

# THE NATIONAL ACADEMIES

*Advisers to the Nation on Science, Engineering, and Medicine*

Board on Environmental Studies and Toxicology

National Research Council  
Eighth Workshop of the Standing Committee on Risk Analysis Issues and Reviews

## EXPOSURE SCIENCE IN THE 21<sup>ST</sup> CENTURY

Public Meeting: June 18-19, 2009  
National Academy of Sciences  
2101 Constitution Avenue, NW  
Lecture Room  
Washington, DC 20418

### PUBLIC AGENDA – June 18, 2009

#### 10:00 Introduction and Purpose of the Workshop

Rick Corley, Chair  
*Planning Committee Member*  
*Laboratory Fellow, Pacific Northwest National Laboratory*

#### 10:05 EPA's Perspective on Exposure Science and Goals for the Workshop

Larry Reiter  
*Deputy Assistant Administrator for Management; Directory of the National Exposure Research Laboratory, U.S. Environmental Protection Agency*

### DEFINING EXPOSURE SCIENCE AND THE CHALLENGES THAT LAY AHEAD

#### 10:20 Exposure Science, Its Evolution and Its Future

Paul Lioy  
*Professor and Vice Chair, Department of Environmental and Occupational Medicine, Robert Wood Johnson Medical School-University of Medicine and Dentistry of New Jersey; Director of Exposure Science Division, Environmental and Occupational Health Sciences Institute of New Jersey*

#### 10:50 Inherent Challenges in Exposure Science

##### An Epidemiologist's Perspective

Paige Tolbert  
*Professor and Chair, Department of Environmental and Occupational Health; Professor, Department of Epidemiology, Emory University*

##### Meeting New Regulatory Challenges

Erik Tielemans  
*Product Manager, TNO*

## **11:50 Panel Discussion**

Panelists: Speakers, Committee Members, and Invited Panelists (David Balshaw, *Program Administrator, National Institute of Environmental Health Sciences*; Paul Price, *Risk Assessment Leader, The Dow Chemical Company*; Edward Zellers, *Professor, University of Michigan*)

Questions to be addressed include the following:

- How has exposure science evolved?
- What are the new challenges that will demand better exposure science?
- What are the inherent challenges and limitations in exposure science?
- How must exposure science evolve to address the future challenges?
- What components of existing practice need to be abandoned to develop a separate predictive scientific discipline?

## **12:30 LUNCH BREAK**

### **MAKING EXPOSURE SCIENCE MORE PREDICTIVE**

#### **1:30 Expansion of Hypothesis-Based Research in Exposure Science**

Thomas McKone

*Senior Staff Scientist and Deputy Department Head, Lawrence Berkeley National Laboratory;  
Adjunct Professor, University of California, Berkeley*

#### **2:00 Predictive Model Frameworks: Statistical Frameworks**

Louise Ryan

*Chief, CSIRO Mathematical & Information Sciences,  
Commonwealth Scientific and Industrial Research Organisation*

#### **2:30 Predictive Model Frameworks: Physical Models**

Miriam Diamond

*Professor, University of Toronto*

#### **3:00 Iterative Use of Models and Measurements to Develop Scientific Understanding**

Haluk Ozkaynak

*Senior Scientist, U.S. Environmental Protection Agency*

#### **3:30 BREAK**

#### **3:45 What New Technologies Can Offer: -Omics, Informatics, and Microsensors**

Joel Pounds

*Senior Staff Scientist, Advisor to the Environmental Biomarkers Initiative  
Pacific Northwest National Laboratory*

#### **4:15 What New Technologies Can Offer: Human Activities and Geographic Analysis**

Michael Jerrett

*Associate Professor, University of California, Berkeley*

**4:45 Panel Discussion**

Panelists: Speakers, Committee Members, and Invited Panelists (David Balshaw, *Program Administrator, National Institute of Environmental Health Sciences*; Paul Price, *Risk Assessment Leader, The Dow Chemical Company*; Edward Zellers, *Professor, University of Michigan*)

Questions to be addressed include the following:

- What is holding exposure science back?
- What is the balance between exposure-specific approaches and overarching exposure approaches and model component?
- Can the new assessment technologies help to address the inherent challenges in exposure science?
- How can new technologies assist in developing predictive approaches for populations or individuals?
- What are the new challenges in model validation, and can new technologies bring new approaches to model validation?

**5:30 Public Comment**

**5:45 ADJOURN PUBLIC SESSION**

**PUBLIC SESSION – JUNE 19, 2009**

**THEORETICAL FRAMEWORKS AND CONCEPTUAL MODELS:  
WHAT OTHER FIELDS HAVE TO OFFER**

**9:00 Occupational Hygiene**

Stephen Rappaport

*Professor of Environmental Health, University of California, Berkeley*

**9:30 Systems Biology**

Thomas Begley

*Assistant Professor, University at Albany, State University of New York*

**10:00 Global Health**

Gretchen Stevens

*Technical Officer, World Health Organization*

**10:30 Disease or Epidemic Modeling**

John Glasser

*Epidemiologist, U.S. Centers for Disease Control and Prevention*

**11:00 Panel Discussion**

Panelists: Speakers, Committee Members, and Invited Panelists (David Balshaw, *Program Administrator, National Institute of Environmental Health Sciences*; Paul Price, *Risk Assessment Leader, The Dow Chemical Company*; Edward Zellers, *Professor, University of Michigan*)

Questions to be addressed include the following:

- How can approaches in other fields inform exposure science to address the future challenges?
- What are the issues that will require exposure science to interface with toxicology, public health, and risk management?
- What information do those other fields need from exposure science to address those issues?
- How should these multidisciplinary collaborations be done?
- What questions or aspects should a National Academies committee consider if given a charge to elaborate the future vision for exposure science?

**12:00 Public Comment**

**12:15 ADJOURN WORKSHOP**