

skin|UVB damage is lethal

by Rob and Carol Trow

The results are in. The most damaging form of ultraviolet (UV) light is UVB, not UVA. That is not to say that UVA is safe—it too can cause cancer, as UV rays of any kind have been indisputably acknowledged as carcinogens.

Types of rays

There are three types of ultraviolet rays: UVA, UVB and UVC.

UVA rays have a slow effect on the skin, a longer wavelength and are poorly absorbed by the ozone layer. They are weaker than UVBs but 1,000 times more common.

It should also have antioxidants to help fight free radicals. Do not be misled by high SPF ratings.

New research findings

Research published in July of 2008 by the Federation of American Societies for Experimental Biology (FASEB) acknowledges that while both types of UV rays are harmful, the body finds it harder to repair the damage caused by UVB rays. This includes harm to DNA. Simply put, UVB rays are more likely to age the skin and cause skin cancer. The FASEB is arguably the most cited biology journal. With the

Solar mutations specific to UVB rays are also more difficult for the body to repair, thereby causing more damage to the skin.

UVB rays have a medium wavelength and are 500 to 800 times stronger than UVA rays. They cause visible damage, commonly seen as redness and blistering and are a major cause of sunburn and skin cancer.

While UVC rays are the most powerful, at present they do not penetrate our atmosphere. If they did, we would all be in serious trouble as they are capable of burning through the skin.

An interesting fact: most sun damage is the result of normal sunlight exposure obtained through daily activities such as driving, shopping, walking, etc. That is why it is vital to regularly apply a sun care product that is broad spectrum and has both physical and chemical protec-

tion. It should also have antioxidants to help fight free radicals. Do not be misled by high SPF ratings.

ever increasing rate of skin cancers, learning the mechanisms of what exacerbates tumor growth can lead to the creation of a new generation of sun care products that will offer more protection.

According to the lead researcher, "This study fills the gaps in the knowledge of mechanisms involved in sunlight associated skin cancers, which cover various aspects of DNA damage and repair and genetic alterations."

These findings will facilitate the identification of criteria to determine the efficacy of consumer products such as sunscreens in helping to prevent or minimize sun damage to the skin. Gerald Weissman, M.D., editor of *The FASEB Journal* believes this research will play a



major role in the development of more effective sunscreens and after-sun products. He also expects it will have an impact in studying how sun exposure leads to tumor formation.

In technical terms, despite the predominance of UVA relative to UVB in overall sunlight, mutations to the fibroblasts caused by UVB are more prevalent. Solar mutations specific to UVB rays are also more difficult for the body to repair, thereby causing more damage to the skin.

The carcinogenicity of UVB is due to the ability of its waveband to induce promutagenic DNA lesions. This study is vital in that it paves the way for further research that will help unravel the underlying mechanisms of sunlight induced carcinogenesis. ■

Rob and Carol Trow, his wife, own *Derma-Concepts USA*, the eastern U.S. (excluding metro NYC) distributors for *Environ® Skin Care*. Rob has been in the skin care field for more than ten years and has authored multiple articles for trade publications.

skin | can sunscreen damage skin?

by Rob Trow

A recent study (University of California, Riverside) found ultraviolet filters in sunscreens, which help keep out ultraviolet radiation, can generate compounds that attack skin cells. In the study, researchers found many ingredients in sunscreens penetrate the skin, which is not perceived as healthy. In addition, sunscreens generate reactive oxygen species (ROS), which are harmful compounds.

How this happens

Ultraviolet filters reduce the amount of ultraviolet radiation that can penetrate the skin. These filters penetrate into the skin, below the epidermis, and leave the body vulnerable to ultraviolet radiation. Many sunscreens contain nano-particles that can facilitate the penetration of harmful ingredients. The higher the SPF, the more the chemicals.

The study found three ultraviolet filters (octylmethoxycinnamate, benzophenone-3 and octocrylene) generate naturally produced ROS. Additional ROS are generated when the filters have penetrated into the skin. Frequent re-application of sunscreen helps prevent this. The study proposes sunscreens that combine filters with antioxidants may be a good solution, as antioxidants have been shown to reduce ultraviolet-induced ROS levels in the skin.

Cancer link

ROS react with cell walls, lipid membranes, mitochondria and DNA; lead to skin damage; and increase the signs of extrinsic aging. This is consistent with

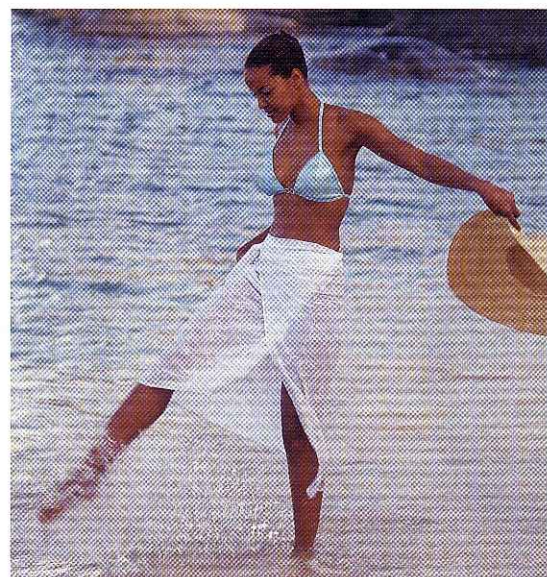
a 1999 finding from a biochemist who suggested the chemicals in sunscreens could cause cell damage and lead to increased risk of cancer because of the creation of free radicals. But many sunscreen manufacturers feel these studies are confusing and not conclusive.

Sunscreens that contain physical and chemical blockers plus antioxidants are the best choices.

Dr. Martin Weinstocks analyzed 13 studies concerning sunscreens and cancer. He found mixed results: four showed increased risk; three, decreased risk; and six were inconclusive. An Australian study concluded many sunscreens do little to stop UVA rays that may play a significant role in the formation of melanomas.

From 15 to 60

There is little difference between an SPF 15 versus 60. SPF ratings measure the ability to filter UVB rays, not the more dangerous UVA ones. It may be safer to use an SPF 15 (90 percent protection) versus 60 (only slightly more) as the higher SPF may lead to longer sun exposure, provide a false sense of security, depress the immune system, increase the amount of chemicals that can penetrate into the skin and exacerbate the signs of aging and melanoma development. The government is revising the entire sunscreen rating system to better help inform us all.



What we do know

Sunscreens that contain physical and chemical blockers plus antioxidants are the best choices. It may also be wise to apply an antioxidant cream that contains vitamin C and/or E with sunscreen to help limit free-radical formation and the resulting chemical damage. Product should be reapplied no less than every two hours, protective clothing (shirts, hats, sunglasses) should be worn and clients should avoid sun exposure between 10 a.m. and 2 p.m. Tell clients to never allow themselves to get a burn. ■

Rob Trow owns *DermaConcepts USA*, the eastern United States (excluding metro NYC) distributors for *Environ Skin Care*. He has been in the skin care field for more than 10 years. Trow is a frequent speaker. He holds two master's degrees and did his doctoral studies at Harvard University.