

The New York Times

Consults

Experts on the Front Lines of Medicine

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## What to Look for in a Sunscreen

By *THE NEW YORK TIMES*

Sally Ryan for The New York Times sunscreen

*Recently, readers submitted questions to the Consults blog, “Readers Ask: Sun Safety and Skin Cancer.” For photos and more information, visit [The New York Times Health Guide: Skin Cancer](#).*

What is the best combination of safe and effective ingredients to look for in a sunscreen?

Brian Gerber

Are some active ingredients in sunscreens better than others? My dermatologist recommended zinc oxide, but I have trouble finding sunscreens that contain it on store shelves. I’m 29 and have had melanoma twice, so I’d like to use what is most effective. Katie K., Portland, Ore.

Can you please discuss the relative advantages (and disadvantages) of physical sunblocks like zinc oxide and titanium dioxide compared to the newer chemical sunblocks? I have very fair skin that never tans, and also suffer from eczema, and I’d like to use a wide-spectrum sunblock that does not irritate my skin. What would you recommend for me?

WashingtonDame

*Dr. Doris Day*

*Dr. Doris J. Day, clinical assistant professor of dermatology at New York University Medical Center and author of “Forget the Facelift” (Penguin/Avery), responds:*

The best sunscreen is one that you will use. Most contain a combination of ingredients for effective protection against damaging ultraviolet rays — both the deeply-penetrating UVA and the shorter-wave UVB.

There are differences between the two main types of sunscreens: physical and chemical. A chemical sunscreen is absorbed by the skin. Sunlight is deactivated or degraded after contact with the organic chemicals contained in the sunscreen. Chemical sunscreens typically contain a range of ingredients like benzones, aminobenzoic acid and cinnamates that, together, protect against UVA and UVB.

A physical block, in contrast, sits on the skin’s surface and contains inorganic compounds like titanium dioxide or zinc oxide that are not absorbed into the skin. In this case, light is either absorbed into sunblock material or reflected away from the skin, similar to a mirror or aluminum foil. Ingredients in physical sunblocks protect against both UVA and UVB and, because they are not absorbed into the skin, they are nonirritating and nonallergenic.

The ideal sunscreen would be a physical block using titanium dioxide or zinc oxide. Titanium dioxide is derived from titanium, a highly reflective white chalky mineral. In addition to being nonirritating and nonallergenic, titanium dioxide is non-comedogenic, meaning that it doesn't produce or aggravate acne. The Food and Drug Administration, in its monograph on sunscreens, lists it as one of the most effective active ingredients for sun protection. Zinc oxide also provides physical protection from damaging rays, absorbing primarily UVA light rather than scattering or reflecting it. It is also a mild antimicrobial and wound healing substance and is considered to be non-comedogenic.

The problem with physical blocks containing titanium dioxide or zinc oxide is that they are too chalky and opaque for daily use. However, mineral powders containing these substances are available and can be reapplied at regular intervals to provide continued protection if you're spending time out in the sun.

The next best thing is to look for a chemical sunscreen that contains avobenzone, also called Parsol 1789, that has been photostabilized to improve its staying power and broaden the spectrum of protection. Companies have given these stabilizing ingredients trade names like Mexoryl, Helioplex, AvoTriplex and others. Gels containing these ingredients are a good bet if you're athletic, though it's important to reapply at regular intervals. [For more on controversy surrounding avobenzone, see Tara Parker-Pope's [Well column](#), "[Sunscreen Safety Is Called Into Question](#)."] ]

Zinc and titanium dioxide are also sometimes broken down, or micronized, into tiny particles that are far finer than powders. In the micronized form, they are absorbed into the skin and act as chemical sunscreens that block UVA and UVB rays. I'm not a fan of these, however, since they absorb heat and energy, and as with the even tinier nanoparticles (see below), more research needs to be done to study what effect they may have in the body.

Salicylates like octyl salicylate, or OCS, are also widely used in sunscreens; however, they are more likely to cause irritation. PABA is rarely used in sunscreens due to bad press about allergic reactions.

In addition to sunscreens, sun smart behavior including avoiding the midday sun, staying in the shade when you can, and wearing a hat and sun protective clothing. Use an SPF of 15 or higher, and reapplying it every two hours or more often if you are swimming or sweating, is critical.

### **The Dangers of Nanoparticles?**

I would like to know about nanoparticles in sunscreen, and if, in the panel's opinion, nanoparticles are something to be avoided. I understand sunscreen ON the skin, but am concerned about having it inside my body through the use of nanotechnology.

H

Is it safe to use sunblocks with nano-particles? I have been using a great Shiseido product with octinoxate (7.4%) and zinc oxide (13.9%) that stays on in the water and doesn't turn me all white, but I assume this has nano-particles in it and I fear their effects.

Sky

*Dr. Day responds:*

Nanoparticles are a hot topic in skin care, but much more study must be done to show the safety and efficacy of these products.

“Nano” basically means very, very, very small. Nano-particles are typically the same sunscreen ingredients now used, just made smaller to allow them to settle into the skin better. The goal is that these products will look and feel better on the skin.

The concern is that nanoparticles may not be safe, and that they may cause problems not just from being absorbed but also from the heat they generate from absorbing UV rays. The main concern is that the heat generated would then increase reactive oxygen species, which are unstable molecules that can wreak havoc in the skin and other tissues of the body, and that might even increase the risk of skin cancer. Therefore, I don’t advise using these products until we learn more about their safety.

### **Breaking Out From Sunscreens?**

What about types of sunscreens that do not lead to adult acne? I’ve tried sensitive skin, non-oil, non-comedeogenic, etc. I have yet to find one, and between the choice of immediate discomfort and long-term risk, I tend to vote for hats and shade. Perhaps this also affects teenager’s willingness to wear it.

Marie

*Dr. Day responds:*

Look for mineral makeup, powder sunscreen or gel sunscreens to help minimize breakouts of adult acne. The mineral makeup sits on the skin so it does not get absorbed or block pores. Gel sunscreens are also generally very light and “breathable” and do not irritate the skin or clog pores.

*Dr. Day is an unpaid educational spokesperson for [The Skin Cancer Foundation](#).*