

skin|less is more

by Carol and Rob Trow

NANOTECHNOLOGY BASED skin care formulas work by delivering active ingredients as much as 10 times faster than conventional products. These formulas contain active ingredients that are less than 1/100,000th the diameter of a human hair, allowing the ingredients to fully penetrate the skin. The resulting nanotechnology product is a skin care line that delivers high performance active ingredients with real results.

Yet we cannot overlook the fact that the benefits and dangers of using nanotechnology in skin care products are unknown. However, evidence is mounting that the use of nanoparticles in sun protection products may indeed be dangerous.

The environmental group Friends of the Earth recently suggested that sunscreens with nanoparticles do *not* increase sun protection and may actually pose potential health hazards. A bevy of new research backs up their theory.

British scientists are undertaking an examination to determine if there is a link between the uses of nano-sized titanium dioxide particles and serious brain diseases, including cancer. The issue is the question of whether these tiny particles can penetrate brain tissues—and if so, what specific problems can they cause?

U.S. scientists have also found evidence that man-made ingredients such as titanium dioxide have made their way into the brains of small mammals, possibly through the skin via topical applications, or via the lungs after breathing in these small particles.

The University of Rochester researchers found that when rats breathed in

nanoparticles, they settled in the brain and lungs, leading to significant increases in biomarkers for inflammation and stress responses.

Do these same phenomena occur in humans? If so, what is the danger? No one knows for sure. Several U.S. cities have considered the need for nano safety, and bills have been introduced to curb the use of nanoparticles. So far, only Berkeley has actually passed such a measure. Which leaves us to wonder: can we be harmed by what we do not know?

Under the general guise of the name "NeuroNano Project," researchers from several European universities and the Biomedical Science Institute in Northern Ireland are joining together to look at what happens when these sunscreen nanoparticles enter the human body.

In June of 2009, *Les Nouvelles Esthétiques & Spa* published "Odd But... Sunscreens May Damage Skin," an article by Robert Trow that discusses a new body of research indicating that some filters used in sunscreens to protect skin may actually generate compounds that could attack healthy skin cells.

The article cites a number of studies that have indicated that SPF ratings may not be a useful guide to evaluating protection levels, and that a higher SPF rating may not, in fact, be the safest. Higher SPF ratings provide a false sense of security, leading individuals to apply sun care products less frequently and stay out in the sun longer.

The U.S. government has acknowledged such problems, and is currently in the process of issuing a new set of sun protection ratings intended to provide better guidance to the consumer.

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Findings by the NeuroNano Project researchers demonstrated that nanoparticles can become lodged in the brain where there are no clearance mechanisms, leading to potential health hazards for humans.

Manufacturers, on the other hand, believe that nanoparticles in sunscreens are more effective in providing protection than larger sized molecules. Many people feel that scientists are raising concerns without adequate evidence. What is indisputable is that more urgent research is needed on the potential health implications of nanoparticles in sunscreens, particularly titanium and zinc dioxides. In the case of sunscreens, the old adage "less is more" may be sound advice. ■

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