Science, Environment, and Public Health: Bringing It Together

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National Institute of Environmental Health Sciences
and National Toxicology Program

National Conversation on Public Health and Chemical Exposures Kickoff Meeting

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Our Commitment to Environmental Public Health
We are the National Institute of Environmental Health Sciences

- One of the National Institutes of Health, but located in Research Triangle Park, NC
- Wide variety of programs supporting our mission of environmental health:
  - Intramural laboratories
  - Extramural funding programs
  - National Toxicology Program
NIEHS Division of Intramural Research

- Basic, applied and epidemiological research to understand biological consequences of environmental exposures
- Interactive and interdisciplinary
- High risk and long term
- 12 laboratories and branches, plus the Clinical Research Program

Examples of research focus areas:
- Molecular carcinogenesis
- Neuroscience and neurotoxicology
- Signal transduction
- Reproductive and developmental toxicology
- Respiratory biology
- Structural biology
- Epidemiology and biostatistics

- New Clinical Research Unit opening July 2009
NIEHS Division of Extramural Research and Training
A Collaborative Scientific Enterprise

- Children’s Environmental Health and Disease Prevention Research Centers
- Centers for Oceans and Human Health
- Obesity and the Built Environment program
- Autism: Early Autism Risk Longitudinal Investigation
- Superfund Research Program/Worker Training Program
- Partners in Environmental Public Health
NIEHS Superfund Program: Two Unique Roles

SRP Mandates

- Detect hazardous substances in the environment
- Evaluate the risk of hazardous substances on human health
- Develop basic biological, chemical, and physical methods to reduce the toxicity of hazardous substances

Worker Training

- Create state-of-the-art training programs for hazardous materials handlers, chemical emergency responders, and waste cleanup workers
- Integrate training with National Response Plan

NIEHS

- Use environmental sciences to understand human biology and human disease

EPA

- Regulate to protect human health and the environment

ATSDR

- Prevent harmful exposures and diseases related to toxic substances
How Do We Protect The Health Of 14 Million People Living Near Superfund Sites?

- Define biological mechanisms of toxicity
- Develop remediation tools
- Train workers in hazardous environments
NIEHS Preparedness Initiatives:

- Hurricane Response Orientation
- Safety Awareness for Responders to Hurricanes
- Protecting Yourself While Helping Others
- Avian Influenza: Worker Safety and Health Awareness for Responders to Wildfires
- Flood Response Orientation
- Protecting Yourself While Helping Others
- Awareness for Radiological Dispersion Device (RDD) Preparedness
SRP Planning and Priority Setting: Protection of Human Health and the Environment

- Ongoing process
- Input from scientific community (through workshops)
- Input from partners (EPA, ATSDR, States, Community)
- Joint participation in national research meetings
- Relevancy considerations

Depends on a better understanding of the:
- routes of exposure
- effects of exposure
- prevention of exposure

Reduce uncertainty of risk
Contribute to decision making
Partnerships for Environmental Public Health: A Program for the Future

Division of Extramural Research and Training, National Institute of Environmental Health Sciences
Goals of the PEPH program

• Strategically coordinate and integrate the various new and existing initiatives that involve communities and scientists working together on contemporary issues in Environmental Public Health research.

• Develop and evaluate strategies to communicate environmental public health messages to a diversity of audiences.

• Create and provide materials to increase awareness and literacy about environmental health risks.

• Evaluate program contributions to the advancement of environmental public health.
National Toxicology Program

• Interagency program
  – Established in 1978 to coordinate toxicology research across the Department of Health and Human Services (DHHS)
  – Headquartered at NIEHS

• Research on submitted “nominations”
  – Thousands of agents evaluated in comprehensive toxicology studies
  – Results communicated through technical reports, scientific publications and the web

• Analysis activities
  – Report on Carcinogens (RoC)
  – Center for the Evaluation of Risks to Human Reproduction (CERHR)
  – NTP Interagency Center for the Evaluation of Alternative Toxicological Methods (NICEATM)
Interagency Program Headquartered at the NIEHS

Policy Oversight

Executive Committee
- ATSDR/NCEH
- CPSC
- EPA
- FDA/NCTR
- NIH/NIEHS
- CDC/NIOSH
- NIH/NCI
- OSHA

Director

External Science Oversight and Peer Review

NTP Board of Scientific Counselors

NIEHS

NCTR

National Center for Toxicological Research
U.S. Food and Drug Administration
Role of NTP in Toxicity Testing

- Provide basic toxicology information for public health protection
- Integrate results from new “data rich” techniques (i.e. genomics, high through-put screening) with traditional toxicology data to provide public health context
- Increase emphasis on understanding and explaining exposure-response relationships and issues of dosimetry
- Develop new methodologies for efficient and thorough toxicological assessments
- Provide guidance for the proper utilization of new types of information in hazard identification and characterization
- Coordinate toxicity testing across the Federal government
Current Research and Testing Areas

- Cellular phone radiation
- Combination HIV therapies
- Dietary supplements
- DNA-based therapeutics
- Drinking water contaminants
- Endocrine disruptors
- Green chemistry
- Herbal Medicines
- Nanoscale materials
- Occupational exposures
- Persistent organic pollutants
- Phototoxicants
Transforming Environmental Health Protection

<table>
<thead>
<tr>
<th>Human experience</th>
<th>Standard rodent toxicological tests</th>
<th>Alternative animal models</th>
<th>Biochemical- and cell-based in vitro assays</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–3 studies/year</td>
<td>10–100/year</td>
<td>100–10,000/year</td>
<td>&gt;10,000/day</td>
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Interagency Coordination on Toxicity Testing

• Nomination of chemical exposures for testing and research
  – FDA priority chemicals
  – ATSDR under the Comprehensive Environmental Response, Compensation, and Liability Act

• Evaluation of nominations and study plans
  – Interagency Committee on Chemical Evaluation and Coordination
  – NTP Executive Committee

• Interagency agreements with FDA/NCTR, CDC/NIOSH, and EPA to carry out testing and research activities
  – Bisphenol A, herbals, dietary supplements, nanoscale materials, mold, phthalates, and phthalate mixtures
  – Characterization of occupational exposures
  – Exposure assessment in occupational settings
New Opportunities for Collaboration with NIEHS

• Health and Environment is a priority

• New issues are emerging

• We need the best individual and team science to address complex diseases and complex environmental impacts.

• We need to improve integration across research disciplines and with all partners.

• We need to improve our translation of basic science into human health protection.
Thank You