

# Interagency Environmental Nanotechnology Grantees Workshop

Sheraton Tampa Riverwalk Hotel  
Tampa, FL

November 19 - 21, 2008

## AGENDA

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### *DAY 1, Wednesday, November 19, 2008*

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- 7:30 – 8:15 a.m.**                      **Registration**
- 8:15 – 8:20 a.m.**                      **Welcome**  
*Nora Savage, National Center for Environmental Research (NCER), U.S. Environmental Protection Agency (EPA)*
- 8:20 – 8:50 a.m.**                      **EPA and Nanotechnology**  
*Christopher Zarba, Deputy Director, NCER, EPA*
- 8:50 – 9:10 a.m.**                      **National Science Foundation (NSF)**  
*Mihail (Mike) Roco, Senior Advisor for Nanotechnology, NSF*
- 9:10 – 9:30 a.m.**                      **National Institute for Occupational Safety and Health (NIOSH)**  
*William (Allen) Robison, NIOSH*
- 9:30 – 9:50 a.m.**                      **National Institute of Environment Health Sciences (NIEHS)**  
*Srikanth Nadadur, Program Administrator, NIEHS*
- 9:50 – 10:20 a.m.**                      **BREAK**
- 10:20 – 10:40 a.m.**                      **U.S. Department of Energy (DOE) Nanotechnology Characterization Facilities**  
*Neal D. Shinn, Sandia National Laboratories*
- Metals, Metal Oxides  
Remediation and Exposure***
- 10:40 – 11:00 a.m.**                      **Engineered Nanomaterials Fate and Transport Research Within the Office of Research and Development's (ORD) National Exposure Research Laboratory (NERL)**  
*Michele Conlon, EPA, NERL*

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**DAY 1, Wednesday, November 19, 2008 (continued)**

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***Metals, Metal Oxides  
Remediation and Exposure (continued)***

- 11:00 – 11:20 a.m.**      **Novel Nanostructured Catalysts for Environmental Remediation of Chlorinated Compounds**  
*Vijay John, Tulane University*  
*Yunfeng Lu, University of California, Los Angeles*
- 11:20 – 11:40 a.m.**      **Synthesis and Application of a New Class of Stabilized Nanoscale Iron Particles for Rapid Destruction of Chlorinated Hydrocarbons in Soil and Groundwater**  
*Dongye Zhao, Auburn University*
- 11:40 – 12:00 p.m.**      **Nanoparticle Stability in Natural Waters and Its Implication for Metal Toxicity to Water Column and Benthic Organisms**  
*James Ranville, Colorado School of Mines*
- 12:00 – 1:20 p.m.**      **LUNCH (on your own)**

***Metals, Metal Oxides  
Fate/Transport***

- 1:20 – 1:40 p.m.**      **The Effect of Surface Coatings on the Environmental and Microbial Fate of Nano-Iron and Fe-Oxide Nanoparticles**  
*Greg Lowry, Carnegie Mellon University*
- 1:40 – 2:00 p.m.**      **The Fate and Effects of Nanosized Metal Particles Along a Simulated Terrestrial Food Chain Investigated Using Genomic and Microscopic Techniques**  
*Jason Unrine, University of Kentucky*
- 2:00 – 2:20 p.m.**      **The Bioavailability, Toxicity, and Trophic Transfer of Manufactured ZnO<sub>2</sub> Nanoparticles: A View From the Bottom**  
*Paul Bertsch, University of Georgia*
- 2:20 – 2:40 p.m.**      **Bioavailability and Fates of CdSe and TiO<sub>2</sub> Nanoparticles in Eukaryotes and Bacteria**  
*Patricia Holden, University of California, Santa Barbara*
- 2:40 – 3:00 p.m.**      **BREAK**

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**DAY 1, Wednesday, November 19, 2008 (continued)**

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***Metals, Metal Oxides  
Toxicity***

- 3:00 – 3:20 p.m.**      **Engineered Nanomaterial Health Effects Research Within  
ORD's National Health and Environmental Effects Research  
Laboratory (NHEERL)**  
*Kevin Dreher, EPA, NHEERL*
- 3:20 – 3:40 p.m.**      **Microbial Impacts of Engineered Nanoparticles**  
*Shaily Mahendra, Rice University*
- 3:40 – 4:00 p.m.**      **Uptake and Toxicity of Metallic Nanoparticles  
in Freshwater Fish**  
*David Barber, University of Florida*
- 4:00 – 4:20 p.m.**      **Characterization of the Potential Toxicity of Metal  
Nanoparticles in Marine Ecosystems Using Oysters**  
*Amy Ringwood, University of North Carolina at Charlotte*
- 4:20 – 4:40 p.m.**      **Chemical Fate, Biopersistence, and Toxicology of Inhaled  
Metal Oxide Nanoscale Materials**  
*Jacob McDonald, Lovelace Respiratory Research Institute*
- 4:40 – 5:00 p.m.**      **Acute and Developmental Toxicity of Metal Oxide  
Nanoparticles to Fish and Frogs**  
*Chris Theodorakis, Southern Illinois University*
- 5:00 p.m.**              **ADJOURN – DAY 1**

