

Nanoparticles in sunscreen get bad rap, but evidence they cause human harm is slim

It is that time of year again. Time to reach to the back of your medicine cabinets and linen closets or dig out the beach bag from under the bed and hunt down last year's sunscreen.

Experts would argue you should probably toss it out because the [active ingredients have a half life](#) and won't be as effective as advertised. And others warn there's another reason to ditch your old sunscreen and look for more natural options: nanoparticles. These microscopic beads of active ingredients, usually zinc oxide and titanium dioxide in American sunscreens, keep the protective elements suspended in thin concentrations, so the layer we apply to our skin is transparent and deemed more attractive by consumers.

Consumer advocates and some public health experts argue that these nanoparticles could cause cancer because contact with sun and skin causes them to become free radicals, a chemical species that's known to damage DNA. In fact, Philip Demokritou at the Harvard School of Public Health has found that these ingredients cause harm to cells in experimental settings. He [recently came up with a new method](#) to test nanoparticles' safety quickly and easily using both human and hamster cells. But, there is no evidence that they cause harm in humans using the products.

The FDA did ban use of nanoparticles in powder and talcum based sunscreens because of inhalation risk, according to the Environmental Working Group a non-profit chemical consumer advocate. But, the particles can still be used in spray-on sunscreens. The efficacy of spray-on sunscreens has also been challenged.

Demokritou and his group at Harvard are looking at ways to make nanoparticles for sunscreen and other products safer using a super thin coating of silica, a naturally occurring element in sand that prevents the active sunscreen ingredients from becoming biologically reactive, he [explained to Chemical World](#) in February:

'The toxicological effects of nanomaterials are often neglected,' Demokritou said. He stresses that developing nanoparticles that cause less damage to the environment is crucial to the sustainability of the nanotechnology industry. '30 years ago we put materials out there with very good properties and years later we've spent billions of dollars to clean up the environmental mess with lots of lives lost. We don't want to replicate the 20th century.'

Silica encapsulation could also be used to coat silver nanoparticles used in children's toys and other products because their antimicrobial properties stop bacteria growth.

However, it's important to remember that the evidence of harm by nanoparticles is limited to the laboratory. Skin cancer, on the other hand, has proven to be the result of sun exposure millions of times over. When weighing the relative risks, good protection against UV rays is clearly the better decision.

Additional Resources:

- [Here comes the sun: Genes and rethinking your sunscreen](#), Ben Locwin, Genetic Literacy Project
- Some sunscreens aren't so hot, researchers find, Jessica White, The Columbus Dispatch
- [New, Better Sunscreens Could Be Coming](#), Alexandra Sifferlin, TIME