Plenaries

Treye Thomas

Dr. Thomas is a Toxicologist and leader of the Chemical Hazards Program team in the U.S. Consumer Product Safety Commission's (CPSC) Office of Hazard Identification and Reduction. His duties include establishing priorities and projects to identify and mitigate potential health risks to consumers resulting from chemical exposures during product use. Dr. Thomas has conducted comprehensive exposure assessment studies of chemicals in consumer products and quantified the potential health risks to consumers exposed to various chemicals. Dr. Thomas is the leader of the CPSC nanotechnology team, and is responsible for developing agency activities and policy for nanotechnology. Dr. Thomas has served as a CPSC representative on a number of nanotechnology committees including the Federal Nanoscale Science, Engineering, and Technology (NSET) subcommittee, and is the co-chair for the Nanotechnology Environmental and Health Implications (NEHI) working group.

Dr. Thomas received an MA degree in Environmental Health Sciences from UCLA, and a PhD in Environmental Sciences at the University of Texas, Health Science Center, Houston. He completed a post-doctoral fellowship in Industrial Toxicology at the Warner-Lambert Corporation (now Pfizer Pharmaceutical).

Lloyd Whitman

Dr. Whitman is the Assistant Director for Nanotechnology at the White House Office of Science and Technology (OSTP), where he oversees the National Nanotechnology Initiative, the Materials Genome Initiative, and the intersection of these initiatives with advanced manufacturing. Dr. Whitman is on detail to OSTP from NIST, where since 2008 he has been the Deputy Director of the NIST Center for Nanoscale Science and Technology, the Department of Commerce's nanotechnology user facility. Prior to joining OSTP, Dr. Whitman served for nine months as the Interim Director of the National Nanotechnology Coordination Office. He received a BS in Physics from Brown University, and MS and PhD degrees in Physics from Cornell University. He spent most of his research career at the Naval Research Laboratory, where he led a diverse portfolio of research studying semiconductor, organic, and biomolecular nanostructures, their use in novel functional surfaces, and their integration into advanced sensor systems. Dr. Whitman has over 160 publications and multiple patents in the areas of nanoscience and sensor technology, and has been recognized with numerous media citations and awards.

George Borlase

George Borlase, Assistant Executive Director, Office of Hazard Identification and Reduction, U.S. Consumer Product Safety Commission (CPSC), is responsible for managing the Commission's Hazard Identification and Analysis Program and its Hazard Assessment and Reduction Program. Under Dr. Borlase's leadership, the Office develops strategies for and implements the agency's operating plans for these two hazard programs. Dr. Borlase leads a team of scientists, engineers, and other technical specialists from the Directorates for Epidemiology, Health Sciences, Economic Analysis, Engineering Sciences, and Laboratory Sciences in the collection

and analysis of data to identify hazards and hazard patterns. The Office is responsible for the implementation of the Commission's safety standards development projects, the coordination of voluntary standards activities, and international liaison activities related to consumer product safety.

Paul Westerhoff

Dr. Paul Westerhoff is the Vice Provost for Academic Research Programming at ASU and Professor in School of Sustainable Engineering and The Built Environment, and member of the Civil, Environmental and Sustainable Engineering faculty, at Arizona State University (ASU). He obtained a PhD from the University of Colorado at Boulder, a MS from University of Massachusetts and BS from Lehigh University. Dr. Westerhoff joined ASU in August 1995 and was promoted to full professor as a University Exemplar in 2007. He served as Department Chair in Civil and Environmental Engineering, and was the founding Director for the School of Sustainable Engineering and the Built Environment. Dr. Westerhoff has a strong publication and research record, has garnered wide recognition for his work related to treatment and occurrence of emerging contaminants in water, and has been active in multidisciplinary research. He has lead research funded by AWWARF, USEPA, NSF, DOD and local organizations investigating the fate of nanomaterials in water, use of nanomaterial-based technologies for water and reuse treatment, reactions and fate of oxo-anions (bromate, nitrate, arsenate) during water treatment, characterization, treatment and oxidation of natural organic matter in watersheds, formation of disinfection by-products, removal of taste and odor micropollutants. He has over 60 peer reviewed journal article publications and an H-Index > 45. He belongs to ASCE, AWWA, AEESP, ACS, IOA, IWA, AWPCA, and IHSS and serves on numerous voluntary committees for these organizations. He currently is a member of the USEPA Science Advisory Board – environmental engineering committee, Vice Chair of the WateReuse Foundation Research Advisory Board, external advisory board member of the EPA-NSF Center for Environmental Impacts of Nanotechnology. Dr. Westerhoff has received several research awards including the 2005 ASCE Walter L. Huber Research Award and the 2006 WEF Paul L. Busch Award.

Chuck Geraci

Dr. Charles Geraci is the Associate Director for Nanotechnology at NIOSH, where he is recognized nationally and internationally for his leadership in the field. At NIOSH, he manages the Nanotechnology Research Center, where he provides overall strategic guidance to ensures that NIOSH maintains its outstanding national and international reputation for scientific achievement in the emerging area of nanotechnology implications for workers. He is responsible for developing strategies for NIOSH to participate scientifically in the growing areas of advanced nanomanufacturing technology and nanomaterial science, and in the new challenges arising from the rapid trend of converging technologies. Dr. Geraci has 39 years of Industrial Hygiene practice experience that has included the federal government, consulting, and private industry. He earned a BS in chemistry from the University of Cincinnati; a PhD in chemistry from the Michigan State University; is certified by the American Board of Industrial Hygiene in both the Comprehensive Practice and the Chemical Aspects of Industrial Hygiene; and is a Fellow of the American Industrial Hygiene Association. He has authored or co-authored

many of the papers that have helped set the direction for proactive thinking in nanotechnology safety and health and manages the development and dissemination of workplace risk management guidelines, including the NIOSH document "*Approaches to Safe Nanotechnology*". Dr. Geraci serves as a subject matter expert on various national and international panels and advisory boards, including representing NIOSH on the US NNI; ISO Technical Committee 229 on Nanotechnology; and the OECD Working Party on Manufactured Nanomaterials.

Jim Zhang

Professor Junfeng (Jim) Zhang's main research interests include exposure science, environmental health sciences, and environmental policy. Dr. Zhang has published more than 140 peer-reviewed articles, including those published in top biomedical journals (e.g., *New England Journal of Medicine, the Lancet, Journal of American Medical Association,* and *American Journal of Respiratory and Critical Care Medicine*) and top environmental science journals (e.g., *Environmental Health Perspectives,* and *Environmental Science and Technology*). His early work on characterizing sources of non-methane greenhouse gases made him one of the officially recognized contributors to the 2007 Nobel Peace Prize awarded to IPCC. He is the 2012 recipient of the Jeremy Wesolowski Award, the highest honor of the International Society of Exposure Science. In 2013, Prof. Zhang was named a fellow of the American Association for the Advancement of Science (AAAS) for his distinguished contributions in exposure science and public health and for improving the health of millions of people around the world through risk assessment.

Dr. Zhang is the overall Project Director and Principal Investigator of the Risk Assessment for Manufactured Nanoparticles Used in Consumer Products (RAMNUC) center which provides a systematic, multidisciplinary approach, including both experimental and computational tools and projects for predicting potential human and environmental risks associated with the use of selected consumer products and the Respiratory Effects of Silver and Carbon Nanomaterials (RESAC) center which focuses in the interactions between Engineered Nano Materials (ENMs) and the lung lining fluid using a systematic, integrated, multidisciplinary approach to produce mechanism-driven toxicological data that will be used in a mechanism-based risk analysis network for ENMs. The centers incorporate leading experts from the United Kingdom (Imperial London College) and the United States (Rutgers University) and have already published more 30 manuscripts in high impact journals.

