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Biological Factors that Underlie Individual Susceptibility to Environmental Stressors, and Their Implications for Decision-Making

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SPEAKERS and PANELISTS/MODERATORS BIOS

SPEAKERS

Nicholas Ashford, Ph.D., is Professor of Technology & Policy at the Massachusetts Institute of Technology, where he teaches courses in *Law, Technology, and Public Policy*; *Sustainability, Trade and Environment* and *Environmental Law, Policy, and Economics.*. He holds both a Ph.D. in Chemistry and a Law Degree from the University of Chicago, where he also received graduate education in Economics. Dr. Ashford also is visiting scientist in Occupational and Environmental Health at the Harvard School of Public Health and teaches intensive courses in Sustainable Development, and European & International Environmental Law at Cambridge University, UK and at the Cyprus University of Technology. He was a public member and chairman of the National Advisory Committee on Occupational Safety & Health, served on the EPA Science Advisory Board, and was chairman of the Committee on Technology Innovation & Economics of the EPA National Advisory Council for Environmental Policy and Technology. Dr. Ashford is the co-author of two recent textbooks/readers: Technology, Globalization, and Sustainable Development: Transforming the Industrial State (2011, Yale University Press; see http://sdm.mit.edu/news/news_articles/webinar_101711/webinar-ashford-systems.html) and Environmental Law, Policy and Economics: Reclaiming the Environmental Agenda (2008, MIT Press; see http://mitpress.mit.edu/9780262012386). He also authored a major policy work for the Ford Foundation, Crisis in the Workplace: Occupational Disease and Injury, (1976, MIT Press). He co-authored four additional books: Public Participation in Contaminated Communities, (2001, http://web.mit.edu/ctpid/www/tl/); Chemical Exposures: Low Levels and High Stakes (second edition 1998, John Wiley Press; http://www.chemicalexposures.com); Technology, Law and the Working Environment (second edition 1996, Island Press) and Monitoring the Worker for Exposure and Disease (1990, John Hopkins University Press). He has published several hundred articles in peer-reviewed journals and law reviews.

Weihsueh Chiu, Ph.D., is an environmental health scientist in the U.S. EPA Office of Research and Development, National Center for Environmental Assessment. His specialties include health risk assessment, dose-response assessment, biological and statistical modeling, pharmacokinetics, and data analysis. Since 2003, he has been the Chemical Manager for EPA's trichloroethylene health assessment. He is also currently Project Area Lead for Advancing Dose Response Analysis in the Human Health Risk Assessment Program at EPA. He worked previously in EPA's Office of Air and Radiation on both exposure assessment and the analysis of health effects from ionizing radiation. He earned a bachelors degree in Physics from Harvard University, a Ph.D. in Physics from Princeton University, and holds a certificate in Science, Technology, and Public Policy from the Woodrow Wilson School for Public and International Affairs. Prior to joining EPA, he worked at the U.S. Governmental Accountability Office (GAO), where he conducted investigations for Congress on various risk assessment-related topics, including the defense against chemical and biological weapons and the health effects from Vietnam veterans' exposure to Agent Orange.

Harvey Clewell, Ph.D., is the Director of the Center for Human Health Assessment at the Hamner Institutes for Health Sciences. He has gained an international reputation for his research on the application of Physiologically Based Pharmacokinetic (PBPK) modeling to chemical risk assessment and

pharmaceutical safety assessment, having played a major role in the first uses of PBPK modeling by FDA, ATSDR, OSHA, and EPA. He has a Masters in Chemistry from Washington University, St. Louis, and a PhD in Toxicology from the University of Utrecht. His current research interests include PBPK modeling of early life exposures, computer simulation of drug-induced liver injury, modeling of nanoparticle disposition and effects, and the use of in vitro data and biological modeling to perform in vitro to in vivo extrapolation in support of risk and safety assessments.