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**DAY 2, Thursday, November 20, 2008**

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- 7:30 – 8:30 a.m.**      **Registration**
- 8:30 – 8:40 a.m.**      **Welcome and Announcements**

***Carbon-Based  
Sensors and Exposure***

- 8:40 – 9:00 a.m.**      **Conducting-Polymer Nanowire Immunosensor Arrays for  
Microbial Pathogens**  
*Ashok Mulchandani, University of California, Riverside*

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**DAY 2, Thursday, November 20, 2008 (continued)**

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***Carbon-Based  
Fate/Transport***

- 9:00 – 9:20 a.m.**      **Carbon Nanotubes: Environmental Dispersion States, Transport, Fate, and Bioavailability**  
*Elijah Petersen, University of Michigan*
- 9:20 – 9:40 a.m.**      **Aggregation and Deposition Behavior of Carbon Nanotubes in Aquatic Environments**  
*Menachem Elimelech, Yale University*
- 9:40 – 10:00 a.m.**      **Cross-Media Environmental Transport, Transformation, and Fate of Manufactured Carbonaceous Nanomaterials**  
*Peter Vikesland, Virginia Polytechnic Institute and State University*
- 10:00 – 10:20 a.m.**      **Fate and Transport of C<sub>60</sub> Nanomaterials in Unsaturated and Saturated Soils**  
*Kurt Pennell, Georgia Institute of Technology*
- 10:20 – 10:40 a.m.**      ***BREAK***
- 10:40 – 11:00 a.m.**      **Photochemical Fate of Manufactured Carbon Nanomaterials in the Aquatic Environment**  
*Chad Jafvert, Purdue University*
- 11:00 – 11:20 a.m.**      **Fate and Transformation of C<sub>60</sub> Nanoparticles in Water Treatment Processes**  
*Jaehong Kim, Georgia Institute of Technology*

***Carbon-Based  
Toxicity***

- 11:20 – 11:40 a.m.**      **Role of Particle Agglomeration in Nanoparticle Toxicity**  
*Terry Gordon, New York University School of Medicine*
- 11:40 – 12:00 p.m.**      **Assessment of the Environmental Impacts of Nanotechnology on Organisms and Ecosystems**  
*Jean-Claude Bonzongo, University of Florida*
- 12:00 – 12:20 p.m.**      **Structure-Function Relationships in Engineered Nanomaterial Toxicity**  
*John Fortner, Rice University*

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**DAY 2, Thursday, November 20, 2008 (continued)**

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***Carbon-Based  
Toxicity (continued)***

- 12:20 – 1:40 p.m.**      ***LUNCH (on your own)***
- 1:40 – 2:00 p.m.**      **Long-Term Cardiovascular Effects of Inhaled Nanoparticles**  
*Gi Soo Kang, New York University*
- 2:00 – 2:20 p.m.**      **Aquatic Toxicity of Carbon-Based Nanomaterials at  
Sediment-Water Interfaces**  
*Baolin Deng, University of Missouri–Columbia*
- 2:20 – 2:40 p.m.**      **Aquatic Toxicity of Waste Stream Nanoparticles**  
*Terry Gordon, New York University School of Medicine*
- 2:40 – 3:00 p.m.**      **Ecotoxicology of Underivatized Fullerenes (C<sub>60</sub>) in Fish**  
*Theodore Henry, University of Tennessee*
- 3:00 – 3:20 p.m.**      ***BREAK***
- 3:20 – 3:40 p.m.**      **Development of Methods and Models for Nanoparticle  
Toxicity Screening: Application to Fullerenes and  
Comparative Nanoscale Particles**  
*Tian Xia, University of California, Los Angeles*
- 3:40 – 4:00 p.m.**      **Effects of Nanomaterials on Human Blood Coagulation**  
*Peter Perrotta, West Virginia University*
- 4:00 – 4:20 p.m.**      **Engineered Nanomaterial Ecological Effects Research Within  
ORD's National Health and Environmental Effects Research  
Laboratory**  
*Steve Diamond, EPA, NHEERL*
- 4:20 – 4:40 p.m.**      **Innate Immune Responses of an Aquatic Vertebrate  
Model to Manufactured Nanoparticles Assessed Using  
Genomic Markers**  
*Rebecca Klaper, University of Wisconsin–Milwaukee*
- 4:40 p.m.**              ***ADJOURN – DAY 2***