Bernd Nowack

Dr. Bernd Nowack holds a MSc (1992) and a PhD (1995) in environmental sciences from ETH Zürich. He is leading the "Environmental Risk Assessment and Management" group at Empa, the Swiss Federal Laboratories for Materials Science and Technology, and is adjunct professor at ETH Zurich. His current research deals with the chances and risks of engineered nanomaterials, comprising a wide spectrum of different approaches: development and application of methods for material flow modeling, exposure modeling, environmental risk assessment and life cycle assessment; experimental studies about release of nanomaterials from products and investigations about their behavior and effects in the environment. With the combinations of these investigations he aims to gain a comprehensive understanding of the

chances and risks of nanomaterials for the environment. Dr. Nowack has published more than 120 peer-reviewed publications which receive >1100 citations/year. He acted as co-advisor of 15 PhD projects and is Associate Editor of the journal *Environmental Pollution*. He is listed in "*The World's most influential scientific minds 2014*" from the Web of Science in the category "Environmental Sciences/Ecology".

Janet Carter

Janet Carter received a BS in Zoology from Miami University, MS in Molecular and Cell Biology from the University of Cincinnati, and is currently attending Emory University Rollin's School of Public Health in Epidemiology. Dr. Carter is currently a Health Scientist in the Directorate of Standards and Guidance with the Occupational Safety and Health Administration. In addition, she worked for 15 years at the Procter & Gamble Co. as a Respiratory Toxicologist and Study Director researching the mechanisms of particle-induced pulmonary inflammation/tumorigenesis and nanoparticle toxicity. She has (co)authored over 35 publications and technical reports with more than 40 presentations and invited-talks at national and international conferences. In addition, she has participated on numerous review panels for nanomaterials with the National Academies Institute of Medicine, EPA, NIOSH and USDA. She is a member of the Society of Toxicology (SOT) and Society for Epidemiological Research (SER), former Vice-Chair of the International Life Science Institute/Health and Environmental Science Institutes (ILSI/HESI) Nanomaterials Safety Committee and was a member of the organizing committee for the SOT Nanotoxicology Specialty Section.

Martie van Tongeren

Prof. Martie van Tongeren is the Director of Research at the Institute of Occupational Medicine, Edinburgh, UK. He leads a multidisciplinary team that carries out research to identify determinants of (new) risks to health, to determine the impact of exposures on health and develop and test (policy) strategies to reduce health risk. The work focusses predominantly in the area of worker and health, although not exclusively and the IOM is also involved in public and consumer health projects. Prof. Tongeren has 25 years of experience in exposure assessment for epidemiology and risk assessment and has co-authored nearly 100 peer-reviewed publications. He was coordinator of the FP7 project on developing of exposure scenarios for nanomaterials (NANEX), is currently theme leader for exposure assessment within the MARINA Project. He is involved in several other projects, including NANOMICEX (WP leader for exposure), SANOWORK, NANOREG (co-work package leader), SUN, and GUIDENANO. He is the co-chair of the EU-US nanoEHS CoRs for Exposure. He is a member of the EC's Scientific Committee on Occupational Exposure Limits (SCOEL) and the UK's Workplace Health Expert Committee (WHEC).

Rick Canady

Dr. Richard Canady has covered a wide range of health risk management issues for foods and the environment over a nearly 30 year teaching and public policy career including senior scientist roles at CDC, FDA, and the Executive Office of the President. He specializes in leading multi-stakeholder expert groups in addressing shared public health goals on technical topics underlying divisive policy issues. Current projects include NanoRelease methods consortia for

methods to measure nanomaterials from foods and consumer products, a foresight report for the Horizon 2020 Prosafe project on Safe by Design for nanomaterial uses, case studies on "big data" for food exposure in the iFoodExposure project, advising the Italian National Research Council on emerging technology to ensure a "Diversified Adaptable Food" supply, and co-chairing the "Exposure through the Life Cycle" Community of Research for the U.S. White House and European Commission's cooperative program on nanotechnology research.

Debbie Kaiser

Debbie Kaiser is currently a Technical Program Director in the Material Measurement Laboratory with responsibility for the areas of nanotechnology environmental, health, and safety (EHS) concerns and materials for sustainability. From 2003-2012, she served as Chief of the Ceramics Division at NIST, refocusing the Division research activities on nanoscale measurements and standards. Dr. Kaiser received a BS from Lehigh University, a MS from Colorado School of Mines, and a ScD from MIT, all in materials science and engineering. She was a Postdoctoral Research Fellow at the IBM T.J. Watson Research Center from 1985-1987, working on high temperature superconducting materials and semi-magnetic materials. Since 2005, she has served as Coordinator of two NIST-wide programs on nanomaterials for biomedical applications and EHS concerns. She is currently Chair of ASTM Committee E56 on Nanotechnology. In 2008, she received a Department of Commerce Silver Medal for the development of the first gold nanoparticle reference materials for biomedical applications.

Greg Lowry

Dr. Greg Lowry is a Professor of Civil and Environmental Engineering at Carnegie Mellon University. He teaches courses in Environmental Engineering, Environmental Fate and Transport of Organic Compounds in Aquatic Systems, Environmental Nanotechnology, Water Quality Engineering, and Environmental Sampling and Sample Characterization.

His research interests broadly include Environmental Nanotechnology, Energy and Environment, and Environmental Remediation. Specific research areas include nanoparticle characterization, reactivity, and transformations, macromolecule-nanoparticle interactions, and contaminant fate in the subsurface.

He is an experimentalist working on a variety of fundamental and application-oriented research projects including developing nano-enabled environmental technologies, assessing environmental fate of engineered and natural nanomaterials and organics, and understanding the impacts of CO_2 on deep subsurface biogeochemistry.

Philip Demokritou

Dr. Demokritou's research interests are primarily in the areas of aerosol science and technology and particle health effects. His current research focuses on the applications and environmental health and safety implications of engineered nanomaterials and environmental nanotechnology applications. Dr. Demokritou has been one of the PI's of the Harvard/U.S. EPA Center for Ambient Particle Health Effects and participated in many international Particle Health Effect field studies (U.S., Chile, Finland, Greece, Kuwait, Cyprus). Dr. Demokritou and his team have

developed over the years more than a dozen instruments and patented methods focusing on the physico-chemical and biological characterization of nanoparticles and environmental nanotechnology. These novel techniques have been used extensively by human exposure assessors in United States and worldwide and helped to advance the field of particle health effects. He is a co-author of two books, numerous book chapters and articles in leading journals in the particle health effect, nanotoxicology and aerosol engineering fields. Dr. Demokritou is currently an Associate Professor at Harvard School of Public Health and the Director of the Environmental Health Nanoscience Laboratory and the Center for Nanotechnology and Nanotoxicology at the Harvard School of Public Health (www.hsph.harvard.edu/nano). Dr. Demokritou's award winning research was highlighted in major mainstream media and online magazines including articles published in *the Economist, NanoWerk, Chemistry world, The Scientist, ACS C&En News, MIT News, Harvard Gazette,* and *NBR*.

Yoram Cohen

Dr. Cohen is a UCLA Professor of Chemical & Biomolecular Engineering (CBE) since 1981, where he is also on the faculty of the Institute of the Environment & Sustainability, Director of the Water Technology Research (WaTeR), Interim Director of the Younes and Soraya Nazarian Center for Israel Studies, a UCLA Luskin Scholar and a Theme Leader at the UCLA Center for Environmental Implications of Nanotechnology (CEIN). Dr. Yoram Cohen received his BS and MA in 1975 and 1977, respectively, both in Chemical Engineering, from the University of Toronto, and his PhD in 1981 from the University of Delaware. He is a recognized expert in the areas of water purification and desalination, membrane separation processes, and environmental impact assessment, with over 225 published research papers and book chapters. Dr. Cohen has contributed to policy and regulatory efforts focused on environmental protection and economics of water reuse and has an active program devoted to assisting disadvantage communities develop clean drinking water resources. He developed patented technologies for smart water treatment and desalination system, high recovery reverse osmosis desalting, membrane monitoring, surface nano-structured membranes for water decontamination and desalination, in addition to software for environmental impact assessment.

Christie Sayes

Dr. Christie M. Sayes has over 10 years of experience in toxicology and environmental health sciences. She is a subject matter expert in Nanotoxicology & Nanopharmacology. She currently holds an Associate Professor position at Baylor University Department of Environmental Sciences in Waco, Texas. Her activities include designing studies, directing studies, training laboratory staff, and advising clients and sales staff with respect to the technical aspects of conducting toxicological studies with nanoparticles and their enabled products. She possesses an extensive working knowledge of laboratory science and U.S. regulatory climates. Routine activities include data analyses and interpretation as well as results documentation and reporting.

