

Interagency Environmental Nanotechnology Grantees Workshop

**Sheraton Tampa Riverwalk Hotel
Tampa, FL**

November 19 - 21, 2008

DRAFT AGENDA (as of August 15, 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 – 8:40 a.m. | Opening Remarks
<i>Christopher Zarba, Deputy Director, NCER, EPA</i> |
| 8:40 – 9:00 a.m. | National Science Foundation (NSF)
<i>Mihail (Mike) Roco, Senior Advisor for Nanotechnology, NSF</i> |
| 9:00 – 9:20 a.m. | ORD Nanotechnology Overview
<i>Kevin Teichman, Deputy Assistant Administrator for Science, ORD, EPA (to be confirmed)</i> |
| 9:20 – 9:40 a.m. | National Institute for Occupational Safety and Health (NIOSH)
<i>William (Allen) Robison, NIOSH</i> |
| 9:40 – 10:00 a.m. | BREAK |
| 10:00 – 10:20 a.m. | National Institute of Environment Health Sciences (NIEHS)
<i>Srikanth Nadadur, Program Administrator, NIEHS</i> |
| 10:20 – 10:40 a.m. | U.S. Department of Energy (DOE) Nanotechnology Characterization Facilities
<i>Altaf Carim, Program Manager, DOE (invited)</i> |
| 10:40 – 11:00 a.m. | National Exposure Research Laboratory (NERL) Presentation |

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.** **Mechanistic Dosimetry Models of Nanomaterial Deposition in the Respiratory Tract**
Bahman Asgharian, CIIT Centers for Health Research
- 2:20 – 2:40 p.m.** **The Bioavailability, Toxicity, and Trophic Transfer of Manufactured ZnO₂ Nanoparticles: A View from the Bottom**
Paul Bertsch, University of Georgia
- 2:40 – 3:00 p.m.** **Hysteretic Accumulation and Release of Nanomaterials in the Vadose Zone**
Tohren Kibbey, University of Oklahoma
- 3:00 – 3:20 p.m.** **BREAK**

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

***Metals, Metal Oxides
Fate/Transport (continued)***

3:20 – 3:40 p.m. **Bioavailability and Fates of CdSe and TiO₂ Nanoparticles in Eukaryotes and Bacteria**
Patricia Holden, University of California, Santa Barbara

***Metals, Metal Oxides
Toxicity***

3:40 – 4:00 p.m. **National Health and Environmental Effects Research Laboratory (NHEERL) I**

4:00 – 4:20 p.m. **Microbial Impacts of Engineered Nanoparticles**
Shaily Mahendra, William Marsh Rice University

4:20 – 4:40 p.m. **Uptake and Toxicity of Metallic Nanoparticles in Freshwater Fish**
David Barber, University of Florida

4:40 – 5:00 p.m. **Characterization of the Potential Toxicity of Metal Nanoparticles in Marine Ecosystems Using Oysters**
Amy Ringwood, University of North Carolina at Charlotte

5:00 – 5:20 p.m. **Chemical Fate, Biopersistence, and Toxicology of Inhaled Metal Oxide Nanoscale Materials**
Jacob McDonald, Lovelace Biomedical & Environmental Research Institute

5:20 – 5:40 p.m. **Acute and Developmental Toxicity of Metal Oxide Nanoparticles to Fish and Frogs**
Chris Theodorakis, Southern Illinois University

5:40 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

9:00 – 9:20 a.m.

**Monitoring and Characterizing Airborne Carbon
Nanotube Particles**

Judy Xiong, New York University School of Medicine

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

9:20 – 9:40 a.m.

**Carbon Nanotubes: Environmental Dispersion States,
Transport, Fate, and Bioavailability**

Walter Weber, University of Michigan

9:40 – 10:00 a.m.

**Aggregation and Deposition Behavior of Carbon Nanotubes in
Aquatic Environments**

Manachem Elimelech, Yale University

10:00 – 10:20 a.m.

**Cross-Media Environmental Transport, Transformation, and
Fate of Manufactured Carbonaceous Nanomaterials**

Linsey Marr, Virginia Polytechnic Institute and State University

10:20 – 10:40 a.m.