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**DAY 3, Friday, November 21, 2008**

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**7:30 – 8:30 a.m.**                      **Registration**

**8:30 – 8:40 a.m.**                      **Welcome and Announcements**

***Other Nanomaterials  
Life Cycle Analysis and Remediation***

**8:40 – 9:00 a.m.**                      **Nanostructured Membranes for Filtration, Disinfection, and  
Remediation of Aqueous and Gaseous Systems**  
*Kevin Kit, University of Tennessee*

**9:00 – 9:20 a.m.**                      **Comparative Life Cycle Analysis of Nano and Bulk Materials  
in Photovoltaic Energy Generation**  
*Vasilis Fthenakis, Columbia University*

**9:20 – 9:40 a.m.**                      **The Life Cycle of Nanomanufacturing Technologies**  
*Thomas Theis, University of Illinois*

**9:40 – 10:00 a.m.**                      **Evaluating the Impacts of Nanomanufacturing Via  
Thermodynamic and Life Cycle Analysis**  
*Bhavik Bakshi, The Ohio State University*

**10:00 – 10:20 a.m.**                      **BREAK**

***Other Nanomaterials  
Exposure***

**10:20 – 10:40 a.m.**                      **Impact of Physiochemical Properties on Skin Absorption  
of Manufactured Nanomaterials**  
*Xin-Rui Xia, North Carolina State University*

**10:40 – 11:00 a.m.**                      **Safety/Toxicity Assessment of Ceria (A Model Engineered NP)  
to the Brain**  
*Robert Yokel, University of Kentucky*

***Other Nanomaterials  
Sensors and Treatment***

**11:00 – 11:20 a.m.**                      **A Novel Approach To Prevent Biocide Leaching**  
*Patricia Heiden, Michigan Technological University*

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**DAY 3, Friday, November 21, 2008 (continued)**

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***Other Nanomaterials  
Fate/Transport***

- 11:20 – 11:40 a.m.**      **Internalization and Fate of Individual Manufactured Nanomaterial Within Living Cells**  
*Galya Orr, Pacific Northwest National Laboratory*
- 11:40 – 12:00 p.m.**      **Methodology Development for Manufactured Nanomaterial Bioaccumulation Test**  
*Yongsheng Chen, Arizona State University*
- 12:00 – 12:20 p.m.**      **Experimental and Numerical Simulation of the Fate of Airborne Nanoparticles From a Leak in a Manufacturing Process To Assess Worker Exposure**  
*David Pui, University of Minnesota*
- 12:20 – 12:40 p.m.**      **Nanoparticle Disruption of Cell Function**  
*Andrij Holian, University of Montana*
- 12:40 – 2:00 p.m.**      **LUNCH (on your own)**
- 2:00 – 2:20 p.m.**      **Agglomeration, Retention, and Transport Behavior of Manufactured Nanoparticles in Variably Saturated Porous Media**  
*Yan Jin, University of Delaware*
- 2:20 – 2:40 p.m.**      **Biological Fate and Electron Microscopy Detection of NPs During Wastewater Treatment**  
*Paul Westerhoff, Arizona State University*

***Other Nanomaterials  
Toxicity***

- 2:40 – 3:00 p.m.**      **Genomics-Based Determination of Nanoparticle Toxicity: Structure-Function Analysis**  
*Alan Bakalinsky, Oregon State University*
- 3:00 – 3:20 p.m.**      **Role of Surface Chemistry in the Toxicological Properties of Manufactured Nanoparticles**  
*Prabir Dutta, The Ohio State University*
- 3:20 – 3:40 p.m.**      **A Rapid *In Vivo* System for Determining Toxicity of Manufactured Nanomaterials**  
*Robert Tanguay, Oregon State University*

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**DAY 3, Friday, November 21, 2008 (continued)**

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- 3:40 – 4:00 p.m.**                    **Cellular Uptake and Toxicity of Dendritic Nanomaterials:  
An Integrated Physicochemical and Toxicogenomics Study**  
*Mamadou Diallo, California Institute of Technology*
- 4:00 – 4:20 p.m.**                    **BREAK**
- 4:20 – 4:40 p.m.**                    **Nanoparticle Toxicity in Zebrafish**  
*Gregory Mayer, Texas Tech University*
- 4:40 – 5:00 p.m.**                    **Effects of Ingested Nanoparticles on Gene Regulation  
in the Colon**  
*John Veranth, University of Utah*
- 5:00 – 5:20 p.m.**                    **Lung Deposition of Highly Agglomerated Nanoparticles**  
*Jacob Scheckman, University of Minnesota*
- 5:20 p.m.**                                **ADJOURN**