



by Michael Q. Pugliese

skin | smart ingredients

sophisticated skin care

DNA, which contains multiple chromophores. A chromophore is a molecule that is particularly attractive to light, and absorbs UV radiation, changing its color and/or structure. Without the use of a sunscreen, this interaction can generate abnormal DNA, and leads to potential carcinoma, or cancer.

3. It can re-configure its molecular structure to be able to contain the extra energy.

The problem with these methods of energy dissipation is that they are all potentially damaging or irritating to the skin, particularly the re-configuring of a molecule. Molecules are joined together

AS PROFESSIONALS AND CONSUMERS, we have been taught that using a sunscreen is critical for the long term protection of the skin. With advances in sun care, we are now able to make safer and more effective sun protection products with the addition of breakthrough technologies.

The focus of this article is a new technology called Solastay® S1 (ethylhexyl methoxycrylene), which is categorized as a photostabilizer. First, let us briefly review exactly what a sunscreen is, what it does, and the difference between physical and chemical sunscreens.

Quite simply, the purpose of a sunscreen is to prevent ultraviolet radiation from interacting with the DNA and other structures in the skin. Physical sunscreens (titanium dioxide and zinc oxide) are thought to mainly reflect light, rather than absorb the high energy, but this remains debatable. A chemical sunscreen, also known as a UV filter or a UV absorber, intercepts and absorbs the energy of the photons before they can reach the

SOLASTAY® S1 IS RECOGNIZED AS THE MOST EFFECTIVE PHOTOSTABILIZER ON THE MARKET, PARTICULARLY WHEN USED WITH AVOBENZONE AND OCTINOXATE.

What happens then to this extra energy that has been absorbed by the sunscreen? Much of the controversy surrounding chemical screens revolves around this question.

Once the chemical screen absorbs the ultraviolet radiation, the molecule enters a heightened energy state known as a singlet state. In the singlet state, the sunscreen is no longer capable of absorbing UV light, and therefore must lose this energy.

There are three ways the chemical sunscreen traditionally dissipates the additional energy:

1. It can radiate as light of a lower energy. This is known as fluorescence.
2. It can give off heat.

er with chemical bonds of a strict shape and a specific energy level. When more energy is absorbed by a molecule than its structure will accommodate, the molecule alters its shape to contain this extra energy. When this happens, it becomes a new chemical. These molecules are called adducts, and they can be dangerous. Adducts can act like a foreign body, or combine with other materials. With use of a quenching agent, however, this risk is greatly reduced.

A quenching agent is any material that deactivates a molecule in the excited, or singlet, state. The role of a photostabilizer such as Solastay® S1 is to "quench" the high energy level in the *continues*

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sunscreen by accepting this extra energy from the sunscreen itself. This allows the sunscreen molecules to return to a normal, or ground state, and again absorb UV light. The key concept to remember is that the excited molecule (in the sunscreen) transfers its high energy to a nearby accepting molecule (the photostabilizer, or quenching agent), which dissipates the high energy of the donating molecule. The quenching molecule is able to dissipate this extra energy safely and enter into the quenching reaction over and over. Possibly the most intriguing aspect of this ingredient technology is that these processes are occurring sequentially, each in less than one thousandth of a second.

INCREASING SOPHISTICATION IN
THE DEVELOPMENT OF "SMART"
FUNCTIONAL RAW MATERIALS
PROVIDES FORMULATORS
WITH THE HIGHEST DEGREE OF
PRODUCT PERFORMANCE.

Solastay® S1 is recognized as the most effective photostabilizer on the market, particularly when used with avobenzone and octinoxate. This product makes sunscreens not only safer, but more effective as well. It has also been shown to reduce photosensitivity associated with the use of chemical screens. This allows adequate sun protection, particularly for skin types with sensitivity issues including rosacea, acne and nonspecific dermatitis.

Increasing sophistication in the development of "smart" functional raw materials provides formulators with the highest degree of product performance. The true art of cosmetic chemistry requires superior ingredients in the effective dose concentrations. The client then can enjoy an elegant product that is pleasant to use and also provides a cumulative improvement in their appearance. ■

Michael Q. Pugliese is the CEO of Circadia by Dr. Pugliese and the Circadia Institute of Advanced Esthetics. Pugliese and his grandfather, Peter T. Pugliese, M.D., hold in-depth classes on a variety of subjects, including cosmetic chemistry and histology of the skin. Pugliese is a licensed esthetician in the state of Pennsylvania, and holds a degree in business management and marketing from Kutztown University.

