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Abstract

An Integrated Systems Toxicology Approach to Assess and Predict the Health Risks of Engineered Nanomaterials and Their Applications

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The impact of nanotechnology on the US EPA and related research needs has been described in the Agency's Nanotechnology White Paper^{1,2} and ORD's Research Strategy³. The US EPA's NMs environmental, health and ecological effects research is conducted in its Chemical Safety for Sustainability (CSS) program which employs an integrated multi-disciplinary systems toxicology approach to examine the environmental, health and ecological implications of engineered nanomaterials (NMs) over a life cycle and safety for success perspectives. The presentation will describe CSS's integrated nanotoxicology approach to address immediate Agency needs while conducting fundamental research to establish translatable and harmonized methods, approaches, and guidelines to: i) screen, rank and predict with greater certainty engineered NMs health effects; ii) identify engineered NMs inherent physicochemical properties and dose metrics regulating their reactivity, biological interactions, uptake, toxicity; iii) inform NM design and applications; iv) identify susceptibility factors influencing engineered NM deposition, fate and toxicity; and v) identify adverse outcome pathways responsible for their toxicity. (This abstract does not reflect EPA policy)

References:

- 1. www.epa.gov/nanoscience/
- 2. www.epa.gov/osa/pdfs/nanotech/epa-nanotechnology-whitepaper-0207.pdf
- 3. www.epa.gov/nanoscience/files/nanotech_research_strategy_final.pdf