NNI EHS Research Strategy in Support of OELs for Engineered Nanomaterial

Sally S. Tinkle, Ph.D.
Deputy Director, National Nanotechnology Coordination Office
Coordinator for NNI EHS Activities
NNI Goal 4: Support Responsible Development of Nanotechnology

EHS Challenge:
• Translate Goal 4 into a Strategy to Decrease Risk and Support Product Development

EHS Mission:
• Protect public health and the environment through science-based risk analysis and risk management, and
• Foster technological advancements that benefit society
NNI’s Strategic Emphasis on Occupational Exposure

1) NNI Goal 4 Objectives: Incorporate safety evaluation of nanomaterials into the product life cycle, foster responsible development, and where appropriate, sustainability across the nanotechnology innovation pipeline, by developing and applying:

- Measurement and screening tools (defined as protocols, standards, models, data, and instruments) to assess the physico-chemical properties of nanomaterials and their biological effects in the environment and on human health and to quantify exposure across the nanotechnology product life cycle.

2011 NNI EHS Research Strategy Human Exposure Research Needs
1. Understand processes and factors that determine exposures to nanomaterials
2. Identify population groups exposed to engineered nanomaterials
3. Characterize individual exposures to nanomaterials
4. Conduct health surveillance of exposed populations
2) NNI Goal Objectives: **Employ nanotechnology and sustainable best practices** to protect and improve human health and the environment, by:

- Creating and implementing **methods, nanomaterials, and nanotechnology-enabled devices** to **reduce human and environmental exposures** to harmful compounds and remediate environmental contamination.
Exposure Strategic Objectives are Integrated Across the 2011 NNI EHS Research Needs

Semantic Map

<table>
<thead>
<tr>
<th>2011 NNI EHS Research Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMI 1</td>
</tr>
<tr>
<td>Obj (1)</td>
</tr>
<tr>
<td>Obj (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2011 Strategic Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENV 1</td>
</tr>
<tr>
<td>Obj (1)</td>
</tr>
<tr>
<td>Obj (2)</td>
</tr>
</tbody>
</table>

LEGEND
- PRIMARY CONTRIBUTION
- PARTIAL CONTRIBUTION
- MINOR/NONE
Nanotechnology for Sensors & Sensors for Nanotechnology

*Improving and Protecting Health, Safety, and the Environment*

**Collaborating Agencies:** CPSC, DOD/DTRA, EPA, FDA, NASA, NIH, NIOSH, NIST, NSF, USDA/NIFA

**Goal:** To coordinate and stimulate creation of the knowledge, tools, and methods to develop
- nanotechnology-enabled sensors and
- sensors to track the fate of engineered nanomaterials in the body and the environment.

*Image from NNI Nanotechnology-enabled Sensing Report, 2009*
Nanotechnology Knowledge Infrastructure

Enabling National Leadership in Sustainable Nanomaterial Design

Collaborating Agencies: CPSC, DOD, DOE, EPA, FDA, NASA, NIH, NIOSH, NIST, NSF, OSHA

Overarching Goal: To develop the infrastructure to support the transformation of data to knowledge in support of nanotechnology
Collaborating Agencies: NIST, NSF, DOE, DOD, EPA, IC/DNI, NIH, NIOSH/OSHA, USDA/FS

Thrust Areas: Use nanotechnology to improve
• design of **scalable and sustainable** nanomaterials, components, devices, and processes
• nanomanufacturing **measurement** technologies
Synergies and Opportunities to Integrate Workplace Safety into Federal Initiatives
Partnering Globally to Achieve the NNI EHS Research Goals

Communities of Research for Nanotechnology EHS

**US NNI administrative support:**
With materials characterization in all three:
- **Exposure through the Life Cycle**
- Ecotoxicity Testing and Predictive Models
- Predictive Modeling for Human Health

**EU administrative support:**
- Databases and ontologies
- Risk assessment
- **Risk management and control measures**

- Under the auspices of the Bilateral Presidential Commission nanoEHS working group young EHS scientist exchange
- **Goal:** US-RF collaboration on nanoEHS research for mutual public health and environmental benefit
Emerging Technologies Interagency Policy Coordination Committee (ETIPC)

- **Broad principles:** guide development and implementation of policies for oversight across the US government

Science and Technology Priorities Memo for FY14 Budget recognizes the importance of nanotechnology, nanoEHS, and NSIs

- nanomaterials should not as a class be presumed either benign or harmful
Federal Information Resources

Visit the NNI Dashboard here:

http://nanodashboard.nano.gov

@NNInanonews

Thank You!

NNI reports

Webinars

NanoTV