BREAK

10:40 – 11:00 a.m.

**Fate and Transport of C₆₀ Nanomaterials in Unsaturated and
Saturated Soils**

Kurt Pennell, Georgia Institute of Technology

11:00 – 11:20 a.m.

**Photochemical Fate of Manufactured Carbon Nanomaterials
in the Aquatic Environment**

Chad Jafvert, Purdue University

11:20 – 11:40 a.m.

**Fate and Transformation of C₆₀ Nanoparticles in Water
Treatment Processes**

Jaehong Kim, Georgia Institute of Technology

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

**Carbon-Based
Toxicity**

- 11:40 – 12:00 p.m.** **Role of Particle Agglomeration in Nanoparticle Toxicity**
Terry Gordon, New York University School of Medicine
- 12:00 – 12:20 p.m.** **Assessment of the Environmental Impacts of Nanotechnology
on Organisms and Ecosystems**
Jean-Claude Bonzongo, University of Florida
- 12:20 – 12:40 p.m.** **Structure-Function Relationships in Engineered
Nanomaterial Toxicity**
Vicki Colvin, William Marsh Rice University
- 12:40 – 2:00 p.m.** **LUNCH (on your own)**
- 2:00 – 2:20 p.m.** **Gene Expression Profiling of Single-Walled Carbon
Nanotubes: A Unique Safety Assessment Approach**
Mary Jane Cunningham, Houston Advanced Research Center
- 2:20 – 2:40 p.m.** **Long-Term Cardiovascular Effects of Inhaled Nanoparticles**
Lung-Chi Chen, New York University
- 2:40 – 3:00 p.m.** **Aquatic Toxicity of Carbon-Based Nanomaterials at
Sediment-Water Interfaces**
Baolin Deng, University of Missouri–Columbia
- 3:00 – 3:20 p.m.** **Aquatic Toxicity of Waste Stream Nanoparticles**
Terry Gordon, New York University School of Medicine
- 3:20 – 3:40 p.m.** **BREAK**
- 3:40 – 4:00 p.m.** **Ecotoxicology of Underivatized Fullerenes (C₆₀) in Fish**
Theodore Henry, University of Tennessee
- 4:00 – 4:20 p.m.** **Development of Methods and Models for Nanoparticle
Toxicity Screening: Application to Fullerenes and
Comparative Nanoscale Particles**
Andre Nel, University of California, Los Angeles
- 4:20 – 4:40 p.m.** **Effects of Nanomaterials on Human Blood Coagulation**
Peter Perrotta, West Virginia University
- 4:40 – 5:00 p.m.** **NHEERL II**

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

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

5:00 – 5:20 p.m. **Innate Immune Responses of an Aquatic Vertebrate Model to Manufactured Nanoparticles Assessed Using Genomic Markers**
Rebecca Klaper, University of Wisconsin–Milwaukee

5:20 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

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

***Other Nanomaterials
Exposure (continued)***

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

***Other Nanomaterials
Toxicity***

- 2:00 – 2:20 p.m.** **Genomics-Based Determination of Nanoparticle Toxicity: Structure-Function Analysis**
Alan Bakalinsky, Oregon State University
- 2:20 – 2:40 p.m.** **Role of Surface Chemistry in the Toxicological Properties of Manufactured Nanoparticles**
Prabir Dutta, Ohio State University

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

***Other Nanomaterials
Toxicity (continued)***

- 2:40 – 3:00 p.m.** **Assessment Methods for Nanoparticles in the Workplace**
Patrick O'Shaughnessy, University of Iowa
- 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.** **BREAK**
- 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.** **Nanoparticle Toxicity in Zebrafish**
Gregory Nayer, University of Maine
- 4:20 – 4:40 p.m.** **Effects of Ingested Nanoparticles on Gene Regulation
in the Colon**
Philip Moos, 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.** **Nanosensors for Detection of Saxitoxin**
Robert Gawley, University of Arkansas
- 5:20 – 5:40 p.m.** **A Novel Approach to Prevent Biocide Leaching**
Patricia Heiden, Michigan Technological University
- 5:40 p.m.** **ADJOURN**