on sebum secretion in ageing women*, Postep Derm Alergol 2013; XXX, 3: p. 140–145

Introduction: Azelaic acid and mandelic acid are superficial peels commonly applied in people of various age groups. As they are mild and do not cause any side effects, they are also often used in elderly people. Aim: To compare the influence of azelaic and mandelic acid peels on facial sebum secretion in mature women aged 49-71 years. Material and methods: The level of secreted sebum was measured in 28 women. Eleven women were treated with azelaic acid peel and 17 with mandelic acid peel. Each of the peels was applied five times with 2-week intervals. The measurements were made on the cheeks and chin with the use of Sebumeter SM 15 (Courage & Khazaka, Germany). The last measurement, i.e. the sixth one, was made 2 weeks after the treatment. Results: We observed a significant increase in sebum secretion in the U-zone after the application of 20% azelaic peel and 40% mandelic peel. Neither peel significantly affected sebum secretion in the T-zone. Conclusions: Peels with 20% azelaic acid and 40% mandelic acid might be considered treatments which contribute to an increase in sebum secretion in ageing women.

*J. Kurpiewska, J. Liwkowicz, K. Padlewska, Prevention of hand dermatoses in small catering enterprises*, Med Pr 2013;64(4): p. 521-525, (Abstract – Article in Polish)

Background: Work in catering and food processing is mostly performed by hands. Mechanical, thermal and chemical agents, as well as damp working conditions and frequent hand washing aggravate skin irritation. The aim of the study was to test the efficacy of hydrophobic skin protection measure at these workplaces. Materials and Methods: We recommended the prevention of contact skin disorders by using hydrophobic skin protection measure. The study was conducted in a group of 20 food service sector workers. They were interviewed about skin problems and skin protection measures. To assess the effect of the protective preparation on the skin dermatological test procedures, corneometry and sebumetry, were applied, as well as the level of transepidermal water loss (TEWL) was measured. The same survey was performed in the control group composed of 10 workers who used and 10 who did not use barrier preparation. Results: The respondents declared dryness, roughness, peeling, burning, redness, erythema of the skin. All who had applied barrier cream observed a significant improvement of the skin - hydration increased by about 30%, and lubrication of the skin - by 11 times on average. Also the level of TEWL decreased by about 25%. Conclusions: The improvement of skin conditions and reduction of skin disorders were observed confirming the effectiveness of the protection of the skin from exposure to harmful factors. Knowledge about prevention of skin diseases should be promoted among employees of catering enterprises.

*G. Munvalli, A single-center, prospective study on the efficacy and safety of microfocused ultrasound for the noninvasive treatment of moderate to severe facial acne*, JAAD, April 2013, Volume 68, Issue 4, Supplement 1, p. AB12

Acne is a very prevalent skin disorder affecting  $\geq 85\%$  of adolescents and often continuing into adulthood.

*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.

*C.W. Choi, J.W. Choi, K.C. Park, S.W. Youn, **Facial sebum affects the development of acne, especially the distribution of inflammatory acne**, J Eur Acad Dermatol Venereol. 2013 Mar; 27 (3): p. 301-6*

**Background:** The increased sebum secretion has been considered as one of the pathogenic factors of acne. **Objective:** The goal of this study was to assess the correlation between the casual sebum level and the severity of acne using objective measuring methods in a large acne patients group. We also investigated the influence of age or gender on the correlation. **Methods:** A total number of 914 acne patients were recruited. The standard digital photographs were taken, and the acne lesions were counted as comedones or inflammatory lesions. The casual sebum level was measured using the Sebumeter SM 815<sup>®</sup>. The correlation analysis was performed. **Results:** The casual sebum level showed positive correlation with the number of acne lesions. The casual sebum level markedly influenced the number of inflammatory lesions and the acne lesions located in the U-zone. In the young acne patients, the casual sebum level showed significant correlations in the U-zone, whereas in the old acne patients, there were significant correlations in the T-zone. The male acne patients were more influenced by the casual sebum level. **Conclusion:** This was the first study to report the significant correlations between the casual sebum level and the number, proportion and location of acne lesions in a large acne patients group, using an objective, bioengineering method. Moreover, we also found that the influence of sebum was prominent on the inflammatory lesions. In addition, both age and gender influenced the correlation between the casual sebum level and the acne.

*B.Y. Kim, J.W. Choi, K.C. Park, S.W. Youn, **Sebum, acne, skin elasticity, and gender difference - which is the major influencing factor for facial pores?**, Skin Res Technol. 2013 Feb;19(1): e45-53*

**Background:** Enlarged facial pores have been esthetic problems and have become a matter of cosmetic concern. Several factors are supposed to be related to the enlargement of facial pores, although scientific evaluations were not performed yet. **Objective:** To assess the correlation between facial pores and possible relating factors such as age, gender, sebum secretion, skin elasticity, and the presence of acne, using objective bioengineering instruments. **Methods:** Sixty volunteers, 30 males and 30 females, participated in this study. Various parameters of facial pores were assessed using the Robo Skin Analyzer. The facial sebum secretion and skin elasticity were measured using the Sebumeter and the Cutometer, respectively. These data were compared and correlated to examine the possible relationship between facial pores and age, sebum secretion and skin elasticity, according to gender and the presence of acne. Male gender and the existence of acne were correlated with higher number of facial pores. Sebum secretion levels showed positive correlation with facial pores. **Results:** The R7 parameter of skin elasticity was negatively correlated with facial pores, suggesting increased facial pores with decreased skin elasticity. However, the age and the severity of acne did not show a definite relationship with facial pores. Male, increased sebum and decreased skin elasticity were mostly correlated with facial pore development. **Conclusion:** Further studies on population with various demographic profiles and more severe acne may be helpful to elucidate the potential effect of aging and acne severity on facial pores.

*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, sweat, 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.

*A.-E. Craciun, M. Moldovan, A. Rusu, C. Nita, C. Craciun, A. Tataru, Predictors of changes in physical properties of skin in patients with diabetes mellitus, Rom J Diabetes Nutr Metab Dis. 19(1):33-40; 2012*

Introduction: The skin, the largest human organ, is often affected by diabetes mellitus (DM). We know that DM affects the hydration of stratum corneum (SC), the sebum content of the skin and to some extent, the barrier function of the epidermis and elasticity, but we do not know the factors leading to these changes. Objectives: The objectives of this study were to determine the factors associated with changes in physical properties of the skin (skin hydration degree, sebumetry, transepidermal water loss and skin elasticity) in patients with diabetes. Materials and methods: The physical properties of the skin were assessed using the Multi Probe Adapter Systems MPA (Courage-Khazaka, Germany) in 57 patients with diabetes and 46 non-diabetic.

*T.H. Sakuma, H.I. Maibach, Oily Skin: An overview, Skin Pharmacology and Physiology 2012; 25: p. 227-235*

Oily skin (seborrhea) is a common cosmetic problem that occurs when oversized sebaceous glands produce excessive amounts of sebum giving the appearance shiny and greasy skin. This paper overviews the main concepts of sebaceous gland anatomy and physiology, including the biosynthesis, storage and release of sebum, as well as its relationship to skin hydration and water barrier function. We also address how skin oiliness may vary according to diet, age, gender, ethnicity and hot humid climates. The deeper understanding of this skin type provides the opportunity to better guide patients regarding skin care and also assist in the development of sebosuppressive agents.

*S. Mac-Mary, A. Elkhyat, J.M. Sainthillier, A. Jeudy, K. Perrot, S. Lafond, O. Predine, P. Mermet, C. Tarrit, P. Humbert, Specific cosmetic for children: an in vivo randomized single-blind study of efficacy in 7- to 12-year-old children, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa*

Few cosmetics are dedicated to the skin of children: most of them have been developed for babies or the acneic skin of adolescents. However, literature seems to indicate that the children's sebum levels are very low. The aim of this study was to assess the acceptability and efficacy of a cosmetic specifically formulated for the skin of prepubertal children.

*S. Hitzel, R. Graf, M. Lefort, G. Witte, S. Daehnhardt-Pfeiffer, H. Tronnier, U. Heinrich, Acne prevention based on a specific antioxidant, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa*

The sun as the center of our solar system is essential for all life on earth. Yet, excessive exposure to the sun's rays can have negative effects, among which are many potentially damaging consequences to the human body which have been attributed to free radicals. There is also evidence that radical induced peroxidation of squalene in the sebum is one of the conditions for the occurrence of impure skin or acne. Skin tending to acne is a frequent appearance especially in juveniles and young adults and often results from oily skin. It is understood as a complex condition with skin subject to an increased formation of sebum lipids, a bacterial population and an inflammatory alteration.

*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 campaigns 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.

*A. Barel, R. Divisova, P. Clarys, Determination of the sebum capitation factor of the sebumeter method: effect of application pressure, ISBS Copenhagen 2012*

The determination of the sebum casual level can be carried out using the photometric method (Sebumeter). The Sebumeter measuring probe (cassette) is applied with a constant pressure on the skin surface using a spring system. In the literature values ranging from 6.6 to 10N are reported. The measured quantity of sebum is only a fraction of the real quantity of sebum present (captation factor). Reported captation factor vary from 0.40 to 0.60. It is the purpose of this work to evaluate the captation factor as a function of the applied probe pressure.

*N. Muizzuddin, M. Matsui, D. Yarosh, R. Sparacio, T. Mammone, **Topical 5-alpha reductase inhibitors may effectively reduce skin surface sebum production**, ISBS Copenhagen 2012*

Many individuals are distressed about having excessively oily skin and seek topical remedies for this condition. Skin having a high water content and low sebum secretion is considered to be highly desirable (moisturized and hydrated but without visible sheen). Sebum lipids are primarily a product of follicular sebocytes, and synthesis is believed to be positively modulated by androgens. The transformation of precursors to androgens such as testosterone is dependent on the enzyme 5-alpha reductase.

*S.Y Huh, J-I Na, C-H Huh, K-C Park, **The Effect of Photodynamic Therapy Using Indole-3-Acetic Acid and Green Light on Acne Vulgaris**, Ann Dermatol 24(1) p. 56-60, 2012*

Background: Photodynamic therapy (PDT) using topical aminolevulinic acid (ALA) has increasingly been used for the treatment of acne vulgaris and several studies have shown its clinical efficacy. However, ALA-PDT needs a relatively long incubation period and is frequently associated with adverse effects. Indole-3-acetic acid (IAA) has been introduced as a new photosensitizer for the treatment of acne in recent study. IAA-PDT requires only a short incubation period and the procedure is relatively painless in contrast to ALA-PDT. Objective: To investigate the efficacy and safety of IAA- PDT in the treatment of acne. Methods: Twenty-five patients with facial acne lesions were enrolled in this study. IAA-PDT was performed for five sessions at 1-week intervals (week 0~4). IAA was treated with 15 minute occlusion, and green light was given for 15 minutes. Clinical efficacy was determined by evaluating acne lesion counts, severity grading, and the Dermatology Life Quality Index (DLQI) at week 0, 2, 4, and 5. Sebum secretion and erythema index was measured by Sebumeter and Mexameter, respectively, at baseline and one week after each treatment session (week 1~5). Histopathological examination was performed at baseline and week 5. Adverse effects were recorded throughout the study. Results: All the patients completed the study. Numbers of both inflammatory and non-inflammatory acne lesions were significantly decreased. Acne severity grade and the DLQI showed significant reduction. Sebum secretion and erythema were also reduced. Histopathological examination showed a reduction in inflammatory reactions. No adverse effects were observed except for transient pruritus in one patient. Conclusion: PDT using IAA and green light was an effective, simple and safe treatment for acne.

*A. Firooz, B. Sadr, S. Babakoohi, M. Sarraf-Yazdy, F. Fanian, A. Kazerouni-Timsar, M. Nassiri-Kashani, M.M. Naghizadeh, Y. Dowlati, **Variation of Biophysical Parameters of the Skin with Age, Gender, and Body Region**, The Scientific World Journal, Volume 2012*

Background: Understanding the physiological, chemical, and biophysical characteristics of the skin helps us to arrange a proper approach to the management of skin diseases. Objective: The aim of this study was to measure 6 biophysical characteristics of normal skin (sebum content, hydration, transepidermal water loss (TEWL), erythema index, melanin index, and elasticity) in a normal population and assess the effect of sex, age, and body location on them. Methods: Fifty healthy volunteers in 5 age groups (5 males and females in each) were enrolled in this study. A multifunctional skin physiology monitor (Courage & Khazaka electronic GmbH, Germany) was used to measure skin sebum content, hydration, TEWL, erythema index, melanin index, and elasticity in 8 different locations of the body. Results: There were significant differences between the hydration, melanin index, and elasticity of different age groups. Regarding the locations, forehead had the highest melanin index, where as palm had the lowest value. The mean values of erythema index and melanin index and TEWL were significantly higher in males and anatomic location was a significant independent factor for all of 6 measured parameters. Conclusion: Several biophysical properties of the skin vary among different gender, age groups, and body locations.

*K. Fritz, **Skin physiologic changes before and after laser treatment**, IMCAS, Congress of Plastic Surgery and Dermatology, 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 physiology. Few studies have been reported to compare the effects of various lasers on the skin physiology which 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, transepidermal water loss (TEWL) and skin hydration and pH (Courage and Khazaka).

A. Costa, L. Lindmark, L.H. Fávoro 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.

H.J. Park, Y.W. Lee, Y.B. Choe, K.J. Ahn, **Skin Characteristics in Patients with Pityriasis Versicolor Using Non-Invasive Method, MPA5**, *Ann Dermatol Vol.* 24, No. 4, 2012

Background: Skin pigmentary changes of pityriasis versicolor may occur as either hyperpigmented or hypopigmented lesions, depending on the outcome of interactions between *Malassezia* yeasts and the skin, such as lipoperoxidation process, stimulus of inflammatory cell to melanocytes, and increased thickness of keratin layer. Objective: To investigate skin characteristic factors that enhance the susceptibility to *Malassezia* yeasts and provoke different color changes of pityriasis versicolor patients. Methods: To clarify these factors, we investigated the skin characteristics of pityriasis versicolor patients, using a non-invasive method known as MPA 5<sup>®</sup> (Courage and Khazaka, Germany). A total of 90 normal healthy subjects and 30 pityriasis versicolor patients were included in this study. Results: Both hyperpigmented and hypopigmented pityriasis versicolor skin lesions showed higher humidity, increased sebum excretion rate and increased transepidermal water loss (TEWL) values than normal healthy subjects. But no significant difference of specific *Malassezia* yeasts species between hyperpigmented and hypopigmented skin lesions was evident. Conclusion: These results indicate that higher humidity and increased sebum level provide a better growing environment of *Malassezia* yeasts in the skin, leading to the assumption that interaction between *Malassezia* yeasts and skin barrier materials makes disruption of skin barrier causing increased TEWL.

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.

*S. Hyodo, S. Yamana, Fullerene: topical application for acne treatment*, Personal Care, March 2012, p. 30-33

Acne vulgaris is one of the most common diseases of the skin and has increased in frequency over the last 50 years. Skin diseases, such as acne, may not be life threatening but have been associated with depression, anxiety, and serious psychological damage in sufferers. Acne is characterised by the formation of non-inflammatory comedos and inflammatory papules, pustules, nodules, and cysts. Generally, the major pathogenic factors involved in acne are sebum overproduction, follicular hyperkeratinisation, and bacterial hypercolonisation, as well as immune reactions and inflammation. Androgens, microbes, and other pathogenic influences may also lead to acne, this the disease has a complex pathogenesis. Sebum produced by sebaceous glands, altered follicular contents, and reactive oxygen species (ROS) may release from serious damaged follicular walls.

*H. Dobrev, Products for Impure, Acne-Like Skin*, J. Fluhr (ed.), Practical Aspects of Cosmetic Testing, Springer-Verlag Berlin Heidelberg 2011

Many people suffer from impure, acne-like skin. This type of skin looks greasy and glossy, rough with enlarged pores, and has a tendency to develop comedones, pimples, and pustules. It feels unpleasant and may be a serious cosmetic problem. The effective control over the impure skin requires daily application of multifunctional cosmetic products for cleansing and intensive care of the skin. Market products should have a proven effect. Testing on human volunteers using sensorial self- and expert evaluation, instrumental skin bioengineering techniques, and questionnaires for quality of life assessment are the preferred ways to prove products claims.

*R. Darlenski, T. Callaghan, J.W. Fluhr, Antiaging and Antiwrinkle Products*, J.W. Fluhr (ed.), Practical Aspects of Cosmetic Testing; Springer-Verlag Berlin Heidelberg 2011

The chronological (intrinsic) and extrinsic aging demonstrate typical macroscopic, histological and functional characteristics. The relative improvement in different parameters characterizing aging skin can be used in efficacy proof of antiaging and antiwrinkle cosmetic products. Different approaches to investigate the efficacy of antiaging products exist such as clinical evaluation and objective assessment with non-invasive methods and invasive procedures. A multiparametric approach is useful in the assessment of antiaging products efficacy. There is no uniform consensus on the protocol and the design of studies aiming efficacy proof of antiaging cosmetics.

*M. Minguet, R. Barcelona, E. Casas, M. Beltrán, J. Seguer, Ethyl Lauroyl Arginate HCL for Natural Preservation*, Cosmetics & Toiletries magazine, Vol. 126, NO.12/December 2011, p. 876-883

In recent years, several preservatives either have been banned or their use strongly limited, which is the case for formaldehyde, its releasers and isothiazolinones. In addition, some studies have misleadingly related parabens with a higher risk of cancer; so although parabens are the most commonly used preservatives in skin care due to their low sensitizing potential and good efficacy, with continued scrutiny from the market, many manufacturers are omitting them and promoting their cosmetics as "paraben-free". Currently, the ideal antimicrobial must show high antibacterial activity yet remain safe for human use and for the environment – and if possible, be based on naturally occurring substances

*M. Mateu, Aknehaut – Ein Tripeptid für die Abwehrkräfte der Haut*, COSSMA 12/2011; p. 14-15

Die Haut ist ständig Verletzungsrisiken und Mikroorganismen der Umwelt ausgesetzt und das Stratum Corneum (SC) stellt die erste Schutzbarriere der Haut gegen externe Aggressionen dar. Normale Humanhaut ist von einer grossen Zahl von Mikroorganismen besiedelt, von denen die meisten harmlose Kommensalen sind, die keine Krankheiten verursachen. Physiologische, biochemische, mechanische, immunologische und Umweltvariablen tragen zu einer gesunden Balance zwischen der Haut und ihrer normalen Flora bei. Die Haut ist ständig pathogenen Keimen ausgesetzt. Die physikalische Barriere der Epidermis ist essenziell, aber viele Mikroben haben effektive Strategien entwickelt, die Epidermis zu überwinden. Dennoch wird gesunde Haut nur selten infiziert.

