

IVIVE* In Human Toxicity Assessments of Microplastics

Session Introduction
Rob Ellis-Hutchings

* IVIVE = *In vitro* to *in vivo* extrapolation



HUMAN HEALTH HAZARDS – WHO ASSESSMENTS

2019

Microplastics in
drinking-
water



2022

Dietary and inhalation
exposure to
**nano- and
microplastic
particles**
and potential
implications for
human health



HUMAN HEALTH HAZARDS – WHO ASSESSMENTS

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Dietary and inhalation exposure to **nano- and microplastic particles**

World Health Organization (WHO)

Key Message re: Bioavailability

- Physiological mechanisms for uptake, distribution, and elimination of MP minimize tissue exposure
 - Probability \uparrow with \downarrow particle size
- Insufficient information to assess biodistribution, including likelihood that NMP will cross biological barriers after deposition
- *In vitro* NMP biokinetics data cannot currently be extrapolated to *in vivo*



Why is this Session Needed?

- **Inhalable and respirable particles have been well studied**
 - Bioavailability of microplastic particles remains a gap
- **Barrier restrictions for ingested particles are insufficiently characterized**
 - Bioavailability of microplastics is even less understood
- ***In vitro* model approaches predominant**
 - All models lack some ability to fully recapitulate intact *in vivo* barrier function

With these limitations in mind an opportunity exists to incorporate *in vitro* to *in vivo* extrapolations early in the planning and generation of microplastics bioavailability data.

MUCH DATA ARE ALREADY BEING GENERATED!



Session Overview

- **Presentations**

- Justin Teeguarden – Pacific Northwest National Laboratory
 - Some fundamentals of Particle Dosimetry for Risk-Directed Studies
- Günter Oberdörster – University of Rochester
 - Earlier and Novel Findings from Inhalation Studies of Ultrafine Particles: Predictors for Effects and Biokinetics of Inhaled Micro- and Nano-Plastics?
- Tanja Hansen – Fraunhofer Institute
 - In-vitro inhalation microplastics assessments: IVIVE approaches

10:00-10:30



- Leah Johnson – RTI International
 - Well-characterized nanoplastics for oral exposure studies in vivo

- **General Discussion – Aim: Identification of science priorities for IVIVE human microplastics assessments**