

## **CANADIAN DERMATOLOGY ASSOCIATION POSITION STATEMENT THE USE OF NANOPARTICLES IN SUNSCREENS**

Zinc oxide (ZnO) and titanium dioxide (TiO<sub>2</sub>) nanoparticle containing sunscreens and cosmetics have been approved for use for many years in Europe, the United States, and Australia. In Canada, they have been used in sunscreens since 2013.<sup>1</sup> ZnO and TiO<sub>2</sub> are considered “mineral” or “physical” sunscreen filters. The original sunscreens contained microparticulate ZnO and/or TiO<sub>2</sub> that left the skin looking white and cosmetically inelegant. Today, ultrafine nanoparticle forms are colourless yet highly effective at blocking ultraviolet A and B radiation.

Some safety concerns have been raised because nanoparticles have the potential to form reactive oxygen species (ROS), which may cause cell damage. However, in order for nanoparticles to cause cell damage, they must first reach living cells. To date, research results have shown ZnO and TiO<sub>2</sub> nanoparticles in sunscreens stay on the skin. The nanoparticles tend to “clump” together on the skin, forming large aggregates that are unable to be absorbed. Furthermore, in commercially available sunscreens, nanoparticles are coated, typically with alumina or silica, to prevent free radical formation. Based on the best available evidence, sunscreens containing ZnO and TiO<sub>2</sub> nanoparticles are not a health risk to humans. Health Canada requires continued safety monitoring of approved sunscreens containing nanoparticles.<sup>3</sup>

Despite the proven safety of nanoparticles in sunscreens for humans, recent research has suggested there may be a negative impact to the environment, specifically to marine life, particularly coral and plants. However, the changes seen in marine life may be due to global warming, with increased ocean temperatures, and not related to nanoparticles. Continued vigilance is required to monitor the effect of nanoparticles on the environment. A National Academy of Sciences study, which should be completed in 2022, is looking at how the ingredients in sunscreen affect the environment, including how they affect coral reef ecosystems.<sup>4</sup>

1. Sunscreen Monograph Health Products and Food Branch, Health Canada July 7, 2013
2. Dréno B et al. *J EADV* 2019;332 (Suppl 7):34-46.
3. <https://www.canada.ca/en/health-canada/services/drugs-health-products/public-involvement-consultations/natural-health-products/draft-guidance-document-sunscreen-monograph-consultation-document.html>
4. <https://oceanservice.noaa.gov/news/sunscreen-coral.html>

April 2022