Michael Dourson, Ph.D., is the President of Toxicology Excellence for Risk Assessment (TERA). He has a PhD in toxicology from the University of Cincinnati in 1980 and is a Diplomate of the American Board of Toxicology (ABT). He has lead TERA's development of partnerships among diverse groups to address chemicals of high visibility, such as formaldehyde, perchlorate, chloroform, and soluble nickel, and cooperative ventures such as the Voluntary Children's Chemical Exposure Program, the International Toxicity Estimates for Risk database (available at Toxnet), and the Alliance for Risk Assessment. He also worked 15 years for EPA, holding several leadership roles and winning awards for joint efforts, such as the creation of EPA's Integrated Risk Information System. In 2003, he won the Society of Toxicology (SOT) Lehman award for major contributions that improve the scientific basis of risk assessment. In 2007, he was elected a Fellow of the Academy of Toxicological Sciences. In 2009, he won the International Society of Regulatory Toxicology and Pharmacology's International Achievement Award in recognition of his outstanding contributions nationally and internationally to the advancement of regulatory science. In 2009, he was also selected a Fellow for the Society for Risk Analysis (SRA) for substantial achievement in science relating to risk analysis and service to SRA. Dr. Dourson has co-published more than 100 papers on risk assessment methods, including methods for assessing risk in sensitive subgroups, on use of animal and human data in the assessment of risk, or on assessments for specific chemicals. He has also co-authored well over 100 government risk assessment documents, made over 100 invited presentations, and chaired well over 100 sessions at scientific meetings and independent peer reviews. He has been elected to multiple officer positions in the American Board of Toxicology, the Society of Toxicology (SOT), and the Society for Risk Analysis. In addition to numerous appointments on government panels, such as EPA's Science Advisory Board, he is also a media resource specialist in risk assessment for the SOT, member on the editorial board of several journals, and vice chair of the NSF International Health Advisory Board.

William H. Farland, Ph.D., is currently the Senior Vice President for Research and Engagement at Colorado State University in Fort Collins, CO. He is also a Professor in the Department of Environmental and Radiological Health Sciences, School of Veterinary Medicine and Biomedical Sciences at that institution. In 2006, Dr Farland was appointed Deputy Assistant Administrator for Science in the US Environmental Protection Agency's (EPA) Office of Research and Development (ORD). He had served as the Acting Deputy Assistant Administrator since 2001. In 2003, Dr. Farland was also appointed Chief Scientist in the Office of the Agency Science Advisor. He served as EPA's Acting Science Advisor throughout 2005. Formerly, he was the Director of the ORD's National Center for Environmental Assessment (NCEA) which had major responsibility for the conduct of chemical-specific risk assessments in support of EPA regulatory programs, the development of Agency- wide guidance on risk assessment, and the conduct of research to improve risk assessment. Dr. Farland's 27 year federal career was characterized by a commitment to the development of national and international approaches to the testing and assessment of the fate and effects of environmental agents. Dr. Farland holds a Ph.D. (1976) from UCLA in Cell Biology and Biochemistry. Dr. Farland served on a number of executive- level committees and advisory boards within the Federal government. In 2005-2006, he chaired the Executive Committee of the National Toxicology Program (NTP). He is also a member of the Scientific Advisory Council of the Risk Sciences and Public Policy Institute, Johns Hopkins University School of Hygiene and Public Health, a public member of the American Chemistry Council's Strategic Science Team for its Long Term Research Initiative (ACC/LRI) and a member of the Programme Advisory Committee for the WHO's International Programme on Chemical Safety. In 2002, Dr. Farland was recognized by the Society for Risk Analysis with the "Outstanding Risk Practitioner Award," and in 2005 was appointed as a Fellow of the Society. In 2006, he received a Presidential Rank Award for his service as a federal senior executive. In 2007, he was elected as a Fellow, Academy of Toxicological Sciences. He continues to teach and publish and has been a member of the Editorial Board for *Risk Analysis*, *Environmental Health Perspectives* and *Chemosphere*.

John E. French, Ph.D., Supervisory Physiologist, leads the Host Susceptibility initiative for the NTP at NIEHS. After receiving his Ph.D. from North Carolina State University at Raleigh, North Carolina, he pursued postdoctoral training in radiation biology at the AFRRI-National Naval Medical Center (NNMC) in Bethesda, Maryland where he investigated ionizing radiation toxicity and suppression of immune and xenobiotic metabolism systems in multiple model organisms. He received an NIH-USPHS fellowship to study occupational health and toxicology at the Finnish Institute of Occupational Health in Helsinki, Finland. Currently, his research is focused on the use of population based models (panels of genetically defined or genetically modified inbred mouse strains or outbred stocks) to investigate toxicity and disease phenotypes with the goal of defining the quantitative basis for population variance associated with susceptibility to radiation and chemical carcinogen-induced DNA damage and repair.

