

In-Cosmetics 2018

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In-Cosmetics Global 2018 was held in Amsterdam and an important part of the event are the technical seminars. This is an overview of those that the author was able to attend.

This year the (unofficial) theme was protection: protection of products against microbial spoilage; protection of the human microbiota and protection of skin against UV radiation, blue light, pollutants and oxidative damage.

The search for alternative preservatives to protect cosmetics from microbial spoilage while avoiding the use of parabens, isothiazolinones, halogenated compounds and formaldehyde releasers continues. **Chemyunion** suggested Hebeitol CG as a synergistic combination of xylitol esters and caprylyl glycol as a broad-spectrum antimicrobial agent for micellar waters and wet wipes. A presentation by **DuPont Tate & Lyle** showed how Zemea propanediol worked well with the phenoxyethanol-based preservatives and boosted the preservative efficacy for gram-positive, gram-negative, and yeast organisms. A presentation by **Symrise** described product protection using caprylyl glycol, 1,2-hexanediol and pentylene glycol, either singly or in combination and one by **Adeka Corporation** was about the use of hexyl glycerin and cyclohexyl glycerin as multi-functional additives that improve emulsion stability, skin hydration and boost preservative efficacy. A presentation on behalf of **Emerald Kalama** gave formulation guidance for improving the efficacy for benzoate preservatives by utilizing chelators, glycols, and preservative synergies in challenging cosmetic formulations.

Lanxess described overcoming the problem of providing adequate preservation of products at pH7 and above using phenoxyethanol with ethylhexyl glycerin and triethylene glycol. Sunscreen preparations that use mineral filters and polar oils pose a problem, stated **Schulke** and suggested Euxyl PE 9010, Sensiva SC10 and Sensiva PA40. These three materials are multi-functional and stable to hydrolysis, pH and high temperatures. A presentation by **Evonik Dr. Straetmans** described its new Dremosoft Decalact range of four multifunctional materials based on sodium caproyl/lauroyl lactylate and triethyl citrate that penetrate the plasma membrane of fungi and yeasts. They were suggested as suitable replacements for triclosan and do not disturb the delicate balance of the skin microbiome.

The human microbiome is the sum of the genomes of the skin microbiota, which is the combination of bacteria, fungi, archaea and viruses that inhabit various areas of the skin. Barbara Brockway chaired a workshop on the human biome and said that the skin is an ecosystem that supports a diverse range of microorganisms. Each microbe has its own unique genetic material and most microbes are harmless or even beneficial to their host. Homo sapiens has approximately 30,000 genes and microbial symbionts of Homo sapiens have approximately 15,000,000 genes. Latest research shows mutual dependence between the microbiota and its host and how cutaneous immune responses can modulate the skin microbiota, but the microbiota also functions in educating the immune system.

ProDerm is a company that specialises in clinical trials and it presented the results of a two-year study into the skin biome with a focus on unwanted microbes and suggested that the body could be divided into three regions; sebum-rich, damp and dry. The microbiome of healthy skin produces antimicrobial peptides and maintains an acid pH, which also limits bacterial growth. The presentation discussed claims that could be made for products created to support a healthy

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microbiome and illustrated this with a case study involving a deodorant and its effect on biodiversity.

Presentations by material suppliers that claimed to be sympathetic to preserving a healthy microbiome included that by **Corum**, which said recent studies provided new insights into the links between bacteria and skin disorders by identifying various skin habitats with distinct patterns of microbial composition. High concentrations of *P. acnes* are often found in sebaceous areas of oily and acne prone skin. **Corum** suggested that its new material, Apobac [Azelamidopropyl dimethyl amine] reduces ROS production and inflammation caused by *P. acnes* and promotes wound healing. A presentation by **Silab** described its multi-disciplinary approach to developing Ecobiotis by investigating the microbiota of floral nectar. Nectar is rich in sugars and is colonised by the yeast *Metschnikowia reukaufi*, which metabolises nectar to produce metabolites. Ecobiotis is an extract of this yeast and **Silab** claims that it specifically rebalances the microbiota of mature skin by reinforcing its immune and mechanical barriers and it acts on the distribution of bacterial communities.

There were many other presentations about materials claiming to support the microbiota; one by **Gova** discussed the interrelationships between the different organisms and how PreBIULIN supports and restores the skin microbiota. **Lipotec** suggested that the industrial revolution was responsible for a loss in microbiotas diversity and an increase in skin sensitivity and inflammatory disorders. It claimed Fensebiome is a new peptide that helps strengthen urban and sensitive skin by promoting a healthy microbiome to restore vulnerable skin to its original condition. Skinolance is a lactobacillus extract from **Evonik**, claimed to support a healthy appearance of the skin by stimulating the growth of selected beneficial bacteria to restore and keep the natural balance.

Quora Noni from **Vytrus Biotech** is claimed to work on the communication system between the microbes comprising the microbiota. It was suggested that microorganisms communicate to coordinate gene expression, collective behaviours and population densities by a process involving volatile biochemicals called quorumones and the process is termed quorum sensing. Vytrus Biotech claims that Quora Noni PRCF is the concentrated metabolome of totipotent cells rich in anti-quorum sensing molecules specially designed to act against quorum sensing mediated dysbiosis. It shows a broad-spectrum bacteriostatic effect by modulating the communication pathways between bacterial colonies.

