

Mechanistic toxicology of engineered nanomaterials: state of the art and future perspectives

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Thursday 15th May 2014, 08:10 – 12:50, room: Singapore

The interest in the ecotoxicological effects of engineered nanomaterials (ENMs) in the scientific literature is rapidly growing along with the increasing number of applications of nanotechnology. This session focus on the state of the art of ENMs mechanistic ecotoxicology, considering effects and responses at different levels of biological organization, from genes to populations and including aspects of ENM toxicokinetics and toxicodynamics. Interest in the mechanistic toxicology of ENMs is driven from both a scientific curiosity perspective, but also by practical needs related to material categorization, read across and mixture effects. This includes the need to establish whether there are nanoparticle specific effect mechanisms. It is planned that this session will provide a summary of the state of the art on the occurrence of specific nanomaterial effects in biological systems; differentiate cells/tissue injuries due to nano and non-nano materials and between nanomaterials with similar chemistry but different physical properties. Specifically the session will focus on the following aspects: nanomaterial (pristine and aged) bioavailability, testing procedures and biomarkers, results from top-down molecular approaches such as transcriptomics, proteomics and metabolomics. A non trivial aspect in mechanistic toxicology of nanomaterials is represented by nanomaterial imaging and tracking in biological systems. This session will aim to include recent results in this area in the illustration of mechanistic pathways. Therefore, this session will include studies of uptake, distribution, toxicokinetics and toxicodynamics, using imaging and localization into cells and biological tissues including high-throughput molecular techniques (transcriptomics, proteomics, metabolomics), to provide links between lower and high organisation effects and address systems toxicology of nanomaterials. Derivation of read-across, extrapolation and QNAR development will also be included. It is expected that scientists, regulators and other stakeholders will have the opportunity to discuss future perspectives and requirements from nano ecotoxicology in relation to Horizon2020 and to the Strategic Vision on Nanomaterial safety research recently released by the European Commission.

SESSION TYPE: Platform and Poster

ADVISORY GROUP: Nanotechnology Advisory Group (Global)