Jim Kaput, Ph.D. is the Head of the Clinical Translation Unit in the newly created Nestle Institute of Health Sciences (http://www.nestleinstitutehealthsciences.com). His immediate past position (11.2007 to 7.2010) was as Director of the Division of Personalized Nutrition and Medicine at the U.S. FDA's National Center for Toxicological Research (Jefferson, AR). He is a member of the Executive Committee of NuGO (Nutrigenomics Organization – www.nugo.org) and its Micronutrient Genomics Project Committee (http://www.nugo.org/micronutrients). He also contributes to the international Human Variome Project (www.humanvariomeproject.org). Dr. Kaput received his PhD from Colorado State University in Biochemistry and Molecular Biology. He spent 5 years as a postdoctoral fellow and assistant professor at the Rockefeller University in the laboratory of GÜnter Blobel, the 1999 Nobel Laureate in Physiology and Medicine. Dr. Kaput was a staff and Biochemistry faculty member at the University of Illinois College of Medicine and Director of the Northwestern University Biotechnology Laboratory for 2 years. He also was science advisor for international activities at the European Nutrigenomics Organization (NuGO), Coordinator of Science and Administrative Activities for the NCMHD Center of Excellence in Nutritional Genomics at the University of California Davis, and Assistant Professor in the Department of Surgery at the University of Illinois Chicago (UIC). He co-founded 2 nutrigenomic biotechnology companies (1998 and 2002), one of which merged with a publically traded company. He received a Fulbright Senior Specialist Program in Public/Global Health for 2006 through 2011 and visited Brazil in 2007. This program is administered through the Bureau of Education and Cultural Affairs in the U.S. Department of State and the Council for International Exchange of Scholars.

Claudia S Miller, M.D., M.S., is Professor of Environmental and Occupational Medicine and Assistant Dean for the 4-year MD/MPH Program at the University of Texas School of Medicine in San Antonio. She received her MD from the University of Texas Health Science Center-San Antonio, completed her residency in Internal Medicine, a fellowship in Allergy/Immunology, and her MS in Public Health (industrial hygiene) from the University of California-Berkeley. Her research interests include the health effects of environmental exposures, individual differences in chemical susceptibility, the role of environmental exposures in initiating chemical intolerance (Toxicant-induced Loss of Tolerance or TILT), and the need for environmentally controlled medical units for research on chronic illnesses associated with chemical, food and drug intolerances. Dr. Miller led the subgroup on individual susceptibility for the CDC's National Conversation on Public Health and Chemical Exposures. Along with Nicholas Ashford, PhD, JD, of MIT, she co-authored the seminal book, *Chemical Exposures: Low Levels and High Stakes* (second edition, Wiley). Dr. Miller founded (1996) and directs the South Texas Environmental Education and Research (STEER) Program, which is considered a national model for training health professions students in environmental health.

Nathaniel Rothman, M.D., received an AB from Harvard College, a MD from Northwestern University Medical School, and a MPH and MHS from Johns Hopkins University School of Hygiene and Public Health. He is board-certified in Internal Medicine and Occupational Medicine/Preventive Medicine. He joined NCI in 1990 and is a Senior Investigator and Head of Molecular Epidemiology Studies in the Occupational and Environmental Epidemiology Branch of the Division of Cancer Epidemiology and Genetics. His research focuses on the molecular epidemiology of known or suspected occupational and environmental carcinogens including aromatic amines, benzene, formaldehyde, TCE, PAHs, and organochlorines. He uses biomarkers of exposure, intermediate endpoints, and genetic susceptibility, in

particular, in studies of bladder, kidney, and lung cancer, and leukemia and lymphoma. He is the author of over 400 publications and lead editor of the new text "Molecular Epidemiology: Principles and Practices" being published this year by IARC.

