Risk Faced by Aquatic Creatures Due to Nanoparticles in Consumer Products

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Written by AZoNano Aug 14 2015

Researchers from the University of Exeter highlight the risk that engineered nanoparticles released from masonry paint on exterior facades, and consumer products such as zinc oxide cream, could have on aquatic creatures.

Textiles, paint, sunscreen, cosmetics and food additives are all increasingly containing metal-based nanoparticles that are engineered, rather than found naturally.

The review, published today in the journal Environmental Chemistry, highlights the risks posed to aquatic organisms when nanoparticles 'transform' on contact with water and as they pass from water to sediment and then into sediment dwelling organisms.

Sediments are important for the health of many aquatic ecosystems and are speculated to be a large potential sink for nanoparticles.

Richard Cross, lead author and postgraduate researcher from the College of Life and Environmental Sciences at the University of Exeter's Biosciences department said: "We argue for the need to incorporate the transformations that engineered nanomaterials undergo as they pass from water bodies into sediments, as their form and nature will change as they do so. This is important to consider if we are to improve environmental realism in our experimental efforts and also better understand the long term effects of these materials in the environment."

Professor Charles Tyler, of the College of Life and Environmental Sciences at the University of Exeter, added: "In the aquatic environment, it is known that many nanomaterials will end up in the sediment, so it makes sense to focus on this environmental compartment as a possible worst case scenario for exposures and effects in aquatic systems. This review serves to highlight what we need to consider when assessing the susceptibility of sediment dwelling organisms to nanomaterials."

The study calls for more research into whether 'marine snow' - organic detritus that falls

through layers of water - acts as a transport system for nanoparticles and closer examination of bioaccumulation and toxicity in sediment-dwelling species.

The study highlights a large knowledge gap and recommends further research into the factors that determine the fate of nanoparticles in aquatic systems.

Source: http://www.exeter.ac.uk/

Alternative Testing Strategies Needed to Cope With New Wave of Emerging Nanomaterials

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A group of international experts from government, industry and academia have concluded that alternative testing strategies (ATSs) that don't rely on animals will be needed to cope with the wave of new nanomaterials emerging from the boom in nanoscience and nanotechnology. Their consensus statement from a workshop on the topic appears in the journal ACS Nano.

Andre Nel and colleagues explain that many new engineered nanomaterials (ENMs) are appearing in laboratories, factories and consumer products as a result of advances in nanoscience and nanotechnology. These fields involve materials so small that hundreds would fit inside the period at the end of this sentence, and they have properties much different from larger particles of the same material. Tests on laboratory mice, rats and other animals have been the standard way of checking new materials for health and environmental effects. Since those tests are costly, labor-intensive and time-consuming, workshop participants considered whether ATSs could have a larger role in checking the safety of ENMs.

They concluded that rapid cellular screening, computer modeling and other ATSs could serve as quick, cost-effective and reliable approaches for gathering certain types of information about the health and environmental effects of ENMs. "After lively discussions, a short list of generally shared viewpoints on this topic was generated, including a general view that ATS approaches for ENMs can significantly benefit chemical safety analysis," they say.

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Source: http://www.acs.org/