Rahn claimed that overproduction of sebum changes the equilibrium of the commensal microflora on our skin. To prevent aggravation of comedones and acne formation multiple physiological constraints need to be overcome. The skin's microflora needs to re-balance to prevent proliferation of *P. acnes* and reduce inflammatory reactions and keratinocytes and sebocytes need to be reprogrammed. **Rahn** introduced its award-winning Seboclear-MP said to optimise the skin microbiota and inhibit *P. acnes* and the inflammatory arachidonic acid pathway, thus preventing 5 α -reductase from forming DHT and resetting the morphology of sebocytes.

Providing protection of the microbiota against air-borne pollutants and blue light was the claim made by **Indena** for Vitachelox. Blue light is high-energy visible light (HEV) of wavelength between 380 nm and 495 nm and represents 40% of solar radiation reaching the earth's surface. It is also emitted by TVs, smart phones, tablets and computers. While short-term exposure is therapeutic long-term exposure causes development of ROS, causing protein carbonylation and the overwhelming of cellular antioxidant systems. Vitachelox is a mixture of extracts from *Vitis vinifera*

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(Grape) seeds, Camellia sinensis leaves and extracts of Quercus robur (Oak) wood and bark. Trials show it protects skin proteins from blue light and pollutants and in doing so it protects the skin microflora and controls proliferation of P. acnes.

Using blue light to activate key cell-repairing enzymes was the claim made by **Greenaltech** for Algaktiv GenoFix Day derived from micro-algae. The second material described was Algaktiv GenoFix Nite, which activates cell repair mechanisms using energy-free enzymes that boost DNA repair and antioxidant systems while the body is at rest. Many biological functions follow the circadian rhythm, but blue light can disrupt this by generating ROS within the cell. Protection of the cells' biological rhythm to prevent the appearance of skin fatigue was the claim made for Circadian presented by **Clariant**.

In the presentation by **Innospec** for Maritech Reverse it was claimed that it protects and soothes the skin and improves elasticity by inhibiting key enzymes responsible for aging. Providing protection from UV light is the claim made for Maritech Brite that captures the combined skin brightening and antioxidant effects of fucoidan and marine polyphenols obtained from Fucus vesiculosus. It provides UV protection, reduces age spots and boosts the expression of the anti-aging protein SIRT-1.

Presented by **BASF**, protection from UV radiation is the function of Tinosorb S Lite Aqua, which is oil-soluble bis-ethylhexyloxyphenol methoxyphenyl triazine (BEMT) encapsulated in acrylates/C12-22 alkyl methacrylate copolymer to provide a stable aqueous dispersion. When combined with BEMT and other oil-soluble UV absorbers it delivers a homogenous and water-resistant film of UV broad spectrum protection on the skin. A presentation by **ADP Cosmetics** described a range of non-nano silica-coated titanium dioxide and zinc oxide filters that it claims can offer SPF values higher than the values of uncoated nanoparticles.

Hallstar presented the benefits of using pourable liquids when working with mineral UV filters. It claimed control of particle size distribution and a coating system that prevented agglomeration of mineral particles delivered high performance, non-whitening sun care. It was also shown that the coating system reduced the possibility of free radical generation within the dispersion. Whatever the cause, combatting ROS is a continuous problem when discussing skin disorders. BergaCare Smart Crystals Rutin from **Berg + Schmidt** are sub-micron size crystals of rutin. Typically, 0.2-0.5 µm, the enormous increase in surface area gives the normally insoluble rutin new physical properties. The crystals have a high adherence to skin giving prolonged release of their antioxidant properties into the epidermis, providing protection against UV and oxidative damage.

It's not only people that suffer from UV light and free radical oxidation; according to **Sensient** fragrances also need protection. Sensorb CF+ is a combination of UV absorbers and antioxidants that protect both the colour and odour of fragrances. Exhaustive tests of an extensive range of fragrance materials over a wide combination of pH, UV exposure and temperatures were presented to illustrate its efficacy.

Outdoor pollution originates primarily from industrial processes and road and air traffic. Primary pollutants can be subdivided into two main groups: particulate matter (PM) and gases such as nitric and nitrous oxide, sulphur dioxide and volatile organic compounds. Air-borne pollution can exacerbate inflammatory disorders and be a carrier for polyaromatic hydrocarbons (PAHs)

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associated with extrinsic premature aging. It may also alter the composition of the skin microbiome and skin barrier, leading to oxidative stress via ROS and oxidation of proteins, lipids and DNA.

A presentation by **BASF** showed a multi-part approach to safeguard the skin against pollutants with lipids and emulsifiers also playing a part. This total approach resulted in an antipollution matrix BASF called PatchH2O. Stopping pollutants adhering to the skin was the role of Tinovis GTC UP [INCI: Acrylates.behenth-25 methacrylate copolymer], which provides a protective anti-adhesion film. Protection from urban pollution was claimed for Blue Oleoactif from **Hallstar**, which is a soybean oil extract of rice containing tocopherols, gamma-oryzanol, phytosterols, phytic and ellagic acids, which provide high antioxidant, photo-protective and anti-inflammatory properties. Seastem from **Ashland** is an extract of giant kelp, *Macrocystis pyrifera*, that mitigates free radicals induced by pollutant nanoparticles and maintains skin regeneration potential and vitality, protecting the skin barrier function and improving skin hydration.

This is just a small selection of the many presentations given, more of which will be discussed in future issues.

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