Eric Schadt, Ph.D., recently joined Mount Sinai Medical School as Chairman and Professor, Department of Genetics and Genomic Sciences and as Director, Institute of Genomics and Multiscale Biology (effective 1 August 2011). Previously, Dr. Schadt had joined Pacific Biosciences as Chief Scientific Officer in June 2009 to oversee the scientific strategy for the company, including creating the vision for next-generation sequencing applications of the company's technology. Dr. Schadt is also a founding member of Sage Bionetworks, an open access genomics initiative designed to build and support databases and an accessible platform for creating innovative, dynamic models of disease. Dr. Schadt's current efforts at Mount Sinai to generate and integrate large-scale, high-dimension molecular, cellular, and clinical data to build more predictive models of disease so that we may better diagnose and treat disease, were motivated by the genomics and systems biology research he led at Merck to elucidate common human diseases and drug response using novel computational approaches applied to genetic and molecular profiling data. His research helped revolutionize a field in statistical genetics (the genetics of gene expression), has energized the systems biology field, and has led to a number of discoveries relating to the causes of common human diseases. At the time Dr. Schadt left Merck in 2009, greater than 50% of all new drug discovery programs at Merck in the metabolic space were derived from Dr. Schadt's work. Dr. Schadt was also recently appointed as Fellow to the Institute of Systems and Synthetic Biology, Imperial College London. Dr. Schadt received his B.S. in applied mathematics/computer science from California Polytechnic State University, his M.A. in pure mathematics from UCD, and his Ph.D. in bio-mathematics from UCLA (requiring Ph.D. candidacy in molecular biology and mathematics).

Joel Schwartz, Ph.D. is Professor of Environmental Epidemiology at the Department of Environmental Health and Department of Epidemiology at Harvard School of Public Health. Dr. Schwartz received his Ph.D. from Brandeis University in 1980. "My research is divided in three main areas: First, I am interested in epidemiology looking at the health consequences of exposure to pollutants. To date this has had two focuses: health effects of lead and health effects of air pollutants. I have recently begun work looking at water contamination. In lead, I have examined cardiovascular effects of lead exposure in adults, cognitive effects in children, auditory effects in children, and effects of lead on children's growth. I have also done work on sources of lead exposure, including establishing gasoline lead as the major source of lead exposure in the United States. My air pollution work has examined both acute and chronic effects of air pollution exposure. Recent research has established that exposure to fine combustion particles in the air at concentrations well below current standards are associated with a range of adverse health effects from increased respiratory symptoms, to increased hospital admissions, to increased deaths. This work has led to a tightening of the U.S. air quality standards. I have also done considerable work on health effects of ozone exposure. I have several international collaborations underway in this area. Recent work has been focused on the cardiovascular effects of air pollution, and on factors which modify the response to air pollution. Recent work has suggested diabetics are more susceptible, for example. I am also interested in methodological questions regarding the modeling of continuous covariates in epidemiologic studies, both for better covariate control and to more accurately assess the relationship between exposure and response. This has involved regression spline models, nonparametric smoothing, and generalized additive models. I have been using mixed and hierarchical models to combine this information across studies. Case-crossover techniques have also been introduced for these purposes. I have demonstrated the effectiveness of these tools in applications in both lead and air pollution studies. I have also been interested in issues involving time series studies, where the outcomes measures are not independent. This has involved generalized least squares and generalized estimating equation approaches. A third major focus of my research is on the effects of antioxidants on respiratory health. To data this has focused on chronic effects (e.g. relationship between dietary intake and level of pulmonary function or symptoms), but future research will examine their potential to modify acute responses as well. A final area of interest is in the use of cost benefit analysis to make environmental decisions. I have developed benefit methodologies for assessing the benefits of lead control, and applied those methodologies to the decision to remove lead from gasoline, and recently, in collaboration with colleagues at the Centers for Disease

Control, to a decision to revise their screening recommendations for children. I am also involved in cost benefit analysis of air pollution control."

Peter Shaw, Ph.D. has held several positions at Bristol-Myers Squibb and now a Merck to advance the discovery and development of molecular biomarkers for personalized medicine approaches Experience at Merck has included directing a matrixed group involved in integration of molecular profiling technologies in pre-clinical and clinical development for: target engagement, Pharmacodynamic measurements and patient selection. The MPRI group was responsible for the execution of molecular profiling projects, integration and execution of pharmacogenetic strategies in clinical development, conduct of all molecular profiling assays with external partners, sample inventory for biomarker research and the Oncology Health Care Solutions Program. Through team work Peter has lead, established and managed multiple external academic and biotechnology alliances, globally, that integrate molecular and clinical information (e.g. the Merck Moffitt Oncology alliance) as well as partnerships to develop diagnostic tests for use in clinical development. Peter is currently responsible for integration and development of genetic scientific strategy for clinical programs in Infectious Diseases and Vaccines. Peter is an active participant on various external committees focused on advancing ethical, legal, and regulatory issues for pharmacogenetics including, the EFPIA pharmacogenetics and pharmacogenomics group, the iPWG (International Pharmacogenetic Working Group). Peter received his Ph.D. from Aberdeen University in 1987; he then studied phenobarbital gene regulation at NYU Medical Center. Peter joined the PanVera Corporation and headed the drug metabolism group, which was involved in characterizing and developing novel commercial recombinant human drug metabolizing enzymes.

