Using New Approach Methodologies to Address Variability and Susceptibility Across Populations

A State of the Science Symposium Webinar

October 26-27th, 2022
Hosted virtually with Zoom

— Agenda and Program —

Overview

The goal of human health risk assessment is to protect very broad populations, within which may exist a broad range of susceptibilities to toxic effects from exposure to chemicals. Traditionally, uncertainty around human variability and susceptibility is addressed by applying conventional safety assessment factors. However, current paradigms for assessing health risks of chemical exposure do not inform quantitative assessment of population-level variability and susceptibility arising from numerous factors such as genetics, life stage, concurrent stressors, co-morbidities, and sociological factors.

New approach methodologies (NAMs) encompass a variety of methods that support efforts to replace, reduce, and refine the use of animals for toxicological testing. Compared to traditional animal studies, NAMs offer greater potential to uncover mechanistic processes underlying adverse health outcomes from chemical exposures. In addition, NAMs have the potential to experimentally incorporate human population variability and susceptibility factors with the incorporation of elements such as human cell lines from diverse populations, genetically diverse non-mammalian species, and in silico approaches incorporating data from different subpopulations. Ultimately, use of NAMs in this manner could allow risk assessors to define more meaningful uncertainty factors. However, there is a need to discuss and identify additional factors of concerns associated with environmental chemicals in specific communities. Understanding interindividual variability and susceptibility stemming from these factors can help to guide NAMs development to address these concerns.

This symposium will bring together scientific experts from government, industry, academia, and the environmental justice community to review the feasibility and future priorities for using NAMs to address population variability and susceptibility to chemical exposures.

Symposium Goals

1. Review the state of the science on NAMs that have been developed to model population variability and susceptibility to environmental chemicals.
2. Identify opportunities for NAMs to provide relevant information on population variability and susceptibility to environmental chemicals.
3. Identify information needs for population variability and susceptibility where NAMs could be designed or improved to fill that need.

Symposium Objectives

1. Review NAMs that have been developed or are in development to address population variability and susceptibility to environmental chemicals.
2. Build an understanding of the environmental health challenges around population variability and susceptibility and explore the potential for NAMs to address those challenges now and in the future.
3. Identify knowledge and data gaps around population variability and susceptibility, determining the feasibility of filling those gaps using NAMs, and prioritizing future research initiatives to address those gaps.
4. Foster connections between NAMs researchers and the environmental justice community to better understand susceptibility to chemical exposure and adverse health outcomes in vulnerable populations.

— Day 1 —
Wednesday, October 26, 2022

9:00 – 9:20: **Welcome and Introductions**
Rick Woychik, National Institute of Environmental Health Sciences
Helena T. Hogberg, National Toxicology Program Interagency Center for the Evaluation of AlternativeToxicological Method (NICEATM)

9:20 – 9:45: **Keynote**
Overcoming Challenges in Use of NAMs to Inform Population Variability and Susceptibility in Regulatory Decision-Making
Maureen Gwinn, U.S. Environmental Protection Agency (EPA)

9:45 – 10:10: **Chemical Exposures and Impacts at the Local Public Health Level**
Shirlee Tan, Public Health - Seattle and King County

10:10 – 10:25: **Break**

10:25 – 10:50: **Determining the Role of Environmental Exposures on Pediatric and Adult Kidney Health Outcomes in Tropical Farming Communities**
Nishad Jayasundara, Duke University

10:50 – 11:55: **Panel Discussion**
Moderator: Monique Perron, EPA
Justin Colacino, University of Michigan School of Public Health
Annette Guiseppi-Elie, EPA
Passley Hargrove, National Center for Advancing Translational Sciences
Steven Munger, The Jackson Laboratory
Veena Singla, Natural Resources Defense Council

11:55 – 12:00: **Wrap Up and Adjournment**
Helena T. Hogberg (NICEATM)

— Day 2 —
Thursday, October 27, 2022

9:00 – 9:10: **Welcome and Introductions**
Helena T. Hogberg, NICEATM

9:10 – 9:35: **Investigating GxE Neurotoxicant Vulnerabilities Across Life Stage and Populations Using iPSCs**
Aaron Bowman, Purdue University

9:35 – 10:00: **Integrating Bayesian Approaches with PBPK Modeling in a Human Health Risk Assessment: A Case Study with Perfluorooctane Sulfonate (PFOS)**
Wei-Chun Chou, University of Florida College of Public Health and Health Professions

10:00 – 10:25: **Comparative Genomics for Precision Toxicology**
Brian Oliver, National Institutes of Health

10:25 – 10:30: **Wrap Up and Adjournment**
Nicole Kleinstreuer, NICEATM