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 feinfühligste Hand der Kosmetikerin, die vieles über das Hautgeschehen wahrnimmt? Auf keinen Fall dürfen Erfahrung und kompetentes Wissen, um negative Hautveränderungen detektivisch aufzuspüren.

C. Schrammek-Drusio, **Fachfrau in Sachen Haut – die Kosmetikerin als Hautpflegetherapeutin**, natur & kosmetik, service, S. 39

Die Kosmetikerin von heute muss sich in Theorie und Praxis rund um das Thema Haut auskennen. Dafür spielt die fundierte und theorie- sowie fachorientierte Ausbildung und eine stetige Weiterbildung die größte Rolle. Ohne berufliche Fortbildung ist es auf Dauer unmöglich, zeitgerecht und marktorientiert zu arbeiten. Um die Haut der Kundinnen und Kunden für die kosmetische Kabinenbehandlung spezifisch zu bestimmen, liegt ein Schwerpunkt im richtigen Erkennen der Hautgrundbilder und Hautzustände – die so genannte Profi-Hautanalyse. Noch immer werden Hauttypen und Hautgrundbilder häufig verwechselt.

C. Schrammek-Drusio, **Haut- und Gesichtsdagnosen – eine Kernkompetenz jeder Kosmetikerin**, dermatologie S. 32-33

Neben dem Dermatologen ist eine kompetente Kosmetikerin die Expertin in Sachen Hautpflege. Doch wodurch zeichnet sie sich aus? Selbstverständlich ist ein umfassendes theoretisches und praktisches Fachwissen erforderlich, komplettiert durch stetige Weiterbildung. Doch wenn Kunden ins Institut kommen, möchten sie auch schnelle Analyseergebnisse und Behandlungspläne erfahren. Grundlage hierfür ist die professionelle Hautdiagnose. Denn alle sich anschließenden Fragen, etwa welche Produkte und Behandlungen in der Kabine angewendet werden, wie das individuelle Pflegekonzept aussehen soll und welche Präparate sich für die Heimpflege empfehlen, hängen von dem Ergebnis der Hautanalyse ab. Für die kosmetische Praxis bedeutet dies das Erkennen und Einordnen des Hautgrundbildes, des Hautzustandes und der Anomalien bzw. unerwünschten Hautveränderungen.

A. Wojcik, E. Budzisz, H. Rotsztein, **Skin surface lipids and their measurements**, Post Dermatol Alergol 2011; XXVIII, 6: 498-505,

On the surface of the corneal layer there is a skin lipid coat, which is a mixture of sebum secreted by sebaceous glands and epidermal lipids synthesized by keratinocytes. The mixture of these substances mixed with the secretion of sweat glands makes up water in oil (W/O) emulsion, called a hydrolipid coat. It acts as a barrier and regulates processes of absorption and skin penetration of substances soluble in water and fats [1, 2].

C. Deep Kaur, S. Sasraf, **Skin care assessment on the basis of skin hydration, melanin, erythema and sebum at various body sites**, Academic Science, International Journal of Pharmacy and Pharmaceutical Sciences, Vol 3, Suppl 4, 2011

The aim of this work was to study skin parameters like melanin, erythema, skin hydration, and sebum score of six body sites namely volar forearm, cheek, chin, forehead, neck and post auricular skin of Asian (Indian) population with different skin colour and types to depict the formulation to be used for taking care. Initially skin colour of various volunteers was assessed by the reference of colour chart numbers and three groups each of 80 human volunteers were made. Group I was named fair which corresponded with Colour chart number 19, 20, 21; group II (medium) (22, 23, 24); group III (dark) (25, 26, 27). The measurements were taken using Mexameter (erythema and melanin), Corneometer (skin hydration) and Sebumeter (sebum score). Results depicted that facial skin had more melanin content than volar forearm; the sebum score was highest in the forehead and lowest at volar forearm, skin hydration was more in periauricular space and forehead and lowest in cheek. The volunteers of group I had high sebum and skin hydration values than group II and III. In the face, cheeks need more care and are more prone to dryness. People with darker skin, require formulations having more humectants, while people with fairer skin need to protect more from tanning and redness. Hence these studies will be helpful for deciding the criteria for type of skin and selection of formulation to people of various skin types at various body sites.

*B.H. Oh, Y.J. Hwang, Y.W. Lee, Y.B. Choe, K.J. Ahn, Skin Characteristics after Fractional Photothermolysis, Ann Dermatol Vol. 23, No. 4, 2011, p. 448-454*

Background: Fractional photothermolysis makes thousands of minute areas called microthermal treatment zones on the skin surface and transmits thermal injury to facilitate heat shock protein formation around the dermis. Potential side effects include acneiform eruption, herpes simplex virus outbreak, erythema, and post-inflammatory hyperpigmentation. Objective: To investigate and compare the changes in the skin of Asian patients after two different fractional photothermolysis systems (FPS) on a split face. Methods: A half-split face study was performed with 10,600 nm carbon dioxide FPS on the left and 1,550 nm erbium-doped FPS on the right side of the face. Only one session of laser irradiation and several biophysical measurements were done. Results: Although both FPS proved to be effective in treating acne scar and wrinkle patients, a slightly higher satisfaction rating was seen with the 10,600 nm FPS treatment. Both types of FPS showed a significant increase in transepidermal water loss which decreased gradually after treatment and returned to pre-treatment level after 1 week. A decreased reviscometer score was sustained for a longer period in wrinkle areas treated with 10,600 nm FPS. Conclusion: Even though the changes in skin varied according to different FPS wavelength, adverse outcomes, such as increased erythema and TEWL were entirely subdued within 3 months of treatment.

*T. Knor, A. Meholfić-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  $44.1 \pm 11.6$  AU (arbitrary units) on the lesions,  $60.2 \pm 12.4$  AU on perilesional skin and  $67.2 \pm 8.8$  AU on uninvolved skin. In healthy controls, the mean value was  $74.1 \pm 9.2$  AU. The mean pH value measured in AD patients was  $6.13 \pm 0.52$  on the lesions,  $5.80 \pm 0.41$  on perilesional skin, and  $5.54 \pm 0.49$  on uninvolved skin. In control group, the mean pH of the skin surface was  $5.24 \pm 0.40$ . 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.W. Shin, D.H. Lee, S.Y. Choi, J.I. Na, K.C. Park, S.W. Youn, C.H. Huh, Objective and non-invasive evaluation of photorejuvenation effect with intense pulsed light treatment in Asian skin, J Eur Acad Dermatol Venereol. 2011 May;25(5): p. 516-22*

Background: Intense pulsed light (IPL) has been widely used for photorejuvenation. Although previous literature has shown clinical effectiveness of IPL treatments on cutaneous photoaging, the associated changes in the biophysical properties of the skin following IPL treatments have not been fully elucidated. Objective: The aim of this study was to evaluate changes in skin biophysical properties in patients with photoaging after IPL treatments, using non-invasive, objective skin measuring devices. Patients and Methods: A total of 26 Korean women with facial dyschromias underwent three sessions of IPL treatment at 4-week intervals. Outcome assessments included standardized photography, global evaluation by blinded investigators, patients' self-assessment and objective measurements of colour (Mexameter MX18, Chromatometer), elasticity (Cutometer), roughness (Visiometer), sebum (Sebumeter) and skin hydration (Corneometer). Results Intense pulsed light treatments produced a 15% decrease in the size of representative pigmented lesions ( $P < 0.05$ ). Conclusions: Patients' self-assessment revealed that 84% and 58% of subjects considered their pigmented lesions and wrinkles were improved respectively. Objective colorimetric measurement demonstrated significant improvements following IPL treatments that were most remarkable after one session of IPL. Moreover, skin elasticity showed significant improvements at the end of the study. Skin wrinkles as measured using Visiometer showed a mild improvement without statistical significance. Sebum secretion and water content of skin remained unchanged. Intense pulsed light provided significant improvement in the appearance of facial pigmented lesions in Korean patients. These effects appeared to be more

remarkable in improving pigmentation, skin tone and elasticity.

*N. Arnejo, O. Carballo, F. Svarc, A. Branca, A renewable, biodegradable substitute for petrolatum, Personal Care, March 2011, p. 120-122*

The usage of petrolatum in cosmetics has been under scrutiny recently, particularly within the EC, due to the potential carcinogen and mutagenic effects attributed to traces of impurities generated during its manufacturing process. Even though these questions have been around for a while, its unsurpassable properties as an occlusive have made difficult its replacement in hydrating and moisturising products. But the enforcement of REACH in Europa has accelerated the process, which is the reason why we have focused on searching for (and finding) a viable substitute. The objective of this study was to test a possible substitute to solid Vaseline (petrolatum) to replace it advantageously in treatment creams with a natural, renewable non-toxic and ecologically sound product.

*L. Rigano, C. Andolfatto, L. Stucchi, M. Bosco, Hyaluronic Acid Butyric Esters for the Improvement of Skin Functionality, Cosmetic & Toiletries Vol. 126, No. 2/February 2011, p. 104-111*

The word hyaluronic is derived from the Greek *hyalos* meaning “glass” or “transparent” and refers to the vitreous humor, the ocular tissue from which it was first isolated by Karl Meyer and colleagues in 1934. It was later located in many other animal tissues, i.e. synovial fluid, cartilage and the umbilical cord, where it has the same structure and biological activities, described in this article. Hyaluronic acid (HA) is a linear polysaccharide of thigh molecular weight that belongs to the family of mucopolysaccharides or glycosaminoglycans (GAGs), the physiological constituents of the dermal connective tissue in the extracellular matrix. In adult humans, the total amount of HA is equal to approximately 15g, half of which is found in the skin.

*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.

*F. Morizot, J. Latreille, S. Gardinier, L. Staner, C. Guinot, A. Porcheron, E. Tschachler, Effects of partial sleep deprivation on face appearance and skin properties, ISBS Besancon, 2009 and Skin Research and Technology 2010; 16; p. 473-474*

A reduction of sleep time on a chronic basis is a hallmark of life in modern society (“modern 24h-society”). Sleep has important homeostatic functions and sleep deprivation has effects on brain plasticity, energy conservation, tissue restoration, immune response and thermoregulatory function. Our objective was to investigate the effect of partial sleep deprivation on facial appearance and on skin functions (skin barrier, skin hydration, skin temperature, sebaceous secretions and skin sensitivity).

*S. Masoud Davoudi, B. Sadr, M.R. Hayatbaksh, S. Keshavarz, M. Shohrati, M.M. Naghizadeh, S. Babakoohi, M. Rashighi-Firouzabadi, A. Firooz, Comparative study of skin sebum and elasticity level in patients with sulfur mustard-induced dermatitis and healthy controls, Skin Research and Technology 2010; 16; p. 237-242*

Sulfur Mustard is the protagonist of vesicant (blistering) agents that was widely used during the World War I and in the Iran-Iraq war between 1983 and 1988. Although the exact mechanism of SM damage is not clearly understood, this cytotoxic agent is able to alkylate nucleic acids and proteins, degrades cell structure and adducts DNA – its most critical lesion. SM has a predilection for eyes, skin and respiratory tract to induce its local toxic effects. After several hours of intracellular interactions, acute phase symptoms including erythema, itching, burning sensation and vesicles appear.

*H. Dobrev, Fluorescence diagnostic imaging in patients with acne*, Photodermatology, Photoimmunology & Photomedicine 2010; p. 1-5

Acne is a chronic inflammatory disorder of the pilosebaceous follicles with a multifactorial etiology and pathogenesis. It typically begins in adolescence when androgen hormones stimulate the production of sebum and proliferation of follicular epidermids. In consequence, the openings of hair follicles become plugged with oil secretion and corneocytes. The follicular impactions develop into initially invisible lesions (microcomedones) and then into clinically evident comedones. Microcomedones and comedones are a suitable microenvironment for colonization by cutaneous bacteria, especially *Propionibacterium acnes*.

*Y. Gozu, M. Moriyama, K. Sakai, S.-I. Haze, Elucidation of Menstrual Cycle-Related Discomfort in Everyday Life and Efficacy of a "Rescue Fragrance"*, IFSCC Magazine 2/2010

The body maintains homeostasis in the face of environmental changes through its endocrine system and autonomic nervous system. The autonomic nervous system can operate at a subconscious level and controls many functions of the internal organs. The endocrine system includes eight major endocrine glands that secrete hormones. After delivery through the bloodstream, hormones reach different parts of the body and help to regulate cellular function. Therefore hormones are thought to be a regulatory system that complements the nervous system. In women, the secretion of sex hormones fluctuates dramatically over the course of the menstrual cycle, causing psychosomatic changes.

*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 Universitätsbibliothek 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.

*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.

*T. Lihoreau, C. Vidal, A. Jeudy, A. Elkhyat, S. Mac-Mary, J.M. Sainthillier, J. lung, 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<sup>3</sup> +/- 5.6); they were sorted in two different populations (apnea versus, n=14, and no apnea syndrome, 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).

*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 individuals of different ages in order to collect the numerical data as the reference for exterior use drugs and before/after sports' cosmetics.

*L. Colomb, G. Francois, C. Gevrey-Renaux, F. Flament, L. Bissey, J. Senée, Innovative combination of in vivo methods to assess pores characteristics in surface and volume, Skin Research and Technology 2010; 16*

Sebaceous activity, through the number of active sebaceous gland (Sebutape) or sebum excretion (Sebumeter) is known to be highly dependant from age, gender, hormonal status, diet and many other parameters. Nevertheless, pores features, which could be also linked to sebaceous activity, was not often studied. This paper attempts to characterize age differences in skin pores features (visible size, density and volume estimation) using two *in vivo* systems. The efficacy of a cosmetic product on pore characteristics will also be presented. Two *in vivo* imaging systems were used to detect and characterize skin pores

*E. Kim, G. Cho, S. Yu, H. Rho, D. Min, D. Kim, H. Kim, The elasticity, depth of wrinkles, and skin color on the neck determine your neck age and shape, IFSCC 2010 Buenos Aires, Argentina*

There are many reports on regional variations in skin properties, but few physiological studies have been performed on the neck. The neck is sun-exposed and we stretch or shrink our neck constantly, so the neck skin can be more apt to be aged. The purpose of this study was to find out the biomechanical and physiological parameter on the neck to change age-dependently and make the photographic scale for the neck age or neck shape. The skin properties on the neck of 56 Korean female volunteers in good health (25-64 years old, 43.1±10.5yr) were assessed non-invasively with the skin measuring devices. And we analyzed the correlation of skin physiological parameters with age. The neck skin was changed age-dependently. The elasticity, skin lightness was reduced. The depth of wrinkles and TEWL were increased. Based on the correlation parameter to age, we chose the skin color, wrinkles and elasticity for the key parameters to determine the neck age or neck shape. As the elasticity was reduced, the sagging of the neck skin increased. The neck wrinkles increased age-dependently and changed to "U" shape because the neck skin was sagged.

*M.D. Gianeti, P.M.B.G Maia Campos, Effects in tactile sensitivity and in skin moisturizing of cosmetic formulations containing vitamins and botanical extracts, IFSCC 2010 Buenos Aires, Argentina*

Skin is a sense organ with sensory nerve endings and receptors, which behaves like a body wrap with its protection and regulation functions. Sensorial informations are originated at the sensory receptors and it makes possible body representation, mediating physical world exploration. Experimental studies have shown that many factors may affect tactile sensations. For this purpose it was measured the current perception threshold (CPT) sensory nerve fibers by using an electric current sine wave stimulator (Neurometer™) in 20 healthy women volunteers, aged from 25 to 35 years, before and after 2 hours of a single application of a formulation containing an association of vitamins A, C, E, *Ginkgo biloba* and *Phorphyra umbilicalis* extracts. The CPT for 5Hz, 250Hz and 2000Hz frequency current are reported to enable a selective quantification of the sensory thresholds of C, Ad, and Ab fibers respectively. In parallel, the stratum corneum hydration, the sebum content and the TEWL were measured using Corneometer™ CM285, Sebumeter™ SM810 and Tewameter™ TM210, respectively. Skin water and sebum content were significantly increased after 2 hours of the formulation application. The test group showed significantly decreased in the TEWL and in the CPT of 2000Hz, while the control group did not demonstrate any change on those parameters.

*H.-U. Jabs, Aquaporation – ein neues Verfahren zur Verbesserung der Elastizität und Feuchtigkeit der Haut, Ästhet. Dermatologie 5/2010; p. 6-12*

Als Aquaporine (AQP) werden Proteine bezeichnet, die Kanäle in der Zellmembran – auch in der Haut – bilden, um den Durchtritt von Wasser und einigen weiteren Molekülen zu erleichtern (Membrantransport). Sie werden daher auch Wasserkanäle genannt. Bei der Aquaporation gelingt der Transport von dermato-kosmetischen Substanzen, z.B. Natürlicher Feuchtigkeitsfaktor (NMF) und Hyaluronsäure in liposomaler Formulierung (Koko GmbH & Co.KG, Leichlingen) durch die Barriere der Haut mit Hilfe von hochfrequenten Strömen (radioSURG 2200, Fa. Meyer-Haake GmbH), wodurch die Feuchtigkeit und Elastizität der Haut erhöht wird. Es wird angenommen, dass die Radiowellen die

Transportkapazität der Aquaporine für Wasser durch Konformationsänderungen der Proteine im Kanal und durch Lockerung der Wasserstoffbrückenbindungen vergrößern.

*S. Hibino, U. Hamada, H. Takahashi, M. Watanabe, N. Nozato, Y. Yonei, Effects of Dried Brewer's Yeast on Skin and QOL: A Single-Blind Placebo-Controlled Clinical Study of 8-Week Treatment, Anti-Aging Medicine 2010*

Objective: Brewer's yeast contains vitamins, minerals, amino acids and other nutrients, and has been reported to control intestinal function as well as to exert anti-ulceration, anti-tumor and anti-allergy effects. The present study evaluated the effects of oral treatment with dried brewer's yeast tablets (study product) on skin in a single-blind placebo-controlled design in humans. Methods: Thirty-two healthy volunteer women (37.0±4.8 years) were allocated as follows: Group E-30 (n=11) were treated with 30 tablets/day of the study product (containing 7,125mg/day of dried brewer's yeast), Group E-9 (n=10) were given 9 tablets/day of the study product, and the control group (n=11) were given 30 placebo tablets/day. The treatment period was 8 weeks. Two patients prematurely discontinued the study (discontinuation rate: 5.9%) and were excluded from the analyses. The study product (Ebios Tablet®) was provided by Asahi Food & Healthcare Co., Ltd. Before and at 4 and 8 weeks after the study, subjective symptoms were evaluated using the Anti-Aging QOL Common Questionnaire (AAQoL) and checking skin symptoms, skin images were analyzed with SK Info (SKI, Integral Co.) and Aphrodite-III (PSI), and skin color (CM-700d, Konica Minolta Sensing, Inc.) and elasticity (Cutometer MPA580, Courage & Khazaka electronic GmbH) were measured. Results: In Group E-30, the AAQoL physical symptom "cold skin" score was significantly improved at 8 weeks ( $p<0.05$ ). The skin symptoms "make-up runs easily" and "desiccated and gritty skin," as well as the physical symptom "menstruation-related troubles" were improved in a significant and dose-dependent way from the control group ( $p<0.01$ ). On skin analysis, SKI demonstrated an increase in moisture content (15.4%,  $p=0.010$ ), decrease in erythema (-18.3%,  $p<0.001$ ) and increase in elasticity (13.3%,  $p=0.003$ ), while PSI revealed an increase in hydration (Total: 14.5%, T zone: 13.7%, U zone: 18.2%,  $p<0.01$ ) and decrease in pores (-32.7%,  $p=0.022$ ). Cutometer analysis showed a dose-dependent increase in skin elasticity, while analysis of skin color showed a decrease in hemoglobin (-9.5%,  $p=0.016$ ), improved lightness (-0.7%,  $p=0.045$ ) and decrease in redness (-8.3%,  $p=0.013$ ). During the study period, no serious adverse events were noted. Conclusion: These results suggest that treatment with dried brewer's yeast is useful in improving skin condition, e.g. moisture content and elasticity, and also QOL.

