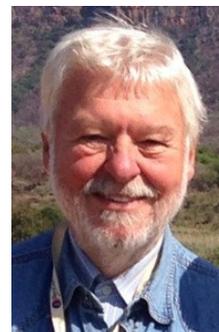


Keynote speakers

Monday, 26 September 2016

11:55 – 12:30 **Control and characterisation of exposure, routes of entry, and translocation in the body (including dosimetry)**

Wolfgang Kreyling, Professor, Helmholtz Zentrum München, German Research Center for Environmental Health, Germany



Dr. Kreyling is a biophysicist freshly and mandatorily retired from coordinating all aerosol-related research within the Focus Network Nanoparticles and Health of the Helmholtz Zentrum München (HMGU) spanning R&D work over five HMGU-institutes ranging from material sciences to toxicology and epidemiology. He additionally had chaired the R&D program of the HMGU Comprehensive Pneumology Center, Institute of Lung Biology and Disease on dosimetry of ultrafine aerosol particles and engineered nanoparticles in the respiratory tract and secondary target organs like the cardiovascular and the central nervous system.

The research interests of Wolfgang Kreyling range from aerosol sciences and nanoparticle technology to biophysics of the lungs reaching from the characterization of ambient aerosols to particle dosimetry and nanoparticle lung interactions on the level of the entire organism, cells like alveolar macrophages, and molecular compounds. His major early achievements include quantitative analyses of the biokinetics after inhalation of taylor-made physico-chemically uniform, radio-labeled micron-sized particles (0.3 – 5 μm) in six experimental animal species and in humans. The results of these interspecies comparisons were rather influential on the “Human Respiratory Tract Model” of the International Commission for Radiological Protection (ICRP66). In the early 90ies he became interested in ultrafine particles, particularly in ambient urban air and he supervised continuous ambient aerosol measurements in Erfurt and later in Augsburg to be used for exposure estimates for the ongoing epidemiologic studies of the Institute of Epidemiology on the effects of the ultrafine number concentration fraction versus PM_{2.5} and PM₁₀ mass fractions. More recently he adopted and applied his biokinetics methodology to study the quantitative biokinetics of engineered nanoparticles in rodent models after lung inhalation or instillation as well as after intravenous injection and oral administration. He found that nanoparticles are able to cross cellular and organ membranes to a small but detectable amount depending on their physic-

chemical properties having access to blood circulation and leading to subsequent accumulation in secondary organs and tissues including the skeleton. In particular, the smaller the particles are the higher the translocated fraction across organ membranes; hence, micron-sized particles don't show any detectable translocation across organ membranes.

He spent a sabbatical year in 1985/86 at the Respiratory Biology Program of the Harvard School of Public Health, Boston, USA, and continues this collaboration since then (NIH grant 2003-08; etc.). Since 1999 he coordinated toxicological collaborations between US-EPA NHEERL and HMGU on ambient air pollution research. He and his team currently participated in six EU-FP7 funded projects and two German Research Foundation (DFG) funded consortia on interactions of engineered nanoparticles with biological systems and the safe and sustainable use of nanoparticles.

In recent years Dr. Kreyling held various officer positions within the board of the International Society for Aerosols in Medicine (ISAM) and was its President (2003-2005). He is member of various other international scientific societies (ERS, ATS, EAC, AAAR, GAeF), serves as a member of several expert panels of International (WHO, HEI), European (ESF, EU-DG SANCO, EFSA, ERS, EASAC) and German committees (DFG, BMBF, BMU). He has published 200 peer reviewed articles and book chapters and he is editorial board member of several international aerosol and nanotechnology related journals and he is currently associated editor of Particle & Fibre Toxicology and Toxicology Research.