Dr. Sayes was formerly a manager at Research Triangle Institute and a faculty member at Texas A&M University; she maintains her adjunct faculty appointment at Texas A&M as well as appointments within the University of North Carolina System and Baylor University. She has

more than a decade of experience in the fields of nanotechnology and nanotoxicology and has authored numerous publications, including original research, invited reviews, and book chapters. She is a member of the Society of Toxicology. She also serves on the Editorial Board of the journals *Toxicological Sciences, Nanotoxicology*, and *Toxicology Letters*. Dr. Sayes is the current President of North Carolina Chapter Society of Toxicology and serves on the local organizing committee and International Advisory Board for the 8th International Nanotoxicology Conference.

Concurrent Sessions
106A Worker Exposure Studies

Bruce Lippy
Bruce Lippy has a PhD in policy from the University of Maryland, with coursework concentrated in regulatory economics and quantitative measures of management. He is a Certified Industrial Hygienist and Certified Safety Professional and was recently designated a Fellow of the American Industrial Hygiene Association. He serves on the AIHA's nanotechnology and ethics committees. He has participated in webinars on nanotechnology for the National Safety Council with Dr. Chuck Geraci from NIOSH and for NIEHS with Dr. Andrew Maynard of the University of Michigan. In 2011, he completed a guidance document with Kristen Kulinowski of Rice University on training workers about the risks of exposures to engineered nanomaterials. Also in 2011, Drs. Kulinowski and Lippy developed, with OSHA funding, an 8-hour awareness course on protecting nanotechnology workers. The course is available for free on the GoodNanoGuide where the modules have been downloaded over 35,000 times. Drs. Kulinowski and Lippy also wrote the nanotechnology chapter for the recently published third edition of the AIHA's, The Occupational Environment: Its Evaluation, Control, and Management. Dr. Lippy served on a review panel for the NIOSH Nanotechnology Strategic Plan FY 2013-2016. He heads the CPWR nanotechnology team and recently presented their industrial hygiene findings at the SENN2015 conference in Helsinki, Finland.

Stephan Froggett
Dr. Steve Froggett is the founder and owner of Froggett & Associates, LLC based in Seattle WA. His work focuses on enabling multi-disciplinary stakeholders to collaborate to generate sound and neutral, empirical data relevant to informing risk policy makers. In the first five years, Froggett and Associates contributed to multiple environmental assessments considering potential impacts from planting new crop seeds derived through genetic engineering. In close collaboration with the International Life Science Institute's Research Foundation, they framed and launched multiple research programs addressing health and safety data gaps related to engineered nanomaterials used in a broad range of durable consumer products and food packaging. The third focus area of the group is broadly on water quality; from development to publishing globally applicable guidelines for sustainable, safe water reuse to investigating the impacts of environmental contaminants and multi-drug resistant bacterial infections.

Prior to forming Froggett & Associates, LLC, Dr. Froggett spent five years in South Asia and East Africa as an associate professor of physiology at multiple medical schools and as a program manager establishing a pediatric HIV research center. Subsequently, he returned from overseas implementation work to advise policy makers first as an American Association for the Advancement of Science (AAAS) diplomacy fellow, then as a science advisor on emerging technologies in crop protection and production, representing the U.S. Department of Agriculture at White House-level policy discussions and supporting trade negotiations.

Dhimiter Bello

Dhimiter Bello, Sc.D., MSc, is an Associate Professor in the Department of Work Environment at the University of Massachusetts, Lowell, USA, and a visiting scientist at the Harvard School of Public Health. His research focuses broadly on exposure biology, an interdisciplinary approach that investigates quantitative and temporal relationships between environmental exposures and disease in humans. Exposure biology integrates critical information on the biological mechanisms of environmental exposures from diverse disciplines that study the exposure-disease continuum, including exposure sciences, molecular biology, pharmacokinetics, and mechanistic toxicology. He is actively researching two classes of chemical agents - engineered nanomaterials and reacting chemicals, such as isocyanates and epoxies - especially in high-risk industries.

Bello's current research interests include: i) Nanotoxicology and NanoEHS; ii) Occupational skin and inhalation toxicology, particularly around reacting chemical systems, such as isocyanates and epoxies; iii) Quantitative exposure assessment for epidemiology and intervention research, primarily in high risk industries; iv) Developing methods, platforms, and tools suitable for comprehensive physicochemical and toxicological characterization of nanoparticle exposures from nano-enabled products and other emerging technologies; and v) Investigating the utility of more biologically relevant exposure and dose metrics for inhaled nanoparticles, including surface activity and oxidative stress.

He serves as associate editor for *Nanotoxicology* and the *Annals of Occupational Hygiene*. In addition, he serves in several national and international scientific committees, including ISO. He has published over 50 peer-reviewed articles and three book chapters.

Matthew Dahm

Lt. Dahm graduated with a Masters of Public Health in Environmental and Occupational Health from Saint Louis University and currently is a Research Industrial Hygienist in the Industrywide Studies Branch at NIOSH. Since joining NIOSH in 2009, Lt. Dahm has focused primarily on the exposure assessment methods for carbon nanotubes and nanofibers. He is currently leading the NIOSH Industrywide Study field efforts to collect representative workplace exposures to these materials and is also the co-principal investigator for a recently initiated epidemiologic study examining workers exposed to carbon nanotubes within the US.

Gary Casuccio

Mr. Gary Casuccio is a Senior Scientist at RJ Lee Group, Inc., where he focuses on environmental particulate analysis, air quality, and nanomaterials characterization. Mr. Casuccio was involved a multi-phase study on unbound nanoparticles (UNP), conducted in collaboration with Lawrence Berkeley National Laboratory (LBNL), to evaluate worker exposure and potential environmental release of UNP. He has also developed techniques for characterization of particulate matter using CCSEM (Computer Controlled Scanning Electron Microscopy), was project leader for the development of sampling and analysis protocols for the Department of Energy Continuous Fiber Composite Program, and is an advisor to the U.S. Environmental Protection Agency (USEPA) on the analysis of particulate matter using SEM and CCSEM

techniques. Mr. Casuccio has published in peer-reviewed literature and has testified in federal courts.

106B Consumer Exposure Studies I: General Products

Marina Vance
Dr. Marina Vance is a Research Scientist at Virginia Tech and the Associate Director of Virginia Tech's Center for Sustainable Nanotechnology (VTSuN). She received her PhD in Civil and Environmental Engineering from Virginia Tech in 2012. Her research interests encompass the environmental implications and applications of nanotechnology, especially dealing with people's exposure to air pollutants, nanomaterials, and other emerging contaminants.

Keana Scott
Keana Scott is a Physical Scientist in the Materials Measurement Science Division at the National Institute of Standards and Technology (NIST). Dr. Scott earned her BS in Engineering and Applied Sciences from the California Institute of Technology, PhD in Mechanical Engineering from the University of Pittsburgh, and MS in Biotechnology from the Johns Hopkins University. After developing automation engineering solutions for Celera Genomics during their collaboration with NIH on the Human Genome Project, Dr. Scott went on to lead a group of scientists involved in computational chemistry and proteomics, while also contributing to informatics and genomics projects within both Celera and Applied Biosystems. Dr. Scott joined NIST in 2006 to work on multi-modal 3D imaging technique development and microanalysis of complex materials using electron and ion beams and served as a group leader of the Microanalysis Science Group from 2008 to 2012. Dr. Scott's current research efforts are on the 2D and 3D microanalysis of nanoscale features in macro-scale matrices and the development of characterization methods for assessing nanomaterial release from nanocomposite materials.

Jo Anne Shatkin
Jo Anne Shatkin, PhD is President of Vireo Advisors, LLC based in Boston, Massachusetts, USA. She develops state of the art analyses on behalf of public and private organizations to inform safer and more sustainable technology innovation. Dr. Shatkin is an environmental health scientist and recognized expert in environmental and emerging science policy, health risk assessment, and environmental aspects of nanotechnology.