*H. Dobrev, Clinical and instrumental study of the efficacy of a new sebum control cream, Journal of Cosmetic Dermatology, 6; 113-118;*

Some botanical compounds are considered useful to reduce sebum production. To evaluate the efficacy of a sebum control cream containing polyphenol-rich extract from saw palmetto, sesame seeds, and argan oil in subjects with oily facial skin. The study was carried out during the winter months (January and February).

*H. Dobrev, Treatment of acne with a new topical product. A clinical and instrumental study, Journal Household and Personal Care Today*

We studied the efficacy of a new topical product containing a combination of lipoaminoacid capryloyl glycine, sarcosine, and Cinnamon zeylanicum bark extract in 19 subjects with mild to moderate acne after twice daily application for a 7-week treatment period. Determination of efficacy included clinical assessment using acne lesion counting and disease severity scoring, bioengineering measurements of sebum on the facial skin using a photometric device and sebum collector foils.

*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 activity 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.

*N. Ismaili, Y. Afifi, B. Hassam, T. Lihoreau, A. Elkhyat, A. Jeudy, P. Humbert, Typology of maghreb skins*, ISBS Besancon, 2009

To study the biometric characteristics of maghreb skin using common cutaneous exploration techniques and by comparing the results by age bracket and by sex. This prospective, randomised monocentre study was carried out on the forehead, the cheeks and the forearm of healthy volunteers giving informed written consent. Healthy volunteers were included of both sexes and of maghreb origin who agreed to apply nothing to the face and arms 24 hours before the study and not to participate in any other test during the study period.

*A. Bigouret, F. de Oliveira, C. Gehin, Objectivation of the individual sensory state by the assessment of specific biophysical properties of the skin in different climatic conditions*, ISBS Besancon, 2009

The CSTB in Nantes is specialized in the study on the climate effects on buildings and on human comfort. To improve human comfort in different climatic conditions, the CSTB must understand the interactions between the environment, the human body and individual perception. As the skin is a sensory organ and the first barrier between the environment and the human interior, some CSTB researchers have choice to study the biophysical properties of the skin to objectify human perception.

*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 wettability 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.

*P.M. Campos, G.M. Goncalves, L.R. Gaspar, In vitro antioxidants activity and in vivo efficacy of topical formulations containing vitamin C and its derivatives studied by non-invasive methods*, NCBI 2009

Vitamins C and its derivatives, mainly due to their antioxidant properties, are being used in cosmetic products to protect and to reduce the signs off ageing. However, there are no studies comparing the effects of vitamin C and its derivatives, magnesium ascorby phosphate (MAP) and ascorbyl tetra-isopalmitate (ATIP), when vehiculated in topical formulations, mainly using objective measurements, which are an important tool in clinical efficacy studies. Thus, the objective of this study was to determine the in vitro antioxidant activity of AA and its derivatives, MAP and ATIP, as well as their in vivo efficacy on human skin, when vehiculated in topical formulations.

*L.R. Gaspar, F.B. Camargo Jr., M.D. Gianeti, P.M. Maia Campos, Evaluation of dermatological effects of cosmetic formulations containing Saccharomyces cerevisiae extract and vitamins*, NCBI 2009,

Saccharomyces cerevisiae extract (SCE) is used in cosmetics since it can act in oxidative stress and improve skin conditions. This study investigated dermatological effects of cosmetic formulations containing SCE and/or vitamins A, C and E. The formulation studied was supplemented or not (F1: vehicle) with vitamins A, C and E esters (F2) or with SCE (F3) or with the combination of vitamins and SCE (F4). Formulations were patch tested on back skin of volunteers. For efficacy studies, formulations

were applied on volunteers and transepidermal water loss (TEWL), skin moisture (SM), skin microrelief (SMR) and free radicals protection were analysed after 3h, 15 and 30 days of application.

*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 specimens obtained from areas with red fluorescence.

*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.

*V. Delvigne, E. Segot, D. Compan-Zaouati, P. Wolkenstein, S. Consoli, C. Rodary, V. Guillou, F. Poll, Development and Validation of a Questionnaire to Evaluate How a Cosmetic Product for Oily Skin is Able to Improve Well Being in Women*, 21<sup>st</sup> World Congress of Dermatology, Buenos Aires, Argentina, 2008

Purpose of the study: To develop and validate a questionnaire to assess the psychological and psychosocial effects of oily skin condition in women and the outcome of a targeted cosmetic skin care treatment. Methods: We developed a concise 18-item questionnaire (OSSIQ), including 2 dimensional scales (emotional state and social behaviour), to assess the impact on self image and confidence of oily skin condition.

*C. Orlandi, R. Loubies, S. Baeza, C. Reyes, X. Worstman, Clinical Experience of the Treatment with Pro-Xylane TM, Isobioline TM and Phytocomplex TM on Chilean Women with Hormonal Aging*, 21<sup>st</sup> World Congress of Dermatology, Buenos Aires, Argentina, 2008

An open and prospective study was performed in order to evaluate the action of a formulation with pro-xylane, isobioline and phyto-Complex in 59 patients with hormonal aging during a period of twelve weeks. An open and prospective study was performed in 59 patients, between 50 and 65 years of age (average 55 years old), with hormonal aging in order to evaluate the action of a formulation with -xylane, isobioline and phyto-complex.

*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*, 21<sup>st</sup> World Congress of Dermatology, Buenos Aires, Argentina, 2008

Background: The adapting process of skin barrier to extra-uterine life and the influence of bathing on term neonates's skin is not completely understood. Thus, we investigated the effect of bathing on skin barrier during the first four weeks of life. Methods: Monocenter, prospective, randomised study with 57 healthy full-term newborns (32 boys and 25 girls).

*J.W. Fluhr, M. Miteva, G. Primavera, M. Ziemer, P. Elsner, E. Berardesca, Functional Assessment of an Acidic Skin Care System in Patients under Chemotherapy, 21<sup>st</sup> World Congress of Dermatology, Buenos Aires, Argentina, 2008*

Background: Cancer patients undergoing chemotherapy frequently experience skin problems e.g. xerosis. The aim of this study was to verify whether a concomitant treatment with an acidic washing and emollient products (pH 5.5) can significantly improve the quality of the skin in such patients

*J. Zoldan, Botulinum Toxin for Treatment of Seborrhc Dermatitis in Parkinsonian Patients, Rabin Medical Center, October 2008*

There's high incidence of seborrhc dermatitis among patients suffering from Parkinson's disease. Seborrhc dermatitis is caused by increased exertion of sebaceous glands. Previous studies have shown an increase of sebum excretion rate in parkinsonian pateints. Other studies demonstrated improvement in seborrhc dermatitis after anticholinergic treatment. From these studies we concluded that there might be hyperactivity of the parasympathetic system among PD patients that cause increased exertion of sebum, therefore local injection of botulinium toxin, which inhibitis acetyl choline realese, might improve the rash of seborrhc dermatitis. 40 patients suffering from Parkinson disease or other parkinsonian disorders will participate in this study. Before treating the patients with botulinium toxin, we will measure the sebum exertion with the sebumeter device and make clinical evaluation of the rash. We will also take a picture of the rash. Then Botulinium toxin (60- 100 units) will be locally injected to the rash area. Two weeks after the injection the patients will be called and evaluated clinicly and by the sebumeter. Then they will be checked again after 3 weeks, after a month and after two, three and four month's.

*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 [1]. 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 [2,3]. The Corneometer<sup>®</sup> (a capacitance method) measures skin hydration, the Sebumeter<sup>®</sup> (a photometric method) measures the sebum of the skin and the Skin-pH Meter<sup>®</sup> (a potentiometric method) measures the pH of the skin [4]. The Visioscan<sup>®</sup> VC98 connected to the software SELS (Surface Evaluation of the Living Skin) can measure several skin surface parameters [5]. This apparatus consists of a special b/w video sensor chip with very high resolution, an objective and an UVA-light source.

*S. Sisalli, N. Voisin, A. Adao, M. Lebel, D. Mouglin, Effect of an acute psychological stress on sebum assessed by SKINSPACE Sorbent Tape method, IFSCC Barcelona 2008*

Responsible for skin shininess and enlarged pores, the excess of sebum could cause inconveniences at all ages of a woman life. Among other biological and environmental factors, the stress is often mentionned as a parameter influencing the sebum hyperproduction. As the data available in litterature are mainly related to young people suffering from acne, the objective of the present study is to evaluate the impact of an acute psychological stress on sebum secretion of 18 female volunteers, with healthy and normal skin, from 18 to 65 years old.

*C. Heusèle, C Derome, D. Kanchankoti, R. Mohile, A. Bernois, S. Schnebert, Clinical and Instrumental Evaluation of the Facial Photoageing on Indian Women, IFSCC Barcelona 2008*

Daily exposure to the sun leads to skin photodamage. Clinical signs of photoageing due to biological and structural alteration of the epidermis and dermis will be function of level of UV exposure and individual protection capacities. The influence of ethnic origin on skin structure and function is more and more investigated but few instrumental or clinical studies describe the characteristics of healthy skin and their evolution with age on Indian women living in India [1]. Previous clinical, instrumental or biological studies were carried on Indian subjects living in South Africa or England.

*J.-H. Hyun, H.-C. Gyu, J.-K. Young, J.-S. Kim, B.-J. Park, **Anti-acne activity of Thyme oil and its applications for cosmeceutical acne care: An innovative Anti-acne challenger**, IFSCC Barcelona 2008*

The skin disease which acne occurs in papule, pustule, cystoma and tuber for teenagers and young generation. The origin of acne takes part in various factors. The main factors are 1) increased Sebum 2) cornification of sebaceous glands 3) Propionibacterium 4) inflammation.

*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.

*S. Davoudi, B. Sadr, A. Firooz, S. Keshavarz, M. Naghizadeh, **Comparative study of skin sebum and elasticity levels in patients with sulfur mustard-induced dermatitis and healthy controls**, Abstract, EADV Paris 09/2008*

Background: Sulfur mustard –a chemical agent- has numerous proven acute and chronic effects on skin. Xerosis which might be due to damage of hydrolipidic barrier of skin is the most common complaint of veterans. Objective: This study was designed to evaluate skin sebum and elasticity in veterans with a history of sulfur mustard contact.

*J. An, K. Kim, H. Eun, **The efficacy of liposome encapsulated 0.5% 5-ALA for the treatment of acne in Asian skin**, Abstract, EADV Paris 09/2008;*

Background and objectives Photodynamic therapy using topical 5 aminolevulinic acid (5-ALA) has been proposed as a treatment option in acne vulgaris, but at least 48-hour sun avoidance after treatment was strongly recommended due to the risk of post-treatment photosensitivity. Recently, lower concentration form of 5-ALA was introduced to minimize the risk. The aim of this study was to evaluate the efficacy and safety of liposome encapsulated 0.5% of 5-ALA (PhotoSpray®, DDD, Denmark) in photodynamic therapy of inflammatory acne and its effects on sebum secretion in Asian skin

*J. Nasarre, G. de la Cruz, M. León, M. Espadas, C. Trullás, **Effectiveness of a cleansing gel and a cream gel containing ZINCAMIDA® as adjuvant treatment and as single treatment for inflammatory acne**, Abstract, EADV Paris 09/2008*

Background: The appearance of bacterial resistance to antibiotic treatment for acne presents a serious problem. Using combined therapies, or alternating treatment with other anti-bacterial and anti-inflammatory products that do not induce bacteria resistance, such as Zincamida® may offer a solution. Objectives: To assess the effectiveness of a cleansing gel and a gel cream containing Zincamida® as adjuvant treatment and as an alternative treatment to antibiotics in the resolution of inflammatory acne.

*T. Chen, T.J. Stephens, J.H. Herndon, F. Forster, Y. Appa, **Skin clearing benefits of a clay-based cleanser mask containing salicylic acid and a novel microgel complex**, Abstract, EADV Paris 09/2008*

The ease and simplicity of being able to use an acne cleanser on a daily basis to treat and control acne is highly desirable for many acne sufferers. A daily acne cleanser with salicylic acid that can also be used as a mask further provides the additional benefits of softness, freshness and deep pore cleanliness that are much sought by people with acne prone skin. This dual purpose cleanser mask is now upgraded with a novel microgel complex that contains an antimicrobial, sebum dissolvers and skin conditioning agents.

*H. Seirafi, K. Farsinejad, A. Firooz, S.M. Davoudi, R.M. Robati, M.S. Hoseini, A.H. Ehsani, B Sadr, **Biophysical characteristics of skin in diabetes: a controlled study**, JEADV 2008, 23, p. 146-149*

Cutaneous complications are common in diabetes, with approximately 30% of patients experiencing some skin involvement during the course of their illness; these may also be the first presenting sign of diabetes or even herald the diagnosis by many years. The skin involvement in diabetes encompasses various clinical entities such as acanthosis nigricans, necrobiosis lipoidica, diabetic dermopathy and neuropathy, sclerodema and granuloma annulare.

*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 thermodynamically unstable systems defined as microscopic dispersions of liquid droplets contained within another liquid, with a diameter ranging from 0.5 to 100 µm. Emulsions usually consist of mixtures of an aqueous phase with various oils or waxes.

*M. Fox, It's true – Stress Makes Teens Break Out*, 2007 ABC News Internet Ventures

Teen-Agers who claim that stress makes them break out are telling the truth: The stress of taking an exam can make pimples worse, researchers reported on Tuesday. And surprisingly, inflammation may be to blame and not greasy skin, said Dr. Gil Yosipovitch, a professor of dermatology at Wake Forest University School of Medicine.

*G. Yosipovitch, M. Tang, A.G. Dawn, M. Chen, C.L. Goh, Y.H. Chang, L.F. Seng, Study of Psychological Stress, Sebum Production and Acne Vulgaris in Adolescents*, Acta Dermato-Venereologica, Volume 87, Issue 2, March 2007, p. 135-139

Sebum production is thought to play a major role in acne vulgaris in adolescents. Psychological stress may exacerbate acne; however, it is not known whether the perceived association between stress and acne exacerbation is due to increased sebum production.

*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, Clinical 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).

*L. Ambrosine, K. Ezzedine, A. Elfakir, S. Gardinier, J. Latreille, E. Mauger, Mi. Tenenhaus, C. Guinot, Relationships between visual and tactile features and biophysical parameters in human facial skin*, Skin Research and 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 methods.

*W. Pratchyapruit, K. Kikuchi, P. Gritiyaranganan, S. Aiba, H. Tagami, Functional analyses of the eyelid skin constituting the most soft and smooth area on the face: contribution of its remarkably large superficial corneocytes to effective water-holding capacity of the stratum corneum*, Skin Research and Technology 2007, 13, pp. 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 an oily appearance even in adults.

*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

*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.

*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. Soost, I. Graupner, A. Morch-Röder, U. Pohrt, M. Worm, 7-step consultation plan for health care workers and hairdressers, J Dtsch Dermatol Ges, 2007 Sep;5(9): p. 756-760*

Background: Skin diseases are among the most common occupational disorders in health care workers and hairdressers. Optimal prevention methods make it possible for more individuals to remain active in their profession. We devised a 7-step consultation plan which was employed in a standard fashion and then evaluated. Patients and Methods: 264 employees were evaluated in the Education and Support Center of the German Accident Prevention and Insurance Association in the Health and Welfare Services (BGW schu.ber.z Berlin) from 2003 to 2005 in a standardized manner. Included were detailed history, physical examination, skin physiology measurements (transepidermal water loss, corneometry, sebumetry) and then making a diagnosis and therapeutic recommendations. Results: Within the study group of 264 employees the most frequent diagnosis were toxic-irritant hand eczema (28.4%), allergic contact eczema (19.7%), atopic eczema (15.5%) and irritant contact eczema with atopic diathesis (13.6%). The frequency of contact sensitivity was high in the study group (80.7%). The skin physiological parameters were not remarkably altered and did not differ between individuals with an atopic diathesis versus without an atopic diathesis. Conclusions: This standardized protocol for a "7-step consultation plan" when applied in a standardized manner offers quality-controlled but also individually-adapted support considering dermatological, educational and occupational aspects. Skin physiology parameters did not provide any further information indicating the need of the development of novel techniques to measure skin barrier function.

*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.

*K. Völkening, Hautpflege für Diabetiker, www.wohlundwehe.de*

Täglich sieben Einstiche in die Hautoberfläche für Blutzuckermessungen und Injektionen sind bei insulinabhängigen Diabetikern für eine gute Zuckereinstellung mindestens notwendig.

*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.

