Nanosafety: Pharmacology and Toxicology

RTI International provides a wide range of services that support investigations using nanomaterials in drug discovery and development and for establishing safety and risks. These include synthesis of nanomaterials such as labeled nanoparticles; characterization of dose formulations; determination of pharmacokinetics, metabolism, and distribution of nanoparticles; and toxicity assessments.

Overview

Nanomaterials have unique physical and chemical properties related to their size, shape, agglomeration state, surface charge, porosity, and surface areas–to–mass ratio. These features have led to the use of nanomaterials in nanomedicine (e.g., contrast agents, cancer therapeutic agents, drug delivery systems), and in the development of consumer products (e.g., conductive fibers, electrical cables, computer processors and chips).

Areas of Expertise

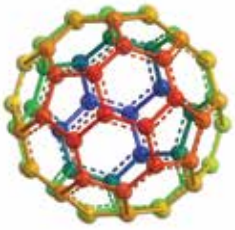
RTI's scientists offer experience in the synthesis and characterization of nanomaterials, preparation and characterization of dose formulations, and the conduct of in vitro and in vivo investigations.

- Nanomaterials synthesis
- Dose formulation and stability analysis
- Nanomaterials characterization
- Purity determination
- Distribution
- Pharmacokinetics
- Metabolism
- Biomarkers
- Toxicity endpoints

Project Highlights

RTI leads a project that is part of the Nanomaterials Health Implications Research (NHIR) Consortium to conduct comprehensive evaluation of interactions between engineered nanomaterials and biological systems. The RTI project involves the investigation of the uptake as well as the effects of nanomaterials in vitro in cell models of the gastrointestinal tract and in the developing rat—focusing on tissue distribution, functional neurobehavioral and cardiovascular endpoints, and metabolomics analysis.

RTI scientists also support NIEHS's National Toxicology Program (contract no. HHSN273201100003C) to provide services for the characterization of nanoparticles in different dose formulations. These investigations help to guide subsequent in vitro and in vivo research activities.



Publications and Presentations

Fennell, T. R., Mortensen, N. P., Black, S. R., Snyder, R. W., Levine, K. E., Poitras, E., Harrington, J. M., Wingard, C. J., Holland, N. A., Pathmasiri, W., and Sumner, S. C. (2016). Disposition of intravenously or orally administered silver nanoparticles in pregnant rats and the effect on the biochemical profile in urine. *J Appl Toxicol*, 10.1002/jat.3387.

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More Information

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