



EMERGING SCIENCE FOR ENVIRONMENTAL HEALTH DECISIONS

AGENDA

Metabolomics as a Tool for Characterizing the Exposome

MAY 28–29*, 2015 ■ THURSDAY 8:30–5:00, FRIDAY 8:30–NOON ■ WASHINGTON, DC

NATIONAL ACADEMY OF SCIENCES

2101 CONSTITUTION AVENUE, LECTURE ROOM

THIS MEETING WILL BE WEBCAST

METABOLOMICS—THE STUDY OF THE CHEMICAL FINGER-PRINTS that cellular processes leave behind—is emerging as an important way to characterize exposure. Join the committee on Emerging Science for Environmental Health Decisions and researchers, professionals, and policy experts for a workshop that will explore this new approach to advancing understanding of environmental impacts on human health.

Presentations and panel discussions will focus on:

- A vision for using metabolomics to characterize human exposures to environmental stressors
- Collecting metabolomics data: technical hurdles and opportunities
- Turning metabolomics data into useable databased information
- Case studies that explore the use of metabolomics

THURSDAY, MAY 28, 8:30AM–5:15PM

SESSION 1 USE OF METABOLOMICS TO CHARACTERIZE HUMAN EXPOSURES TO ENVIRONMENTAL STRESSORS — A VISION

Session Moderator: Chirag Patel[†], Harvard University

- 8:30 Welcome and Opening Comments — Chirag Patel[†], Harvard University
- 8:45 NIEHS Perspective — David Balshaw, National Institute of Environmental Health Sciences
- 9:00 What Is the Exposome? — Stephen Rappaport, University of California, Berkeley
- 9:20 Use of Metabolomics to Characterize Exposure — David Wishart, University of Alberta
- 9:50 Addressing the Analytical Challenges Presented by the Human Exposome: What Are We Measuring, How, and Why? — Toby Athersuch, Imperial College London
- 10:20 Q&A
- 10:40 Break

SESSION 2 COLLECTING METABOLOMICS DATA: TECHNICAL CHALLENGES AND OPPORTUNITIES

Session Moderator: Ana Navas-Acien[†], Johns Hopkins University–Bloomberg School of Public Health

- 11:00 Challenges in Separation Technologies — Erin Baker, Pacific Northwest National Laboratory
- 11:30 Detection Challenges — Anthony Macherone, Agilent Technologies and Johns Hopkins University School of Medicine
- 12:00 Lunch
- 1:00 Panel Discussion — Collecting Metabolomics Data: Technical Challenges and Opportunities
Panel Moderator: Dean Jones, Emory University
- Susan Sumner, RTI International
 - Andrew Patterson, Penn State University
 - Anthony Macherone, Agilent Technologies and Johns Hopkins University School of Medicine
 - Erin Baker, Pacific Northwest National Laboratory
 - Stephen Rappaport, University of California, Berkeley

[†] indicates a member of the Standing Committee on Use of Emerging Science for Environmental Health Decisions.

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THURSDAY, MAY 28, 8:30AM–5:15PM (CONT.)

SESSION 3 TURNING DATA INTO INFORMATION

Session Moderator: David Balshaw, National Institute of Environmental Health Sciences

- 2:10 **Challenges in Data Processing and Compound Identification** — Oliver Fiehn, University of California, Davis
- 2:40 **Tools for Community Annotation of Metabolomics Information** — Pieter Dorrestein, University of California, San Diego
- 3:10 *Break*
- 3:30 **Panel Discussion — Turning Data into Information**
Moderator: David Balshaw, National Institute of Environmental Health Sciences
- David Wishart, University of Alberta
 - Chirag Patel[†], Harvard University
 - Pieter Dorrestein, University of California, San Diego
 - Oliver Fiehn, University of California, Davis

SESSION 4 METABOLOMICS CASE STUDY

Moderator: William Farland[†], Colorado State University

- 4:15 **Understanding Exposure and Disease Etiology** — David Wishart, University of Alberta
- 4:40 **Q&A and Discussion**
- 5:15 **Adjourn for the Day**

FRIDAY, MAY 29, 8:30AM–12:00PM

- 8:30 **Welcome and Recap of Day 1** — Chirag Patel[†], Harvard University

SESSION 5 EXPOSOME, METABOLOME, AND IMPLICATIONS FOR DECISION MAKING

Session Moderator: Ivan Rusyn[†], Texas A&M University

- 8:45 **Use of Metabolomics to Understand Background Exposures** — Roel Vermeulen, Utrecht University (*by phone*)
- 9:15 **Q&A**

About the Committee

At the request of the National Institute of Environmental Health Sciences (NIEHS), the National Research Council formed the Standing Committee on Use of Emerging Science for Environmental Health Decisions to facilitate communication among government, industry, environmental groups, and the academic community about scientific advances that may be used in the identification, quantification, and control of environmental impacts on human health.

- 9:30 **Moving Beyond Traditional Measurement: Predicting to Inform Decision Making** — Elaine Cohen Hubal, US Environmental Protection Agency
- 9:50 **Q&A**
- 10:05 *Break*
- 10:25 **Panel Discussion — Use of Metabolomics to Understand Background Exposures: Research and Policy Implications**
Moderator: Ivan Rusyn[†], Texas A&M University
- George Daston[†], Procter & Gamble Company
 - Stephen Rappaport, University of California, Berkeley
 - Elaine Cohen Hubal, US Environmental Protection Agency
 - William Farland[†], Colorado State University
 - Benjamin Blount, Centers for Disease Control and Prevention (*by phone*)
1. Can the metabolome help us to understand adverse outcome pathways based on changes to the metabolome associated with chronic low-level exposures...biomarkers of response?
 2. Can the metabolome help us identify susceptible individuals or populations by flagging pre-existing disease or concurrent exposures which impact response to an exogenous exposure?
 3. Will the metabolome be helpful in quantifying endogenous chemicals that also have exogenous exposures so we understand relative “backgrounds” from physiology versus nutritional or other environmental sources?
 4. How can metabolomics data be incorporated into epidemiological studies?
 5. How will the answers to these questions help us to bring the exposome concept into the risk assessment process?
 6. What are the implications of metabolomics information for the public understanding of their risk?
- 11:40 **Closing Comments** — William Farland[†], Colorado State University
- 12:00 *Lunch*
- 12:45 **Committee and Government Liaison Meeting in Open Session**
- 2:00 **Adjourn**

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