

Evidence that nanoparticles in sunscreens could be toxic if accidentally eaten

April 7 2010



Credit: AI-generated image ([disclaimer](#))

Scientists are reporting that particle size affects the toxicity of zinc oxide, a material widely used in sunscreens. Particles smaller than 100 nanometers are slightly more toxic to colon cells than conventional zinc oxide. Solid zinc oxide was more toxic than equivalent amounts of soluble zinc, and direct particle to cell contact was required to cause cell

death. Their study is in ACS' *Chemical Research in Toxicology*.

Philip Moos and colleagues note that there is ongoing concern about the potential toxicity of nanoparticles of various materials, which may have different physical and chemical properties than larger particles. Barely 1/50,000 the width of a human hair, nanoparticles are used in foods, cosmetics and other consumer products. Some sunscreens contain nanoparticles of zinc oxide. "Unintended exposure to nano-sized zinc oxide from children accidentally eating [sunscreen](#) products is a typical public concern, motivating the study of the effects of [nanomaterials](#) in the colon," the scientists note.

Their experiments with cell cultures of colon cells compared the effects of zinc oxide nanoparticles to zinc oxide sold as a conventional powder. They found that the nanoparticles were twice as toxic to the cells as the larger particles. Although the nominal particle size was 1,000 times larger, the conventional [zinc oxide](#) contained a wide range of particle sizes and included material small enough to be considered as nanoparticles. The concentration of [nanoparticles](#) that was toxic to the colon cells was equivalent to eating 2 grams of sunscreen — about 0.1 ounce.

This study used isolated cells to study biochemical effects and did not consider the changes to particles during passage through the digestive tract. The scientists say that further research should be done to determine whether zinc nanoparticle toxicity occurs in laboratory animals and people.

More information: "ZnO Particulate Matter Requires Cell Contact for Toxicity in Human Colon Cancer Cells", *Chemical Research in Toxicology*.

Provided by American Chemical Society

Citation: Evidence that nanoparticles in sunscreens could be toxic if accidentally eaten (2010, April 7) retrieved 19 April 2024 from <https://phys.org/news/2010-04-evidence-nanoparticles-sunscreens-toxic-accidentally.html>

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