*R. Debowska, C. Vincent, K. Bazela, M. Kruszewski, B. Winkler-Spytkowska, A. Maciejczyk, K. Rogiewicz, I. Eris, The repair effect of Folacin on skin damage due to radiotherapy, Kosmetische Medizin 2/2007*

Zusammenfassung Obwohl medizinische und pharmakologische Fortschritte unübersehbar sind, ist die Behandlung bösartiger Tumore nach wie vor mit einem hohen Risiko unerwünschter Nebenwirkungen verbunden. Insbesondere bei der Strahlentherapie sind allgemeine Nebenwirkungen (Krankheitsgefühl und Unwohlsein) und lokale Nebenwirkungen wie kutane Strahlenschäden zu beobachten. Kutane Strahlenschäden bedürfen einer entsprechenden Behandlung und Pflege sowohl während der Radiatio als auch nach Beendigung der Strahlentherapie. Viele Patienten greifen dabei nach kosmetischen Produkten, die die vorher geschädigte wieder in eine gesunde Haut zurückführen sollen. Ziel dieser Studie war es, Wirksamkeit, Tolerabilität und kosmetische Qualität einer

Folacin-haltigen Creme während und nach trahlentherapie zu untersuchen. In vitro wurden Experimente an primären Fibroblastenkulturen vorgenommen: Der Alkalincomet-Assay wurde verwendet, um die Reparaturwirkungen von Folacin auf Röntgenstrahlen- induzierte DNA-Schaden zu erfassen. Bei 41 Patienten mit Strahlentherapie führten wir in vivo Untersuchungen durch. Über nichtinvasive Verfahren wurden die Parameter Erythem, Feuchtigkeit der Haut und Talgbildung an den bestrahlten Körperregionen (Wangen, Hals oder Brust) jeweils 2, 4 und 8 Wochen nach Behandlung mit der Creme erfasst. Die Repairrate von DANN Schäden war nach 15–30 min post radiationem höher bei Folat-behandelten primären Fibroblastenkulturen als bei Kontrollen. Unsere Daten sprechen für eine Folsäure-modulierte Reparatur der DANN mit einer rascheren Verknüpfung der Strangbrüche. Wir stellten eine wirksame Verbesserung der Hautparameter durch Folin-haltige Creme unter Radiotherapie fest. Die Anwendung des Verums verminderte i. Vgl. zu Kontrollen Rötung und Couperose, verbesserte aber auch Hautfeuchte und Sebumgehalt. Die Creme wurde sehr gut durch die Patienten toleriert und ihre kosmetischen Eigenschaften waren überzeugend.

*H. Fujita, T. Hirao, M. Takahashi, A Simple and non-invasive visualization for assessment of carbonylated protein in the stratum corneum*, Skin Research and Technology 2007, p. 84-90

Stratum corneum (SC) is the interface of body and environment and is continuously exposed to oxidative stress, resulting in oxidative modification of proteins. Consequent carbonylated proteins (CPs) have so far been labelled with 2,4-dinitrophenyl (DNP) hydrazine and subsequently detected with anti-DNP antibody.

*S. Nouveau-Richard, W. Zhu, Y.H. Li, Y.Z. Zhang, F.Z. Yang, Z.L. Yang, S. Lian, B.Y. Qian, Y.P. Ran, C. Bouillon, H.D. Chen, O. de Lacharrière, Oily skin: specific features in Chinese women*, Skin Res Technol, 2007 Feb;13(1): p. 43-48

Background/purpose: Inconsistent data are available on the various types of skin, their prevalence and characterization, particularly regarding Asian skins. This observation prompted to conduct a large study in China to assess the prevalence of oily skin and identify the specific factors related to that type of skin. Methods: The multicentre trial involved 1787 Chinese women in Shenyang, Harbin, Beijing, Chengdu and Suzhou, between 18 and 65 years of age. Data on history of acne, the presence of environmental factors and a detailed self-evaluation of the skin were collected using a standardized questionnaire. A clinical evaluation of facial skin oiliness was carried-out by a dermatologist at each centre. Sebum secretion was measured on the forehead using Sebumeter SM810. Statistical analysis (multiple correspondence analysis) of typology was conducted based on self-evaluation data. Results: According to self-evaluation data, oily skin prevalence in the overall Chinese population of the study was 25.6%. Self-evaluation results were quite consistent with sebum measurements and with clinical assessment by dermatologist. Parameters associated with oily skin were (i) shiny skin and a past history of acne, (ii) irregular menstruation, and (iii) highly reactive or sensitive skin. Moreover, a clear and significant link was noted between oily skin and the ingestion of spicy or sweet food. Lastly, sebum levels were found to be twice as high in Beijing as in the other cities and were correlated to higher oily skin prevalence. Conclusion: The study demonstrated the capacity of women for proper self-evaluation of their skin type. It also suggests a potential link between nutritional factors such as spicy and/or sweet diets and oily skin as well as between sensitive and oily skin in this population.

*F. Tokumura, Y. Yoshihura, T. Homma, H. Nukatsuka, Regional differences in adhesive tape stripping of human skin*, Skin Research and Technology 2006, 12, p. 178-182

Medical pressure-sensitive adhesive tapes are applied to various regions of the human body for many purposes. Although some adhesive tapes are designed for a specific purpose and applied to a single region, such as first-aid bandages for the fingers and a variety of adhesive pads for foot-care, a large number of adhesive tapes are applied to various regions.

*U. Wollina, J. Kubicki, Dexpanthenol supports healing of superficial wounds and injuries*, Kosmetische Medizin 5+6/2006, p. 240-249

Oberflächliche Hautverletzungen und Wunden sind häufig. Unter Einsatz eines Spektrums verschiedener In-vivo-Modelle der epidermalen Barriestörung und der Wundsetzung untersuchten wir das Potential der topischen Dexpanthenol-Anwendung in der Förderung der epidermalen Regeneration und der Wundheilung.

*B.-I. Bettzüge-Pfaff, H. Prieur, Nutzen einer adjuvanten Basiscreme bei trockener, atopischer Haut*, Kosmetische Medizin 5+6/2006, p. 261-263

Im Rahmen eines dermatologisch kontrollierten Anwendungstests und hautphysiologischer Messungen an Patienten mit atopischem Ekzem hat sich eine lipidreiche Basiscreme auch bei Kindern als effektive und gut verträgliche Formulierung erwiesen. Nach Anwendung der Creme wurde eine Steigerung der Hautfeuchtigkeit und Hautfettung sowie eine Verbesserung der Hautbarrierefunktionen erreicht.

*C. Lenaers, D. Brunet, K. Ladegaillerie, M. Pinel, B. Closs, **Influencing the Equilibrium of the Cutaneous Ecosystem to Improve the Properties of Skin Prone to Acne**, IFSCC Magazine, Vol. 9, No. 4/2006, p. 305-310*

The skin is colonized by a variety of microorganisms such as *Propionibacterium acnes*, *Staphylococcus epidermidis* and *Malassezia furfur* that are in a stable balance and form the resident skin flora. The homeostasis of this ecosystem is of fundamental importance since it plays a barrier role by limiting the invasion and growth of pathogenic bacteria on the skin surface.

*M. Roh, M. Han, D. Kim, K. Chung, **Sebum output as a factor contributing to the size of facial pores**, Br J Dermatol. 2006 Nov; 155(5): p. 890-4*

Background: Many endogenous and exogenous factors are known to cause enlarged pilosebaceous pores. Such factors include sex, genetic predisposition, ageing, chronic ultraviolet light exposure, comedogenic xenobiotics, acne and seborrhoea. This study was an attempt to determine the factors related to enlarged pores. Objectives: To assess the relationship of sebum output, age, sex, hormonal factors and severity of acne with pore size. Methods: A prospective, randomized, controlled study was designed. A total of 60 volunteers, 30 males and 30 females, were recruited for this study. Magnified images of pores were taken using a dermoscopic video camera and measured using an image analysis program. The sebum output level was measured with a Sebumeter. Results: Using multiple linear regression analysis, increased pore size was significantly associated with increased sebum output level, sex and age. Among the variables, sebum output level correlated most with the pore size followed by male sex. In comparing male and female participants, males had higher correlation between the sebum output level and the pore size (male:  $r = 0.47$ , female:  $r = 0.38$ ). Thus, additional factors seem to influence pore size in females. Pore size was significantly increased during the ovulation phase ( $P = 0.008$ ), but severity of acne was not significantly associated with the pore size. Conclusions: Enlarged pore sizes are associated with increased sebum output level, age and male sex. In female patients, additional hormonal factors, such as those of the menstrual cycle, affect the pore size.

*H. Dobrev, **Treatment of Acne with a new topical preparation. A clinical and instrumental study**, EADV, October 2006, Rhodes, Greece (abstract).*

Background: Sepicontrol A5 is a cosmetic active ingredient designated to improve the appearance of oily, acne prone facial skin. Aim: To evaluate the sebum regulation activity, clinical efficacy and safety of a 3% and 4% Sepicontrol A5 containing cream and gel in subjects with mild to moderate acne.

*S.H. Lee, C.H. Huh, K.C. Park, S.W. Youn, **Effects of repetitive superficial chemical peels on facial sebum secretion in acne patients**, J Eur Acad Dermatol Venereol, 2006 Sep;20(8): p. 964-968*

Background: Glycolic acid and Jessner's solution are popular superficial chemical peel agents for the treatment of facial acne, and increased sebum secretion is one of the major aetiological factors of acne. Objective: To compare the effects of 30% glycolic acid peels and Jessner's solution peels on sebum secretion in facial acne patients. Methods: Thirty-eight patients with mild to moderate facial acne were included. Twenty-seven patients were treated with 30% glycolic acid peels and 11 patients with Jessner's solution peels. Each peel was performed twice with an interval of 2 weeks. Before and 2 weeks after each peel, sebum levels of forehead, nose, chin and cheeks were measured by using a Sebumeter (SM810 Courage & Khazaka, Cologne, Germany). Results: The sebum levels were not significantly changed by two peels treatments of 30% glycolic acid peels or Jessner's solution peels on the facial skins of patients with facial acne. Conclusions: The two types of peels, 30% glycolic acid peels and Jessner's solution peels, did not affect sebum secretion of the facial skins of patients with facial acne after the two peels treatments. The accumulative effects of more than two peels treatments using these modalities need further evaluation.

*D. Khazaka, **Objective Measurement at all Stages of the treatment**, 5<sup>th</sup> 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 ( $r(2) = 0.14$ ).

*R. Rizer, N. Trookman, J. Herndon, T. Stephens, A 4-week, randomized, double-blind, parallel group trial evaluating the efficacy and tolerability of sebum control, AB14 J. Am. Acad. Dermatol.*

Excessive production of sebum on acne prone individuals often leaves skin with an undesirable appearance that emphasizes facial shine, acne lesions, and enlarged pores. The factors that often contribute to this appearance include family history, hormonal activity changes, stress and the use of certain types of birth control pills.

*M. Wahlen, N. Buhles, Beruflich bedingtes allergisches Handekzem durch Euro-Münzen bei vorbestehender Hyperhidrosis manuum, Akt Dermatol 2006; 32: p. 260-264*

Nickel ist das meist verbreitete Allergen in Europa und weltweit, so auch in Euro-Münzen. Münzen werden allerdings nicht zu den Gebrauchsgegenständen, die direkten und langen Kontakt zur Haut haben, gerechnet. Die 1-Euro-Münzen und die 2-Euro-Münzen weisen eine Bimetallstruktur auf. In Kombination mit Schweiß entsteht aus diesem Grunde ein sog. "Galvanisches Element". Durch einen messbaren Stromfluss werden vermehrt Nickelionen freigesetzt. Wir berichten über den Fall eines 55-jährigen Bankkaufmannes in einer Sparkasse, der arbeitskongruent im September 2001 ein dyshidrotisches Handekzem entwickelte. Der Patient wies zudem eine Hyperhidrosis manuum auf. Zuvor hatte der Patient nie an Ekzemen gelitten. Ab Herbst 2001 kam der Patient im Rahmen der Einführung erstmals mit Euro-Münzen in Kontakt. Ein Epikutantest zeigte eine Typ-IV-Sensibilisierung gegenüber Nickel und den Inhaltsstoffen von 1-Euro- und 2-Euro-Münzen.

*G. Varju, G. Garay, Surface Evaluation of Living Skin (SELS) during Microdermabrasion Treatment Course, Poster Presentation, Dr. Derm Laser Center of Dermatology, Budapest Hungary, 2005*

Microdermabrasion has become a popular method of skin rejuvenation for treating photodamage, fine rhytides, age spots, dyschromia, enlarged pores and mild acne. This procedure is one of the newest skin rejuvenating techniques employed to help improve the texture and appearance of the skin.

*C. Vincent, M. Szubert, K. Rugiewicz, I. Eris, The assessment of efficacy, tolerability and cosmetic features of Diosperin K 1% PROLONGATUM cream containing complex of diosmine, hesperidine and vitamin K, Poster Presentation, Centre for Science and Research Dr. Irena Eris, 2005*

Face redness and couperoses can cause very negative visual effect and influent on patients' quality of life. Such type of skin requires special regime. Application of very gentle cleaners, sun protective products and appropriate cosmetic creams can improve the skin condition and minimize the red face effect.

**Dermokosmetik**, Beratung in der Apotheke, PTA Nr. 11, Oktober 2005

Eine gute Unterstützung bei Promotionaktionen zum Thema „Hautpflege“ sind Hautanalysegeräte. Sie erleichtern den Einstieg in die Beratung, individuell auf den Hauttyp und Hautzustand der Kundin oder des Kunden abgestimmt.

*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.

*Y. Sunwoo, C. Chou, J. Takeshita, M. Murakami, Y. Tochiara, **Physiological and Subjective Responses to Low Relative Humidity***, Journal of Physiological Anthropology 2005; p. 7-14

In order to investigate the influence of low relative humidity, we measured saccharin clearance time (SCT), frequency of blinking, heart rate (HR), blood pressure, hydration state of skin, transepidermal water loss (TEWL), recovery sebum level and skin temperature as physiological responses. We asked subjects to judge thermal dryness and comfort sensations as subjective responses using a rating scale. Sixteen non-smoking healthy male students were selected. The pre-room conditions were maintained at an air temperature (Ta) of 25°C and a relative humidity (RH) of 50%. The test room conditions were adjusted to provide a Ta of 25°C and RH levels of 10%, 30% and 50%.

*H. Dobrev, **Clinical and instrumental study of the sebum regulation efficacy of REGU®-SEB***, Poster Presentation at the EADV in London, October 2005

Excessively oily facial skin is due to overactive sebaceous glands and can occur in both males and females. The skin is greasy and shiny, with large open pores, feels unpleasant and may be a serious cosmetic problem. Moreover, this type of skin is sensitive and much more prone to acne and seborrhoeic dermatitis. That is why the control over the excessive oiliness is very important.

*J.W. Fluhr, C. Uhl, **Hautphysiologische Messungen in der täglichen Praxis: Corneometrie und Sebumetrie bei physiologischen und krankhaften Hautveränderungen***, Diagnostische Verfahren, Kap. Nr. 37, 2005, p. 321-345

Grundlagen der Methoden: Bei der Corneometrie handelt es sich um eine nicht-invasive Messung der Hautoberfläche zur Bestimmung des Feuchtigkeitsgehalts im Stratum corneum. Die Messung erfolgt auf kapazitivem Weg und beruht auf der Tatsache, dass Wasser eine von anderen Stoffen sehr unterschiedliche Dielektrizitätskonstante besitzt.

*S.W. Youn, J.I. Na, S.Y. Choi, C.H. Huh, K.C. Park, **Regional and seasonal variations in facial sebum secretions: a proposal for the definition of combination skin type***, Skin Res Technol. 2005 Aug;11(3): p. 189-95

Background/Aims: Facial sebum secretions are known to change under various circumstances. Facial skin types have been categorized as oily, normal, dry, and combination types. However, these have been evaluated subjectively by individuals to date, and no objective accepted standard measurement method exists. The combination skin type is most common, but its definition is vaguer than the definitions of the other skin types. Methods: We measured facial sebum secretions with Sebumeter. Sebum secretions were measured at five sites of the face seasonally for a year, in the same volunteers. Using the data obtained we developed a set of rules to define the combination skin type. Results: Regional differences in sebum secretion were confirmed. Sebum secretions on forehead, nose, and chin were higher than on both cheeks. Summer was found to be the highest sebum-secreting season, and seasonal variations were found in the T- and U-zones. A mismatch of skin type in the T and U-zones in more than two seasons appears to be close to subjective ratings of what is described as the 'combination' skin type. Conclusion: We showed that the face shows definitive regional and seasonal variations in sebum secretion. To define the combination skin type, seasonal variations in sebum secretion should be considered in addition to regional variations.

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.

R. Osborne, A. Matsubara, K. Biedermann, G.G. Hillebrand, B. Schnell, K. Miyamoto, **Improvement in Facial Surface Sebum and Pore Appearance with Niacinamide**, (Poster)

Introduction: One of the signs of aging facial skin is the appearance of enlarged pores. Previous studies have suggested a link between excessive sebum secretion and enlarged pores. To explore this link further, two types of studies were conducted: surveys comparing surface sebum and pores in Asian and Caucasian women, and studies evaluating the effects of use of a 2% niacinamide-containing facial moisturizer. Niacinamide has been shown to reduce sebum production in an *in vitro* human skin model, and the appearance of surface sebum *in vivo*. In the present studies, the effects of a niacinamide-containing facial moisturizer on both surface sebum and pore appearance are established.

M.R. Pena Ferreira, P. Costa, M.F. Bahia, **Study of Efficacy Comparison of 20 Anti-Oily Hair Shampoos Using Sebumeter SM 810**, Presentation at the IFSCC in Florence 2005

Summary: There are many different types of shampoos available to the consumer to control greasy hair. In our study we compare the efficacy of 20 shampoos in the treatment of oiliness using a non-invasive method (Sebumeter SM 810). A sample of 400 male and female volunteers with greasy hair or tendency to oily (ages 18 - 65) was tested. All products reduced the sebum excretion rate after the 10 application of the tested shampoo. No significant differences were found between the results of the shampoos.

T. Tsuchiya, S. Haze, T. Hirao, J. Hosoi, A. Kikuchi, K. Shoji, M. Tanida, T. Tsuda, **Odorant Inhalation Lowered Stress Levels Systemically, Subsequently Resulting in the Improvement of Cutaneous Functions: Linkage Between Olfactory Sensation and Skin**, Presentation at the IFSCC Florence 2005

Our research conducted over several years has demonstrated that odorant inhalation produces an effect on cutaneous functions by inducing changes in the neuroendocrinological system. For example, inhalation of the natural sedative component of the rose flower, DMMB (1,3-dimethoxy-5-methylbenzene), inhibited an increase in plasma cortisol levels and barrier recovery delay or an increase in forehead sebum, which was induced by stress. These findings were obtained using authentic experimental patterned stress and short-period odorant inhalation.

S.Y. Pande, R. Misri, **Sebumeter**, Indian J Dermatol Venereol Leprol 2005; 71: p. 444-6

Excess oiliness or excess dryness affects cosmetic appearance of the skin. Hence, estimation of oiliness is important to decide on the correct regimen to achieve cosmesis. Besides, sebum affects the permeability of skin and absorptivity of water, protects against bacteria and fungi, limits evaporation and affects permeation of pharmaceutical preparations and other active or non-active substances. Hence measurement of natural presence of sebum on human skin particularly facial skin is a matter of current interest amongst dermatologists and pharmaceutical and cosmetic manufacturers. Heterogenous components of sebum are produced from secretion of sebaceous glands, fat of keratinous layer and remnants of perspiration. Sebum is a complex and variable mixture of lipids like glycerides, free fatty acids, wax esters, squalene, cholesterol esters, and cholesterol.

