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Hallstar Innovation in Clean, Elegant and Safe Sun Care

Interview with Felicia Parks, Ph.D.,
Technical Director at Hallstar Beauty

It is increasingly challenging to develop globally acceptable sun protection products that work within regional limitations on allowableUV filters, levels and combinations. How does Hallstar assist formulators with this challenge?

The first challenge for any ingredient supplier is tracking all the ever-changing global restrictions for sun care products. Hallstar maintains a strong understanding of current and anticipated global regulations and regional legislation so it can quickly produce customer solutions that address any proposed changes.

There are two common themes in regulatory: restricted and open markets. A ‘regulatory restricted‘ designation generally applies to organic UV filter packages, as the global regulations for inorganic filters are more similar across regions when it comes to maximum usage levels. The United States is an example of a regulatory and regionally restricted market since the US government permits only a handful of organic UV filters – making it nearly impossible to obtain SPF 30 and above in a sun care formulation without critical performance aids. These performance aids are used to photostabilize the formula, provide solvency for crystalline organic UV filters, promote uniform distribution of actives on skin, improve water resistance of the formulation, optimize skin feel to promote use of the appropriate quantity of sunscreen, and impart physical stability.

Hallstar has a suite of materials that, individually or in combination, provide this type of support to sunscreen development, enabling higher performing global sunscreen product development that meets regulatory restricted market requirements. For example, Hallstar’s photostabilizers – triplet and singlet excited state quenchers and solvent polarity optimizers – reduce the photodegradation from any combination of UV filters and other actives, which effectively increases finished products‘ SPF and PFA.

With your Micah® photoprotection technology, you won the Innovation Zone Silver Award at in- cosmetics some years ago. Why do you call Micah an ‘ante-oxidant?’

Even now, four years after we took home the in-cosmetics Global Silver for Micah® [INCI: Bis(Cyano Butylacetate) Anthracenediylidene], it is still an ingredient ahead of its time. By focusing research on light-induced oxidative stress – specifically, how to stop the generation of reactive oxygen species (ROS) – Hallstar chemists developed a

new technology that, rather than repair already-damaged DNA or block some of skin's exposure to ultraviolet or visible light, protects by quenching excitation of skin's [endogenous] photosensitizers. Photo-induced aging damage is thus avoided because the formation of singlet oxygen and other ROS is stopped before it starts. For this reason, we refer to Micah® as an '*ante*-oxidant.'

You have made further studies on this molecule. What did you find out?

Singlet oxygen is an extraordinarily reactive molecule. When singlet oxygen attacks cell membranes, it can create leakage, cell death, and most visibly, peroxidation. You'll see this when you leave a book out in the sun: the book cover becomes photobleached (i.e., color molecules are destroyed) in a matter of days.

But it is singlet oxygen's impact on cell DNA that is especially catastrophic for skin. There is a cause and effect relationship between DNA damage and the onset of inflammation. We also know that the inflammatory response is the single most effective mechanism for accelerating skin aging. One singlet oxygen molecule can introduce one single 8-OH-dG (or lesion) in one DNA molecule and that alone will trigger what is called the NFkB cascade – the onset of inflammation that entails a chain reaction of thousands of molecular modifications in the cell membrane, as well as the over-expression of MMP-1 which destroys collagen and other elastic fibers.

Given this reality, Micah®'s ability to prevent virtually 100% of UVA-induced 8-OH-dG lesions is the most significant finding of the new *in vivo* tests – and it puts Micah® in a category all its own.

Consumers want natural ingredients in their products. What new natural ingredients do you offer for sun care products?

While beauty customers who strongly prefer natural ingredients are historically known to make concessions for effective anti-photoaging chemistry like Micah®, interest in nature-derived beauty has continued to increase rapidly. Add to that the recent proliferation of sun care regulations limiting permissible UV filters and the accelerating popularity of mineral sunscreens, and you can understand why we're so excited about introducing several all-natural sun care ingredients this year.

We're beginning our naturals expansion with multifunctional SolaPure™ Glo [INCI: Vegetable Oil, Simmondsia Chinensis (Jojoba) Seed Oil, Curcuma Longa (Turmeric) Root Extract]. SolaPure™ Glo is inspired and guided by nature – and more specifically by the inherent culinary, beauty and wellness benefits of turmeric. The curcuminoids found in turmeric plants boast anti-inflammatory, antioxidant and anti-microbial properties, and have even been known to reduce the ROS production that leads to oxidative skin damage. SolaPure™ Glo leverages curcumin's benefits to improve sun protection's SPF and PFA performance, control hyperpigmentation and promote overall skin wellbeing.

Emulsifiers play an important role in sun care formulation. Do you have solutions for the formulators?

Hallstar has always recognized the impact that performant emulsifiers can have on successful sun care formulations. Functional bases form fluid (even sprayable) sun care lotions, enhancing the texture and viscosity of formulation and improving emulsion stability, sensorial profile and dermatological compatibility.

Over the years, Hallstar Beauty has launched some of the world's most successful emulsifiers, emollients and surfactants. The fatty acid composition of these products and their ability to generate liquid crystal structures that biomimic the strateum corneum organization of human skin allow for light, nourishing ingredients with exceptional sensoriality.

Our newest cold process emulsifier, Olivem® 2090 [INCI: Polyglyceryl-4 Olivate/Polyricinoleate], is a water-in-oil, nature-derived ingredient that is especially well-suited to sun care. In addition to improving spreadability and enabling an excellent after-feel, Olivem® 2090 allows a reduction in solvent quantity and makes it easier to formulate with inorganic UV filters and powders as well as organic sun filters because of its all-natural powder dispersion properties. Its simple emulsification process can be achieved with either cold or hot process, making Olivem® 2090 very versatile.

For organic UV filter based systems, another Hallstar cold-process emulsifier, Olivem® 2020 [INCI: Ethylhexyl Olivate, Sodium Acrylates Copolymer, Polyglyceryl-4 Olivate] provides the ability to stabilize high oil phases with 0.5 – 2.0% with no additional emulsifiers or thickeners, enabling a wide variety of viscosities from a lotion spray to a gel or cream. In addition to the sensory contribution, this reduction in emulsifiers and thickeners provides improved skin feel.

The positive impact of our Olivem products on sensoriality and spreadability is critical to successful sun care formulations. After all, the safest and most effective sunscreen is the one you are willing to use regularly!

Tags

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