



Toxicity of Silver Nanoparticles – Ion or Nanoparticles

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Wednesday, January 23, 2013
LECTURE: 2:00 PM - 3:00 PM

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Abstract:

The emerging field of nanotechnology has led to substantial advances in energy, medicine, and clean technologies. Due to their small size and their unique properties, there has been a concern that exposure to these materials are associated with an increase risk for adverse health effects. These concerns were due to increase risk of cardiovascular disease (CVD), cancer and mortality associated with ambient air pollution, that also contain ultrafine particles of increased risk of CVD, cancer and mortality, as well as the similarity of some nanoparticles with asbestos, e.g. carbon nanotubes. The focus of our work has been on silver NP particles, as they are used in many different consumer products. The toxicity of silver nanoparticles and silver ion has been investigated in both human and animal cells using different parameters for toxicity. ROS was demonstrated both by direct measurements and by formation of DNA adducts, e.g. bulky adducts measured by P32 postlabelling, 8-oxo-dG by MS. Potential genotoxicity was also assessed by induction of micronuclei as assessed by flow-cytometry. The observed toxicity was due to both the Ag NP and the release of Silver ion, however using gene array assay, significant differences between Ag NP and silver ion heat maps was noted. In vitro studies are the preferred model for assessment of toxicity and determination of the MOA for nanoparticles.

Biography:

Professor Herman Autrup has a MSc in organic chemistry from University of Copenhagen, Denmark (1971), and a PhD in experimental pathology, University of Nairobi, Kenya (1975). He worked at National Cancer Institute, Bethesda MD 1975-1983 as a head of section, Laboratory of Human Carcinogenesis, before becoming head of Laboratory, Environmental Carcinogenesis, Danish Cancer Society, Copenhagen (1984-1990). In 1990 he was appointed professor in environmental medicine, School of Public Health, University of Aarhus, Denmark. He was elected member of the Danish Academy of Technical Sciences in 1997, and was elected member of Academy of Toxicological Sciences in 2010. He is recipient of the Frits Sobel award from the European Environmental Mutagen Society, and in 2008, he received the Princess Chulabhorn Gold Medal award. He has served on many international and national committees in the area toxicology, and is currently president-elect for the International Union of Toxicology, vice-chair of ILSI Health Environment Science Institute, and vice-chair of DGSANCO Scientific Committee on Health and Environmental Risk. Herman Autrup has published more than 200 papers in international peer-reviewed journals and more than 50 contributions to books and meeting proceedings

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