

Advancing Understanding of the Implications of Environmental-Chemical Interactions with the Human Microbiomes

Committee

Ronald M. Atlas

Chair

Ronald M. Atlas (chair) is professor of biology at the University of Louisville. His early research focused on oil spills and bioremediation. He later focused on the molecular detection of pathogens in the environment, which informs the development of biosensors to detect biothreat agents. Dr. Atlas has authored nearly 300 manuscripts and 20 books. He is a fellow of the American Academy of Microbiology and has received the American Society for Microbiology (ASM) Award for Applied and Environmental Microbiology, the ASM Founders Award, the Edmund Youde Lectureship Award in Hong Kong, and an honorary doctorate from the University of Guelph. He has served as a member of the Department of Homeland Security's Science and Technology Advisory Committee, the National Aeronautics and Space Administration's Planetary Protection Board, the Federal Bureau of Investigation's Scientific Working Group on Bioforensics, and the National Institutes of Health's Recombinant DNA Advisory Committee. He has been served as the ASM president and is co-chair of the ASM Biodefense Committee. Dr. Atlas has also served as a chair or a member of numerous National Academies committees. He received his Ph.D. in microbiology from Rutgers University.

Kjersti M. Aagaard

Member

Kjersti M. Aagaard is an associate professor in the Department of Obstetrics and Gynecology, and Departments of Molecular and Human Genetics, Molecular and Cellular Biology, and Molecular Physiology and Biophysics all at Baylor College of Medicine. She specializes in the field of maternal-fetal medicine where her research interests include both basic science investigations and translation into clinical research. Specifically, she is interested in microbiome interactions with preterm birth and in the role of the in utero environment and epigenetics in fetal programming and development. Dr. Aagaard earned her MD from the University of Minnesota Medical School at Minneapolis and her PhD from the Mayo Graduate School of Medicine.

Elaine Hsiao

Member

Elaine Hsiao is an assistant professor in the Department of Integrative Biology and Physiology and the Department of Medicine, Digestive Diseases at the University of California, Los Angeles. Her research interests include the microbiome, neurobiology of disease, neuroimmunology, and host-microbe interactions. Specifically, her research explores the effects of the microbiota on the nervous system and communication between microbes and the nervous system. Dr. Hsiao also studies the particular functions of microbiome species and the impact of modifying the microbiome on neurological disease. She was awarded the De Logi Chair in Biological Sciences at UCLA and a National Geographic Emerging Explorer Award and was selected for the Forbes' "30 Under 30 in Science & Healthcare." Dr. Hsiao was also the 2013 Caltech Everhart Lecturer and served on the White House Office of Science and Technology Microbiome Forum. Dr. Hsiao received her PhD in neurobiology from the California Institute of Technology.

Yvonne Huang

Member

Yvonne Huang is an assistant professor of internal medicine at the University of Michigan in the Division of Pulmonary and Critical Care Medicine. Dr. Huang's research interests include the microbiome, asthma, chronic obstructive pulmonary disease (COPD), and interactions between therapeutics and the microbiome. Her work on the respiratory microbiome in asthma and COPD includes trials sponsored by the National Institutes of Health. She was a Yale/Johnson & Johnson Physician Scholar in International Health and served as associate director of the adult cystic fibrosis program at the University of California, San Francisco (UCSF). Dr. Huang earned her MD from the University of Alabama at Birmingham, trained in internal medicine at Yale, and completed a fellowship in pulmonary/critical care medicine at UCSF.

Curtis Huttenhower

Member

Curtis Huttenhower is an associate professor of computational biology and bioinformatics at the Harvard T.H. Chan School of Public Health and an associate member at the Broad Institute. Dr. Huttenhower's laboratory worked extensively with the NIH Human Microbiome Project (HMP) to identify and characterize the microorganisms found in association with both healthy and diseased humans. In 2015, he co-led one of the follow-up HMP2 Centers for Characterizing the Gut Microbial Ecosystem in Inflammatory Bowel Disease. He received a National Science Foundation CAREER award in 2010 for his research on microbial communities and was awarded a Presidential Early Career Award for Scientists and Engineers in 2012. Dr. Huttenhower was also awarded in 2015 the Overton Prize from the International Society for Computational Biology. He is a member of the editorial boards for the academic journals Genome Biology, Microbiome, and BMC Bioinformatics. Dr. Huttenhower received his PhD in genomics from Princeton University.

Susan Lynch

Member

Susan Lynch is an associate professor of medicine at the University of California, San Francisco where she also directs the Colitis and Crohn's Disease Microbiome Research Core. Dr. Lynch's research program focuses on understanding the contribution of the human microbiota to chronic gastrointestinal and airway inflammatory disease pathogenesis. Specifically, her work focuses on the relationship between the gastrointestinal microbiome and host immune status and disease development. Her laboratory also studies the role of specific bacterial species in both microbiota manipulation and immunomodulation, particularly in the context of childhood asthma development and in immune priming at sites remote from the gastrointestinal tract. Dr. Lynch also works on the development of novel high-resolution microbial diagnostic tools to examine the diversity of organisms present in clinical samples. Dr. Lynch earned her PhD at the University College Dublin in Molecular Microbiology.