Since 2005, Dr. Shatkin has provided leadership on the responsible development of nanotechnology. She served as an expert to several international committees on nanotechnology safety. Her book, *Nanotechnology Health and Environmental Risks Second Edition* (CRC Press 2012) describes the use of life cycle thinking in risk analysis for nanomaterials. Dr. Shatkin serves on the boards of the Center for Environmental Policy at American University and the University of Maine Forest Bioproducts Research Institute, and served as Councilor of the Society for Risk Analysis, where she also organized cooperative efforts with the OECD Working Party on Manufactured Nanomaterials. She is leading efforts to develop EHS standards for nanocellulose, a bio-based nanomaterial through TAPPI. Dr. Shatkin received an Individually Designed PhD in Environmental Health Science and Policy and MA in

Risk Management and Technology Assessment from Clark University, Worcester, Massachusetts. Her Bachelor of Science degree is from Worcester Polytechnic University in Molecular Biology and Biotechnology.

Gediminas Mainelis

Dr. Gediminas "Gedi" Mainelis is Professor of Environmental Sciences at Rutgers, the State University of New Jersey. He has undergraduate degree in Physics from Vilnius University, Lithuania, and PhD in Environmental Health from the University of Cincinnati, Ohio. Dr. Mainelis's research focuses on various aspects of health-related aerosols and exposure assessment. Over the past years, Dr. Mainelis's group has been actively investigating consumer exposures to nanoparticles due to use of nanotechnology-enabled consumer products. His research has been presented in more than 60 peer-reviewed publications and numerous conference abstracts and proceedings. Dr. Mainelis is a recipient of CDC/NIOSH Career Award, Twinning Fellowship from the National Academy of Sciences, and Research Excellence Award from the School of Environmental and Biological Sciences of Rutgers University. He has served twice as Chair of the Health-Related Aerosols Working Group of the American Association for Aerosol Research.

Li-Piin Sung

Li-Piin Sung is a research physicist in the Polymeric Materials Group (PMG) of the Materials and Structural Systems Division (MSSD) of the Engineering Laboratory (EL) at the National Institute of Standards and Technology (NIST). Dr. Sung joined the Polymeric Materials Group as a contractor in October 1999, and was converted as a full-time Research Physicist in November 2001. She is responsible for leading, planning, and implementing research on optical properties and microstructure characterization (including filler dispersion) of polymer coatings and composites. Dr. Sung's main interests are in understanding the interactions between fillers and polymeric matrix, and in investigating the impact of filler dispersion on optical, mechanical, and short-term and long-term performance properties. Since 2008, she has been the Director and project leader of NIST/Industry Polymer Surface and Interfaces (PSI) consortium. In this capability, she has taken the leadership and initiative in developing test methods for characterizing scratch resistance using scattering measurement science to articulated industry needs. Dr. Sung's current research efforts are on developing metrologies for surface damage and durability study of nanocomposites, and for assessment of nanoparticles release under environmental stresses (UV radiation, thermal, moisture, mechanical stresses).

Prior to joining PMG/EL, Dr. Sung completed her PhD in physics from UCSB, and joined NIST as a Guest Researcher in the Polymers Division in 1993. Thereafter, she worked as an instrumental scientist in the neutron reflectivity facility at the NIST Center for Neutron Research, and as a researcher in the Optical Technology Division, conducting surface and interfacial characterization using optical scattering metrology.

106C Consumer Exposure Studies II: Food, Food Contact and Personal Care Products

Margaret Kraeling

Margaret E.K. Kraeling, MS is a Research Biologist for the FDA's Center for Food Safety and Applied Nutrition (CFSAN), in the Office of Applied Research and Safety Assessment, Division of Toxicology. Ms. Kraeling received her BS degree in Biological Sciences from Northern Kentucky University and an MA degree in Pharmaceutical Sciences from the University of Cincinnati and joined FDA/CFSAN in 1990. Ms. Kraeling is a principal investigator and study director with CFSAN, and conducts in vitro and in vivo skin absorption and metabolism studies of mostly cosmetic ingredients and contaminants and evaluates the exposure associated with the use of these ingredients in personal care and consumer products. Her most current research is evaluating the penetration of various nanoparticles (nanosomes, dendrimers and silver nanoparticles) and biologically active anti-aging peptides in animal and human skin. Along with her research duties, Ms. Kraeling served as a reviewer for the Office of Food Additive Safety, evaluating the toxicology and exposure associated with the use of the color additive carbon black (D&C Black No. 2).

Ms. Kraeling is a reviewer for the *Journal of Regulatory Science, Nanomedicine: Nanotechnology, Biology, and Medicine,* and *Cutaneous and Ocular Toxicology*. She has authored or co-authored 17 research papers in peer reviewed journals, 10 book chapters and over 45 abstracts presented at national and international conferences. She is a member of the Society of Toxicology (SOT), Councilor of the Dermal Toxicology Specialty Section of SOT, and is Past President for the Association of Government Toxicologists.

Jay Ansell

Dr. Ansell joined the Personal Care Products Council (formerly CTFA) in May 2006 and is Vice President-Cosmetic Programs where he is responsible for providing technical support for the Council staff and various committees and task forces addressing the science and regulation of personal care products.

Dr. Ansell came to the Council from Yves Rocher, a France-based personal care products company, where he served as Director of North American Product Safety and Regulatory Affairs. He previously has been Vice President of Product Safety and Regulatory Affairs at two international specialty chemical companies.

Dr. Ansell has been an invited speaker on topics including safety and risk assessment; he was founder and president of the Council for Advance Agricultural Formulations, chaired both the Alkylphenol Ethoxylates and NMP Producers groups, leads the Council's nanotechnology activities, currently serves as Chairman of the U.S. Technical Advisory Group to ISO TC 217 – Cosmetics, and is past President of the International Society of Regulatory Toxicology and Pharmacology.

Trained as a chemist, Dr. Ansell received his BA from Gettysburg College, Gettysburg, Pennsylvania, and an MS from Marshall University in Huntington, West Virginia. He completed

his graduate studies at the State University of New York-Binghamton where he was granted a PhD for his work on novel synthetic routes to bioactive materials and was first certified as a Diplomat of the American Board of Toxicology in 1986.

Stephen Ebbs

Dr. Ebbs is a native of Southern Illinois, but has lived throughout the United States. He attended McKendree College (now McKendree University) from 1986 to 1990, graduating with a BS in Biology from the Honor's Program. His undergraduate thesis, *Patterns of sexual dimorphism in a population of house sparrows (*Passer domesticus*)*, was the first undergraduate thesis published in *The Sigma Zetan*, the official publication of the Sigma Zeta National Science and Mathematics Honor Society. After leaving McKendree College, Dr. Ebbs moved to Cornell University in Ithaca, NY, to begin his graduate studies in Environmental Toxicology. His Masters research was carried out at the Boyce Thompson Institute for Plant Research on the Cornell campus under the supervision of the late Dr. Leonard Weinstein, examining a trace element interaction between selenium and arsenic in plants. His dissertation research was conducted at the U.S. Plant, Soil, and Nutrition Laboratory, USDA-ARS under the supervision of Dr. Leon Kochian. This research examined several facets of heavy metal and radionuclide phytoremediation, including the screening of plants for contaminant bioaccumulation and the use of soil amendments to increase solubility and plant uptake. The contaminants of focus were zinc, copper, radiocesium and uranium. Dr. Ebbs followed with a two year post-doctoral position with Dr. Kochian, studying the mechanisms of transport and tolerance in the metal hyperaccumulator *Thlaspi caerulescens*. Dr. Ebbs accepted a tenure-track position in the Department of Plant Biology at Southern Illinois University in the fall of 1999. In August, 2004, Dr. Ebbs was promoted to Associate Professor and then to full professor in July 2013. During his time at SIUC, Dr. Ebbs has held a three-year term adjunct appointment at Carnegie Mellon University, and has been a visiting professor at Purdue University (2002), the University of Melbourne (2005), and Cornell University (2006). Since 2008, Dr. Ebbs has served as the Assistant Chair of Plant Biology and has been networking with regional community colleges to aid with undergraduate recruiting. On November 1, 2011, Dr. Ebbs became the Interim Chair of the Department of Plant Biology.