14:40 – 15:15 **Particles for diagnosis and therapy**

Yi Yan Yang, Group Leader, Institute of Bioengineering and Nanotechnology, Singapore, Adjunct Associate Professor, Department of Pharmacy, National University of Singapore



Dr. Yang is leader of the Group Nanomedicine at IBN, A*STAR, where functionalized polymers, hydrogels and biologics are developed as therapeutics and carriers for the controlled release and targeted delivery of medication to diseased cells and organs. Their research projects include Encapsulation and Delivery of Active Ingredients for Medical and Consumer Applications; Gene-Engineered Stem Cells and Immune Cells for Cancer Therapy; Injectable Biodegradable Hydrogels for Drug Delivery and Tissue Engineering; Macromolecular Antimicrobials to Combat Microbes; Polymeric Nanoparticles for Targeted Drug Delivery towards Cancer Cells and Cancer Stem Cells; and Using Green Tea Nanocomplex to Fight Cancer.

14:40 – 15:15 **Technical challenges in particle toxicology**

Phil Demokritou, Associate Professor, Center of Nanotechnology and Nanotoxicology, Harvard University, Boston, USA



Dr Demokritou's research interests are primarily in the areas of nano-aerosol science and technology with emphasis on the elucidation of particle health effects. His particle research spans across the exposure- disease continuum and includes the development of personal PM monitoring systems for use in exposure assessment and epidemiological studies, methods for the physico-chemical and in-vitro/in-vivo toxicological characterization of nanoparticles. Such novel methods linking particle exposures to toxicology and adverse health effects have been widely used by scientists in the field and also adopted as reference methods by scientists at US EPA, Environment Canada and other PM exposure assessors around the world and helped in advancing the field of particle health effect research. His current research focuses on nanosafety and nano-bio interactions related to engineered nanomaterials (ENMS) and the role of ENM structure on bioactivity. His nanosafety research has involved development of in-vitro screening approaches for nano-specific effects (DNA damage, epigenetics, translocation of ENMs across biological barriers, etc), "safer by design" approaches for families of ENMs, development of advanced tools and framework approaches for in-vitro/in-vivo dosimetry, life cycle specific risk assessment studies for nano-enabled products (NEPs) and environmental nanotechnology applications for pathogen inactivation. Dr Demokritou is currently the Director of two interdisciplinary research Centers at Harvard University: Harvard-NIEHS Nanosafety Research Center and the Center for Nanotechnology and Nanotoxicology at (www.hsph.harvard.edu/nano). He served as a co-PI of the Harvard-EPA PM Health Effect Center (1999-2010, US EPA star grant) and as the Director of Harvard-Cyprus International Institute for the Environment and Public Health from 2005-2008 and participated in the development of graduate level degree programs in the area of Environmental Health. He served as PI, co-PI or co-investigator on several grants funded by NIH, EPA, NIOSH, NSF, USDA/NIFA, CPSC and EU research framework (FP7). He holds 6 international/US patents and inventions. He is a co-author of two books, numerous book chapters and hundreds of articles in leading journals and conference proceedings. Dr. Demokritou's innovative 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, NBR news. Dr Demokritou is currently an Associate Professor at Harvard School of Public Health and a founding co-Editor in Chief of NanoImpact, a journal that focuses on all aspects of nanosafety research.

Tuesday, 27 September 2016

08:40 – 09:15 **Particle sources and properties linked to toxicology**

Rodger Duffin, *MRC Senior Lecturer/Fellow in Respiratory Medicine, The University of Edinburgh, Edinburgh, UK*

10:30 – 11:00 **Bioprocessing and tissue interactions of engineered particles**

Uschi Graham, *Research Scientist Principal, Centre for Applied Energy Research, University of Kentucky, USA*

Dr. Uschi Graham has over 15 years of experience with expertise in nanotechnology for wide variety of applications including but not limited to electronics, catalysts, fuel cells, nano-toxicology, and nanocoatings. During her tenure at University she has worked with several well-known academic researchers as well as companies for development of industrial solutions. She is currently serving as the President of the Tri-State Catalysis Society and is a co-founder of the bi-annual International NanoMat Workshop. Dr. Graham has over 50 publications, one US Patent involving nanomaterials synthesis and 4 pending patent applications in related fields. Apart from academics, she is a member on the board of several companies and institutes such as InfraReDx Inc, Gill Heart Institute, Atomic Analytics and TalkingScience Inc.