Duncan Thomas, Ph.D., is is Professor of Preventive Medicine, Director of the Biostatistics Division, and Verna R. Richter Chair in Cancer Research at the University of Southern California Keck School of Medicine. He received his Ph.D. from McGill University in 1976. His primary research interest has been in the development of statistical methods for environmental and genetic epidemiology, with numerous collaborations in both areas. On the environmental side, he has been particularly active in radiation carcinogenesis and air pollution health effects research, notably as one of the senior investigators on the Southern California Children's Health Study and as a member of President Clinton's Advisory Committee on Human Radiation Experiments. On the genetic side, he is a coinvestigator in the NCI's Colon Cancer Family Registry, the Genetic Analysis Workshop, the ENDGAME consortium to develop methods for genome-wide association studies, and past President of the International Genetic Epidemiology Society. Dr. Thomas has numerous publications, including the textbooks *Statistical Methods in Genetic Epidemiology* (Oxford University Press, 2004) and *Statistical Methods in Environmental Epidemiology* (Oxford University Press, in press). These three broad areas of interest make him uniquely qualified to address methodological challenges in studying gene-environment interactions.

Fred A. Wright, Ph.D., is a Professor in the Department of Biostatistics at UNC-Chapel Hill. He received his Ph.D. in Statistics from the University of Chicago in 1994, and is an elected Fellow of the American Statistical Association. His interests include gene mapping, methodology development in the statistical analysis of expression microarrays, somatic genomics of cancer, genome-wide association studies, and expression quantitative trait locus (eQTL) analysis. In the last several years, he has worked on new methods for computational toxicology and investigation of genetic susceptibility, through the work of the Carolina Environmental Bioinformatics Center and the Carolina Center for Computational Toxicology, both funded by the U.S. EPA as STAR Centers. His current research interests include dissection of disease and variation in genetic susceptibility using combinations of genetic and genomic sources of information.

Lauren Zeise Ph.D., is Chief, Reproductive and Cancer Hazard Assessment Branch, of the California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment. In that role she oversees a variety of scientific activities concerning risk assessment, including chemical hazard and dose response assessment and development of improved methods for risk assessment. As part of Cal/EPA's environmental justice work, her group is also developing the Agency's approach to cumulative impact assessment – for characterizing the impact on communities of multiple sources of pollution and non-chemical stressors in the presence of community vulnerability. Her group works with other departments in California government in operating Biomonitoring California, the state's biomonitoring

program. She co-led the team that developed California's Green Chemistry Hazard Trait regulation. Dr. Zeise has served on numerous national and international science advisory committees and boards focusing on environmental public health and improving the way chemicals are tested or evaluated for health risk. She has coauthored a number of National Academy of Science (NAS) reports, including "Science and Decisions: Advancing Risk Assessment" (2009), "Toxicity Testing in the 21st Century: A Vision and Strategy" (2007), "Sustainability and the US EPA" (2011), and "Understanding Risk: Informing Decisions in a Democratic Society" (1996). She is currently a member of the NAS committees including the Committee on Use of Emerging Science for Environmental Health Decisions. She is member, fellow, former editor and former councilor of the Society of Risk Analysis and was the 2008 recipient of the Society's Outstanding Risk Practioner Award. She is a lifetime NAS National Associate. She received her doctorate from Harvard University.

PANELISTS/MODERATORS

Daniel Axelrad, Ph.D. is an Environmental Scientist in the U.S. EPA's Office of Policy. He is a co-author of America's Children and the Environment, EPA's reports of children's environmental health indicators. His research includes work on mercury, air toxics, and risk assessment methods. He has served as chair of EPA's Science Policy Council Steering Committee and EPA's workgroup on polybrominated diphenyl ethers. His work has been recognized with an EPA Gold Medal for America's Children and the Environment, and an EPA Scientific and Technological Achievement Award for research on air toxics.