Jason White

Jason White is currently Vice Director and Chief Analytical Chemist at the Connecticut Agricultural Experiment Station. He received a BS in Ecology from Juniata College in Huntingdon, PA in 1992. He received a PhD in Environmental Toxicology from Cornell University in 1997. He had a one-year post-doctoral position at the Connecticut Agricultural Experiment Station in New Haven CT from 1997-1998 in the Department of Soil and Water and joined CAES as a full time scientist in 1998. He also has adjunct status at the University of Texas-El Paso, University of New Haven, Quinnipiac University, and Post University. He is currently serving on the Dissertation Committee of two PhD students at Hasselt University in Belgium and is hosting a one year Post-Doctoral Fellow from Parma University in Italy. He is Managing Editor for the *International Journal of Phytoremediation*, President of the International Phytotechnology Society, on the Editorial Advisory Board (SAB) of *Environmental Science and Technology and*

Environmental Science and Technology Letters. His primary research interest is food safety, including the fate and effects of engineered nanomaterials in food and agricultural systems.

Roland Franz

Dr. Roland Franz is Head of the Department 'Product Safety and Chemical Analysis' of the Fraunhofer Institute for Process Engineering and Packaging IVV in Freising, Germany. He made his PhD in Organic Chemistry at the University of Würzburg, Germany, followed by a post-doc research in experimental toxicology in the area of carcinogenic primary lesions. Main focus of his scientific work is on interactions between packaging and food. He was and is involved in numerous national and international research activities as well as expert groups in support of legislation and safety of food contact articles. Most recent research activities were within the EU project 'FACET' where the objective was to develop and substantiate a migration model which enables calculation of migration into foodstuffs in support of consumer exposure estimations. Another actual research area was and is on the question whether or not nano-particles can migrate from food contact materials. He is (co-)author of more than 140 scientific publications. Member and chair of the 'Committee for Consumer Products' of the German Federal Institute for Risk Assessment, BfR, in Berlin. Dr. Franz is a member of the EFSA Panel on Contact Materials, Enzymes and Flavourings (CEF), a member of the International Editorial Board of the Journal *Food Additives and Contaminants* and assistant Editor of the Journal *Food Packaging and Shelf Life*.

Linda Katz

Dr. Linda Katz has held a variety of positions at the FDA. Since 2002 she has been the Director for the Office of Cosmetics and Colors (OCAC), has served as Chief Medical Officer in FDA's Center for Food Safety and Applied Nutrition (CFSAN) since 2007, and was the Acting Deputy Director for Operations at CFSAN from September 2012 through March 2013. In these positions, she establishes the priorities and missions of OCAC, focusing on cosmetic safety, compliance, certification of color additives research, such as nanotechnology, phototoxicity and percutaneous absorption, and addressing safety and medical concerns for CFSAN regulated products. She has had numerous presentations and publications, including those related to nanotechnology from a cosmetic and food perspective, as well as other specific cosmetic and food issues. Prior to assuming leadership of OCAC, she began her FDA career in the Center for Drug Evaluation and Research (CDER), holding positions of Deputy Director for the Division of Over-the-Counter Drug Products, Deputy Director for the Division of Dermatologic and Dental Drug Products, and Team Leader and Acting Director for the Pilot Drug Evaluation Staff. Dr. Katz received her BA in biology from the University of Pennsylvania, her MD from the University of Connecticut and a M.P.H. in epidemiology from the University of Michigan School of Public Health. She completed her internship and residency in Internal Medicine, and fellowship in Rheumatology, at the George Washington University Medical Center, in Washington, D.C. She is a Fellow in the American College of Physicians and a Fellow Member of the American College of Rheumatology and is boarded in both Internal Medicine and Rheumatology. In addition, Dr. Katz maintains an academic appointment, as Associate Clinical Professor of Medicine, at The Uniformed Services University of the Health Sciences. In her latter position she continues to teach and sees patients at Walter Reed National Military Medical Center.

106D Ecological and General Population Exposure Studies Shenandoah C

Elijah Petersen
Elijah Petersen graduated from Case Western Reserve University in 2003 with BS and MS degrees in Civil Engineering and a BA in Psychology. He then received a PhD at the University of Michigan studying the ecological uptake and elimination behaviors of carbon nanotubes using earthworms (Eisenia foetida) and sediment-dwelling oligochaetes (Lumbriculus variegatus). He then received a Fulbright scholarship to do postdoctoral research at the University of Joensuu in Finland where he studied the uptake and elimination of carbon nanotubes and fullerenes in Daphnia magna. Dr. Petersen joined NIST as a National Research Council postdoctoral research fellow from 2009-2010 and then became a staff research scientist in 2010.

Jeff Steevens
Dr. Jeffery A. Steevens is the Senior Scientist (ST) in Biotechnology for the U.S. Army at the U.S. Army Engineer Research and Development Center in Vicksburg, MS. He obtained his bachelor's degree in biochemistry from the University of Missouri at Columbia in 1994 and his doctoral degree in pharmacology and toxicology from the University of Mississippi in 1999. His research activities include risk assessment and management of contaminated sediments and bioavailability and biological effects of military-relevant materials (e.g., explosives, nanomaterials, metals). One of his current responsibilities is leading a multi-disciplinary ERDC research cluster focusing on the fate, transport, and toxicology of advanced materials in Army technologies.

In addition to his research on nanomaterials, he has been a technical advisor to the World Bank on international projects and to the EPA Superfund Program, and provides expertise on many contaminated sediments projects throughout the U.S. Dr. Steevens has actively published the results of his work and has over 60 peer-reviewed journal publications and 20 book chapters and technical reports. He is an active member of several national organizations including the Society of Environmental Toxicology and Chemistry (SETAC), the American Chemical Society (ACS), the American Association for the Advancement of Science (AAAS), and the Society of Toxicology. Dr. Steevens is a Technical Advisor for the nanomaterials work group of the Chemical and Material Risk Management Directorate (CMRMD), Office of the Deputy Under Secretary of Defense. Currently he is a member of the Nanotechnology Environmental and Health Implications (NEHI) Working Group of the Nanoscale Science, Engineering, and Technology (NSET) Subcommittee.

Paul Westerhoff
Dr. Paul Westerhoff is the Vice Provost for Academic Research Programming at ASU and Professor in School of Sustainable Engineering and The Built Environment, and member of the Civil, Environmental and Sustainable Engineering faculty, at Arizona State University (ASU). He obtained a Ph.D. from the University of Colorado at Boulder, a MS from University of Massachusetts and BS from Lehigh University. Westerhoff joined ASU in August 1995 and was promoted to full professor as a University Exemplar in 2007. He served as Department Chair in

Civil and Environmental Engineering, and was the founding Director for the School of Sustainable Engineering and the Built Environment. Westerhoff has a strong publication and research record, has garnered wide recognition for his work related to treatment and occurrence of emerging contaminants in water, and has been active in multidisciplinary research. He has lead research funded by AWWARF, USEPA, NSF, DOD and local organizations investigating the fate of nanomaterials in water, use of nanomaterial-based technologies for water and reuse treatment, reactions and fate of oxo-anions (bromate, nitrate, arsenate) during water treatment, characterization, treatment and oxidation of natural organic matter in watersheds, formation of disinfection by-products, removal of taste and odor micropollutants. He has over 60 peer reviewed journal article publications and an H-Index > 45. He belongs to ASCE, AWWA, AEESP, ACS, IOA, IWA, AWPCA, and IHSS and serves on numerous voluntary committees for these organizations. He currently is a member of the USEPA Science Advisory Board – environmental engineering committee, Vice Chair of the WateReuse Foundation Research Advisory Board, external advisory board member of the EPA-NSF Center for Environmental Impacts of Nanotechnology. Westerhoff has received several research awards including the 2005 ASCE Walter L. Huber Research Award and the 2006 WEF Paul L. Busch Award.