R. Debowska, K. Rogiewicz, T. Iwanenko, M. Kruszewski, I. Eris, **Folic Acid (Folacin) – New Application of a Cosmetic Ingredient**, Kosmetische Medizin 3/2005, p. 16-22

Many years of trials and research tests proved that a lot of well-known vitamins could be successfully used in cosmetology. The available data indicate that one of them – folic acid plays an important role in life process of mitotically active tissues and its deficiency increases background level of DNA damage.

*H. Dobrev, R. Iankova, L. Zissova, Study of therapeutic effectiveness of four antidandruff shampoos*, 12<sup>th</sup> Congress of the European Academy of Dermatology & Venereology, Oct. 15-18, 2003, Barcelona, Spain and Dermatol Venerol (Bulgaria), 2004

Dandruff and scalp seborrhoeic can be successfully treated with shampoos containing different active substances. In patients with dry seborrhoea an increase in scalp lipid level occurs due to the elimination of follicular occlusion and improvement of sebum delivery.

*J. J. Wille, Corneotherapy: skin hydration and occlusivity of some commercial skin moisturizers and skin protectants*, Skin Research and Technology 10, Abstracts, 2004.

Corneotherapy is defined here as a topical treatment that improves the condition of the stratum corneum. In this respect, cosmetic and dermatological vehicles play an important role independent of their capacity to deliver drugs or cosmetic actives, in formulating an optimal topical treatment for skin diseases such as atopic dermatitis.

*S. Savic, S. Tamburic, M. Savic, N. Cekic, J. Milic, G. Valuta, Vehicle-controlled effect of urea on normal and SLS-irritated skin*, International Journal of Pharmaceutics, Oct. 2004.

It is known that, depending on the concentration, treatment with urea could improve skin barrier function, despite its penetration-enhancing properties. This controversial skin effect of urea has been explored systematically in this study in terms of the effect of vehicle on the performance of urea. In the first part, a series of four semi-solid emulsions with 5% (w/w) urea, varying in the type of emulsion, nature of emulsifier and polarity of oil ingredients, have been evaluated with regard to their skin hydrating and transepidermal water loss (TEWL)-modifying properties.

*K. Wanatabe, M. Masuda, K. Nakamura, T. Inaba, T. Yanagida, T. Yanaki, A. Noda, A new makeup remover prepared with a system comprising dual continuous channels (bicontinuous phase) of silicone oil and water*, IFSCC Magazine, Vol. 7, No. 4, Oct.-Dec. 2004

Removing makeup is considered to be the first step in the skincare process. Makeup that has served its purpose is a kind of impurity that should ideally be removed completely to maximize the effects of skincare products applied afterwards. However, the use of silicone resins has significantly improved the long-lasting property of makeup with the result that makeup can hardly be removed efficiently either with surfactant-type cleansers like soaps or with oil-based cleansers like liquid crystalline cleansers.

*M. Fröschle, R. Plüss, A. Peter, F. Etzweiler, Phytosteroids for skin care*, Personal Care, Vol. Sept. 2004

Healthy skin is a largely self-regulating system. In order to keep metabolic processes functioning efficiently, the relevant biological precursors and activators must be available to the skin cells for metabolism. If, due to age-related changes, the body no longer provides a sufficient amount of certain substances, an additional external supplement can proactively support the biological processes and thus counteract the advance of the ageing process.

*R. Rudolph, E. Kownatzki, Corneometric, sebumetric and TEWL measurements following the cleaning of atopic skin with a urea emulsion versus a detergent cleanser*, Contact Dermatitis, 2004 Jun;50(6): p. 354-358

A non-detergent urea emulsion cleanser and a detergent cleanser with added moisturizers were compared for their effects on stratum corneum moisture, surface lipids and transepidermal water loss (TEWL) of atopic skin. Following a single wash with either cleanser, low corneometry and sebumetry values increased and elevated TEWL values decreased. Over the course of more than 6 h, all induced changes gradually returned to their starting points. In all instances, the changes induced by the urea emulsion lasted significantly longer than those caused by the detergent cleanser. The sebumetry increase after a wash with the lipid-free detergent cleanser indicated that this method recognized not only true lipids but also the lipid-derived and skin lipid-depleting detergents. The transient TEWL normalization with either cleanser could not be attributed to a passing barrier restoration nor to an occlusion. It is speculated that the TEWL changes were related to stratum corneum water binding capacity.

*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).

*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  $19.9 \pm 3.1$  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 significant 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 reasonable 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.

*E. Camel, L. Arnaud-Boissel, L. Basset, S.K. Tan, J.-P. Guillot, Do Skin Moisturization, pH Colour, Water Loss, Lipids or Age, Phototype and Racial Origin (Asian/Caucasian) Affect S.P.F.?, Personal Care Ingredients Asia, Guangzhou, March 2004*

The aim of these studies was first to investigate the possible reasons inducing S.P.F. variations during clinical testing, as regards specific cutaneous parameters (skin colour, hydration, barrier function, pH, surface lipids ...), and secondly to assess the effect of racial origin (Asian/Caucasian) in a large range of sunscreen products (S.P.F. 4 to 30).

*A. Kramer, V. Mersch-Sundermann, H. Gerdes, E.-A. Pitten, H. Tronnier, Toxikologische Bewertung für die Händedesinfektion relevanter antimikrobieller Wirkstoffe, in Günter Kampf (Ed.): Hände-Hygiene im Gesundheitswesen, Springer Verlag, 2003, Kapitel 5*

In zahlreichen Ländern (z.B. Belgien, Dänemark, Deutschland, Finnland, Schweden, Schweiz und allen osteuropäischen Ländern) sind Hände-Desinfektionsmittel Arzneimitteln gleichgestellt und zulassungspflichtig.

*G. Gasic-Vukovljak, I. Li, A. Vagt, Beyond superior feel in skin care, Personal Care 2003, p. 45*

Silicones have a long history in personal care products where they are recognized for their smooth, silky and nonoilyfeel, spreadability, lubrication properties, substantivity, and lack of harm to the environment.

*A. Castro, Evaluation of the moisturizing effectivity of different materials (ES), Colamiq Congress in Cartagena, 2003*

La resequeadad de la piel tiene diversos origenes: disminucion de lipidos, perdida de agua transepidermal, factores hormonales, geneticos, medicamentosos, ambientales. Durante muchos anos se han buscado medicamento o procedimientos que puedan revertir o detener los danos de la piel que se presntan a traves del curso de la vida, inducidos por factores externos o internos. La condicion de piel seca que afecta a un amplio universo de la poblacion, viendose mas marcada en la poblacion adulta, aunque tambien se presenta en la poblacion joven, juega un papel determinante en el proceso de envejecimiento de la piel.

*L.C. de Ramayo, A. Castro, L. A. Castro Sader, Medida de la efectividad de reguladores de grasa de origen natural, Colamiq Congress in Cartagena, 2003*

En la actualidad existe un numero considerable de consumidores que presentan una piel con una apariencia aceitosa, grasosa, brillante, untuosa al tacto que desde todo punto de vista resulta

desagradable. Hoy en día, se habla más de un problema de calidad de sebo en la superficie de la piel que de aumento de la oleosidad y la piel grasosa se ha convertido en un problema serio de la piel.

*B.A. Green, B.L. Edison, R.H. Wildnauer, R. Hwu, **Cosmetic uses of benzilic acid – a lipophilic Alpha-Hydroxyacid (AHA)**, 12<sup>th</sup> European Academy of Dermatology and Venereology, Barcelona 2003 October 15.-18.*

The alpha-hydroxyacids (AHAs) are used extensively to enhance skin smoothness and clarity, while promoting overall skin health and normalcy. They are also used adjunctively with topical medications for the treatment of skin conditions including acne and hyperpigmentation. Commonly used AHAs, including glycolic acid and lactic acid, are highly hydrophilic and less lipophilic.

*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 mercadológico dos produtos destinados aos cuidados com a pele e com os cabelos tem-se baseado cada vez mais em evidências científicas e técnicas sensíveis, precisas e validadas, ao invés de serem fundamentadas em especulações.

*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 1<sup>st</sup> 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.

*H. Dobrev, R. Iankova, L. Zissova, **Study of therapeutic effectiveness of four antidandruff shampoos**, 12<sup>th</sup> Congress of the European Academy of Dermatology & Venereology, Oct. 15-18, 2003, Barcelona, Spain and Dermatol Venerol (Bulgaria), 2004*

Dandruff and scalp seborrhoeic can be successfully treated with shampoos containing different active substances. In patients with dry seborrhoea an increase in scalp lipid level occurs due to the elimination of follicular occlusion and improvement of sebum delivery.

*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 particularly 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.

*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 self-reported subjective evaluations of skin condition and objective measurements of skin conditions, and then looked for correlations between the subjective and objective skin measures.

*P.-G. Sator, J.B. Schmidt, H. Hönigsmann, **Clinical Evidence of the Endocrinological Influence of a Triphasic Oral Contraceptive Containing norgestimate and Ethinyl Estradiol in Treating Women with Acne vulgaris**, Dermatology 2003;206: 241-248*

Acne vulgaris is a multifactorial inflammatory follicular skin disorder occurring in pilosebaceous units, especially on the face and the trunk. The major etiological factors are increased sebum production, hypercornification of the pilosebaceous duct, abnormal microbial flora and inflammation. There are many different faces of acne. Acne and acneiform eruptions affect persons of all ages, beginning with neonatal acne and progressing to include rosacea in older persons. Acne vulgaris is the most common skin disorder, affecting close to 80% of people at least once between 11 and 30 years of age.

*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 cisailés 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.

*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-invasive 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.

*H.K. Lee, S.Y. Bae, S.J. Moon, I.S. Chang, Comparisons of skin characteristics between men and women using non-invasive methods in young healthy Asians*, Skin Research and Technology, Vol. 9, No. 2, May 2003

Skin has different properties depending on intrinsic effects such as inherent factors, race, gender and so on. Besides, it has been known that skin may change because of the environmental stress such as UV, climate and life style. We would like to know the differences of skin characteristics between male and female. The results of this study might be applicate the depart of dermatology and cosmetology.

*D. Lautenschläger, Hautanalyse – Moderne Geräte helfen*, Ki-Magazin 3/2003

Die Hautanalyse ist ein zentraler Bestandteil der kosmetischen Behandlung. Sie schafft die Grundlage für für erfolgreiche hautspezifische Konzepte. Ein großes Angebot an Geräten kann die Hautbestimmung erleichtertern. Was können diese Instrumente genau.

*J.S. Dosik, T. Plott, R.D. Gilbert, Efficacy and Tolerability of Sodium Sulfacetamide 10% and Sulfur 5% Short-Contact Therapy for the Treatment of Acne Vulgaris*, 61<sup>st</sup> Annual Meeting, San Francisco, March 2003

A short-contact acne therapy containing sodium sulfacetamide 10% and suffer 5% was investigated for its efficacy and tolerability in the treatment of acne vulgaris. Poster at the American Academy of Dermatology,

*P.-G. Sator, J.B. Schmidt, H. Hönigsmann, Comparison of epidermal hydration and skin surface lipids in healthy individuals and in patients with atopic dermatitis*, J Am Acad Dermatol, March 2003

The water content of the stratum corneum and the skin surface lipids form a balance that is important for the appearance and function of the skin. Nevertheless, the water content of the stratum corneum and the skin lipids, the water-binding substances from the hydro-lipid film of the skin, act together as a barrier to the environment.

*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 hydration 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 pseudoplastic fluids.

*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.

*I. Le Fur, S. Lopez, F. Morizot, J. Latreille, C. Guinot, E. Tschachler, **Age-Related Reference Ranges for Skin Biophysical Parameters in Healthy Women***, 20<sup>th</sup> World Congress of Dermatology, Paris 2002

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

*I. Le Fur, A. Reinberg, S. Lopez, F. Morizot, E. Tschachler, **Facial Skin Circadian Rhythms of Healthy Women Investigated Using Non-Invasive Methods***, 20<sup>th</sup> World Congress of Dermatology, Paris 2002

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

*U. Uksal, C. Atasavun, B. Özcelik, S. Utas, A. Ferahbas, **The effects of hormone replacement therapy on the skin of postmenopausal women (abstract)***, 11<sup>th</sup> 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.

*R. Korichi, **Video Imaging in the Measurement of Makeup Efficacy and Performance***, Cosmetics & Toiletries October 2002, Vol. 117 No. 10

Video imaging techniques add quantitative data about the visual effects of makeup when evaluating efficacy and performance of products such as mascaras, lip colorants, facial foundations and nail enamels.

*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 m<sup>2</sup>, 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 mortar-Modell). Die Ziegelsteine entsprechen in dieser Modellvorstellung proteinreichen Korneozyten, die hauptsächlich aus seiner starren Zellhülle [6], Keratinfilamenten [107] und dem interfilamentären Matrixprotein [28] bestehen.

*P.G. Sator, J.B. Schmidt, M.O. Sator, J.C. Huber, H. Hönigsmann, **Parameters of skin aging during hormone replacement therapy***, EADV 7th Congress, 2002, Abstract

All patients with HRT showed an increase in skin hydration, elasticity and thickness, as well as subjective and clinical improvement.

*M.M. Jiménez Soriano, M.J. Fresno Contreras, E. Sellés Flores, Pharmacotechnical characterization and effectiveness testing of a proposed emulsion for the treatment of dry skin, Boll Chim Farm. 2002 Sep-Oct; 141(5): p. 333-342*

One of the most important objectives of the Pharmaceutical Industry is the development of new excipients as well as the optimization of other more traditional ones. Also, the investigation of new active substances able to prevent, palliate or treat the cutaneous dehydration is another of the most important of their objectives. Both tendencies are implanted in this experimental work: we propose an emulsion formulated with the base--Neo PCL' (25%), NMF (Lactil', 5%) and a peculiar active--Honey of Rosemary (15%). The working scheme is as follows: 1) Pharmacotechnical Characterization--organoleptic characteristics, Photomicrograph Study, Type of Emulsion, pH, Rheology; 2) Stability Study by means of accelerated tests based on temperature and centrifugation; 3) Effectiveness Study by applying of non-invasive assessment techniques. An emulsified dermopharmaceutical form is obtained (O/W) with a satisfactory organoleptic characteristics and eudermic pH (5.2), attributable to the acid character of Honey. From the rheological study, a very good results are obtained: viscosity (T = 408.8.D0.549), structural recuperation (30%) and thixotropy (AD1/AD2 = 1.36). On the other hand, from the effectiveness results (corneometric--P.I.120 = 43.2%- and sebumetric--E.I. = 33-144 mg/cm<sup>2</sup>-), a high level of moisturizing is deduced, which is attributable to the synergic action of both Lactil' and Honey. Finally, the proposed emulsion would serve as a treatment for all type of dry skin.

*J. Willms, S. Dolphin, S. Albiston, L. Parmar, P. Westgate, G.J. Harrap, Free internal lipids in hair from pre- and post-menopausal women, Posters of the 22nd IFSCC Congress, Edinburgh 23.-26. Sep. 2002*

Little is known about changes in hair lipids during life and their effects on hair properties.

*N. Muizzuddin, K. Marenus, M. Sullivan, S. Schnittger, D. Maes, Effects on normal female monthly hormonal cycles on skin functions, Posters of the 22nd IFSCC Congress, Edinburgh 23.-26. Sep. 2002*

Menstrual cyclicity is a major biological process for women during their reproductive years and is associated with significant changes in hormonal status and behaviour.

*L. Ambrosine, 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*

The skin does more than simply encase the human body.

*I. Uhoda, N. Faska, C. Robert, G. Cauwenbergh, G.E. Pierard, Split face study on the cutaneous tensile effect of 2-dimethylaminoethanol (deanol) gel, Skin Research and Technology, Vol. 8, No. 3, August 2002*

Large interindividual variations precluded any significant finding in the first study. The DMAE formulation showed, however, a significant effect characterized by increased shear wave velocity in the direction where the mechanical anisotropy of skin showed looseness. The DMAE formulation under investigation increased skin firmness.

*S.W. Youn, S.J. Kim, I.A. Hwang, K.C. Park, Evaluation of facial skin type by sebum secretion: Discrepancies between subjective description and sebum secretion, Skin Research and Technology, Vol. 8, No. 3, August 2002*

People secrete varying amounts of sebum at different skin sites. Reclassification of skin type based on sebum secretion revealed that most participants underestimated the amount of facial sebum excretion. When sebum secretion amounts were compared, a statistically significant difference was apparent between the oily and dry skin types. However, there were no statistical differences between oily and normal, and normal and dry skin.

*C. Piérard-Franchimont, G.E. Piérard, Postmenopausal Aging of the Sebaceous Follicle: A Comparison between Women Receiving Hormone Replacement Therapy or Not, Dermatology 07/2002*

The endocrine control of sebaceous follicles is complex in women. During aging, a decline in sebum output is often experienced. However, some women report increased seborrhoea after the menopause.

*T. Gambichler, P. Altmeyer, S. Rotterdam, M. Herde, M. Stücker, K. Hoffmann, **Bioengineering der Haut**, Kosmetische Medizin, 4/2002, 23. Jahrgang*

Nicht-invasive Untersuchungstechniken (Bioengineering) am Hautorgan werden in der Dermatologie und Kosmetologie zunehmend eingesetzt. Gegenüber der bloßen klinischen Untersuchung bietet der Einsatz von Bioengineering-Methoden viele Vorteile. Es lassen sich morphologische und funktionelle Parameter der Haut objektiv darstellen und standardisiert messen, die der bloßen klinischen Untersuchung bzw. sensorischen Wahrnehmung oft unzugänglich sind.

*MegaSun beauty & care, **Sonnen ohne Risiko**, Kosmetische Medizin, 4/2002, 23. Jahrgang*

Sonne gilt für große Bevölkerungsteile als die Universal-Arznei aus der „Himmelsapotheke“. Doch der Dermatologe rät: Was für die Risiken und Wirkungen von Arzneimitteln gilt, gilt auch für die Solarien-Besonnung: Die Dosis ist entscheidend. Auf der Pressekonferenz am 16.10.2002 in Hamburg präsentierte die KBL-Solarien AG den Medien sowie dem Fachhandel ein auf streng wissenschaftlicher Basis entwickeltes Gerät zur individuellen Hauttypbestimmung, um Solarstrahlen für gesunde und natürliche Bräune optimal zu dosieren – das megaSun care Terminal.

*J. Djordjevic, G. Vuleta, J. Milic, H. Zhai, H. Maibach, **O/W Emulsions Enriched with Vitamin E**, Cosmetics & Toiletries 2002 April, Vol. 117, Nr. 4*

Vitamin E has an important protective function for the entire organism. It is believed that the broad biological activities of vitamin E are due to its ability to inhibit lipid peroxidation and stabilize biological membranes.

*G. Maramldi, M. A. Esposito, **Potassium Azeloyl Diglycinate: A Multifunctional Skin Lightener**, Cosmetics & Toiletries, March 2002, Vol. 117, Nr. 3*

Skin lightening and sebum normalization are among the useful cosmetic functions of potassium azeloyl diglycinate, a soluble derivative of azelaic acid.