11:40 – 12:15 **Immunity and systemic responses**

Albert Duschl, *Professor, Department of Molecular Biology, University of Salzburg, Austria*

Albert Duschl studied at the University of Giessen, Germany, where he received his PhD in December 1986. He spent his postdoc years at the University of California, Irvine and at the Max-Planck-Institute for Biochemistry at Martinsried, Germany, before becoming a University Assistant at the University of Würzburg in 1990. He established his own research group, working on molecular mechanisms in the regulation of the human immune system. Specific areas of interest evolved in the fields of allergy, of signal transduction in dendritic cells, and of interactions between immune cells and environmental agents, in particular engineered nanoparticles. In 2001, Albert Duschl moved to the University of Salzburg where he is Full Professor (Chair) of Biochemistry.



11:40 – 12:15 **Non-specific effects of particles**

Gaku Ichihara, *Professor, Faculty of Pharmaceutical Sciences, Tokyo University of Science, Japan*



14:40 – 15:15 **Nanoparticle impact on developing fetus and offspring**

Masakazu Umezawa, Ph.D., *Center for Environmental Health Science for the Next Generation, Tokyo University of Science, Japan*

14:40 – 15:15 **Raising to the challenge of complex nanomaterials in EHS**

Lanry Yung Lin Yue, *Associate Professor, Department of Chemical and Biomolecular Engineering, National University of Singapore*

Wednesday 28 September 2016

08:40 – 09:15 **Bioavailability, biopersistence, bioprocessing, biomodification, and bioclearance**

Iseult Lynch, *Professor, School of Geography, Earth and Environmental Sciences, University of Birmingham, UK*

Professor Iseult Lynch, Chair of Environmental Nanosciences, joined the academic staff at the University of Birmingham in March 2013.

She is an Associate Editor for Environmental Science: Nano, and Deputy director for the Facility for Environmental Nanomaterials Analysis and Characterisation (FENAC) at the University of Birmingham. Her research focuses on the environmental interactions of nanoparticles and nanostructured surfaces with biological entities from macromolecules to organisms.

She has a very broad overview of all aspects of nanomaterials safety assessment and the data requirements, having served as Chair of the EU Nanosafety Cluster Working Group (NSC WG) on databases for two years (and as co-Chair of the Hazed WG prior to that), as well as being theme editor for the Materials and classification section of the NSC Vision2020 research roadmap (under review for publication in June 2013). Prior to the University of Birmingham she was Strategic Research Manager at the Centre for BioNano Interactions in University College Dublin, where she was instrumental in the development and implementation of numerous large EU-funded projects.

11:10 – 11:45 **Forest and coal fire particles**

Alan Vette, *Deputy National Program Director, US EPA*

His research aims to determine the impact of air pollutants and their sources on inhalation exposures at the personal, residential and community scales for analyses of human health effects. He was previously a Principal Investigator in EPA's World Trade Center study, which investigated the composition, transport

and health effects of dust and other air pollution resulting from the aftermath of the September 11 attacks.

His current research collaborations focus on next generation air monitoring devices and understanding and managing public health risks associated with wildland fires.

Thursday 29 September 2016

08:40 – 09:15 **New concepts and methodologies in particle toxicology**

Chunying Chen, *Principal Investigator*, National Center for Nanosciences and Technology of China, Chinese Academy of Sciences (CAS), Beijing



Chunying Chen is currently is a principal investigator at Key Laboratory for Biomedical Effects of Nanomaterials and Nanosafety in National Center for Nanoscience and Technology of China (NCNST). Dr. Chen received her Bachelor's degree in chemistry (1991) and obtained her PhD degree in Biomedical engineering from Huazhong University of Science and Technology of China in 1996. She is one of the earliest researchers in this new field in China. Her research interests include the interaction of nanoparticles with biological systems, investigating the mechanism of toxicity and the key properties of the nanoparticles that make them toxic; safe-by design for malignant tumor therapies using theranostic nanomedicine systems and vaccine treatments using nanomaterials as potential non-viral vectors, which are supported by the China MOST 973 Programs, EU-FP6 and FP7, DSF and IAEA.

