

# HAPPY NEW SUNSCREEN YEAR!

**J**UNE 18, 2012 is the day the first Final Rule ever for sunscreen regulations in the US will be finalized and enforced. That segment of the regulations allows manufacturers to claim that “sunscreen reduces the risk of skin cancer and early skin aging when used as directed” providing that their products meet the following minimum requirements: an SPF of 15 or higher, a broad spectrum protection with a critical wavelength of 370nm or higher, and select additional changes on the packaging Drug Facts Panel (PDF).

Upon contacting Dr. Reynold Tan from the FDA for an update on progress, he diplomatically answered, “We have internally discussed the issues raised about the Final Rule (testing and labeling), Proposed Rule (SPF 50), and the ANPR (sprays and other dosage forms) within our FDA division (Office of Drug Evaluation IV—Division of Nonprescription Regulation Development).”

I am hopeful that these issues will be addressed and resolved fairly soon and end the saga that has spanned almost four decades since regulations of the

sunscreen industry were first proposed in the early 1970s.

The efforts of the Skin Cancer Foundation ([skincancer.org](http://skincancer.org)), the Personal Care Products Council ([www.pccp.com](http://www.pccp.com)), the American Association of Dermatologists ([www.aad.org](http://www.aad.org)) and many manufacturers to educate the public about the hazards of overexposure to the sun are to be applauded. Still, misinformation, misconception and scare tactics articles about sunscreen permeate the internet and the airwaves. Articles such as “Sunshine Helps Prevent Skin Cancer, While Sunscreen Promotes It” ([www.naturalnews.com](http://www.naturalnews.com)), “Are Sunscreens Harmful to Your Health?” ([www.thewellnessguys.com](http://www.thewellnessguys.com)) and many more remain in the mainstream realm of cyberspace.

In a recent video widely circulated on the internet ([www.naturalsunscreen.org](http://www.naturalsunscreen.org)), the presenter extols the virtues of the three most important natural sunscreen ingredients—shea butter, coconut oil and sesame oil—as being “REALLY good for your skin” and promising that these natural ingredients will “protect [you] from the sun without the chemicals that burn the sensitive skin.” If strictly adhered to without any other UV filters in the formulation, it’s a recipe for toasting and basting sunbathers! Myths must be debunked, and legitimate concerns regarding the safety and effectiveness of sunscreen to protect against skin cancer must be addressed. The top consumer companies and the organizations mentioned in this column must step up their campaigns to address safety and effectiveness issues.

In a recent article entitled “They Are Determined to Scare You” by Alan Caruba from the Canada Free Press ([www.canadafreepress.com](http://www.canadafreepress.com)), the author noted, “We are bombarded by lies from environmental



When did coconut oil become a UV protectant?

and consumer groups, all of whom have their own agendas, which usually are intended to stop technological and other advances, denying their benefits to humanity.”

Caruba blasted the Environmental Working Group May 2011 report ([www.ewg.com](http://www.ewg.com)) for claiming that “the majority of sunscreens are unfit to use.” Caruba’s response echoed the one generated by the American Council on Science and Health (ACSH) in its report “The Top 10 Unfounded Health Scares of 2011.” The EWG’s claim that sunscreens were “unfit for use” was listed as No. 5 in the Top 10 Health Scares of 2011. The ACSH’s rebuttal and its report are very interesting and informative. The ACSH and The National Anxiety Center, founded by Caruba, are two examples of individuals and groups addressing misinformation, celebrity science myths ([www.anxietycenter.com](http://www.anxietycenter.com)) and exaggerated claims. Unfortunately, Caruba concluded that “the lesson learned is that all scares often do not die even when debunked, and new ones are always waiting to be sprung.”