Barbara Bowles Biesecker, PhD., M.S. is Director of the Johns Hopkins University/National Human Genome Research Institute Genetic Counseling Training Program and Associate Investigator in the Social and Behavioral Research Branch of the National Human Genome Research Institute at the National Institutes of Health. She is also an Adjunct Associate Professor in the Department of Health, Behavior and Society at the Johns Hopkins University Bloomberg School of Public Health. Barbara obtained her Ph.D. in health psychology from Kings College, London and her M.S. in human genetics from the University of Michigan. She has been at the NIH for over 18 years and prior to that held six different academic positions in genetic counseling. Barbara's current research studies focus on how individuals and families adapt to a genetic condition or risk, and decisions to undergo genetic testing, specifically to receive results from whole exome or whole genome sequencing. She teaches several genetic counseling graduate courses, provides professional supervision and advises students on their thesis research.

Zachary Pekar holds a MSPH and Ph.D in Environmental Management and Policy from the University of North Carolina's School of Public Health. His areas of specialization include exposure analysis and human health risk assessment with an emphasis on modeling multi-pathway population health impacts through the use of GIS. Dr. Pekar has been at the U.S. Environmental Protection Agency since 2003 and currently works in the Office of Air Quality Planning and Standards (OAQPS). While at EPA, Dr. Pekar has lead the design and implementation a number of complex human health risk assessments, including analyses supporting the Agency's review of National Ambient Air Quality Standards (NAAQS) for lead, ozone and particular matter (PM), as well as a national-scale assessment of recreational and subsistence fisher exposure to methylmercury associated with power plant emissions. Dr. Pekar has also participated in several international training and collaboration initiatives focused on demonstrating the use of health impact analysis and cost-benefit analysis as potential tools in regulatory decision-making involving ambient air pollution.

Dan S. Sharp, M.D., Ph.D. is the Associate Director of Science at the Health Effects Laboratory Division of the National Institute for Occupational Safety and Health. He manages external peer review of intramural project proposals for the Division. He is a physician, holds a doctorate in epidemiology from University of California, Berkeley, and has focused on chronic disease epidemiology in occupations and in cardiovascular disease. Dr. Sharp was a Senior Scientist at the Medical Research Council Epidemiology Unit in Cardiff, Wales, 1988-1990, and the Director of the Honolulu Heart Program, 1992-1997.

Nsedu Obot Witherspoon, MPH, serves as the Executive Director for the Children's Environmental Health Network (CEHN), where her responsibilities include successfully organizing, leading, and managing policy, education/training, and science-related programs. Ms. Witherspoon has directed and been personally involved in the oversight and organization of CEHN's Strategic Plan to serve as the "Voice for Children's Environmental Health" in the nation's capital for the past 10 years. She serves as a key spokes person for children's vulnerabilities and the need for their protection, conducting presentations and lectures across the country. She is a leader in the field of children's environmental health, serving on the Intersection Council of the American Public Health Association (APHA) and as a former APHA Executive Board Member. Ms. Witherspoon is a former Board member of the National Association of Environmental Health Sciences Council and the NIEHS Public Interest Partners. She is also a member of the Children's Health Protection Advisory Committee for the Environmental Protection Agency (EPA) and a member of the Institute of Medicine's Environmental Health Sciences Roundtable. She has a BS in Biology and a Master's in Public Health in Maternal and Child Health, from The George Washington University School of Public Health. Ms. Witherspoon is a contributing author to Mike Wallace's 2008 book titled Where We Will Be 50 Years From Today: 60 Of The World's Greatest Minds Share Their Visions On The Next Half-Century and co-author on the publication titled: "Incorporating environmental health into pediatric medical and nursing education." Environmental Health Perspectives 112: 1755-60 (2004). She also wrote a guest editorial titled: "Are We Really Addressing the Core of Children's Environmental Health?" Environ Health Perspectives. doi:10.1289/ehp.0901441 available via http://dx.doi.org [Online 25 September 2009].

Richard Woychik, Ph.D. is Deputy Director of the National Institute of Environmental Health Sciences, NIEHS. He is a molecular geneticist with a Ph.D. in molecular biology from Case Western Reserve University and postdoctoral training with Dr. Philip Leder at Harvard Medical School. He spent almost 10 years at Oak Ridge National Laboratory rising in the ranks to become head of the Mammalian Genetics Section and then director of the Office of Functional Genomics. In August 1997, he assumed the role of vice chairman for research and professor in the Department of Pediatrics at Case Western Reserve University. In 1998, he moved to the San Francisco Bay area, first as the head of the Parke-Davis Laboratory for Molecular Genetics and then as chief scientific officer at Lynx Therapeutics. He returned to academics as the president and CEO of The Jackson Laboratory in August 2002 and served in that role until January 2011. He has been in his current position since February 2011.