Professor Chen has authored/co-authored over 120 peer-reviewed papers, 5 books (Wiley, RSC and Chinese Science publishers) and 10 book chapters, including Nature Methods, Nature Communication, PNAS, JACS, Advanced Materials, Nano Letters, ACS Nano, Chemical Society Reviews, and Accounts of Chemical Research. She is currently an Editorial Board Member of several international journals including Particle and Fiber Toxicology, Nanotoxicology, Metallomics, NanoImpact, Toxicology Research, Science Bulletin, etc.

In addition, Professor Chen put efforts into WHO, ISO and OECD working groups investigating the health effects of nanomaterials. She has been awarded the National Award for Innovation and Outstanding Service to the Standard authorized by Standardization Administration of the People's Republic of China in 2011, the Second Prize of Beijing Science and Technology (ranked second) in 2008 and the Second Prize of the National Natural Science Award (ranked

second) in 2012. She was awarded China Outstanding Young Female Scientists in 2014 and the National Science Fund for Distinguished Young Scholars in 2014.

08:40 – 09:15 **Particles in the environment and the link to human toxicology**

Richard Handy, *Professor, School of Biological Science, Plymouth University, UK*



Professor Richard D. Handy (FRSB) holds a Chair in Environmental Toxicology at Plymouth University, in the School of Biological Sciences. His research has a strong theme on nanoscience and he works on many different organisms from microbes, invertebrates, fishes, and mammals including man. In addition to national project grants, his laboratory is a partners in several EU projects including NANOSOLUTIONS, SUN, and NanoFASE. His expertise covers toxicity test methods with nanomaterials, dietary uptake studies (in vivo, gut perfusions, cell lines), as well as work on clinical safety (dentistry, injectable nanomaterials, nanomedicines) and environmental effects especially on aquatic species such as fishes. Crucially, his interests are driven by fundamental mechanistic understanding of the mode of action of nanomaterials in biological systems. The laboratory has an extensive archive of nanopathologies from different animals, and unique expertise on nanomaterials in fishes. The laboratory is currently investigating TiO₂, Cu-NPs, Ag-NPs, Silica NPs, SWCNT, MWCNT, C60 and composite materials. Aged materials are also studied. Plymouth has excellent facilities for particle characterisation (electron microscopy, atomic force microscopy, nanoparticle tracking analysis, single particle ICP-MS, etc.). Plymouth also has a state-of-the-art systems biology facility. Richard has served as an external adviser on national and international committees, as well as working on international test guidelines for the OECD including health effects and dosimetry. He most recently worked on the bioaccumulation guideline for the OECD working party on nanomaterial (WPMN).

11:10 – 11:45 **Future directions in nanomaterial research**

Srikanth Nadadur, *Health Scientist Administrator, National Institute of Environmental Health Sciences, USA*



Nano-EHS) and environmental cardiopulmonary health extramural research programs at NIEHS. Nadadur has more than 25 years of research experience in molecular biology and toxicology. While working as a bench scientist he focused on integrating novel state of the art technologies to address fundamental biological questions.

These efforts led to cloning and characterizing novel genes in the pre-genome era. Prior to joining NIEHS, Nadadur worked as a Principal Investigator at the National Center for Environmental Assessment (NCEA), National Health and Environmental Effects Research Laboratories (NHEERL), Office of Research and Development, U.S. Environmental Protection Agency. At NCEA his research efforts were focused on developing ambient air quality criteria documents for the health effects of ozone and lead in support of the national ambient air quality standard setting process. At NHEERL, Nadadur's research efforts were to integrate genomics and systems biology approaches to understand molecular alterations in the cardiopulmonary effects of air pollutants.

Nadadur is currently overseeing Nano-EHS research efforts by the NIEHS Centers for Nanotechnology Health Implications Research (NCNHIR) consortium involving more than a dozen academic institutions across the U.S. He is also a member of a trans-NIH Nano Task force and the agency representative to the Nanotechnology Environmental and Health Implications (NEHI) subcommittee, National Nanotechnology Initiative (NNI). With other federal agency partners, he has contributed to the human health sections of the NNI 2011 strategy document for Nanotechnology-Related Environmental, Health and Safety Research for federal research coordination. Recently, Nadadur took on the responsibilities for scientific and administrative oversight on countermeasures against chemical threats on pulmonary health funded through the trans-NIH CounterAct program.