

Mechanistic ecotoxicology of engineered nanomaterials: lessons learnt from human models

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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 ENM specific effect mechanisms. A key aspect of this session is to explore how much studies on human models, which have a longer track record, originally arising from studies on air pollution, might inform effects on environmental models. This session will provide a summary of the state of the art on the occurrence of specific ENM effects in biological systems; differentiate cells/tissue injuries due to nano and non-nano materials and between ENMs with similar chemistry but different physical properties. Specifically the session will focus on ENM (pristine and aged) bioavailability, testing procedures and biomarkers, results from topdown molecular approaches such as transcriptomics, proteomics and metabolomics. An important aspect in mechanistic toxicology of ENMs is represented by ENM 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 highthroughput 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.