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[\[Environment\] Scientists Proved Toxic Nanoparticles Change Fish's Swimming Velocity and Activity, Raising Worries over Nano-cosmetics' Environmental Impact](#)

[Environment] Scientists Proved Toxic Nanoparticles Change Fish's Swimming Velocity and Activity, Raising Worries over Nano-cosmetics' Environmental Impact ([Chinese Version](#))

The Liberty Times (2011/09/07) Nanoparticles may be carried with potential risks to human body, and they may threaten the environment as well. Scientists points out, the nanomaterials widely used in producing the cosmetics are influencing the rivers and our environment through sewers. Findings have proved that toxic nanoparticles can change fish's velocity and activity.

A nanometer is a unit of length; one nanometer equals to one billionth of a meter (1×10^{-9} m). Nanotechnology refers to the study of manipulating matter on an atomic and molecular scale, developing extremely tiny materials, devices, or other structures.

Nanotechnology is getting more influential in cosmeceutical products such as suntan lotion. The sunblock products which are claimed to be clear, bright and transparent and consist of zinc oxide or titanium dioxide, are often contains nano-ingredients.

Te-Hao CHEN, Research Associate at National Museum of Marine Biology and Aquarium, as well as Assistant Professor at Institute of Marine Biodiversity and Evolutionary Biology, National Dong Hwa University, et al. have just published a paper "Behavioral Effects of Titanium Dioxide Nanoparticles on Larval Zebrafish (*Danio rerio*)" in the latest Marine Pollution Bulletin (Volume 63, Issues 5-12, 2011, Pages 303-308).

In this study, zebrafish embryos were exposed to titanium dioxide nanoparticles (TiO₂ NPs at 0.1, 0.5, 1, 5, 10 mg/L or control) from fertilization to free swimming stage. The team finds, hatchability, survival, and malformation rate were not affected by TiO₂ NPs at these exposure levels. However, larval swimming parameters, including average and maximum velocity and activity level were significantly affected by TiO₂ NPs. It should be the case, CHEN suggests, that nanoparticles have entered the brain of zebrafish and damage the brain cells influencing the fish's behavior.

Zinc oxide has been proved to have greater effect on the embryo. The higher the concentration is, the more significant the effect is observed. CHEN points out, the factors of the effect is not only the size of the zinc oxide itself, but also include the active dissociation of the matter releasing zinc ions.

Distinguished Professor Chuh-Yung CHEN at Department of Chemical Engineering, National Cheng Kung University, says, no one can guarantee that nanomaterials are non-toxic, and the impact of the nanotechnology upon the environment and human body are yet to be further determined. Particularly remarkable, he says, is that the nanoparticles in cosmetics can easily enter human body via pores. Even given that the particles be non-toxic, the particles would block up the pores and weaken perspiration. On the other side, he also doubts that the so-called nano-cosmeceutical products really meet nano-scale.

Related Website:

<http://www.sciencedirect.com/science/article/pii/S0025326X11002190>

Further Information:

[The Liberty Times 2011/09/07](#) (Chinese)

[National Science Council International Cooperation Sci-Tech Newsbrief](#)

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