Contribution ID: **2** Type: **not specified**

Toxicity and biodistribution of surface chemically modified Ag nanoparticles

Monday, 9 March 2015 16:30 (30 minutes)

With the advance in material science, silver nanoparticles (AgNPs) are modified by different surface coatings. However, how these surface modifications influence the effects of AgNPs on human health is still largely unknown. We have evaluated the toxicity and pharmacokinetics of AgNPs coated with citrate, polyethylene glycol, polyvinylvpyrolidone and branched polyethyleneimine (Citrate AgNPs, PEG AgNPs, PVP AgNPs and BPEI AgNPs, respectively). Our results demonstrated that the toxicity of AgNPs depends on the intracellular localization that was highly dependent on the surface charge. BPEI AgNPs (Î¶ potential = +46.5 mV) induced the highest cytotoxicity and DNA fragmentation in Hepa1c1c7. In addition, it showed the highest damage to the nucleus of liver cells which is associated with a high accumulation in liver tissues. The PEG AgNPs (Î¶ potential = -16.2 mV) showed the lowest toxicity, a long blood circulation, as well as a high bioaccumulation in spleen, which suggest better biocompatibility. Moreover, the adsorption ability with bovine serum albumin revealed that the PEG AgNPs has an optimal biological inertia and can effectively resist opsonization or non-specific binding to protein in mice. This toxicological data could be useful in supporting the development of safe by design AgNPs for consumer products and drug delivery applications.

Primary author: PANG, Chengfang (Ca' Foscari Univeristy - Venice)

Co-author: BRUNELLI, Andrea (Ca' Foscari Univeristy - Venice, Italy)

Presenter: PANG, Chengfang (Ca' Foscari Univeristy - Venice)

Session Classification: 2A Toxicology and human health risks

Track Classification: Parallel session 2A: Toxicology and human health risks