

Anticipatory Research for EPA's Research and Development Enterprise to Inform Future Environmental Protection: The Road Ahead

Committee

Daniel S. Greenbaum

Chair

Mr. Greenbaum is President of Health Effects Institute (HEI), where he leads HEI's efforts to provide public and private decision makers — in the U.S., Asia, Europe, and Africa — with high quality, impartial, relevant, and credible science about the health effects of air pollution in order to inform air quality decisions in the developed and developing world. In this role he works with HEI's sponsors in government and industry, its Scientific Committees and staff, and other environmental stakeholders to develop and implement the HEI Strategic Plan for Understanding the Health Effects of Air Pollution, which every five years sets HEI's course. Mr. Greenbaum has been a member of the National Academies Board of Environmental Studies and Toxicology, chair of the Planning Committee for How We Move Matters: Exploring the Connections between New Transportation Mobility Options and Public Health, and vice chair of the Committee for Air Quality Management in the United States. In addition, he served on the National Academies Committee on The Hidden Costs of Energy, the Committee on Grand Challenges for Environmental Engineering, and the Committee on Science for EPA's Future. Mr. Greenbaum also chaired the EPA's Blue Ribbon Panel on Oxygenates in Gasoline and EPA's Clean Diesel Independent Review Panel, which reviewed technology progress in implementing the 2007 Highway Diesel Rule. He has over four decades of governmental and non-governmental experience in environmental health. Before coming to HEI, he served as Commissioner of the Massachusetts Department of Environmental Protection, where he was responsible for the Commonwealth's response to the Clean Air Act, as well as its award-winning efforts on pollution prevention, water pollution, and solid and hazardous waste. Mr. Greenbaum received his B.S. in urban studies and planning and M.S. in city planning from the Massachusetts Institute of Technology.

Shahzeen Z. Attari

Member

Dr. Attari is an Associate Professor at the O'Neill School of Public and Environmental Affairs at Indiana University, Bloomington. Previously, she was a fellow at the Center for Advanced Study in the Behavioral Sciences at Stanford University and in 2018 received the Andrew Carnegie Fellowship. She was a postdoctoral fellow at the Earth Institute and the Center for Research on Environmental Decisions at Columbia University. Her research focuses on people's judgments and decisions about climate change and resource use. Her key areas of expertise include behavioral science, survey design, and data analysis. Shahzeen Attari received her B.S. in engineering physics from University of Illinois, Urbana-Champaign, and a Ph.D. in civil and environmental engineering & engineering and public policy from Carnegie Mellon University.

Thomas A. Burke

Member

Dr. Burke is the Jacob I. and Irene B. Fabrikant Professor and Chair in Health Risk and Society Emeritus at Johns Hopkins University's Bloomberg School of Public Health, Department of Health Policy and Management. He holds joint appointments in the Department of Environmental Health and Engineering. He is also Director of the Johns Hopkins Risk Sciences and Public Policy Institute. Dr. Burke was nominated by President Barack Obama to serve as EPA Assistant Administrator for the Office of Research and Development. His research interests include environmental epidemiology and surveillance, evaluation of population exposures to environmental pollutants, assessment and communication of environmental risks, and application of epidemiology and health risk assessment to public policy. Before joining the University faculty, Dr. Burke was Deputy Commissioner of Health for the State of New Jersey and Director of Science and Research for the New Jersey Department of Environmental Protection. In New Jersey, he directed initiatives that influenced the development of national programs, such as Superfund, the Safe Drinking Water Act, and the Toxics Release Inventory. Dr. Burke serves as chair of the National Academies Environmental Health Matters Initiative Steering Committee. His previous National Academies service includes: member of the Board on Environmental Studies and Toxicology; chair of the Committee on Improving Risk Analysis that produced the report Science and Decisions; chair of the Committee on Human Biomonitoring for Environmental Toxicants; and member of the Committee on Science for EPA's Future. He is a fellow of the Society for Risk Analysis and a lifetime National Associate of the National Academies. He was Inaugural Chair of the Advisory Committee to the Director of the U.S. Centers for Disease Control and Prevention National Center for Environmental Health and a member of EPA's Science Advisory Board and Board of Scientific Counselors. Dr. Burke received his B.S. from St. Peter's College, his M.P.H. from the University of Texas, and his Ph.D. in epidemiology from the University of Pennsylvania.