Brian Mader

Brian Mader earned a BS in Chemistry from the University of Minnesota in 1993 and an MA degree from the Department of Civil Engineering at the University of Minnesota in 1996. Brian's MA research advisor was Professor Steven J. Eisenrech and his research involved the study of the fate of organic chemicals in the environment. Specifically Dr. Mader developed a high performance liquid chromatography (HPLC) method to measure the aqueous/solid partition coefficients of polycyclic aromatic hydrocarbons (PAHs) and chlorinated aromatic hydrocarbons. Dr. Mader completed his PhD in Environmental Science and Engineering in 2000 at the Oregon Graduate Institute in Beaverton, Oregon under the direction of Professor James F. Pankow. His doctoral dissertation focused on the physical/chemical processes that govern the atmospheric fate and transport of semi-volatile compounds (SOCs) such as dioxins and PAHs. Dr. Mader developed new analytical methods for the measurement of the gas/particle partition coefficients of dioxins and PAHs. Using field and laboratory data he developed models of the atmospheric distribution of dioxins and PAHs, and in particular probed the influence of aerosol carbon content on the atmospheric distribution of SOCs.

From 2000 until 2002 Dr. Mader conducted research as a postdoctoral scholar at the California Institute of Technology in Pasadena, California working for John Seinfeld. Dr. Mader conducted research regarding the chemical composition of atmospheric organic aerosol particles. Using gas chromatography/mass spectrometry he identified SOCs comprising organic aerosols. He collected organic aerosols using a new high-volume particle trap impactor/denuder sampler that he designed and constructed. These samplers were deployed in 2001 on ground and aircraft platforms in Japan and Korea during an international research project called the Aerosol Characterization Experiment in Asia (ACE-Asia). The goal of this project was to evaluate the influence of aerosol particles on climate change.

Karen Murphy
Karen E Murphy is a research chemist in the Chemical Sciences Division at NIST. She received her BS degree in chemistry from Indiana University of Pennsylvania before coming to NIST in 1989. Her research interests include the application of inductively coupled plasma mass spectrometry (ICP-MS) to the development of high accuracy sample preparation procedures utilizing chemical separations and the implementation of measurement methods to enhance nanometrology including the application of single particle ICP-MS.

Jason White
Jason White is currently Vice Director and Chief Analytical Chemist at the Connecticut Agricultural Experiment Station. He received a BS in Ecology from Juniata College in Huntingdon, PA in 1992. He received a PhD in Environmental Toxicology from Cornell University in 1997. He had a one-year post-doctoral position at the Connecticut Agricultural Experiment Station in New Haven CT from 1997-1998 in the Department of Soil and Water and joined CAES as a full time scientist in 1998. He also has adjunct status at the University of Texas-El Paso, University of New Haven, Quinnipiac University, and Post University. He is currently serving on the Dissertation Committee of two PhD students at Hasselt University in Belgium and is hosting a one year Post-Doctoral Fellow from Parma University in Italy. He is Managing Editor for the *International Journal of Phytoremediation*, President of the International Phytotechnology Society, on the Editorial Advisory Board (SAB) of *Environmental Science and Technology and Environmental Science and Technology Letters*. His primary research interest is food safety, including the fate and effects of engineered nanomaterials in food and agricultural systems.

205A Exposure Studies in Gaseous Media

Vince Castranova
Dr. Castranova is the former chief of the Pathology and Physiology Research Branch, NIOSH Health Effects Laboratory Division, in Morgantown. He is currently a professor in the Department of Department of Pharmaceutical Sciences, West Virginia University, and an adjunct professor in the Department of Environmental and Occupational Medicine, University of Pittsburgh. He holds a PhD degree in physiology and biophysics from West Virginia University.

Gediminas Mainelis
Dr. Gediminas "Gedi" Mainelis is Professor of Environmental Sciences at Rutgers, the State University of New Jersey. He has undergraduate degree in Physics from Vilnius University, Lithuania, and PhD in Environmental Health from the University of Cincinnati, Ohio. Dr. Mainelis's research focuses on various aspects of health-related aerosols and exposure assessment. Over the past years, Dr. Mainelis's group has been actively investigating consumer exposures to nanoparticles due to use of nanotechnology-enabled consumer products. His research has been presented in more than 60 peer-reviewed publications and numerous conference abstracts and proceedings. Dr. Mainelis is a recipient of CDC/NIOSH Career Award, Twinning Fellowship from the National Academy of Sciences, and Research Excellence Award from the School of Environmental and Biological Sciences of Rutgers University. He has served

twice as Chair of the Health-Related Aerosols Working Group of the American Association for Aerosol Research.

Jon Thornburg

Dr. Jonathan W. Thornburg is the Director of Aerosol Research at RTI International. He applies his fundamental understanding of aerosol physics to understand aerosol spatial and temporal variability in ambient and indoor environments as a means to reduce inhalation exposure. His specific expertise includes theoretical aerosol modeling, particle adhesion, aerosol instrumentation development, and large field studies. His managerial duties include business development and proposal preparation for government and commercial clients in the U.S. and internationally. He directly supervises a diverse staff of engineers and scientists who perform the technical research and assist with business development.

Dr. Thornburg received a PhD in Aerosol Physics and Engineering from the University of North Carolina at Chapel Hill, a MS in Environmental Engineering from the University of Wisconsin, and a BS in Chemical Engineering from Purdue University. He also was a post-baccalaureate research fellow in Chemical Engineering at the Massachusetts Institute of Technology.

Philip Demokritou

Dr. Demokritou's research interests are primarily in the areas of aerosol science and technology and particle health effects. His current research focuses on the applications and environmental health and safety implications of engineered nanomaterials and environmental nanotechnology applications. Dr. Demokritou has been one of the PI's of the Harvard/U.S. EPA Center for Ambient Particle Health Effects and participated in many international Particle Health Effect field studies (U.S., Chile, Finland, Greece, Kuwait, Cyprus). Dr. Demokritou and his team have developed over the years more than a dozen instruments and patented methods focusing on the physico-chemical and biological characterization of nanoparticles and environmental nanotechnology. These novel techniques have been used extensively by human exposure assessors in United States and worldwide and helped to advance the field of particle health effects. He is a co-author of two books, numerous book chapters and articles in leading journals in the particle health effect, nanotoxicology and aerosol engineering fields. Dr. Demokritou is currently an Associate Professor at Harvard School of Public Health and the Director of the Environmental Health Nanoscience Laboratory and the Center for Nanotechnology and Nanotoxicology at the Harvard School of Public Health (www.hsph.harvard.edu/nano). Dr. Demokritou's award winning research was highlighted in major mainstream media and online magazines including articles published in *the Economist, NanoWerk, Chemistry world, The Scientist, ACS C&En News, MIT News, Harvard Gazette,* and *NBR*.

Phoebe Stapleton

Dr. Phoebe Stapleton is a Research Assistant Professor at West Virginia University. She received her PhD in Exercise Physiology specializing in microvascular physiology in 2010, recently completed a postdoctoral fellowship focused in cardiovascular toxicology. During her postdoctoral training she received numerous awards for her work in microvascular nanotoxicology. She has previously served as the postdoctoral representative for Allegheny-Erie

regional chapter and Women in Toxicology specialty section of the Society of Toxicology; she currently serves as the President of the Allegheny-Erie regional chapter. Her research aims are to evaluate the microvascular responses and functional vascular alterations associated with xenobiotic exposures in non-traditional models.

205B Exposure Studies in Aqueous Media

Jeff Steevens

Dr. Jeffery A. Steevens is the Senior Scientist (ST) in Biotechnology for the U.S. Army at the U.S. Army Engineer Research and Development Center in Vicksburg, MS. He obtained his bachelor's degree in biochemistry from the University of Missouri at Columbia in 1994 and his doctoral degree in pharmacology and toxicology from the University of Mississippi in 1999. His research activities include risk assessment and management of contaminated sediments and bioavailability and biological effects of military-relevant materials (e.g., explosives, nanomaterials, metals). One of his current responsibilities is leading a multi-disciplinary ERDC research cluster focusing on the fate, transport, and toxicology of advanced materials in Army technologies.

