

Safe Nano Design

Molecule → Manufacturing → Market

AGENDA

Date: August 14 – 16, 2012

Location: College of Nanoscale Science & Engineering (CNSE) of the University at Albany

Event Organizer: National Institute for Occupational Safety and Health (NIOSH) Prevention through Design Program

Event Coordinators

- D. Heidel, Prevention through Design Program, NIOSH
- C. Geraci, Nanotechnology Research Center, NIOSH
- S. Brenner, CNSE

Event Purpose

Participants at this workshop will provide input into the safe commercialization of nano products resulting in the development of guidelines for the safe synthesis of nanoparticles and associated products, using a Prevention-through-Design approach.

August 14

9 am—12 noon	Optional tour of CNSE
12 noon—1 pm	Lunch
1 pm—5 pm	Plenary opening session

Overview: Following welcoming remarks from NIOSH and CNSE, plenary session speakers will frame the need to apply prevention through design to the commercialization of nano products. Speakers representing the nanotechnology industry, both large and small, will discuss encountered challenges and potential solutions for ensuring worker health and safety. In addition, the value of worker participation in PtD-related activities in the nano industry will be discussed by a labor leader. Our plenary session will conclude with an overview of the legal perspectives for “designing-in” protections for workers.

1:00—1:30 **Welcome and Opening Remarks**

Welcome

- Margaret Kitt, MD, MPH, Deputy Director for Program
- Michael Liehr, PhD, CNSE Vice President for Research

Opening Remarks: Prevention through Design and Nanotechnology

- Paul Schulte, PhD, Director Education and Information Division

1:30 – 3:00

Keynote Addresses

MaryBeth Miller, Principal EHS Scientist and Chief Product Stewardship Officer, Applied Nanostructured Solutions, A Lockheed Martin Company

Mark A. Banash, PhD, Vice President of Quality and Regulatory Affairs, Nanocomp Technologies, Inc.

3:00 – 3:15

Break

3:15 – 3:45

Seth Coe-Sullivan, Co-founder and Chief Technology Officer, QD Vision, Inc.

3:45 – 4:15

Bill Kojola, Industrial Hygienist, AFL-CIO

4:15 – 4:45

Lynn Bergeson, J.D., Bergeson & Campbell PC

4:45 – 5:00

Brief overview of the next two days; introduction of break-out session moderators—Donna Heidel, Charles Geraci, and Sara Brenner

5 pm—7pm

Reception

August 15

9 am—5 pm Break-out sessions with a lunch break from 12 noon—1 pm

Session 1: Design of safer nano molecules

Participants will discuss the design of safer nanoparticles; that is, molecules that exhibit the same functionality but are potentially less toxic to human health. Experts will lead discussions on molecule and surface modification and structural and physical changes to reduce toxicity while maintaining functionality; tools to characterize nanomaterials and appropriate screening tests, and nanoparticle hazard indices and bands, based on the latest nano toxicology.

Break-out session moderator: Michele N. Shepard

- 9:00 – 12:00 Panel Discussion on molecular, structural, and physical modifications to reduce toxicity while preserving function
- Designing Nanomaterials for ESH: a window of opportunity
 - Robert Hurt, Brown University
 - Dose rate-related effects on the toxicology of nanoparticles
 - Alison Elder, University of Rochester
 - Safety by Design: relative toxicity of pristine vs. functionalized MWCNT
 - Dale Porter, NIOSH
 - Safe Design within TNO
 - Maaïke leFeber, Netherlands Organization for Applied Scientific Research
 - NIEHS perspective on screening tests to evaluate safety
 - Christopher Weis, NIEHS/NTP
 - Chemical sensors for ESH applications
 - Michael Carpenter, CNSE
- (Break from 10:30 – 10:45)
- 12:00 – 1:00 Lunch
- 1:00 – 3:00 Panel Discussion on screening, characterizing, and detecting nanomaterials
- Detecting and measuring nanomaterials in a biological matrix
 - Byron Cheatham, CytoViva Inc.
 - Tools to characterize nanomaterials: high through-put content systems
 - Jim Hutchison, Safer Nanomaterials and Nanomanufacturing Initiative
 - High throughput evaluation techniques
 - Robert Tanguay, Oregon Nanoscience and Microtechnologies Institute
 - How molecular design drives biological effects
 - Christie Sayes, Center for Aerosol and Nanomaterials Engineering, RTI
 - Bringing exposure science to the fab: nanoelectronics workforce case study
 - Sara Brenner, CNSE
- 3:00 – 3:15 Break

