

Interagency Environmental Nanotechnology Grantees Workshop

Sheraton Tampa Riverwalk Hotel
Tampa, FL

November 19 - 21, 2008

DRAFT AGENDA

(as of October 9, 2008)

DAY 1, Wednesday, November 19, 2008

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

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

***Metals, Metal Oxides
Remediation and Exposure***

- 11:00 – 11:20 a.m.** **Novel Nanostructured Catalysts for Environmental Remediation of Chlorinated Compounds**
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 – 1:00 p.m.** **LUNCH (on your own)**
- 1:00 – 1:20 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

***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 Georgia
- 2:00 – 2:20 p.m.** **The Bioavailability, Toxicity, and Trophic Transfer of Manufactured ZnO₂ Nanoparticles: A View from the Bottom**
Paul Bertsch, University of Georgia
- 2:20 – 2:40 p.m.** **Bioavailability and Fates of CdSe and TiO₂ Nanoparticles in Eukaryotes and Bacteria**
Patricia Holden, University of California, Santa Barbara
- 2:40 – 3:00 p.m.** **BREAK**

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

***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, NHEERL
- 3:20 – 3:40 p.m.** **Microbial Impacts of Engineered Nanoparticles**
Shaily Mahendra, William Marsh 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 Biomedical & Environmental
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**

DAY 2, Thursday, November 20, 2008

- 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

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

***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**
Manachem 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 C₆₀ 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 C₆₀ Nanoparticles in Water Treatment Processes**
Jaehong Kim, Georgia Institute of Technology

***Carbon-Based
Toxicity***

- 11:20 – 11:40 p.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**
Vicki Colvin, William Marsh Rice University

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

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

- 12:20 – 1:40 p.m.** ***LUNCH (on your own)***
- 1:40 – 2:00 p.m.** **Gene Expression Profiling of Single-Walled Carbon Nanotubes: A Unique Safety Assessment Approach**
Mary Jane Cunningham, Houston Advanced Research Center
- 2:00 – 2:20 p.m.** **Long-Term Cardiovascular Effects of Inhaled Nanoparticles**
Lung-Chi Chen, New York University
- 2:20 – 2:40 p.m.** **Aquatic Toxicity of Carbon-Based Nanomaterials at Sediment-Water Interfaces**
Baolin Deng, University of Missouri–Columbia
- 2:40 – 3:00 p.m.** **Aquatic Toxicity of Waste Stream Nanoparticles**
Terry Gordon, New York University School of Medicine
- 3:00 – 3:20 p.m.** ***BREAK***
- 3:20 – 3:40 p.m.** **Ecotoxicology of Underivatized Fullerenes (C₆₀) in Fish**
Theodore Henry, University of Tennessee
- 3:40 – 4:00 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
- 4:00 – 4:20 p.m.** **Effects of Nanomaterials on Human Blood Coagulation**
Peter Perrotta, West Virginia University
- 4:20 – 4:40 p.m.** **Engineered Nanomaterial Ecological Effects Research Within ORD's National Health and Environmental Effects Laboratory**
Steve Diamond, NHEERL
- 4:40 – 5:00 p.m.** **Innate Immune Responses of an Aquatic Vertebrate Model to Manufactured Nanoparticles Assessed Using Genomic Markers**
Rebecca Klaper, University of Wisconsin–Milwaukee
- 5:00 p.m.** ***ADJOURN – DAY 2***

DAY 3, Friday, November 21, 2008

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 p.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, 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**
Xia Xin-Rui, 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
Fate/Transport***

11:00 – 11:20 a.m. **Internalization and Fate of Individual Manufactured Nanomaterial Within Living Cells**
Galya Orr, Battelle Memorial Institute–Pacific Northwest Division

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

11:20 – 11:40 a.m. **Methodology Development for Manufactured Nanomaterial Bioaccumulation Test**
Yongsheng Chen, Arizona State University

11:40 – 12:00 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

12:00 – 12:20 p.m. **Nanoparticle Disruption of Cell Function**
Andrij Holian, University of Montana

12:20 – 12:40 p.m. **Agglomeration, Retention, and Transport Behavior of Manufactured Nanoparticles in Variably-Saturated Porous Media**
Yan Jin, University of Delaware

12:40 – 1:00 p.m. **Biological Fate and Electron Microscopy Detection of Nps During Wastewater Treatment**
Paul Westerhoff, Arizona State University

1:00 – 2:20 p.m. **LUNCH (on your own)**

***Other Nanomaterials
Toxicity***

2:20 – 2:40 p.m. **Genomics-Based Determination of Nanoparticle Toxicity: Structure-Function Analysis**
Alan Bakalinsky, Oregon State University

2:40 – 3:00 p.m. **Role of Surface Chemistry in the Toxicological Properties of Manufactured Nanoparticles**
Prabir Dutta, Ohio State University

3:00 – 3:20 p.m. **A Rapid *in Vivo* System for Determining Toxicity of Manufactured Nanomaterials**
Robert Tanguay, Oregon State University

3:20 – 3:40 p.m. **Cellular Uptake and Toxicity of Dendritic Nanomaterials: An Integrated Physicochemical and Toxicogenomics Study**
Mamadou Diallo, California Institute of Technology

3:40 – 4:00 p.m. **BREAK**

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

4:00 – 4:20 p.m.

Nanoparticle Toxicity in Zebrafish
Gregory Mayer, Texas Tech University

4:20 – 5:40 p.m.

**Effects of Ingested Nanoparticles on Gene Regulation
in the Colon**
John Veranth, University of Utah

4:40 – 5:00 p.m.

Lung Deposition of Highly Agglomerated Nanoparticles
Peter McMurry, University of Minnesota

***Other Nanomaterials
Sensors and Treatment***

5:00 – 5:20 p.m.

A Novel Approach to Prevent Biocide Leaching
Patricia Heiden, Michigan Technological University

5:20 p.m.

ADJOURN