G. A. Burton, Jr.

Member

Dr. Burton is a professor in the School for Environment and Sustainability and the Department of Earth & Environmental Sciences. He also is Director of the Institute of Global Change Biology, holding an Honorary Doctorate from the University of Roskilde (Denmark), and both a Concurrent Professor at Nanjing University and Honorary Professor at the State Key Laboratory of Environmental Criteria and Risk Assessment in Beijing China. His research has taken him to all seven continents with Visiting Scientist positions in China, Denmark, Italy, New Zealand and Portugal, dealing with sediment and storm water toxicant bioavailability, improving causality linkages of risk at multiple trophic levels, and ranking stressor importance. While at the University of Michigan, he also served as director of the Water Center and NOAA Cooperative Institute of Limnology and Ecosystems Research. He was a Distinguished Faculty Fellow of the Graham Sustainability Institute and the Brage Golding Distinguished Professor of Research. Dr. Burton is a member of the executive committee of EPA's Board of Scientific Counselors. He is the editor-in-chief of Environmental Toxicology & Chemistry and a fellow and past President of the Society of Environmental Toxicology & Chemistry, serving on numerous national and international panels with over 200 peer-reviewed publications. In 2006-2007 he served on the National Research Council Committee on Evaluation of the Effectiveness of Dredging at Contaminated Sediment Sites. In January 2020, he spoke at the National Academies symposium on Emerging Technologies to Advance Research and Decisions on the Environmental Health Effects of Microplastics. Dr. Burton received his B.S. in biology and chemistry from Ouachita Baptist University, his M.S. in microbiology from Auburn University, and his Ph.D. in aquatic toxicology from the University of Texas, Dallas.

Herek L. Clack

Member

Dr. Clack is an associate professor of Civil & Environmental Engineering at the University of Michigan. His research group focuses on chemical and biological aerosols and their interactions with electric fields and electrical discharges. He is the recipient of the XVI Distinguished Young Alumni/ae award (MIT, 2000), the NSF CAREER Award (NSF, 2004), the Harry J. White Award for Outstanding Achievement in the Science and Application of Electrostatic Precipitation (Int'l Soc. for Electrostatic Precipitation, 2013), and the Kenneth M. Reese Outstanding Research Scientist Award (University of Michigan College of Engineering, 2019). He is vice-president and a member of the Board of Directors of the International Society for Electrostatic Precipitation (ISESP); serves on the Mitigation and Control Technology working group of the American Association for Aerosol Research; and is co-founder and acting CEO of the startup company Taza Aya LLC. He has served on numerous National Academies committees, addressing environmental issues ranging from the implications of changes to the regulations governing power plant emissions to the safe and ethical thermal destruction of conventional munitions and chemical warfare agents by the U.S. military. Dr. Clack earned his S.B. in aeronautical and astronautical engineering from the Massachusetts Institute of Technology and his M.S. and Ph.D. in mechanical engineering from the University of California, Berkeley.

Otakuye Conroy-Ben

Member

Dr. Conroy-Ben, is an assistant professor of environmental engineering in the School of Sustainable Engineering and the Built Environment at Arizona State University. She was a research engineer for the Los Angeles County Sanitation Districts, where she studied municipal wastewater odor mitigation. As a postdoc in the Department of Chemistry and Biochemistry at the University of Arizona, her work focused on bacterial metal and multi-drug resistance. Dr. Conroy-Ben previously served on the Board of Directors for the American Indian Science and Engineering Society (AISES), was the recipient of the AISES Technical Excellence Award, and is an AISES Sequoyah Fellow. Her research interests include wastewater engineering and reuse, environmental endocrine disruption, multi-drug resistance in wastewater systems, wastewater-based epidemiology, and Tribal water quality. Dr. Conroy-Ben received her B.S. in chemistry from the University of Notre Dame, her M.A. in chemistry, and her M.S. and Ph.D. in chemical and environmental engineering from the University of Arizona.