In addition to his research on nanomaterials, he has been a technical advisor to the World Bank on international projects and to the EPA Superfund Program, and provides expertise on many contaminated sediments projects throughout the U.S. Dr. Steevens has actively published the results of his work and has over 60 peer-reviewed journal publications and 20 book chapters and technical reports. He is an active member of several national organizations including the Society of Environmental Toxicology and Chemistry (SETAC), the American Chemical Society (ACS), the American Association for the Advancement of Science (AAAS), and the Society of Toxicology. Dr. Steevens is a Technical Advisor for the nanomaterials work group of the Chemical and Material Risk Management Directorate (CMRMD), Office of the Deputy Under Secretary of Defense. Currently he is a member of the Nanotechnology Environmental and Health Implications (NEHI) Working Group of the Nanoscale Science, Engineering, and Technology (NSET) Subcommittee.

Richard Zepp

Richard Zepp is a Senior Research Scientist at the U.S. EPA National Exposure Research Laboratory in Athens, Georgia. He received his BS in Chemistry at Furman University and PhD from Florida State University. His research interests include processes affecting transformations and transport of nanomaterials and pathogens in the environment. He is a member of the NanoRelease Consumer Products Steering Committee and the UNEP Environmental Effects Assessment Panel. He is an Adjunct Professor at the Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, Miami, Florida and the Department of Chemistry, State University of New York, Syracuse, New York and a member of AGU, ACS, SETAC, ISES, ASM, ASLO, Sigma Xi, and AAAS.

Christopher Knightes

Dr. Christopher Knightes joined the U.S. Environmental Protection Agency's Office of Research and Development in 2002. Dr. Knightes studies the fate and transport of environmental contaminants in surface waters and watersheds with emphasis on physical, chemical, and biological processes. He applies and develops numerical, mechanistic models to link release of contaminants to their ecological receptors. His research with EPA originally focused on mercury, but has expanded to look at nutrients and nanomaterials. He was the original developer of SERAFM for evaluating target remediation sediment mercury concentrations for historically contaminated sites. He works on applying and developing WASP (Water Quality Analysis Simulation Program) for environmental contaminants in aquatic ecosystems. Dr. Knightes received his MA and PhD in Civil and Environmental Engineering from Princeton University, his MS in Civil Engineering from Northwestern University, and his BS in Physics from the University of Rochester.

Dr. Steve Diamond

Dr. Steve Diamond, is Vice President of NanoSafe Incorporated's Midwest Division based in Duluth, Minnesota. Dr. Diamond's professional focus is on nanotechnology hazard and and risk assessment, standardized testing of nanomaterials and nano-enabled products, and worker safety. His expertise in these areas is based on 8 years of experience in a broad range of activities related to nanomaterial safety and ecotoxicology. Dr. Diamond's current activities include co-leading the development of a nanomaterial ecotoxicity testing Guidance Document for the Organization for Economic Cooperation and Development (OECD) and working with DoD researchers to develop online tools and a risk framework for nanomaterials and nano-enabled products.

Previous to joining NanoSafe, Inc. Dr. Diamond was Task Lead for U.S. EPA's ecotoxicity research program within the Office of Research and Development (ORD). In that capacity, he coordinated research efforts and budgets for three regional Divisions. Dr. Diamond also lead research efforts within ORD's Mid-Continent Ecology Division where his team studied fate and effects of a variety of nanomaterials in aquatic and sediment systems. Dr. Diamond's research team published several manuscripts and book chapters focusing on fate, hazard, and risk for nanoscale titania, silver, zinc, and titania-graphene composites. In addition to applied research Dr. Diamond provided technical assistance and advice to EPA regulatory offices responsible for the safety of manufactured nanomaterials. Dr. Diamond was an author on ORD's Nanomaterials Research Strategy, which guided the initial five years of EPA nanomaterials fate and effects research.

Dr. Diamond has been involved in OECD projects on nanomaterial health and safety since 2008. He participated in initial planning meetings for the OECD's Working Party on Manufactured Nanomaterials (WPMN), chaired an international workgroup that reviewed all OECD Ecotoxicity Test Guidelines to determine their adequacy for testing nanomaterials, and drafted major portions of guidance documents for the WPMN's Sponsorship Program. More recently, he lead development of a formal project proposal for drafting an over-arching Guidance Document that

will describe modifications necessary for the application of existing Test Guidelines to nanomaterial regulatory testing.

Dr. Diamond has served on review panels for academic research programs and for the National Nanotechnology Initiative and continues to participate in expert elicitations and workshops on many aspects of nanotechnology development. Dr. Diamond has a broad background in environmental stressors other than nanomaterials, and has published manuscripts on genetic markers and consequences of contaminant exposure, metal and PAH toxicity and photoxicity, direct UV-B effects in wetlands, and worked on Natural Resource Damage Assessments for PAHs, PCBs, and petroleum releases.

Howard Fairbrother

Howard Fairbrother received his BA from Oxford University, England (1989) and a PhD in physical chemistry from Northwestern University (1994), where he worked with Professors Peter Stair and Eric Weitz. Following a postdoctoral position with Professor Gabor Somorjai at the University of California, Berkeley, he joined the Chemistry Department at Johns Hopkins University in Baltimore in 1997. His research expertise is principally in the area of surface science and his main research interests are in understanding the behavior of carbon-based particles and materials in the environment and in the role of interfacial processes in materials deposition. Dr. Fairbrother is a recipient of a Career award from the National Science Foundation in 2000 and was elected as an ACS Fellow in 2011. He is currently the Vice-Chair elect of the American Chemical Society, Colloids and Surface Science Division and served as the secretary of the division from 2005-2013. In 2013 he was appointed as a senior editor for the ACS Journal of Physical Chemistry.

205C Exposure Studies in Biological/Tissue/Serum

Elijah Petersen

Elijah graduated from Case Western Reserve University in 2003 with BS and MS degrees in Civil Engineering and a BA in Psychology. He then received a PhD at the University of Michigan studying the ecological uptake and elimination behaviors of carbon nanotubes using earthworms (Eisenia foetida) and sediment-dwelling oligochaetes (Lumbriculus variegatus). He then received a Fulbright scholarship to do postdoctoral research at the University of Joensuu in Finland where he studied the uptake and elimination of carbon nanotubes and fullerenes in Daphnia magna. Elijah joined NIST as a National Research Council postdoctoral research fellow from 2009-2010 and then became a staff research scientist in 2010.

Will Boyes

Dr. Boyes is currently serving as Project Leader for Emerging Materials for Chemical Safety for Sustainability in the Office of Research and Development, U.S. Environmental Protection Agency in Research Triangle Park, NC. His role is to coordinate research on engineered nanomaterials across the Office of Research and Development. In addition, Dr. Boyes continues to be a research scientist in the Neurotoxicology Branch, Toxicity Assessment Division, National

Health and Environmental Effects Research Laboratory, where his research focuses on the toxicity of nanomaterials.

Previously, he served as the Acting Director of EPA's Neurotoxicology Division and as Chief of the Neurophysiological Toxicology Branch. Dr. Boyes received a PhD in Environmental Health from the University of Cincinnati, College of Medicine in 1981, and was a National Research Council postdoctoral fellow at the Neurotoxicology Division of the EPA in Research Triangle Park from 1981-1983. Dr. Boyes has served as President of the International Neurotoxicology Association (2007-2009), Associate Editor for *Neurotoxicology* (2009-present), and was named as a Fellow of the Academy of Toxicological Sciences. He is also currently President of the Neurotoxicology Specialty Section of the Society of Toxicology.

Dr. Boyes is the author/coauthor of over 100 peer-reviewed manuscripts or book chapters dealing with various aspects of environmental neurotoxicity, and also has authored or co-authored numerous EPA documents including Neurotoxicity Health Effects Testing Guidelines, Neurotoxicity Risk Assessment Guidelines, nanomaterial research strategy documents, and several EPA reports to Congress.

Kim Rogers

Kim Rogers is the Acting Chief for the Exposure Measurements & Analysis Branch at the U.S. EPA, National Exposure Research Laboratory in RTP North Carolina. Dr. Rogers training is in the area of biochemistry and he has published extensively in the areas of biosensors and bioanalytical chemistry. Current research areas of interest include human exposure and environmental implications of nanomaterials.