*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 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 substantial professional experience of using hand rubs (Group 2, viro laboratory staff).

*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.

*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.

*A. Castro, A. Vargas, Formulacao de Sabonete Liquido com Productos Naturais: Medida de sua Efectividade*, Cosmetics & Toiletries (Portugese), Vol. 13 No 6, p. 93, 2001

*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.

*K.-D. Neander, F. Hesse, The role of cream mousses in the treatment of dry skin in patients with diabetes mellitus*, Podology, LII, Issue 10/2001, p. 19-21

Diabetics are well known for their frequent struggles with the problem of "dry skin". The diverse and unpleasant effects to which these patients are exposed range from pruritus to skin inflammations, particularly in the interdigital spaces of the feet. As has been demonstrated in a variety of studies, lack of moisture is at the heart of this problem.

*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.

*P.-G. Sator, J.B. Schmidt, M.O. Sator, J.C. Huber, H. Hönigsmann, The influence of hormone replacement therapy on skin ageing. A pilot study*, Maturitas 39 (2001) 43-55

We studied the effect of hormonal treatment on skin ageing in menopausal women. Twenty-four patients without hormone treatment for at least 6 months were included. Patients were assigned to three therapy groups: 1. oestrogen only 2. transdermal oestrogen and progesterone. One group without therapy was included as a control group. Treatment was continued for 6 months. Three patients, one from group 2 and two from group 3, discontinued therapy before the study endpoint. The following skin parameters were measured at monthly intervals during treatment.

*G.G. Hillebrand, B. Schnell, K. Miyamoto, M. Ichihashi, R. Shinkura, S. Akiba, The Age-Dependent Changes in Skin Condition in Japanese Females Living in Northern Versus Southern Japan*, IFSCC Magazine, Vol. 4, No. 2, April/June 2001

Image analysis and biophysical methods used to compare skin conditions of a group of females ranging in age from 5-65 years who have lived all of their life in either Kagoshima prefecture (n=300) located in southern Japan or Akita prefecture (n=302), located in Northern Japan.

*F. di Pierro, G. Gugliemini, Cosmetic evaluation of Cucurbita pepo and Zanthoxylum alatum supercritical CO<sub>2</sub> extract*, 5<sup>th</sup> ASCS March 2001

*Cucurbita pepo* L. (English name: pumpkin) is an herbaceous annual plant of the Curcubitaceae family.

*H. Song, The Effects of Inositol Extracted from Rice on the Skin*. Personal Care Ingredients Asia, March 2001

*K. Mijiyamoto, Quantitative comparison of the differences in facial skin aging and Skin Biophysical Properties in Japanese femals living in south and north part of Japan, and global research expansion on Caucasians, East Asians, Indian Asian and Latinos*, 5<sup>th</sup> ASCS, March 2001

Avoidance of sun exposure has been clearly recognized as the best way to prevent premature skin aging (e.g. wrinkling and age spots) and more severe neoplastic disease (squamous and basal cell carcinoma and malignant melanoma).

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

Measuring biophysical properties of the skin is not only useful to study cutaneous physiology and pathology but may also be of value for the prediction of eczema risk, for the detection of subclinical eczema and for therapy control in occupational dermatology.

*N. Ota, T. Horiguchi, N. Fujiwara, N. Kashibuchi, Y. Hirai, H. Mori, Identification of Skin Sensitivity through corneocytes Measurements, XXIst IFSCC Congress 2000, Berlin*

Surveys conducted in many nations suggest that up to 50% of cosmetic users believe they have sensitive skin and products specifically designed for this skin type have become an important cosmetic category. In developing such products, objective assessment of the degree and the type of sensitivity is desirable.

*W. van Es-Spiekman, G.W. Lucassen, Skin Characterization: Human Skin Water Content Versus Lipid Content Measured by Corneometer, Sebumeter and ATR-FTIR Spectroscopy, XXIst IFSCC Congress 2000, Berlin*

Skin characterization methods are important for the cosmetic industry, personal care industry, in pharmacology and dermatology. Water content and lipid content are of special importance because of their crucial role in the barrier function of the skin.

*S.M. John, W. Uter, H.J. Schwanitz, Relevance of Multiparametric Skin Bioengineering in a Prospectively-followed Cohort of Junior Hairdressers, Contact Dermatitis, Vol. 43, No. 3, September 2000*

There is conflicting evidence concerning predictors of individual susceptibility to develop irritant contact dermatitis in wet work. A cohort of initially 92 hairdresser apprentices was prospectively followed for 3 years.

*A. Zlotogorski, S. Dikstein, Skin Surface Sebum on the Forehead and Cheek of Adults, Skin Research and Technology, Vol. 6, No. 3, August 2000*

The casual level of skin surface sebum and the rate of replacement after 30 min. was measured by the SM-401 Sebumeter on the forehead (of 270 men and 382 women) and the cheek (of 183 men and 196 women) aged 20-95.

*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, Ilième Congrès de la Société D'Ingénierie Cutanée, Juin 2000*

Les modifications environnementales au cours des saisons favorisant la survenue de pathologies cutanées mais sont aussi citées par les femmes comme favorisant l'apparition des signes de sensibilité cutanée.

*B. Rode, U. Ivens, J. Serup, Degreasing method for the seborrheic areas with respect to regaining sebum excretion rate to casual level, Skin Research and Technology, Vol. 6, No. 2, May 2000*

Insulin resistance and increased levels of serum steroids have been hypothesized to be relevant etiological factors for breast cancer. The present study analyzed the association of breast cancer with markers of insulin resistance and elevated serum sex steroids, abdominal adiposity, increase in sebum production and hirsutism in a case-control study nested in a prospective cohort study.

*G. Gacic-Vukavljak, Sebum Control Performance with Powdered Silicone Elastomers, Personal Care Ingredient Asia Conference, Bangkok, March 2000*

E-powders (Treffil®) are elastomeric silicone powders comprised of spherical particles which show good characteristics of elastomers in general.

*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, 13<sup>th</sup> ISBS Jerusalem, March 2000 and 13<sup>th</sup> 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.

*S. Lopez, I. Le Fur, F. Morizot, G. Heuvin, C. Guinot, E. Tschachler, Transepidermal Water Loss, Temperature and Sebum Levels on Women's Facial Skin Follow Characteristic Patterns, Skin Research and Technology, Vol. 6 No. 1, February 2000.*

The aim of this study was to compare the biophysical properties of different facial zones.

*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.

*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.

*M.M. Jiménez Soriano, M.J. Fresno Contreras, E. Sellés Flores, Pharmacotechnical characterization and effectiveness study of a dermopharmaceutical form: Rosemary honey contributions as a moisturizing active*, Bollettino chimico farmaceutico 138(8): p. 401-417, October 1999

We have designed, elaborated and studied a dermopharmaceutical form formulated on the basis of a modern self-emulsifying excipient and rosemary honey (known as Miel de La Alcarria--Spain--according to the Governing Council), in order to obtain a high degree of cutaneous hydration. The formulation is typified and characterized from a pharmacotechnical and rheological points of view. In this sense, the experimental protocol has emphasized rheological essays which give relevant practical information. Also, we have performed a complete study of its physical and structural stability, and, lastly, we evaluated the dermopharmaceutical effectiveness. The work plan included the following tests: 1) Pharmacotechnical Essays--organoleptic characteristics, photomicrograph study, type of interposition, pH-determination, rheological and thixotropic study and physical stability tests; 2) Dermopharmaceutical Effectiveness Assays--Corneometric and Sebumetric measurements. From the results, we have deduced that the emulsified binary system that is proposed, stable from a physical and structural points of view, presents confirmed properties and a very good cosmetological adequation. In this sense, our emulsion presents a high degree of moisturizing/emollient power that qualifies it not only as a magnificent eudermic dermopharmaceutical form, but also as a very appropriate vehicle for Dermopharmaceutical and/or Dermatological Formulation.

*C. Piérard-Franchimont, O. Martalo, A. Richard, A. Rougier, G.E. Piérard, Sebum rheology evaluated by two methods in vivo. Split-face study of the effect of a cosmetic formulation*, European Journal of Dermatology. Volume 9, Number 6, 455-7, September 1999

Modulation of the rheological characteristics of sebum at the surface of the skin might represent a valuable strategy for the treatment of seborrhea. In this field, only a small number of studies have addressed sebum diffusion within the stratum corneum. In an open, split-face study conducted on 20 men, we measured the sebosuppressive effect of Effidrate® cream which is based on a glycerol alkyl-ether. Measurements were made in the morning at three-week intervals for a total period of 3 months. Sebum casual levels and sebum excretion rates were measured using a SM810® Sebumeter. Lipid-absorbent Sebutape® was also used to collect all the sebum released from infundibular reservoirs over a four-hour period. Clinical assessments were relatively uninformative but the photometric measurements showed that Effidrate® cream had a sebosuppressive action. The underlying biological mechanism remains unclear but a hypothesis based on enhanced sebum absorption by the stratum corneum is discussed

*I. Le Fur, S. Lopez, F. Morizot, C. Guinot, E. Tschachler, Comparison of cheek and forehead regions by bioengineering methods in women with different self-reported "cosmetic skin types"*, Skin Research and Technology, Vol. 5, No. 4, August 1999

Understanding structural and functional differences between facial areas is necessary for the formulation of cosmetics and dermatological preparations well tailored to the skin's biophysical characteristics.

*K. Lanzerath, Eine Notwendigkeit für die dermatologische 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.

*W.D. Becker, S. Hillmer, M.A. Presser, A Clinical Model for Surface Sebum Measurement, Poster Arbois 1999*

Accurate and reproducible measurements of skin surface sebum level is important to establish the efficacy of compounds which could play a role in controlling oily skin.

*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 through cosmetic products as well.

*R.G. Azzini, L. Licursi, P.A. Rocha-Filho, Colour Evaluation „In Vitro“ Method of Facial Powders, IFSCC Chile May 1999*

The work speaks about the evaluation of the colouration of facial powders inside the own packing and the resulting colour that is obtained when the same is put to the skin.

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

Numerosos pacientes se hicieron a la consulta cosmética...

*P. Muti, M. Stanulla, A. Micheli, V. Krogh, J.L. Freudenheim, J. Yang, H.J. Schünemann, M. Trevisan, F. Berrino, Markers of Insulin Resistance and Sex Steroid Hormone Activity in Relation to Breast Cancer Risk: A Prospective Analysis of Abdominal Adiposity, sebum production, and hirsutism (Italy). Pediatric Research April 1999*

*W. Voss, G. Schlippe, M. Breuer, Tests on Cosmetics Scientific Standards, SÖFW-Journal 4/99*

In general, body care articles and cosmetics have only a low allergy potential. The probability that toxic-irritative reactions will arise after proper use is even lower. But especially with patients with sensitive skin, unclear skin reactions, which can frequently be confused with allergies, can arise. The cosmetics manufacturers, however, would like to produce safer products and naturally want to avoid that type of problem from the start.

*B. Chadoutaud, L. Curtil, C. Veret, F. Alais-Gallou, Evaluation objective en double aveugle de la performance hydratante et de la rémanence de deux émoullients corporels E/H et H/E dans le traitement des peaux sèches et très sèches. Les Nouvelles Dermatologiques, Vol. 18 No. 2 – Feb.99*

Cette étude en double aveugle randomisée chez 20 volontaires à peau sèche et très sèche, concerne l'analyse contrôlée de l'activité hydratante de deux émulsions

*A. Fendl, Einzelheiten der Hautdiagnose. Natürlich schön/Grundlagen 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.

*H. Knaggs, J. Bajor, W. Becker, The Sebumeter® and Its Use, Mediscript 12/98*

The Sebumeter is a quick and easy tool to use in measuring skin surface lipids. The type of lipids sampled largely depends on the body site at which the measurement is taken. The Sebumeter has most commonly been used to measure skin lipids on the forehead which consist predominantly of sebaceous gland-derived lipids or sebum.

*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 den Waschwasserwechsel, und dies nicht nur aus hygienischen Gesichtspunkten.

*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.

*J.S. Koh, K.S. Chae, H.O. Kim, Skin Characteristics of Normal Korean Subjects According to Sex and Site using Non-Invasive Bioengineering Methods*, Korean J Dermatol., 1998 Oct; 36(5): p. 855-864

Background: During the last few years, the in vivo study of the physiological parameters of the skin by non-invasive methods has been considerably developed. So far, there have been some reports on the skin characteristics only in parts, but there has not been any criteria to classify those of normal subjects. Objective: The aim of the present study was to investigate the skin characteristics of healthy Korean subjects according to sex and sites using non-invasive methods. Methods: To determine normal levels of sebum, skin hydration, transepidermal water loss (TEWL), skin elasticity and skin color according to sex, 163 subjects (male; 124, female; 39) were used to investigate 5 different anatomical sites. 6 different instruments were used: The Sebummeter SM 410, Corneometer CM 820, Evaporimeter EP1, Cutometer SEM 474, Chromameter CR-121, and Mexameter MX 16, for evaluating sebum excretion rate, capacitance, TEWL, mechanical property and skin color respectively. Results: Differences were noticed depending on the anatomical sites and sex. Most of the measuring parameters were significantly different according to sites and sex. The values of sebum levels, capacitance and TEWL were higher in the males on the cheek, forehead and crows foot, whereas in the females, higher values were observed on the dorsum of the hand. The skin elasticity varied considerably among the nine-parameters but, for the elastic ratio (R2, R5), the females showed significantly higher values than the males in all sites except the forehead. Skin lightness (L\* value) was higher in the females, whereas the males showed higher values in the category of redness (a\* value) and yellowness (b\* value). The values of the erythema index (EI) and melanin index (MI) were also higher in the males on all sites. Correlations between the skin parameters mentioned above were calculated. A negative correlation between capacitance and TEWL was observed only on the cheek (male/female,  $r = -0.2 / r = -0.4$ ,  $p < 0.05$ ). The L\* value correlated negatively with MI. Moreover the values between a\* and EI also showed significant correlations in the male (cheek and dorsum of hand,  $y = 0.2$ , forehead and crows foot,  $r = 0.3$ ,  $p < 0.05$ ). There were considerably significant correlations between the visual pigmentation score and instrumental skin parameters in the males (visual pigmentation score vs. L\* value measured by Chromameter ; cheek/crows foot,  $r = -0.3 / y = -0.4$ , visual pigmentation score vs. MI by Mexameter ; cheek/crows foot,  $r = 0.2 / r = 0.4$ , visual wrinkle score vs. sebum excretion rate measured by Sebumeter ; cheek,  $r = 0.2$ , visual wrinkle score vs. elasticity parameters measured by Cutometer ; cheek, R2/R5/R7,  $r = -0.3 / r = -0.2 / r = -0.3$ ,  $p < 0.05$ ). Conclusion: Skin physiological parameters can be evaluated by non-invasive skin bioengineering methods which show quantitative modifications in physiological conditions in relation to sites and sex.

*I. Le Fur, S. Lopez, F. Morizot, M. Dubourgeat, C. Guinot, E. Tschachler, Comparison of Malar and Frontal Zones by Bioengineering Methods for Different Cosmetic Skin Type Groups of Women*, Poster - 20th IFSCC Congress Cannes, 09/1998

During the past decades the in vivo study of physiological parameters of the skin by non invasive methods has considerably developed.

*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

*T. Fischer, C. Greif, W. Wigger-Alberti, P. Elsner, Instrumentelle Methoden zur Bewertung 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.

*W.D. Becker, J.S. Bajor, K. Hoyberg, S. Hillmer, D. Thiboutot, H. Knaggs, Measurement Of Human Surface Sebum Levels*, The Journal of Investigative Dermatology, Vol. 110, No. 4, April 1998  
High facial levels of sebum haven been shown to be cosmetically undesirable.

*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 Rohstoffe für den Fettkörper einer Emulsion müssen die speziellen Bedingungen, die durch den pH-Wert bedingt sind, berücksichtigt werden.

*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.

*H. Gerny, IV Medizinische und Kosmetische Behandlungen*, Kosmetik und Dermatologie, Krause & Pachernegg Verlag GmbH, Wien.

Die Langzeitwirkung einer Pflege kann nur dann einigermaßen beurteilt werden, wenn ein klar definierter Ausgangspunkt bezüglich des aktuellen Hautzustandes und Hauttypes gegeben ist. Die Bestimmung des Hauttypes ist ein sehr komplexer Vorgang, da viele äusserliche Einflüsse auf unser Hautbild einwirken. Auch ist die Haut hormonell empfindlich und stellt ein Bild unseres Innenlebens dar. Da der Zustand der inneren Schichten ohne chirurgische Maßnahmen nicht definitiv beurteilbar ist, kann nur die Summe aller Beobachtungen durch Auge, Lupe, und Woodlampe sowie Apparativer Hilfsmittel einen approximativen Anhaltspunkt über den Zustand der Haut geben. Es ist empfehlenswert, nach dem 35. Altersjahr von Zeit zu Zeit eine Hautbeurteilung durchführen zu lassen, um die Pflege nach dem aktuellen Hautbedürfnis anzupassen.

*J.W. Wiechers, A Supplier's contribution to performance testing of personal care ingredients*. SÖFW-Journal, 123. Jahrgang 14/97

Current cosmetic formulations address a wide variety of customer needs. This variety requires a plethora of personal care ingredients. In order to create excellent new products, it is essential that the formulator not only knows the physical properties of the components (s)he chooses, but also the skin performance that these products may have. In order to facilitate the selection process for the formulator, we have investigated the effect of our products against some of the most prominent claim areas of cosmetic products: skin moisturisation, elasticity, substantivity, and mildness.

*J.W. Wiechers, Relative performance testing: Introducing a tool to facilitate cosmetic ingredient selection*, Cosmetics and Toiletries, 112 (9) 1997, p. 79-84.

*H. Dobrev, L. Zissova, Effect of Ketoconazole 2% Shampoo on Scalp Sebum Level in Patients with Seborrhoeic Dermatitis*, Acta Derm Venereal, Stockholm 1997

Twenty patients with scalp seborrhoeic dermatitis were treated twice weekly with ketoconazole 2% shampoo for 4 weeks. Clinical assessment, culture for *P. ovale* on Dixon broth and lipid measurement at two places were made before treatment and after 2 and 4 weeks. Significant improvement of the severity of seborrhoeic dermatitis ( $p < 0.001$ ) and negative mycological tests by 19 (95%) of patients were observed. The scalp lipid content remained unaltered in 11 patients with an initial lipid value over 220  $\mu\text{g}/\text{cm}^2$  but increased those with lower initial values.

*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.

*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.

*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 Austrocknungswirkung 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.

*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.

*D.R. Black, J.M. Lagarde, C.M. Auzoux, Y. Gall, An Improved Method for the Measurement of Scalp Sebum,* Skin Research and Technology, Vol.2, No.4, Nov 1996.