Victor G. Corces

Member

Dr. Corces is a member of the National Academy of Sciences and a professor of human genetics at the Emory University school of Medicine. He also is a member of the Cell and Molecular Biology Research Program at Winship Cancer Institute. Research in Dr. Corces' laboratory studies the mechanisms by which the three-dimensional organization of the chromatin is established and maintained. His current research focuses on understanding the mechanisms by which environmental chemicals affect the epigenome of germline cells and how these epigenetic alterations can be transmitted from the gametes to the embryo after fertilization to cause disease states. He has published extensively in the area of epigenetics and genomics, with a recent focus on the organization of the nucleus of egg and sperm. Dr. Corces received his B.S. in chemistry from Universidad Complutense de Madrid, his Ph.D. in chemistry from the Autonoma University in Madrid, Spain, and his postdoctoral and training in molecular and cellular biology from Harvard University.

George P. Daston

Member

Dr. Daston is the Victor Mills Society Research Fellow at the Procter & Gamble Company and an adjunct professor of pediatrics at University of Cincinnati. He has published over 100 articles and book chapters and edited five books on toxicology and risk assessment. His current research efforts are in the areas of toxicogenomics and mechanistic toxicology, particularly in addressing how findings in these fields can improve risk assessment of chemicals and the development of non-animal alternatives. He has served as president of the Teratology Society; councilor, treasurer, and president of the Society of Toxicology; member of the US EPA Science Advisory Board; member of the Board of Scientific Counselors of the National Toxicology Program; member of the National Academies' Board on Environmental Studies and Toxicology and multiple consensus study committees; and member of the National Children's Study Advisory Committee. He was the founding editor of Birth Defects Research: Developmental and Reproductive Toxicology. He has been awarded the Josef Warkany Lectureship and the Distinguished Service Award by the Teratology Society, the George H. Scott Award by the Toxicology Forum, and the Society of Toxicology's Best Paper of the Year Award. He is an elected fellow of the American Association for the Advancement of Science. Dr. Daston earned his Ph.D. in developmental biology from the University of Miami.

Frank W. Davis

Member

Dr. Davis is a Distinguished Professor of Landscape Ecology and Conservation Planning at the Bren School of Environmental Science and Management, University of California, Santa Barbara. He also serves as executive director of the Long Term Ecological Research (LTER) Network Office, and director of the La Kretz Center for Research at Sedgwick Reserve. His research focuses on the landscape ecology of California plant communities, climate change effects on plant species distributions, the design of protected-area networks, and forest and rangeland management. He has received several honors and awards including Aldo Leopold Leadership Fellow, fellow of the American Association for the Advancement of Science, and fellow of the Ecological Society of America. He serves as chair of the National Academies Board on Environmental Studies and Toxicology and has previously chaired the National Academies Committee on Independent Scientific Review of Everglades Restoration Progress as well as the Committee on Effective Approaches for Monitoring and Assessing Gulf of Mexico Restoration Activities. In addition, he has served as a member of numerous National Academies committees, including the Committee on Science for EPA's Futures. Dr. Davis received his B.A. in biology from Williams College and his Ph.D. in geography and environmental engineering from Johns Hopkins University.

Edan T. Dionne

Member

Ms. Dionne is Vice President of Environmental, Energy and Chemical Management Programs with IBM's Corporate Environmental Affairs. She leads a team that is responsible for defining IBM's strategy in those areas, as well as IBM's global environmental management system and internal requirements and goals. The corporate staff is responsible for driving performance consistent with environmental leadership across the company. She has over 35 years of experience as an environmental professional. She has direct working knowledge and experience in each of the areas she now leads. She regularly works with peers in industry, eNGOs and governments toward advancing environmental sustainability goals. Ms. Dionne received her M.S. degree in chemical engineering from Michigan State University.

Todd Kuiken

Member

Dr. Kuiken is an analyst in science and technology policy in the Resources, Science and Industry Division of the Congressional Research Service. Previously, he was an environmental scientist and senior research scholar with the Genetic Engineering and Society Center at North Carolina State University. He also was the principal investigator for the Woodrow Wilson Center's Science and Technology Innovation Program. He explores the scientific and technological frontier, stimulating discovery and bringing new tools to bear on public policy challenges that emerge as science advances. Dr. Kuiken is a member of the U.N. Convention on Biological Diversity's Ad-Hoc Technical Expert Group on Synthetic Biology, the Cartagena Protocol on Biosafety's Ad Hoc Technical Expert Group on Risk Assessment, and the technical and policy task force on synthetic biology and gene drives for the International Union for Conservation of Nature (IUCN). He is also the chair of the International Genetically Engineered Machines Competition's (iGEM) sustainable development goals program, former co-chair of the human practices committee, and founding member of its biosafety/biosecurity committee. He has previously been called to present to numerous National Academies studies on various topics. Dr. Kuiken received his B.S. in environmental management and technology from Rochester Institute of Technology, his M.A. in environmental and resource policy from the George Washington University, and his Ph.D. in environmental sciences from Tennessee Technological University.