Monique E. Johnson

Dr. Monique E. Johnson, an analytical chemist, received her undergraduate degree in Chemistry from Lincoln University and her doctorate degree in Analytical Chemistry from The University of Massachusetts Amherst. She is presently a Research Chemist and postdoctoral fellow at the National Institute of Standards and Technology (NIST). Dr. Johnson's current research is an interdisciplinary project which explores the uptake of engineered nanomaterials in a model organism, *Caenorhabditis elegans*, where internalized nanomaterials are detected via conventional and single particle ICP-MS (inductively coupled plasma mass spectrometry), as well as TEM and confocal microscopy. As an analytical chemist, Monique has extensive experience in sample preparation of complex matrices such as human breast milk, plants, and food stuffs for total analysis, as well as ICP-MS and ICP-OES (optical emission spectrometry) analysis.

Katherine Tyner

Dr. Tyner is a chemist in the Division of Applied Regulatory Science in the Center for Drug Evaluation and Research (CDER). She received her BA in Chemistry from Carleton College in 1999 and her PhD in Chemistry from Cornell University in 2004, where she worked under the direction of Emmanuel Giannelis. From 2004 - 2006 she completed a postdoctoral fellowship in a joint appointment between the Toxicology Program and the Chemistry Department at the

University of Michigan under the direction of Martin Philbert and Raoul Kopelman. She joined the Food and Drug Administration in 2007 as a chemist specializing in nanotechnology. Her research involves assessing nanotechnology as it relates to the safety and efficacy of therapeutics. While at the FDA, Dr. Tyner's research group has investigated the safety and efficacy of nano-sunscreens, the effects of agglomeration and aggregation on distribution and product performance, and the effects of bioaccumulation of durable nanoparticles. Dr. Tyner is the author of multiple book chapters and journal articles concerning the appropriate characterization and biological impact of nanoparticle therapeutics.

Robert R. Mercer
Over the past 30 plus years Dr. Mercer's research studies have been focused on the study of pulmonary physiology and pathophysiology at the EPA, Duke University Pulmonary Medicine Department and most recently as a Biomedical Engineer with the National Institute for Occupational Health and Safety (NIOSH). He has published over 124 journal articles and book chapters in the general area of lung anatomy, physiology and pathology. These studies have included examination of lung injury from a wide range of inhalation hazards ranging from gases such as ozone and nitrogen dioxide to particulates such as asbestos and silica. In recent years his research at NIOSH has been focused on inhalation injury from nanoparticles and development of microscopy techniques to detect and study the fate of nanoparticles in the body. Data from these studies have contributed to the determination of a Recommend Exposure Limit (REL) for MWCNT recently published by NIOSH [DHHS (NIOSH) Publication No. 2013-145].

205D Epidemiology: The ExposureHealth Interface

Mary Schubauer-Berigan
Dr. Schubauer-Berigan is a Senior Research Epidemiologist with the Division of Surveillance, Hazard Evaluations, and Field Studies of the National Institute for Occupational Safety and Health (NIOSH), in Cincinnati, OH. She has conducted epidemiologic studies of cancer and other health effects among U.S. workers at NIOSH for the past 16 years.

For the past five years, she has been conducting feasibility and exposure assessment studies, and planning and carrying out cross-sectional and prospective epidemiologic studies, of workers exposed to engineered carbonaceous nanomaterials. She contributed to strategic planning for epidemiology and health surveillance in the U.S. National Nanotechnology Initiative. Additionally, while at NIOSH, she has conducted epidemiologic studies of nuclear workers, beryllium processing facility workers, and uranium miners. She has contributed to the development of methods to analyze cohort studies, risk-based analytic tools for the compensation of radiogenic cancers among U.S. nuclear workers and has worked with a committee of the World Health Organization to develop guidance on compensation programs for nuclear workers. She is Assistant Coordinator of the Cancer, Reproductive, and Cardiovascular diseases cross-sector of the NIOSH National Occupational Research Agenda. Before NIOSH, Mary was a statistician and environmental toxicologist at U.S. EPA laboratories in Cincinnati OH and Duluth MN. She has co-authored over 70 peer-reviewed publications on

epidemiology, risk assessment methods, and environmental toxicology. She received her PhD in epidemiology from the Medical University of South Carolina in 2000, and a MS in biology from the University of Minnesota in 1990.

Sara Brenner

Dr. Brenner is a preventive medicine and public health physician at the SUNY Polytechnic Institute Colleges of Nanoscale Science & Engineering (CNSE), serving as the Assistant Vice President for NanoHealth Initiatives and an Assistant Professor of Nanobioscience. Her research and initiatives aim to develop novel nanotechnology applications in the life sciences, including medicine and public health. Dr. Brenner is leading health and safety research initiatives related to nanoparticle and nanomaterial exposures in the workplace, consumer marketplace, and environment. She was integral in building the NanoHealth and Safety Center at CNSE, a public-private partnership that is addressing gaps in our understanding of the safety and risk associated with the unique characteristics of nanoscale materials. In collaboration with NIOSH, she is working to expand these efforts through the New York State-wide NanoHealth and Safety Consortium. Her research team incorporates theory from many disciplines such as physics, engineering, biology, genetics, medicine, public health, epidemiology, industrial hygiene, and environmental science to advance risk assessment and reduction strategies for occupational exposures, monitoring of materials that may impact population health and public safety, and the development of industrial practice standards for product safety. She is also the CNSE Program Director of the MD/PhD program in medicine and nanoscale science or engineering, a program that she helped co-found with SUNY Downstate Medical Center. It is the first dual-degree clinical training program in nanomedicine that aims to produce a new, hybrid generation of physician researchers. Dr. Brenner is both personally and professionally dedicated to health and wellness and practices what she preaches by participating in fitness events including road, trail, and snowshoe races ranging from 1 km sprints to 50 mile ultramarathons. She is the recipient of the Albany-Colonie Chamber of Commerce Women of Excellence Award 2012 (Emerging Professional).

Adam Friedman

Adam Friedman, MD, FAAD is an Associate Professor of Dermatology and serves as Residency Program Director and Director of Translational Research in the Department of Dermatology at The George Washington University School of Medicine & Health Sciences. Dr. Friedman completed his undergraduate training at the University of Pennsylvania and graduated with Distinction in Dermatologic Research at the Albert Einstein College of Medicine in New York. He completed his internship at New York Hospital Queens, and returned to Einstein for his Dermatology residency and was appointed Chief Resident during his final year. Dr. Friedman joined the Einstein faculty after graduation from 2010-2015, during which time he was the Director of Dermatologic Research, Director of the Translational Research Fellowship, and the Associate Program Director.

Dr. Friedman is currently investigating novel nanotechnologies that allow for controlled and sustained delivery of a wide spectrum of physiologically and medicinally relevant molecules, with an emphasis on treating infectious diseases, accelerating wound healing, immune

modulation, and correcting vascular dysfunction. He holds multiple patents derived from these investigations, and has published over 120 papers/chapters and 2 textbooks on both his research as well as a variety of clinical areas in dermatology with an emphasis on emerging medical therapies. In line with his research interests, he serves as Vice President of the Nanodermatology society and Vice Chair of the Dermatology Section of the New York Academy of Medicine. He has received multiple awards such as the American Dermatologic Association Young Leader Award, the American Society for Dermatologic Surgery Cutting Edge Research Award, the Journal of Drugs in Dermatology Leader in Photoprotection award, the La Roche Posay North American Foundation Research award, and he was voted to New York Times Magazine's Super Doctors® Rising Stars each year since 2013.

Dr. Friedman's clinical interests span the gamut of medical and pediatric dermatology, including acne, eczema, psoriasis, skin infections, hair loss, wound healing, urticaria, blistering diseases, lupus, sarcoidosis, and skin cancer to name a few. He is a dermatology expert for healthguru.com and everydayhealth.com, and hosts an online series titled "*Ask an Expert*." Dr. Friedman has appeared on television news programs such as *Good Morning America* and *Fox News*, and has been quoted in numerous leading publications, including *Time.com, WebMD, Health, MSN.com, Vogue, Dr. Oz The Goodlife, Good Housekeeping*, and *Women's Day*.