Several new websites provide information about these new regulations and about the hazards of non-protection



**Nadim Shaath**  
Alpha Research  
& Development Ltd

*Dr. Nadim Shaath is the president of Alpha Research & Development, Ltd. in White Plains, NY. He has over 30 years of experience as chairman of the chemistry department at SUNY-Purchase and the CEO of Kato Worldwide. Recently he formed a consulting company serving the cosmetic industry called ShaathMeadows Corporation (SMC) with laboratories in New York, New Jersey, Texas, Florida and Egypt. He can be reached at [alphamd@aol.com](mailto:alphamd@aol.com).*

from the sun. An educational site, [www.suncreenguide.com](http://www.suncreenguide.com), was created by Dr. Steven Wang, a researcher from the Memorial Sloan Kettering Cancer Center, who is interested in providing information to the public about photoprotection. According to Dr. Wang, "Application of sunscreen remains as one of the most important strategies for the public to prevent sunburn, photoaging and skin cancer. There is no doubt enormous progress has been made through decades of collaborative research among the scientists, formulators, basic researchers and medical professionals."

Dr. Wang noted that modern sunscreens have delivered more uniform UV protection and have expanded coverage to the long-range UVA wavelength.

"In the coming decades, the quality and safety profile of future sunscreens will continue to improve. Close collaborations are needed among the different stakeholders to develop superior products," he said. "More importantly, ongoing education to the public regarding photoprotection remains of paramount importance. The public needs to be reminded about the hazards associated with excessive amounts of UV exposure. They need to be informed that an overwhelming body of research has been published, which demonstrates the safety, efficacy and health benefits associated with sunscreen use."

I applaud the efforts of Dr. Wang, who has requested feedback and suggestions from our readers on possible improvements to the site.

Regarding litigation, there has been a flurry of lawsuit activity concerning claims, infringement on patents, etc. by marketers. Also, the National Advertising Division (NAD) of The Council of Better Business Bureau ([www.elsevierbi.com](http://www.elsevierbi.com)) recommended that Merck, the maker of Coppertone, discontinue its sunscreen claim that products with a sun protection of 15 or higher "protect across 100% of the UVA/UVB spectrum."

Merck complied after issuing the following statement that while "it disagrees with the NAD's view about other conveyed messages, Merck Consumer Care

will take the NAD's view into consideration in its advertising going forward."

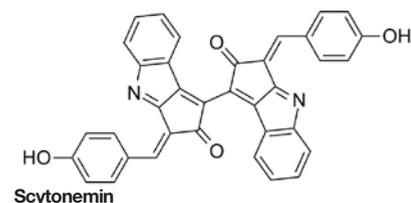
On Dec. 21, 2011 the FDA was sued by a coalition of six consumer safety groups. These six groups, led by the International Center for Technology Assessments (ICTA), cited the FDA's chronic failure to regulate materials derived from nanotechnology used in sunscreens, cosmetics and drugs. The lawsuit demands the FDA's response to a petition that the coalition filed in May 2006, which called for regulatory action ([www.nanotech-now.com](http://www.nanotech-now.com)). Also in December, the cosmetic firm Bare Escentuals ([www.elsevierbi.com](http://www.elsevierbi.com)) filed in a citizens' petition with the FDA requesting that powder-based sunscreen products be included in the OTC sunscreen monograph since they are "substantially indistinguishable from topical sunscreen products already listed."

### Natural Alternatives?

Meanwhile, scientists are creating more efficacious sunscreen products and UV absorbing filters. One trend in the industry that I subscribe to has been to try and emulate how plants, algae, microorganism, coral, etc. produce natural products and ingredients to seek protection from the harsh elements of nature, most notably the damaging effects of the sun. This trend, which attempts to unravel how Mother Nature provides for its plant and animal kingdom to survive the elements, may unlock the secrets to a unique mode of naturally-derived UV protection. Here is a summary of some of the recent research that show great promise for finding the key to unlock these secrets and provide improved protection from the sun:

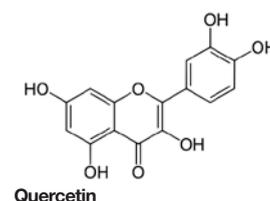
1. Isabella Karlsen, in her Ph.D. thesis from the University of Gothenberg entitled "Chemical and Dermatological Aspects of UV Absorbing Compounds," claims that a substance from bacteria can lead to allergen-free sunscreen ([www.eurkalert.org](http://www.eurkalert.org)). She describes the UV filter Scytonemin, found in certain cyanobacteria that live in the habitat exposed to very strong sunlight, absorbs UV radiation and thus protects the bacteria from being damaged by the sun's damaging rays.

