

3rd International Summit on Toxicology & Applied Pharmacology

October 20-22, 2014 DoubleTree by Hilton Hotel Chicago-North Shore, USA

Cell type- and size-dependent *in vitro* toxicity of silica particles in human skin cells

Claudia Moia, Huijun Zhu and Mousallam Almousallam
Cranfield University, UK

Silica nanoparticles (SiNP) have been increasingly applied in biomedical areas including imaging and drug delivery. Although their bulk counter parts are generally regarded safe, the safety of SiNP and submicron silica particles (SMP) is yet to be established. This study aimed to investigate the size relevance of silica particles (SiP) in toxicity using two human skin cells *in vitro*. Since fetal bovine serum (FBS) is commonly used in cell culture to mimic *in vivo* environment, SiP toxicity is also investigated in the presence and absence of FBS to model the consequences of exposure via systemic and topical routes. SiPs of different size were assessed at 10-200 µg/ml for their effect on cell growth, viability, and ability to induce apoptosis. SiNP20 nm induced toxicity in keratinocyte HaCaT and melanoma A375 cells in the presence and absence of FBS, whilst SiNP 70 nm, SMP200 nm and SMP500 nm were toxic only in HaCaT cells in the absence of FBS. The toxicity in both types of cells was associated with the reduction of cell viability and induction of apoptosis. This study demonstrated size-dependent toxicity of SiP in both cell lines, with HaCaT being more sensitive. SiP showed higher toxicity in the absence of FBS than in the presence of FBS, suggesting that they could be more toxic via topical route than systemic route. As no blood supply can reach epidermis where keratinocytes and melanocytes are located, SiP can interact directly with these cells, leading to toxicity.

Biography

Claudia Moia obtained her Graduate Degree in 2009 and her Master's Degree in October 2011 in Biotechnology at the University of Pavia (Italy). As of May 2012 she is working as an Early Stage Researcher in Cranfield University (UK) as part of EU-funded Marie Curie ITN (initial training programme) network called NANODRUG, aiming to complete her PhD in Toxicology in May 2015.

c.moia@cranfield.ac.uk