3:15 – 5:00 Panel Discussion on nanoparticle toxicology, hazard indices, bands and OELs

- Overview of nano toxicology and its challenges
 - Vince Castranova, NIOSH
- Hazard indexing and risk characterization
 - Gunter Oberdorster, University of Rochester
- Genotoxicity: an additional element to consider
 - Linda Sargent, NIOSH
- Benchmark approach to classifying nanomaterials
 - Eileen Kuempel, NIOSH
- Inflammatory markers for nanomaterials assessment
 - J. Andres Melendez, CNSE

August 15

9 am—5 pm Break-out sessions with a lunch break from 12 noon—1 pm

Session 2: Process containment and controls

Participants will discuss appropriate exposure containment and control technology and equipment, based on the considerations of risk of exposure to workers. Participants will discuss task-related control needs and case studies from research laboratories to product manufacture; task-related control potential solutions from equipment developers and suppliers; and an overview of control banding approaches, exposure monitoring techniques, and the latest in analytical methods.

Break-out session moderator: Kenneth Martinez, NIOSH

- 9:00 – 9:30 Overview of PtD applied to a nanotechnology research center
— John Weaver, Birck Nanotechnology Center, Purdue University
- 9:30 – 10:00 Nano-enabled product introduction in a traditional manufacturing setting – one company’s approach
— Cindy L. Kosek, Goodrich Corporation
- 10:00 – 10:30 Living where the nanomaterial meets the road: how to right-size your approach
— Bob Segura, CNSE
- 10:30 – 10:45 Break
- 10:45 – 12:00 Panel Discussion on task-related control needs and case studies
— Matthew Dahm, NIOSH
— Kevin Dunn, NIOSH
— Michael Ellenbecker, Center for High Rate Nanomanufacturing, University of Massachusetts Lowell
— Mark Banash, Nanocomp
— Leonid Turkevich, NIOSH
- 12:00 – 1:00 Lunch
- 1:00 – 3:00 Panel Discussion on task-related control potential solutions
— Gary Partington, Walker Barrier Systems
— Steve Janz, Flow Sciences
— Scott Patterson, Dover Pak Containment Systems
— Pengfei Gao, NIOSH
— Jennifer Trodden, CNSE
- 3:00 – 3:15 Break
- 3:15 – 5:00 Panel Discussion on exposure monitoring and sample analysis
— Kenneth Martinez, NIOSH
— Keith Rickabaugh/Gary Casuccio, R J Lee Group
— Keith Swain, Dupont
— James Beach, CytoVivo, Inc.

August 16

Moderator: Charles Geraci, NIOSH

9:00 – 12:00 Plenary session and panel discussion on OHS Management Systems

Our final workshop day will begin with a session discussing the value of a systems approach to “design-in” worker health and safety into the facilities, processes, equipment selection, and operation of nano research, synthesis, & product formulation operations. Effective management systems approaches that organizations have adopted to ensure worker H&S will be discussed.

9:00 – 9:30 Overview of OHS Management Systems / PtD
— Charles Redinger, Ph.D. MPA CIH, President, Redinger 360, Inc.

9:30 – 12:00 Panel Discussion on the value of a management systems approach
(10:50 break)
— Keith Swain, DuPont
— Mark Banash, Nanocomp Technologies, Inc.
— Renae Goldman, 3M
— Ted Braun, Liberty Mutual
— Charles Redinger, Redinger 360, Inc.

12:00 – 1:00 Lunch

1:00 – 3:00 Summary of the Outcomes from Break-Out Sessions and Panel Discussion

At this session, the elements of an PtD program to design safer nanomolecules, fabricate them, and manufacture them into products all while ensuring the health and safety of the workers will be framed. Participants will review the outcomes from each breakout session, reach consensus on the points of agreement, and determine the additional research that may be recommended.

1:00 – 2:00 Summary of the outcomes from break-out sessions
— Moderator of the design of safer nano molecules break-out session
— Moderator of the process containment and controls break-out session

2:00 – 3:00 Panel discussion
— Moderator of the design of safer nano molecules break-out session
— Kenneth Martinez; moderator of the process containment and controls break-out session
— Lynn Bergeson, Bergeson & Campbell PC
— Charles Geraci, NIOSH