William W. Nazaroff

Member

William Nazaroff is the Daniel Tellep Distinguished Professor of Engineering in the Department of Civil and Environmental Engineering at the University of California, Berkeley. His research group studies the physics and chemistry of air pollutants in proximity to people, especially in indoor environments. The group also works in the domain of exposure science and stresses the development and application of methods to better understand mechanistically the relationship between emission sources and human exposure to pollutants. Dr. Nazaroff has served as president of the Academy of Fellows in the International Society of Indoor Air Quality and Climate and president of the American Association for Aerosol Research. For the Academies, he chaired the Planning Committee for the Workshop on Health Risks of Indoor Exposure to Particulate Matter and served on the Committee on the Effect of Climate Change on Indoor Air Quality and Public Health and the Committee on Air Quality in Passenger Cabins of Commercial Aircraft. Dr. Nazaroff earned his PhD in environmental engineering science from California Institute of Technology.

Andrew Patterson

Member

Andrew Patterson is an associate professor of molecular toxicology at Pennsylvania State University. Dr. Patterson studies the metabolism of drugs and foreign compounds by the human body and how chemicals in diets or nutrients derived from diets influence health and disease. Much of his research involves the use of metabolomics tools. Dr. Patterson was a Research Fellow of the National Cancer Institute, and he served on the National Academies' committee responsible for planning the workshop "Getting the Most from Microbiome Research in the Next Decade." Dr. Patterson earned his PhD in genetics from the George Washington University.

John Rawls

Member

John Rawls is an Associate Professor in the Department of Molecular Genetics and Microbiology at Duke University, and Director of the Duke Center for the Genomics of Microbial Systems. He has secondary appointments in Duke University's Department of Medicine, Center for Host-Microbial Interactions, and Cancer Institute. Dr. Rawls's laboratory uses zebrafish and mouse models to study how intestinal microbiota impact vertebrate health and disease. Dr. Rawls was recognized as a Pew Scholar in the Biomedical Sciences. Dr. Rawls received his PhD in developmental biology from Washington University.

Joseph V. Rodricks

Member

Joseph V. Rodricks is a founding Principal of Ramboll Environ. An expert in toxicology and risk analysis, Dr. Rodricks has consulted for hundreds of manufacturers and government agencies and for the World Health Organization in the evaluation of health risks associated with human exposure to chemical substances of all types. Before Environ, Rodricks served 15 years as a scientist at the US Food and Drug Administration; in his last four years he served as Associate Commissioner for Health Affairs. His experience extends from pharmaceuticals, medical devices, consumer products and foods, to occupational chemicals and environmental contaminants. He has served on the National Academies' Board on Environmental Studies and Toxicology and on 30 boards and committees of the National Academy of Sciences and the Institute of Medicine, including the committees that produced the seminal works *Risk Assessment in the Federal Government: Managing the Process* (1983) and *Science and Decisions: Advancing Risk Assessment* (2009). Dr. Rodricks has nearly 150 scientific publications and has received honorary awards from three professional societies for his contributions to toxicology and risk analysis. Dr. Rodricks earned his PhD in biochemistry from the University of Maryland, College Park and was a post-doctoral scholar at University of California, Berkeley.

Pamela Shubat

Member

Pamela Shubat is retired from the Minnesota Department of Health Environmental Health Division where she supervised the work of the Health Risk Assessment Unit. Dr. Shubat has worked in many areas of risk assessment, toxicology, and exposure assessment. For example, she has been involved in work on sensitive subpopulations and life stages and drinking water contaminants. Her major responsibilities have included research on fish contaminants; childhood lead poisoning prevention; population-based exposure assessment; and rules for groundwater contaminants. In addition to state work, she served as an appointed member and chair of EPA's Children's Health Protection Advisory Committee and has served as a peer reviewer for EPA projects involving methylmercury, polychlorinated biphenyls, and risk assessment practice. Dr. Shubat is also a member of the EPA Federal-State Toxicology Risk Analysis Committee. She earned a PhD in pharmacology and toxicology from the University of Arizona.

Brian Thrall

Member

Brian Thrall is an associate director in the Biological Sciences Division, and Chief Scientist for the Health Impacts and Exposure Science Group at Pacific Northwest National Laboratory (PNNL). Dr. Thrall has over 20 years of experience in leading research programs focused on developing and applying systems toxicology and exposure science strategies to elucidate, and ultimately predict, biological response pathways modulated by exposure to environmental agents of concern to human health. As director of PNNL's Center for Nanotoxicology, Dr. Thrall leads a multidisciplinary team that employs state-of-the-art genomics, proteomics, bioinformatics, and cell imaging to understand receptor-mediated interactions between biological systems and engineered nanomaterials. In addition, Dr. Thrall serves as the Thrust Leader for PNNL's Microbiomes-in-Transition research program, which includes a focus on developing tools and strategies to elucidate microbiome-exposome interactions. Dr. Thrall earned his PhD in pharmacology and toxicology from Washington State University.

Rosa Krajmalnik-Brown

Member

Rosa Krajmalnik-Brown is an associate professor in Civil and Environmental Engineering and is part of the Swette Center for Environmental Biotechnology in the Biodesign Institute at Arizona State University. She specializes in molecular microbial ecology for bioremediation, the use of microbial systems for bioenergy production, and the human intestinal microbial ecology and its relationship to obesity, bariatric surgery, and autism. She is an author of five patents and more than 60 peer-reviewed publications and has presented numerous talks and posters at national and international conferences. She was awarded a Fulbright scholarship and completed her Ph.D. in environmental engineering at the Georgia Institute of Technology.