Special Seminar & Networking Opportunities
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Nanomaterial Applications and Implications for Environmental Health

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Wednesday
February 27, 2013

Seminar: 10 – 11:30 a.m.

Chamblee 106 1A/B

Informal Lunch with Speaker
11:30 a.m. – 1:00 p.m.
Chamblee 106 Cafeteria

Office Hours: 1:00 p.m. – 4:00 p.m.
By Advanced Appointment

Centers for Disease Control and Prevention
Chamblee Campus
4770 Buford Highway NE
Atlanta, Georgia 30341-3717

Two decades of nanoscience research have produced a set of new materials that are now serving as building blocks in the development of next-generation technologies in energy, electronics, and health care. These same materials may become the pollutants

and toxicants of the future as commercial products become widespread and nanomanufacturing moves to larger scales. Environmental professionals cannot afford to ignore the nanotechnology movement. Nanomaterials offer wholly new functions and properties for solving environmental problems, and the environmental paradigms developed for legacy contaminants can be used to anticipate and avoid environmental health problems associated with nanotechnology.

This talk presents examples of nanotechnology applications and implications based on multidisciplinary research at Brown University. The first example is a nanoselenium-based technology for capturing mercury vapor in spill scenarios and from broken fluorescent lamps. The second application uses graphene, the new atomically thin sheet material, to create barriers films capable of containing mercury and other toxic vapors and limiting their transport to regions where human exposure is likely. In the implications area, it will be shown that some types of graphene-based materials are manufactured as dry powders that can lead to inhalation exposures. The talk also describes the fate and transport of nanosilver, which is a useful antibiotic that is also toxic to marine organisms. It will be shown that nanosilver undergoes chemical transformations (including dissolution, sulfidation, photoreduction, and selenium reactions) that modify its bioavailability in the natural environment and the human body. Finally, carbon nanotubes show a cytotoxicity that is dependent on their geometry and composition. The implications of these results for nanomaterial safety and prevention by design will be discussed.

Chemical engineer **Robert Hurt** is Editor-in-Chief of the materials science and nanotechnology journal CARBON. His research focuses on carbon materials, the behavior of nanomaterials in living systems and the natural environment, safe material design, liquid crystals, and the assembly of three-dimensional material architectures from graphene building blocks. His interests include carbon nanotubes, graphene, nanosilver, nanocopper, mercury, selenium, silver, metals analysis, vapor barriers, environmental fate and transport, and toxicology. He likes learning about new things and talking to people in other scientific areas, so is eager to chat with ATSDR and NCEH staff.

Learn more about his research & publications!

http://www.ncbi.nlm.nih.gov/pubmed?term=Hurt%2C%20Robert%20H%5BFull%20Author%20Name%5D&cmd=DetailsSearch

http://www.brown.edu/Departments/Engineering/Labs/LINC/

http://tools.niehs.nih.gov/srp/programs/Program_detail.cfm?Project_ID=P42ES136600104&FY=2012

http://tools.niehs.nih.gov/srp/programs/Program_detail.cfm?Project_ID=P42ES13660

Brown University SRP's Engineering State Agencies Liaison, **Dr. Jim Rice**, will accompany Dr. Hurt. His interests include PAH mixture work, which he previously presented to ATSDR. He is very interested in hearing about the challenges that ATSDR faces with respect to tars, NAPLs, and PAHs, and fate and transport of organics in general. Please consider eating lunch with him so you can share your perspectives!

Questions about these events? Contact Olivia Harris at (770) 488-0597. Local partners outside CDC who wish to attend in person should contact OHarris@cdc.gov for security clearance (1 week notice for US citizens; 2 weeks for non-citizens). These events will not be ENVISIONED. Employees outside Atlanta and state/local partners may participate in the 10 a.m. seminar via LiveMeeting on the internet. Please contact Sandra Gosnell (SGosnell@cdc.gov) for passcodes. Employees present on the Chamblee campus are asked to attend in person since the number of webports is limited.

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