An improved photometric technique for scalp sebum measurement is presented based on a previously reported method (Saint Leger et al. 1979 Arch Dermatol Res 265).

*D.A. Comes, E.J. Fendler, M.J. Dolan, 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.

*P.M. Clarys, A.O. Barel, Sebumetry: A comparison between Lipid Collection Techniques,* Skin Research and Technology, Vol.2, No.4, Nov.1996

Recently, several methods have been developed for the collection of skin surface lipids. We compared 3 of those measurement techniques: the Sebutape, the Sebufix, and the Sebumeter. Lipid sampling with the Sebufix and with the Sebumeter takes only 30 seconds while lipid sampling with the Sebutape takes 1 hour. As demonstrated by several authors application of a film on the skin surface may interfere with several skin properties such as skin temperature, skin hydration, and skin surface water loss. Our experimental set was designed in order to make a comparison between the 3 measurement techniques and in order to evaluate the effect of Sebutape application on the above skin parameters. Comparison of the lipid quantification with the 3 techniques delivered a good correlation. The Sebutape seems to have no or only a minor influence on skin temperature and TEWL. The hydration state of the stratum corneum increased significantly during the Sebutape application.

*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.

*R. Wolf, M. Friedman, **Measurement of the skin-cleaning effects of soaps**, Int J Dermatol. 1996 Aug; 35(8): p. 598-600*

Background: In the past 30 years, many tests for assessing the irritancy of soaps have been introduced, but only very few tests for evaluating their cleaning properties. The urgent need for such a method is obvious. Method: The method is based on the principles developed by Schrader, with substantial modifications. As in Schrader's method, we used a fat-based ointment to emulate "dirt." The washing process was performed by placing the examined hand in a rotating soap solution for 5 minutes. The capacity of various soaps to remove the "dirt" was assessed by comparing the sebumeter readings before and after the washing process. The difference between the two readings provided a quantitative estimate of the percentage of "dirt" (ointment) that was washed off during the process. Results: The cleansing capacity of two soaps was compared to that of water. Soap 1 showed a cleansing of 81.7 +/- 2.4%, soap 2 a cleansing of 75.3 +/- 2.9%, as compared to water of 29.7 +/- 3.4%. The curve representing the distribution of the data was very smooth, bell-shaped and symmetric about its mean. The difference between the cleaning activity of the two soaps tested was statistically significant ( $P < 0.0001$ ). We have presented a new method for testing the cleansing capacity of soaps. Conclusions: We believe, that our method gives better results than that of Schrader; in particular, it enables us to discriminate more effectively among the various soaps. Our results indicate that the method is reliable and reproducible. It is also practical, easy to perform, does not require an expensive and complex washing machine, and can be carried out in every laboratory.

*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.

*L. Celleno, A. Vasselli, M.V. Tolaini, A. Mastroianni, F. Macchia, **Verifica di tollerabilità ed accettabilità cosmetica di detergenti cutanei: confronto di metodiche**, Cosmesi Dermatologica 45, 1995*

La deterzione cutanea è un atto igienico ma rappresenta altresì 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).

*P. Elsner, **Nichtinvasive Techniken in der Hautphysiologie**, 38. Tagung der Deutschen Dermatologen Gesellschaft, Berlin, 29. April - 03. Mai 1995*

Nichtinvasive Techniken (Synonyma: Bioengineering-Verfahren, biophysikalische Meßverfahren) haben in den vergangenen Jahren in verschiedenen dermatologischen Forschungsgebieten Eingang gefunden. Dazu zählen insbesondere die Hautphysiologie, die Dermatopharmakologie und Dermatotoxikologie, die Allergologie und die Berufsdermatologie, aber auch die Erforschung der Kollagenosen, der Veränderungen der Altershaut (dermatologische Gerontologie) und die Onkologie.

*L. Zissova, H. Dobrev, **Quantitative Investigation of Sebum Excretion in Seborrhoeic Dermatitis of the Scalp Treated with Ketoconazole 2% Shampoo**, 2nd Congress of the ECMM, Brussels, April 27-29, 1995*

The quantity of sebum excretion before, during and after treatment with Ketoconazole 2% shampoo / Nizoral<sup>®</sup>, Janssen Pharmaceutica, Belgium / in 20 patients with seborrhoeic dermatitis of the scalp, aged 16-40 years, was studied.

*G.E. Piérard, Relevance, Comparison, and Validation of Techniques*, Handbook of Non-Invasive Methods and the Skin, J. Serup G.B.E. Jemec, 1995

Measuring in an objective way is always in need of additional breakthrough. Dermometry and bioengineering have been and remain closely associated in the search for improvements of quantitative noninvasive assessments. The pre-bioengineering times and the descriptive phase of dermometry are behind us. Ingenious researches pioneered methods that may now look crude, time-consuming, and sometimes lacking in reproducibility.

*P. Elsner, Sebum*, Bioengineering of the Skin: Methods and Instrumentation, CRC Press 1995

While the epidermal barrier function depends largely on intercellular lipids in the stratum corneum, skin surface lipids are mainly from sebum. Sebum is an oily mixture of lipids, keratin, and cellular membrane structures excreted by the sebaceous glands.

*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 whether 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.

*S. La Mendola, F. Rinaldi, M.C. Salvadori, F. Clemente, Competence and satisfaction. A Study of the Hair and Shampoo of 1.000 Users of a Trichology Service*, 18th International IFSCC-Congress, Venice, October 1994

The awareness which 1.000 users of the medical trichology service at the San Raffaele Hospital of Milan have of the conditions of their scalps is first issue tackled in this study. The self-assessment that each person makes of their own hair conditions is compared to data measured by means of sebumetric instruments. A high degree of incompetence is recorded and correlation with some personality traits of the subjects illustrate this. Some aspects of the impact of different competence levels on behaviour are evaluated. In addition, the level of satisfaction expressed by these users about the shampoo used are examined, taking into account the relationship with some subjective variables.

*C. Trullas, J. Coll, C. Pelejero, J. Vilaplana, S. Sirigu, C. Dederen, Cosmetological Activity of Glycolic Acid Incorporated in a New Topical Delivery System (W/O/W Emulsion)*, 18th International IFSCC-Congress, Venice, October 1994

The cosmetological potential of alpha hydroxyacids (AHA'S) is still evolving. The powerful research in physicochemistry has provided a promising new delivery system, the multiple emulsion W/O/W which could permit a controlled and sustained release of AHA'S, modifying their efficiency and safety. The cosmetological activity and safety of a W/O/W multiple emulsion containing 3% of glycolic acid has been assessed by bioengineering methods using several tests. A six-hour test and 30-days study for comparison of the effects of 3% glycolic acid in two delivery systems W/O/W multiple emulsion and O/W emulsion were conducted. The cutaneous biophysical variables evaluated were electrical capacitance of stratum corneum, skin surface lipids, transepidermal water loss, biomechanical properties, blood flow and skin surface topography. The safety of 3% glycolic acid in the two delivery systems was determined using patch testing and assessment of cutaneous responses by visual scoring and biophysical non-invasive methods (evaporimetry, laser doppler flowmetry, reflectance spectrophotometry).

*C. Münzberger, U.F. Haustein, U. Elefant, Effects of UVA- and UVB-radiation on transepidermal water loss, water content of the horny layer and skin surface lipids*, Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994

In the last year many studies have provided important new knowledge concerning the benefits and risks of skin exposure to sunlight and ultraviolet radiation, among them the acute and chronic effects on damage of the skin barrier. We examined the transepidermal water loss, the water content of the horny layer and the amount of skin surface lipids in relation to low dose UV-radiation. The transepidermal water loss was measured with the TEWAMETER TM 210, the water content of the horny layer with the

CORNEOMETER CM 820 and the skin surface lipids with the SEBUMETER SM 810 PC (all from Courage and Khazaka GmbH). The ultraviolet radiation of 25 healthy adults was performed with UVA (Philips TL-K 40W/09N) and UVB (Philips TL 20W/01).

*A.M. Grunewald, M. Gloor, Value of barrier creams against skin damage due to repeated washings, Second International Symposium on Irritant Contact Dermatitis (ISICD), Zurich, April 14-16, 1994*

The aim of our study was to evaluate the protective effect of barrier creams onto irritant contact dermatitis. Therefore the following skin function parameters were evaluated: corneal lipids (sebumetry), water content of the corneal layer (corneometry), transepidermal water loss (TEWL), pH of the skin, skin reddening (colorimetry) and skin blood flow (laser doppler flow). We did standardized washings of both arms on the first and the 8th day. The subjects were asked to wash 5 times daily for one week. In a first study we evaluated the irritating effect of repeated washings with 0.01 mol/l sodium lauryl sulphate solution on 20 subjects. We were able to show that there is a more than 12 hours lasting change in skin function parameters after one week of repeated washings. Concerning corneometry, corneal lipids, tewl, pH and laser doppler flow there were highly significant differences before and after repeated washings ( $p < 0.01$ ). In a second study we evaluated the irritation reducing effect of 3 barrier creams on 15 subjects for each cream. Using the same method as in our first study, one selected arm was additionally treated with a barrier cream 5 times daily. Barrier creams had a highly significant ( $p < 0.01$ ) effect on laser doppler flow, corneometry and tewl. Nevertheless they were not able to offer complete protection. The different barrier creams showed significant differently positive effects onto skin function parameters.

*J. Bettinger, M. Gloor, W. Gehring, Influence of a pretreatment with emulsions on the dehydration of the skin by surfactants, Int. Journal of Cosmetic Science 16, 53-50, 1994*

Improving the water content of the horny layer of the skin is of great importance in dermatology (atopic dermatitis, ichthyosis etc.) and in cosmetics (to soften the skin surface [1]). It is believed that emulsion bases lead to hydration of the stratum corneum [2]. The hydration is believed to last a few minutes if an o/w-emulsion is used [3] and a few hours in the case of w/o-emulsions [4]. The present study addresses whether the hydrating effect really does last for such a short time. Literature also proposes an increase in water content by using urea, which is a component of many dermatological skin-care ointments [3, 5-8].

*M. Lodén, M. Lindberg, Product Testing-Testing of Moisturizers, Bioengineering of the Skin: Water and the Stratum Corneum, 275-288, 1994*

Moisturizers are used to restore and/or to maintain a normal function of the stratum corneum (SC). Mostly they are used on the indication of so-called dry skin. When performing product testing of moisturizers, bioengineering devices are used for evaluating how these products affect the function of SC, the main diffusion barrier in the skin. Biophysical measurements of dry skin need to be carefully evaluated. A number of highly developed noninvasive methods for the study of skin physiology have appeared during recent years and a number of papers on the use of these methods are now being published.

*P. Clarys, C. Eeckhout, J. Taeymans, P. Gross, A.O. Barel, Influence of short daily exposure to thermal water on the hydration state of the skin, Threat to the Skin, 333-337, 1994*

The thermal Kurzentrum of Lenk (Switzerland) is one of the spas recognized by the Department of Health of Switzerland as a centre specialized in the treatment of rheumatic patients. Part of the typical 3-week cure in the centre consist of daily bathing in hot thermal water containing high concentrations of salts and sulphur (sulphates and hydrogen sulphide). According to recent data from balneo-therapeutic treatments, the sulphur which penetrates the skin is oxidized and provokes various physiological responses in the skin: vasodilatation in the microcirculation, an analgesic influence on the pain receptors and inhibition of the immune response.

*R. Bimczok, A. Ansmann, S. Bielfeldt, D. Billek, H. Driller, G. Feistkorn, F. Heinze, R. Huttinger, B. Komp, H. Lautenschläger, M.-C. Leneveeu-Duchemin, L. Motitschke, L. Pohl, A. Reng, H.-J. Schulze, B. Thomaskamp, K. Tolkieln, H. Tronnier, H.-U. Wekel, K.P. Wittern, A multicenter comparison of different test methods for the assessment of the efficacy of skin care products with 368 human volunteers, J. Soc. Cosmet. Chem., 45, 1-19 (January/February 1994)*

In a multicenter study, commonly used objective and subjective methods for the assessment of the efficacy of skin care products were compared. The study was performed with two different all-purpose skin care creams at eleven centers in Germany, with a total of 368 healthy female volunteers. Measurement of skin hydration with the comeometer demonstrates a fundamental improvement of skin condition and correlates with subjective assessment by the volunteers. Results are statistically highly

significant, and there is a fair correlation between the different centers. The methylene blue method, surfometry, and image analysis are also suitable for performance measurements, but show broader standard deviations and lower statistical significance. Under the chosen conditions, results for TEWL and skin surface lipid measurements were not significant at the  $p < 0.05$  level.

*V. Bousquet, D. Redoules, I. Raynal, G. Dahlem, Y. Gall, Les principales techniques d'objectivation des effets des dermo-cosmétiques, Cosmétologie, 1993*

La mise au point de produits dermo-cosmétiques de plus en plus performants grâce aux progrès de la galénique a entraîné le développement d'un ensemble de méthodes d'évaluation visant à mesurer leurs effets directement sur la peau et de la manière la plus objective.

**Quantitative evaluation of sebaceous secretion on the forehead: comparison between the Sebumeter® and a microporous film (Sebutape™)**, 9th international symposium "Bioengineering and the skin", Sendai / Japan, 19.-20. October 1992

The Sebutape technique seems to be a reliable and as fast procedure to obtain numerical values concerning the amount of skin surface lipids. The technique with the Sebutape is more time consuming but has the advantage to examine a greater surface of the skin, to protect the evaluated region and the Sebutape leaves the possibility for further quantitative lipid determination. Direct scanning of the Sebutape instead of scanning of an enlarged picture of the Sebutape results in a more standardised method with a greater surface that can be used for evaluation. The correlation between the Sebumeter and between the Sebutape technique increased from  $r=0,73$  to  $r=0,94$  when using direct scanning of the Sebutape instead of indirect scanning of the Sebutape.

*J.P. Marty, C.M. Vincent, E. Fiquet, Études des propriétés hydratante de la Crème Hydratante Visage Neutrogena, Réalités Thérapeutiques en Dermato-Vénérologie N. 15, Feb. 1992*

La crème Hydratante Visage Neutrogena est une émulsion huile/eau dont les propriétés hydratantes peuvent être liées d'une part à un effet occlusif et d'autre part à une action humectante directe sur les cellules cornées.

*E. Fiquet, C.M. Vincent, A. Cohen-Letessier, J.P. Marty, Evaluation des propriétés de la crème hydrophile lipophile (Effadiane™), Nouv. Dertol. 1992: 11 p. 429-431*

Effadiane™ is a water/oil emulsion, its effect on the skin hydration has been investigated in human volunteers by non-invasive techniques: the transepidermal waterloss to verify occlusive effects, the corneometric measurement to demonstrate a direct water uptake by the horny layer.

*R. Wolf, E. Tur, D. Wolf, M. Landau, The effect of smoking on skin moisture and on surface lipids, International Journal of Cosmetic Science 14/92*

In the present retrospective study we investigated the effect of smoking on the moisture and surface lipid levels of the skin. We analysed data from the files of 576 female clients treated in a Tel-Aviv cosmetic parlour. Measurements have been conducted by the same cosmetician, by commercially available equipment, on every client receiving cosmetic treatment, regardless of the nature of the treatment. Results demonstrated a significant difference of skin moisture in the various smoking groups: women who smoked 11-20 cigarettes per day showed significantly lower mean values than the non-smoker group, as expected. Moreover, women before or after menopause showed no significant differences in their moisture measurements. The surface lipid variables showed no significant differences in mean over the four smoking groups. We believe that the objective of the study was achieved, and that the results, indicating decreased skin moisture in smokers, will serve well in anti-smoking campaigns. We also believe that the present study will stimulate other investigators to conduct similar studies that will provide answers to many questions which still remain open.

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

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

*A. del Pozo, C. Cosa, Dispensacion dermofarmaceutica: Apoyo tecnologico al rol del Farmaceutico, Departamento de farmacia, Unidad docente de Farmacia Galenica, Universidad de Barcelona, 1991*

El concepto "dermofarmacia" resulta en ocasiones, poco preciso, resultando a veces difícil delimitar su contenido y ámbito de actuación en relación, por un lado, al de la "dermatología", y por estrictamente el extremo opuesto, al de la "cosmología".

**Check-up Cosmetologique et Biometrologie Cutanee**, Actualités Pharmaceutiques, Jul. 1991, Special Dermo-cosmétologie, No. 289

La notion de "Check-Up" cutane a toujours exprime un souci de rigueur pour definir des besoins cutanes et des reponses performantes. Une logique, aujourd'hui scientifique, qui s'assuie sur des connaissances precises de la physiologie cutanee pour interpreter les differents etats de la peau et proposer de veritables methodes de correction; c'est l'avenement d'une cosmetologie de soins, rigoureuse.

*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 Ärzte: Wasser, Scheuern und waschaktive Substanzen (Seife, Tenside) zur Hautreinigung entfernen die physiologischen Hautoberflächentenside.

*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.

*L. Celleno*, **Valutazione dermatologica dei prodotti per la detersione della cute**, Cosmesi Dermatologica, 30/1990

The authors report the results and the methods of the dermatological and cosmetological evaluation of 16 solid products for cleaning the skin (traditional soaps, neutral soaps, syndets). There is a growing need for valid and reliable tests to evaluate the cosmetic properties and the safety of cosmetics. Data obtained in this field will contribute to the protection of both the consumer and the cosmetic industry.

*G. Campagnoli, L. Celleno, S. Grifeo, A.G. Nume, C. Ronchi*, **Valutazione dell'attività sebonormalizzante di un'emulsione a base di lipoaminoacidi**, Cosmesi Dermatologica 39/1990

Aim of the present study is to investigate thoroughly a new class of compounds, the lipoaminoacids. These are molecules with sebum-normalizing and antimicrobial activity, useful in the cosmetologic treatment of seborrheic and preacneic skin. The experience is based on the instrumental measurement of sebumetry and pH-metry in 21 subjects, selected according to sebometric parameters above the physiologic limits (group A), and on the evaluation of the onset of allergic symptoms in 20 different subjects (group B) following 27 day treatment with a suitable preparation. Results show a sebum-normalizing activity also following 7-day treatment, with no case of intolerance and/or sensitization.

*C. Torresani*, **Utilizzo del fango termale sulfureo nel trattamento della cute seborroica**, Cosmesi Dermatologica, 1990

In the present study the efficacy of mud containing sulphurous thermal water, in the treatment of the face seborrheic skin was evaluated. The results provided evidence for effectiveness as well as

tolerability of the treatment. Mechanism by which sulfur and, in particular, sulphurous thermal mud operate in the sebaceous secretion are discussed with regard to literature data.