Scytonemin is a novel dimeric molecule of indolic and phenolic subunits with a molecular weight of 544g/mol. It is a photostable molecule with broad-spectrum absorption encompassing the entire region from 325-425 with a max of 375nm!



An interesting review on microbial sunscreens by Gao and Pichel (*Nature Review Microbiology*, 9,791-802, November 2011) listed scytonemin, mycosporins and naphthalene-based melanin as potential candidates for UV protection.

2. A study conducted by Ed Kohl from the University of Saskatchewan ([www.saskatoon.ctv.ca](http://www.saskatoon.ctv.ca)) reported on a compound found in plants called quercetin that promised to offer protection from UV radiation. These flavonoids are broad spectrum and protect the plant from both UVA and UVB rays. Quercetin is found in black and green tea (2,000 mg/kg), capers (1800mg/kg), lovage (1700mg/kg), apples (440 mg/kg) and onions (190 mg/kg). Quercetin (C<sub>15</sub>H<sub>10</sub>O<sub>7</sub>) with a molecular weight of 302g/mol has an IUPAC name of 2, (3,4-dihydroxyphenyl)-3,5,7-trihydroxy-4H-chromene-4-one.



3. Diego Libkind, a biologist at the Institute of Biodiversity and Environmental Research, Bariloche, Argentina, found a microsporine molecule in yeast that allows it to survive the conditions of high incidents of radiation. "Often these mechanisms of adaptation and survival produce compounds that may be useful for humans" (*Environmental Journalist*, Dec. 5, 2011).

4. I have reported on coral's potential in the past. Coral is often found in shallow waters and therefore naturally produces a type of UV filter for protection from the sun's UV rays. A collaborative study from London's Kings College, Australia's Institute of Marine Science and the University of Maine hopes to synthetically recreate this recently identified natural sunscreen for human use ([www.isaa.org](http://www.isaa.org)).

5. Other notable research on natural products that may yield ultraviolet filters and ingredients with potential for use in humans as protectants from the sun (read 2011 issues of *The Sunscreen Filter* in HAPPI) include:

- US scientists reported that broccoli extracts with the antioxidant sulfurane reduces sunburn and tumor development.
- Extracts from the Totara and Manuka trees act in a similar way to broccoli, according to scientists from a New Zealand report.
- When the results are substantiated, our own work on jojoba byproducts

offering protection from the sun holds the promise for superior UV protection.

- British scientists who reviewed extracts from the Cordyceps fungus, have found that these extracts could help protect the skin from damage caused by UV radiation.
- Scientists in India have reported that turmeric displays significant hydration when topically applied to UV-damaged skin.
- Anthocyanins extracted from sweet potatoes were added to a cosmetic cream to provide additional protection against UV radiation.
- Nanoparticles from English Ivy have been isolated by researchers from the University of Tennessee and found to be more uniform than ZnO and TiO<sub>2</sub>, thereby enhancing their absorption and light-scattering characteristics.

Currently, the closest approach to a natural sunscreen would be to use as many natural ingredients as possible to create the cosmetic base and to rely on TiO<sub>2</sub> and

ZnO filters along with a few other UV absorbing extracts for protection. FDA has not issued any commentary on the legality or acceptability of those formulations and so they remain as acceptable efforts to produce more natural sun care formulations. To date, however, a 100% natural sunscreen formulation does not exist.

Numerous reports on these natural ingredients, as well as many others including aloe, caffeine, cholesterol, etc., demonstrate that going back to nature may be an ideal way to emulate how plants, animals, microbes, bacteria, coral and other living species resort to mechanisms of adaptation and survival within the harsh elements of their environments.

A host of ultraviolet filters, antioxidants, moisturizers, anti-inflammatories, etc., when isolated from their natural source, concentrated, and of course, sanctioned by the FDA, may hold the future promise for superior natural UV protection from the sun. ●