Rachel A. Morello-Frosch

Member

Dr. Morello-Frosch is a member of the National Academy of Medicine and an environmental health scientist, epidemiologist and professor in the School of Public Health and the Department of Environmental Science, Policy and Management at the University of California, Berkeley. Her research examines structural determinants of community environmental health with a focus on social inequality, psychosocial stressors and how these factors interact with multiple environmental hazard exposures to produce health inequalities. Her work explores this question in the context of environmental chemicals, climate change, air pollution, and effects on perinatal, maternal and children's health, often using community-based participatory research methods. In collaboration with communities and scientists, she has developed science-policy tools to assess and map the cumulative impacts of chemical and non-chemical stressors to improve regulatory decision-making. Dr. Morello-Frosch received her B.A. in development studies from the University of California, Berkeley, her M.P.H. in epidemiology and biostatistics and Ph.D. in environmental health sciences from the University of California Berkeley School of Public Health.

Ana Navas-Acien

Member

Dr. Navas-Acien is a professor of environmental health sciences and vice chair of research and faculty affairs at the Columbia University Mailman School of Public Health, and director of the Columbia University Superfund Research Program. Her research investigates the long-term health effects of environmental exposures (including metals, tobacco smoke, e-cigarettes, and air pollution), their interactions with genetic and epigenetic variants, and effective interventions for reducing involuntary exposures. For more than 10 years, she has worked with the Strong Heart Study (SHS), one of the flagship population-based cohort studies funded by the National Institutes of Health, to identify major environmental exposures contributing to the epidemics of diabetes and cardiovascular disease affecting American Indian communities. She is also the P.I. of an ancillary study on Multi-Ethnic Study of Atherosclerosis, which is measuring urinary metal levels in another major NIH-funded multi-ethnic study of atherosclerosis in US adults, and of a new cohort study called VapeScan to evaluate the health effects of e-cigarette use. In addition to these observational studies, she is the P.I. of the biorepository of TACT2, a large NIH-funded chelation trial that is assessing the impact of metal chelation in preventing cardiovascular disease and other outcomes. Both in the U.S. and internationally, she evaluates exposure to tobacco smoke including emerging public health challenges, such as waterpipe smoking and e-cigarettes. She has been a member of multiple National Academies committees, including the Committee on the Evaluation of the Protocol for the IRIS Toxicological Review of Inorganic Arsenic and the Committee to Review of the Health Effects of Electronic Nicotine Delivery Systems (ENDS). She is a physician-epidemiologist and environmental health scientist with a specialty in preventive medicine and public health. Dr. Navas-Acien received her M.D. from the University of Granada, Spain. She received her M.P.H. from the National School of Health in Spain, and her Ph.D. in epidemiology from Johns Hopkins University.

Paula J. Olsiewski

Member

Dr. Olsiewski is a contributing scholar at the Johns Hopkins Center for Health Security, where she is leading a team to develop pandemic policy for indoor air. She is a pioneering leader in policy and scientific research programs in the microbiology and chemistry of indoor environments. Prior to joining the Center, Dr. Olsiewski spent 2 decades at the Alfred P. Sloan Foundation, where she led innovative and multidisciplinary programs that inspired, accelerated, and produced lasting impact. Her expertise in partnering with academic, governmental, and for-profit stakeholders fostered innovation and built research capacity through the creation of diverse stakeholder networks. Dr. Olsiewski is recognized as a leading expert in biosecurity and is a member of the Council on Foreign Relations. She is chair of the US Environmental Protection Agency (EPA) Homeland Security Research Subcommittee and is a member of the EPA Board of Scientific Counselors Executive Committee. She is a fellow of the American Association for the Advancement of Science in chemistry. She was a member of the National Academies Committee on Advances in Technology and the Prevention of Their Application to Next Generation Biowarfare Threats, which produced the 2006 report "Globalization, Biosecurity, and the Future of Life Sciences." Dr. Olsiewski received her B.S. in chemistry from Yale University and her Ph.D. in biological chemistry from the Massachusetts Institute of Technology.

