

Nanotech safety: Smaller particles may be riskier

Julie Steenhuysen

CHICAGO (Reuters) - In determining the safety of improbably small materials known as nanoparticles, special properties associated with some of the very smallest particles may be the key, scientists said on Sunday.

Nanotechnology, the design and manipulation of materials thousands of times smaller than the width of a human hair, has been hailed as a way to make strong, lightweight materials, better cosmetics and even tastier food.

But scientists are only starting to look at the impact such tiny objects may have. Some studies suggest nano-sized objects may have different effects in the body than larger ones.

Traditionally, a particle is deemed nano if its diameter is between 1 and 100 nanometers -- about 1/10,000 the diameter of a human hair, and if it has properties not present in its naturally occurring counterpart.

But a team led by researchers at Duke University in Durham, North Carolina, believes focusing on these special properties may be a better way to look for any potential hazards posed by nanotechnology.

"There are an infinite number of potential new man-made nanoparticles, so we need to find a way to narrow our efforts," said Mark Wiesner, an engineering professor at Duke and director of the federally funded Center for the Environmental Implications of Nanotechnology, whose study appears in the journal Nature

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Nanotechnology.

Wiesner said it appears the very smallest particles -- those less than 30 nanometers in width -- are most likely to have unique properties that could pose a risk.

"Many nanoparticles smaller than 30 nanometers undergo drastic changes in their crystalline structure that enhance how the atoms on their surface interact with the environment," Wiesner said in a statement.

He said some nanoparticles can be highly reactive with other chemicals in the environment and can also disrupt certain activities within cells.

"While there have been reports of nanoparticle toxicity increasing as the size decreases, it is still uncertain whether this increase in reactivity is harmful to the environment or human safety," Wiesner said.

Devising a better definition of nanoparticles is important as teams attempt to determine whether they pose a threat, he said. "We need to be speaking the same language when assessing any unique properties of these novel materials."

Last December, a report by the National Research Council found serious gaps in the government's plan for determining if nanomaterials pose a risk and called for an effective national plan for identifying and managing potential risks.

Currently, more than 600 products involving nanomaterials are on the market. Most are health and beauty products, but many researchers are working on ways to use the materials for medical therapies, food additives and electronics.

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