NATIONAL ACADEMIES Sciences Engineering Medicine

ENVIRONMENTAL HEALTH MATTERS INITIATIVE

Microplastics and Health Webinar Series: Webinar 3 – The potential hazards to human health and the environment from microplastics and the complexity of assessing risks.

April 10, 2025 | 12:00PM – 1:30PM ET

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April 10, 12:00PM - 1:30PM – All Times in Eastern Time

12:00pm	**Welcome and Meeting Overview**	**Moderator: Rachel Meidl,** Rice University
12:05pm	**Session 1: Presentations** **The potential hazards to human health and the environment from microplastics and the complexity of assessing risks.**	**Speakers**: **Philip Landrigan,** Boston College **Todd Gouin,** TG Environmental Research **Stephanie Wright,** Imperial College London **Valerie Hanley,** California Department of Toxic Substances Control
1:00pm	**Session 2: Multisectoral Panel Discussion** **Identifying Gaps and Proposing Solutions to Enhance Research and Policy.**	**Moderator**: **Margaret Spring,** Monterey Bay Aquarium Submit your question **in advance** on Slido
1:25pm	**Brief Reflections and Goals of Future Webinars**	Please submit your feedback on our **post-event questionnaire**
1:30pm	**ADJOURN**	

About the Webinar

This third webinar in this series aims to inform the public about the potential hazards associated with microplastics, drawing on documented studies and scientific evidence. It will explore the harmful characteristics that researchers and stakeholders should consider in future studies. Additionally, the session will discuss established methodologies for risk assessment while examining the complexities, uncertainties, and challenges involved in evaluating risks. By identifying and prioritizing key elements, this webinar aims to establish a foundation for developing a comprehensive and standardized framework for assessing microplastic-related risks, which can inform research priorities and downstream decision-making.

Learn more and register: https://www.nationalacademies.org/event/44826_04-2025_microplastics-and-health-webinar-series-webinar-3-the-potential-hazards-to-human-health-and-the-environment-from-microplastics-and-the-complexity-of-assessing-risks

YOU CAN SET THE AGENDA! We invite you to answer a very short questionnaire to better understand your concerns and what you hope to get from this and future webinar.

Example Questions that could be covered

Questions:

- What are the routes of exposure to microplastics, uptake, and clearance pathways?
- What effects have been observed in response to microplastic exposure
- Do we know what doses/exposures (and their associated chemicals) elicit adverse responses?
- How exactly do microplastics interact with cells and tissues?
- What factors can amplify microplastics' effect on human health? Are there any known cumulative effects?
- How do differences in particle size (from micro- to nano-scale), shape (fibers, fragments, beads), and chemical makeup (types of polymers, additives) affect toxicity?
- Should we worry more about the chemical composition or the shape/size?
- How readily do microplastics cross biological barriers (e.g., gut lining, lung tissue) and accumulate in different organs?
- Can studies be designed to avoid confounding harms due to shape/size with harms from chemicals and potentially infectious agents found in/on microplastics?
- What are trends/patterns in human chronic disease, such as increased morbidity/mortality in “sensitive” groups (e.g. reproductive female, child, fetus) that could be correlated with increased microplastic exposure?
- What standardized methods can be developed to reliably detect, quantify, and characterize microplastics in different environmental and biological samples?
- How can we reconcile findings from laboratory studies with real-world complexities, given the wide variability in microplastic types and environmental conditions?
- Related to research design, what is the best path forward, in your opinion?
- What chronic disease trends may correlate with microplastic exposure? What could be further explored?
- What are diseases of interest? How should the research be prioritized to answer?

Speaker Biographies

Todd Gouin

Dr. Todd Gouin received a PhD specializing in the field of environmental chemistry from Trent University, in Canada, through the Watersheds Ecosystems Graduate Programme in June 2006. Following his graduate studies, Dr. Gouin obtained both experimental and modelling experience in assessing diverse chemical exposures including current use pesticides in Costa Rica and polycyclic aromatic hydrocarbons in the Arctic regions of Alaska. More recently, he gained valued experience working for Unilever, where he was involved in the development and application of tools for use in screening and prioritizing chemicals as well as the development and application of higher-tier risk assessment methods. Now, Dr. Gouin provides consultancy work on a range of topics including the development and application of risk assessment methods for particulates, such as microplastic particles, nanomaterials, and UVCBs, as well as the development and application of models to better assess chemical exposures for both humans and the environment.

Valerie Hanley

Dr. Valerie Mitchell Hanley is a Senior Toxicologist at the California Department of Toxic Substances Control (DTSC), where her passion for science and dedication to public health guide her daily work. For over 16 years, Dr. Hanley has dedicated her career to DTSC, striving to make California a safer place for all through the evaluation of Human Health Risk Assessments and her involvement with DTSC's Safer Consumer Products Program. Valerie’s areas of focus ranged from arsenic bioavailability in soils to the study of microplastics, all with a focus on risk communication. This work is evidenced by her participation in the Interstate Technology and Regulatory Council (ITRC) for the last decade, where she

was most recently the co-lead of ITRC's Microplastics Team, which developed an online technical guidance, an outreach toolkit, and online training for environmental professionals. Dr. Hanley earned a bachelor's degree in Molecular, Cellular, and Developmental Biology from The University of California (UC) Santa Cruz in 2001 and her PhD in Comparative Pathology from UC Davis in 2007. She completed a postdoctoral fellowship at UC Davis in Respiratory Toxicology in 2008. In addition to her career, Valerie is a mom to four children ages 8 through 20.

Stephanie Wright

Dr Stephanie Wright is a Senior Lecturer in Environmental Toxicology in the Environmental Research Group, Imperial College London (ICL). She completed a B.Sc Hons 1.1 (Newcastle University), followed by a PhD in Biosciences at the University of Exeter (2015), which focused on the toxicity of microplastics in the marine environment. She has since had 15 years' experience in microplastic research. Through two research fellowships, she has established a track record in microplastics and human health. This has included vibrational spectro-microscopic and mass spectrometric fingerprinting of microplastic in complex samples, leading to the first observations of plastic in PM10. More recently, she has built a national resource of MP test materials for pulmonary toxicology studies. She currently leads the Microplastics Team, who's multidisciplinary research advances analytical and data science approaches to quantify external and internal micro- and nanoplastic exposure, in complement to assessing adverse outcomes in vitro. She has participated in working groups for the World Health Organization and the European Commission and is an editor for the journal Microplastics and Nanoplastics (Springer).

Philip Landrigan

Dr. Philip Landrigan is a pediatrician, public health physician and epidemiologist. His research uses the tools of epidemiology to elucidate connections between toxic chemicals and human health, especially the health of infants and children. He is interested in understanding how toxic chemicals injure the developing brains and nervous systems of children and in translating this knowledge into public policy to protect health. Dr. Landrigan's early studies of lead poisoning demonstrated that lead is toxic to children even at very low levels and contributed to the US government's decision to remove lead from paint and gasoline, actions that reduced population mean blood lead levels in the USA by more than 90%. A study he led in the 1990's at the National Academy of Sciences defined children's unique susceptibilities to pesticides and other toxic chemicals and catalyzed fundamental revamping of US pesticide policy. He was also involved in the medical and epidemiologic follow-up of 20,000 9/11 rescue workers which found that of the men and women documented, more than 40% have persistent abnormalities of pulmonary function and approximately 15% have mental health problems related to their service. From 2015 to 2017, Landrigan co-chaired the Lancet Commission on Pollution & Health, which reported that pollution causes 9 million deaths annually and is an existential threat to planetary health. He now directs the Global Observatory on Pollution and Health at Boston College.