*R. Mehl, La cosmétologie active arrive à l'officine, Le quotidien du Pharmacien, 08.10.1990*

*I.-M. Bergbrant, J. Faergemann, The role of Pityrosporum ovale in Seborrheic Dermatitis, Seminars in Dermatology, 12/90*

This paper discusses the relation between the lipophilic dimorphic yeast *Pityrosporum ovale* and seborrheic dermatitis. A review of studies concerning the microbiology in seborrheic dermatitis and immune reactions to *P. ovale* are given. In our own studies with quantitative cultures, no significant difference was found in the number of *P. ovale* in patients compared with controls, or between healthy and lesional skin in the patient group. IgG serum antibodies against *P. ovale* cells estimated with indirect immunofluorescence did not show any difference between patients and controls, but a significant difference was found when a *P. Ovale* protein extract and ELISA were used. Immunological investigation on serum samples were done on 30 patients with seborrheic dermatitis. Defects were found in their T-cell function. The number of *P. Ovale* is of importance in those individuals who are susceptible to seborrheic dermatitis and the development of the disease depends on the way their immune system reacts to the antigens derived from *P. Ovale*.

*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.

*C. Torresani, D. Rastelli, M. E. Berio, G. De Panfilis, Valutazione dell'efficacia di un'emulsione cosmetica a base di acqua termale sulfurea, Incontri di Cosmetologia, 07/89*

Lo studio è stato condotto su un gruppo di 20 pazienti, 13 femmine e 7 maschi, di età compresa tra 21 e 43 anni. Il trattamento è consistito in due applicazioni giornaliere di una emulsione O/A contenente per il 79% acqua termale sulfureo-solfato-calcica, per un periodo di quattro settimane. Durante tale periodo è stato escluso qualsiasi altro trattamento ed i pazienti sono stati invitati ad effettuare la detersione del viso esclusivamente con acqua. I pazienti sono stati controllati prima dell'inizio del trattamento, nonché al 7°, 14°, 21° e 28° giorno del trattamento stesso. La valutazione quantitativa della seborrea è stata effettuata mediante sebometro riflettometrico Sebumeter SM 410 della ditta Schwarzhaupt. Come gruppo di controllo, è stato scelto un gruppo di 10 pazienti, omogeneo per sesso, età e patologia. Tali pazienti sono stati trattati, secondo le stesse modalità, con una emulsione placebo contenente i soli eccipienti e priva del principio attivo.

*P. Morganti, S.D. Randazzo, L'utilizzazione degli indici di correzione per il trattamento cosmetico della cute secca e disidratata, Il Prodotto Chimico, April 1989*

La normale funzione protettiva della cute è strettamente legata all'azione protettiva svolta dal film lipidico di superficie che la ricopre come una barriera, difendendola dalle aggressioni dell'ambiente esterno, e dal suo contenuto di acqua, indispensabile per mantenerla morbida ed elastica e idratata.

**Solaroli, Manifestazioni seborroiche e desquamative del capillizio, trattate con un nuovo preparato a base di urea e acido salicilico, La Medicina Estetica, 13.04.1989**

Seborrhea and desquamation of the scalp treated with a new preparation based on urea and salicylic acid. The activity of salicylic acid and urea from particular lotions was studied in vivo by measuring the possible antiseborrheic effect. We used the modified photometric technique (Sebumeter SM 810) which permits measurement of casual levels (CL) or sebometric index (SI); although this is less accurate than a sebum excretion rate (SER) assessment, but there is some correlation between (SER) and (CL). In the study of 30 patients we have employed the method described to assess the bioavailability of Keratolytic and Keratoplastic agents incorporated in topical formulations; in this way we have shown the benefit of these preparations.

**P. Morganti, S.D. Randozzo, Gli indici di idratazione e di emolienza per la verifica dello stato cutaneo, Incontri di Cosmetologia No. 3, 07/89**

Per la misurazione sia del sebo di superficie che dell'idratazione cutanea ci si è serviti di un sistema computerizzato denominato Dermotest Hytech dato dall'unione del Sebumeter SM 810 PC et del CORNEOMETER CM 820 PC, opportunamente collegati ad un PC mediante un adeguato programma di utilizzazione. Utilizzando il Dermotest Hytech è possibile ottenere direttamente sia i valori sebometrici espressi in mg/cm<sup>2</sup> che i valori della idratazione cutanea espressi in CV (corneometer values).

**A.O. Barel, P. Clarys, B. Wessels, R. van Straat, Quantitative Biophysical Measurements of the Mildness Properties of Cleaning and Detergent Products in Hand Immersion Test, Algemene en Biologische Scheikunde, Vrije Univeriteit Brussel, Belgium**

**H.I. Maibach, E. Patrick, Sampling Multiple Skin Sites Delineated by a Template Increase the Reality of Surface Sebum Measurement Units Using the Sebumeter, 7th International Symposium of Bioengineering and the Skin, 1988**

The variance of data collected by most techniques used to measure surface sebum level is large.

**L. Nogueira, D. Gabrielle, New techniques to assay skin care products, D & CI 09/88**

The skin is a complex organ with numerous functions, some remarkable subtle. Cosmetic products play an important role in maintaining the integrity of the skin, including restoration of the skin's slightly acidic pH (average 5 to 5.5).

**P. Thune, T. Gustavsen, Comparison of two photoelectric techniques for quantitative measurement of skin surface lipids, Acta Derm. Venerol. 1987**

A method for quantitative assessment of skin surface lipid by means of extraction with solvents, was first developed by Kligman & Shelley.

**H. Tronnier, Dermatologische Bewertung von Kosmetika und Körperpflegemitteln, Ärztliche Kosmetologie, 374-398, 1987**

The practicing dermatologist is interested in body care products and cosmetics because of their potential side-effects which may be allergic or primarily toxic. In view of skin physiology also cosmetics and body care products having special effects, such as light and skin protective preparations, deodorants and antiperspirants, dandruff and hair removing products, washing products and preparations which are supposed to have an anti-wrinkle effect on the skin, are of interest to the dermatologist. These preparations claiming a certain effect are opposed to the series of cosmetics which to some extent also make this claim, but on the whole have general effects such as improvement of the hydration of the horny layer and influence on the pH-value of the skin effects which, however, are also assigned to some special products. These preparations contain a number of active substances the effects of which are at least controversial and often difficult to prove. So, it is pointed out to the fact that just in case of body care products and cosmetics the effect of the basic substances used is essentially responsible for the effects of care.

**S. Dikstein, Comparison of the Sebumeter and the Lipometer, Bioeng. Skin, 197 - 207, 3, 1987**

Die Instrumente Lipometer und Sebumeter wurden durch gleichzeitige Messungen der zufälligen Lipidwerte an nebeneinander liegenden Stellen derselben Person verglichen. Der Koeffizient der Bestimmung zwischen den Instrumenten ist 92%. Das Sebumeter ist geeigneter für die Messungen eines raschen Screenings.

*P. Muti, E. Gelentano, S. Panico, F. Berino, Measurement of cutaneous sebum: reproducibility at different cleansing conditions, J. Appl. Cosmetol. 07-09/1987*

Within the feasibility stage of ORDET (Prospective Study on Hormons and Diet in Breast Cancer Etiology) a representative study on the measuring of the cutaneous sebum has been carried out.

*M.P. DePadova, A. Tosti, S. Veronesi, Gelatin-Cystine in Seborrheic Alopecia, J. Appl. Cosmetol. 04-06/1986*

The gelatin-cystine spherules seem to be able to affect the regulation of sebum genesis. In the order to demonstrate the sebum normalizing property performed by this product, a study was carried out on 60 subjects affected by seborrheic alopecia. A significant reduction of seborrhea was observed in 30% of the subjects taking the gelatin-cystine spherules for the period established. It was also observed a significant reduction of serine, proline, glycine, alanine, 1/2 cystine, valine, leucine and methionine is always found and a parallel increase of glutamin acid, phenilalanine and argine.

*S. Dikstein, W. Courage, Verteilung von Talgspiegelmessungen bei gesunden erwachsenen Frauen, Ärztliche Kosmetologie, 15, 41-44, 1985*

The sebumeter measures the amount of fats on the skin by absorbing it onto a thin plastic strip and measuring its transparency. The range of values relevant to medicocosmetics was established by asking experienced cosmeticians to define and classify the skin of over 150 women according to "Dry" (insufficient sebum level), "Normal" or "Oily". The skin was then measured by Sebumeter. 70-80 % agreement is present between the cosmetician's definition of "Dry" or "Oily" skin at the extremes, but in the middle the definition is casual. Tabulating the data into histograms permits in finding the best balance between the subjective cosmetic definition and the instrumental reading. On the forehead, Sebumetric readings of less than 90, and on the cheek and neck readings of less than 60 mean "Dry" skin. Sebumetric readings of more than 200 on the forehead, more than 160 on the cheek, and more than 100 on the neck, mean "Oily" skin. The advantage of using objective instrumental readings in place of observational methods is the prevention of misdiagnoses.

*H. Schaefer, Kuhn-Bussius, Methodik zur quantitativen Bestimmung der menschlichen Talgsekretion, Arch. klin. exp. Derm. 238/1970, 429-435*

Bei Milchglas nimmt die Lichtdurchlässigkeit durch Aufdruck kleiner Fettmengen stark zu. Diese Transmissionszunahme kann photometrisch erfaßt und durch Wägung des abgenommenen Fettes auf der Mikrowaage geeicht werden. Sie ist daher zur quantitativen Bestimmung des Hautüberflächenfettes geeignet. Durch vergleichende Messung mit bekannten, auf die Stirn aufgetragenen Vaselinmengen sind Rückschlüsse auf den Fettfilm und damit die Talgdrüsenfunktion menschlicher Haut möglich. Eine ins Einzelne gehende Testbeschreibung wird am Schluß der Arbeit gegeben.

*J.P. Pavlichko, A.M. Fleichner, A. Selner, Improvement in critical properties of emollience and crack reduction via direct additives, Toilet Soaps in Skin Care – Part I*

The recent study by the authors sought to achieve such improvements by simple, direct addition of compatible chemicals.

*U. Huschka, A. Schulewsky, Hauttalgsekretion und Haarshampoos, Ärztliche Kosmetologie, 1984*

Mit insgesamt 1520 Messungen wurde an 20 Probanden der Einfluß von vier Haarshampoos, die unterschiedliche Antischuppenwirkstoffe enthielten, auf die Rückfettung der behaarten Kopfhaut und der Stirn sebumetrisch mit der Kunststoffbandmethode untersucht. Im Gegensatz zu anderen Berichten war bei 85% unserer Probanden der Ausgangsfettspiegel auf der behaarten Kopfhaut nach der Wäsche innerhalb von 24 Stunden wieder erreicht; die vollständige Rückfettung der Stirn erfolgte bei 90% der Probanden zwischen 2 und 5 Stunden. Die Änderung der Rückfettung war durch Fettmessungen im kinetischen Bereich nach 2, nach 5 und 24 Stunden wesentlich empfindlicher bestimmbar als im Steady-state nach 72 Stunden. Die nach den ersten Haarwäschen einsetzende Änderung der Rückfettungsgeschwindigkeit verstärkte sich über mindestens 3 Wochen und war erst nach diesem Zeitpunkt eindeutig bewertbar. 0,6% Pyrithiondisulfid führte zu leicht verstärkter Rückfettung, 0,2% Pyrithiondisulfid mit 7% Dinatriumundecylensäuremonoäthanolamidosulfosuccinat war neutral, eher sebestatisch wirksam, 0,5% Octopirox führte zur Verstärkung der Rückfettung. Am behaarten Kopf und an der Stirn war die Wirkung der Inhaltsstoffe in der Regel gleichgerichtet.

*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.

**K. Zeller, H. Huben, Sebumetrische Messungen des "Casual Level" der Hautoberflächenlipide bei einem studentischen und einem geriatrischen Kollektiv hautgesunder Probanden,** Aktuelle Dermatologie, Juni 1983

Für dermatologische Reihenuntersuchungen wäre es wünschenswert, die in der Regel makroskopische Einschätzung des "seborrhöischen" oder "sebostatischen" Hautstatus mittels eines einfachen, leicht transportablen Meßgerätes objektivieren zu können. Es wurde daher an zwei altersunterschiedlichen Probandengruppen (223 Junioren, 116 Senioren) untersucht, ob mit einem neuen reflexphotometrischen sog. Sebumeter eine quantitative Untersuchung bezüglich des Hautoberflächenfettfilmes möglich ist. Das Gerät erwies sich vor allem im Hinblick auf eine semiquantitative Objektivierung des exsikkativen oder sebostatischen Hornschichtstatus brauchbar. Darüber hinaus wurden auch Geschlechtsunterschiede ermittelt. Anwendungsmöglichkeiten bestehen bei Einstellungsuntersuchungen für ekzemgefährdete Feuchtberufe (z.W. Friseure, Maurer, Stukkateure) sowie zur Früherkennung der sog. Alterssebostase.

**D. St. Léger, J.-L. Leveque, Les méthodes quantitatives des lipides de surface chez l'homme,** International journal of cosmetic science, 1980

Three main methods to measure quantitatively surface lipids in man have been used. A comparison of the information they produce and their routine practicabilities are given. Adaptation and standardization of the Schaeffer and Kuhn-Bussius method, using a photoelectric absorptiometer and ground glass plates are described. This procedure, applied to thirty-two adults, demonstrated the quantitative nature of the sampling mechanism. A mathematical approach gives the precise definition of the casual-level. This procedure shows that casual-level values appear to be correlated with skin types.

**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.

**S. Dikstein, A. Hartzshtark, R. Bercovici, A. Orgad, Distribution of sebum measurement in normal adult women,** 4th International Symposium on Bioengineering and the Skin, 09/83

The Sebumeter measures the amount of fat on the skin by absorbing it onto a thin plastic strip and measuring its transparency. The method is not sensitive to water. The instrument is calibrated so that in the range of 20-200 the readings are equal within 10% to the concentration of the sebum on the skin in  $\mu\text{g}/\text{cm}^2$ .

**Nur die Werbung geht glatt unter die Haut,** "Test" 01/1978

Mehr als die Hälfte aller Frauen – so die Umfrage des Magazins – benutzen täglich eine Universal- oder Spezial-Hautcreme.

**F. Greiter, S. Doskoczil, Forschung in der Kosmetik,** Österreichische Chemie-Zeitschrift, Juni 1976

Diese Arbeit ist ein Versuch, sinnvolle Forschung in der Kosmetik zu beschreiben und zu begründen. Nur neuere Methoden werden beschrieben. Bekannte Prüfungsverfahren einschließlich Spektralphotometrie und Gaschromatographie dürfen als üblich vorausgesetzt werden. Spezieller Wert wird auf das Gebiet des Sonnenschutzes gelegt. Auch die Notwendigkeit besonderer Emulsionsformen wird behandelt. Es wird daran erinnert, daß die Kosmetik nicht nur die Aufgabe des Schmückens (Kosmein), sondern vor allem auch der Reinigung, der Pflege und des Schutzes der Haut hat. Es wird ausgeführt, daß kosmetische Präparate, die zum Teil im Grenzbereich Kosmetik-Pharmazie liegen, einen Beitrag zur Fitneßbewegung leisten können. Es wird allerdings auch unmißverständlich dargelegt, daß Irreführung in der Kosmetik abzulehnen ist und eine weit gehende Deklaration der Kosmetikpräparate notwendig erscheint.

**H. Tronnier, Methodisches zum Nachweis des Hauttals unter besonderer Berücksichtigung der Akne,** Vortrag anläßlich der Tagung der Gesellschaft Deutscher Kosmetik-Chemiker e.V., 14.16-03.74

Die Problematik der Hautfettbestimmung wird beschrieben, die in der uneinheitlichen Zusammensetzung, in der unterschiedlichen Lokalisation und in der verschieden vollständigen Gewinnung des Hauttals begründet ist. Vor- und Nachteile der verschiedenen Methoden werden,

teilweise unter Heranziehung eigener Versuche, dargestellt. Von den drei für die Seborrhoe und die Erkrankungen des seborrhoischen Formenkreises in Frage kommenden Störungen im Hauttalgsystem, nämlich in der Menge, in der Zusammensetzung und im physikalischen Verhalten des Talgfilms auf der Hautoberfläche, scheint letzterem die wesentlichste Rolle zuzukommen. Dies konnte aus zahlreichen Untersuchungen einerseits bei der Akne und andererseits bei der Seborrhoe abgeleitet werden. Auf die Bedeutung des Verhältnisses von Talgmenge zur Spreitungsfähigkeit für die Ausbildung von Comedonen bei Akne wird anhand vergleichender Talguntersuchungen mit verschiedenen Methoden und unter Glucocorticoid-Medikation hingewiesen. Die bei Akne vorliegende Störung in dieser Relation wird an weiteren experimentellen Befunden erörtert.

*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.

*H. Tronnier, Brunn, Vergleichsuntersuchungen des Hautoberflächenfettes Hautgesunder und Aknekranker*, Berufsdermatosen, 79-88, 1972

Mit Hilfe einer aus Säulen-, Dünnschicht und Gaschromatographie sowie IR-Spektroskopie kombinierten Methode wurde eine Vollanalyse der Hautoberflächenlipide bei Aknekranken im Vergleich zu hautgesunden Kontrollpersonen durchgeführt. Aus den Mittelwerten von je 5 Probanden ergab sich: 1. Die Menge der Oberflächenlipide ist bei der Akne gering erhöht. 2. Bei der Auftrennung in die einzelnen Fraktionen waren in der Kontrollgruppe u.a. die Triglyzeride, bei der Akne dagegen die freien Fettsäuren vermindert. 3. Die Verteilungen im Übrigen entsprachen unter Berücksichtigung methodischer Unterschiede den Angaben in der Literatur. 4. Die möglichen Auswirkungen der gefundenen Differenzen auf die Pathogenese der Akne bezüglich der Gesamtverteilung auf die Fraktionen (z.B. Spreitung) und der Kettenlänge (z.B. Reizwirkung) werden erwähnt.

*M. Gloor, U. Schulz, G. Wieland, I. Wieland, H.C. Friedrich, Beitrag zur quantitativen Bestimmung der Hautoberflächenlipide in der Praxis*, Dermatologica 27.12.71

Es wird über Bestimmungen der Menge der Hautoberflächenlipide (casual level und replacement sum) mit Hilfe des Osmiumsäuretest nach Brun et al. an 33 Versuchspersonen und mit Hilfe des Milchglastests nach Schäfer und Kuhn-Bussius an 14 Versuchspersonen berichtet. An der symmetrischen Körperstelle wurden jeweils exakte gravimetrische Lipidbestimmungen nach der Methode von Honsig vorgenommen. Zusätzlich wurde die Zusammensetzung der Hautoberflächenlipide dünnschichtchromatographisch analysiert. Im Gegensatz zum Milchglastest erwies sich der Osmiumsäuretest als aussagekräftig. Die Zusammensetzung der Hautoberflächenlipide beeinflusst das Ergebnis beider Methoden nur wenig.