ManishKumar B. Shrivastava

Member

Dr. Shrivastava is currently a senior Earth Systems Scientist at the Pacific Northwest National Laboratory (PNNL). He is also an adjunct professor in the Department of Chemistry at Michigan Technological University. In addition, he holds a courtesy faculty position in the Department of Environmental and Molecular Toxicology at Oregon State University. He serves on the editorial boards of two peer-reviewed journals in atmospheric sciences: Atmospheric Chemistry and Physics (ACP) and Atmosphere. In 2018, he was awarded the highly prestigious and competitive U.S. Department of Energy Early Career Award to conduct research on finding missing links associated with aerosol-cloud interactions. His research bridges measurements and modeling of secondary organic aerosols (SOA), and their interactions with clouds and radiative forcing. His research also connects climate relevant SOA particles with human-health relevant cancer-causing polycyclic aromatic hydrocarbons, which are persistent organic pollutants known for their long-range transport. Over the past decade, he has developed and implemented several new measurement-based model formulations of SOA within community regional and global models. In 2015, he organized and chaired a US DOE-supported workshop on SOA at PNNL and led a critical review paper on the topic in Reviews of Geophysics (2017). He has published 48 peer-reviewed journal articles with several high impact papers in Science, Nature Communications and the Proceedings of National Academy of Sciences (PNAS). Dr. Shrivastava received his B.E. in mechanical engineering from Mumbai University, his M.Tech. in environmental science and engineering from the Indian Institute of Technology, Mumbai, and Ph.D. from Carnegie Mellon University, USA.

Terry F. Yosie

Member

Dr. Yosie has served in senior level executive management positions at the U.S. Environmental Protection Agency and the private sector, and he was CEO of the global, non-profit World Environment Center. He is presently an advisor to a number of major institutions on environmental and sustainability issues, including Trane Technologies, The Dow Chemical Company, the William K. Reilly Center for Environmental Policy at American University, the United Nations Environment Programme's High Level Advisory Group for the 6th Global Environment Outlook, a monthly Sustainability Columnist for www.greenbiz.com, and an opinion contributor to The Hill. His range of expertise includes business strategy, climate change, global plastics waste, economic development strategies, environmental protection and energy policies, institutional governance and management, emerging issues analysis, science policy and risk assessment. He has more than 40 years of professional experience in managing and analyzing the use of scientific information in setting environmental standards. He was the first executive director of U.S. EPA's Clean Air Scientific Advisory Committee, served as director of U.S. EPA's Science Advisory Board, and instituted policies and procedures for enhancing the use of scientific information in regulatory decision-making. Dr. Yosie has served on a number of National Academies committees and boards, including the Committee to Review the Structure and Performance of the Health Effects Institute, the Committee on Research Priorities for Airborne Particulate Matter, the Board on Environmental Studies and Toxicology, and the Committee on Scientific Tools and Approaches for Sustainable Development at the Environmental Protection Agency. He is the author of over 100 publications on the use of scientific information in the development of public health and environmental policies and strategies to advance sustainable development. Dr. Yosie received his B.A. in pre-law from Indiana University of Pennsylvania and his M.A. in history and Ph.D. in humanities and social sciences from Carnegie Mellon University.

Hao Zhu

Member

Dr. Zhu is a professor in the Department of Chemistry and Biochemistry at Rowan University. His major research interest is to use cheminformatics tools to develop predictive models. All resulted models can be used to directly predict the chemical toxicity, based on public big data and molecular structure information. His current research interests include intelligent data-driven modeling, artificial intelligence algorithm development and rational nanomaterial design. He is serving as the member of the editor boards of journals (e.g., *Ecotoxicology and Environmental Safety*), member of multiple national scientific committees (e.g. for the National Institutes of Health) and grant review committees (e.g. for the Department of Defense). He received his B.S. in chemistry from Jilin University, his M.S. in chemistry from Peking University, and his Ph.D. in chemistry from Case Western Reserve University.

Raymond A. Wassel

Staff Officer