



Forum on Neuroscience and Nervous System Disorders
Board on Health Sciences Policy

**Autism and the Environment:
Challenges and Opportunities for Research**

Wednesday, April 18, 2007

Keck Building, Room 100
500 Fifth Street, NW
Washington, DC 20001

Workshop Objectives

- Discuss the most promising scientific opportunities for improving the understanding of potential environmental factors in autism.
 - Discuss what scientific tools and technologies are available, what interdisciplinary research approaches are needed, and what further infrastructure investments will be necessary in the short- and long-term to be able to explore potential relationships between autism and environmental factors.
 - Explore potential partnerships needed to support and conduct autism research.
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8:00 a.m. Welcome, Introductions, and Workshop Objectives

ALAN LESHNER
Workshop and Forum Chair
Chief Executive Officer, AAAS
Executive Publisher, *Science*

8:05 a.m. Charge to Workshop Participants

WILLIAM RAUB
Science Advisor to the Secretary
Department of Health and Human Services

8:15 a.m. Perspectives of the Advocacy Community

LAURA BONO
Workshop Planning Committee Member
Board Member
National Autism Association

SESSION I: Autism – The Clinical Problem: “What do we know? What do we need?”

Session Objective: Describe the problem and discuss how environmental factors may impact a developmental disorder like autism. Identify what standards of evidence are needed to move forward.

SARAH SPENCE, *Session Chair*
Staff Clinician
Pediatrics and Developmental Neuropsychiatry Branch
National Institute of Mental Health, NIH

8:25 a.m. Clinical Overview: How can the clinical manifestations of autism shed light on potential environmental impacts on its biology?

SUSAN SWEDO
Senior Investigator
Pediatrics and Developmental Neuropsychiatry Branch
National Institute of Mental Health, NIH

8:45 a.m. Genes and the Environment: How may genetics be used to inform research searching for potential environmental triggers?

PAT LEVITT
Professor of Pharmacology
Vanderbilt University

9:05 a.m. How may Environmental Factors Impact Potential Mechanisms in Humans?

ISAAC PESSAH
Director, Children’s Center for Environmental Health and Disease
Prevention
University of California, Davis M.I.N.D. Institute

9:25 a.m. Defining Autism: Biomarkers and other research tools

MARTHA HERBERT
Assistant Professor of Neurology
Harvard Medical School

9:45 a.m. Discussion

SARAH SPENCE, *Session Chair*
Staff Clinician
Pediatrics and Developmental Neuropsychiatry Branch
National Institute of Mental Health, NIH

10:20 a.m. **BREAK**

**SESSION II: LESSONS LEARNED FROM OTHER DISORDERS:
“STANDARDS OF EVIDENCE”**

Session Objective: Explore how the autism field may employ approaches and strategies utilized by other fields. What has been learned from research that has examined environmental exposure effects on other disorders?

DAVID SCHWARTZ, *Session Chair*
Director
National Institute of Environmental Health Sciences, NIH

10:35 a.m. Lead toxicity

PHILIP LANDRIGAN
Chair of Community and Preventive Medicine
Mt. Sinai School of Medicine

10:55 a.m. Schizophrenia and starvation

EZRA SUSSER
Chair of Epidemiology
Mailman School of Public Health
Columbia University

11:15 a.m. Asthma

FERNANDO MARTINEZ
Swift-McNear Professor of Pediatrics
Director, Arizona Respiratory Center
University of Arizona

11:35 a.m. Discussion

DAVID SCHWARTZ, *Session Chair*
Director
National Institute of Environmental Health Sciences, NIH

12:10 p.m. **LUNCH**

**SESSION III: ENVIRONMENT AND BIOLOGY I:
WHAT ARE THE TOOLS FOR AUTISM –
WHAT DO WE HAVE? WHAT DO WE NEED?**

Session Objective: Review how environmental factors can impact fundamental biological processes. Examine the resources available, and needed, to examine susceptibility to environmental agents.

PAT LEVITT, *Session Chair*
Professor of Pharmacology
Vanderbilt University

1:00 p.m. Environmental Factors and Mutations: How may environmental factors generate mutations and impact the biology of autism? What factors could be causing these outcomes?

ROBERT STRAUSBERG
Group Leader of Human Genomic Medicine
J. Craig Venter Institute

1:20 p.m. How may Environmental Factors Impact Potential Molecular and Epigenetic Mechanisms?

ART BEAUDET
Professor and Chair, Department of Molecular and Human Genetics
Baylor College of Medicine

1:40 p.m. How may Environmental Factors Impact Potential Cell Based Mechanisms?

MARK NOBLE
Professor of Genetics
University of Rochester Medical Center

2:00 p.m. How animal models may be used to Examine Potential Environmental-based Mechanisms

THEODORE SLOTKIN
Professor of Pharmacology and Cancer Biology
Duke University Medical Center

2:20 p.m. **BREAK**

2:35 p.m. Autism, Infection and Immunity: What are the potential causative environmental factors and how can they be identified and prioritized?

W. IAN LIPKIN
Director, Greene Infectious Disease Laboratory
Mailman School of Public Health of Columbia University and
Scientific Director, Northeast Biodefense Center

2:55 p.m. Environmental Factors and Oxidative Stress: How may oxidative stress impact the biology of autism? What factors may be causing this outcome?

JILL JAMES
Professor of Pediatrics
University of Arkansas Medical College

3:15 p.m. Discussion

PAT LEVITT, *Session Chair*
Professor of Pharmacology
Vanderbilt University

SESSION IV: NEW APPROACHES AND DISCUSSION

4:20 p.m. Discussion with Meeting Participants and Audience

ALAN LESHNER, *Moderator*
Workshop and Forum Chair
Chief Executive Officer, AAAS
Executive Publisher, *Science*

5:00 p.m. ADJOURN

Reception to immediately follow



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Research**

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**SESSION V: ENVIRONMENTAL EPIDEMIOLOGY – UTILIZING POPULATION-
BASED STUDIES TO ISOLATE THE ENVIRONMENTAL CAUSES OF AUTISM.**

Session objective: Discuss and identify what resources are available and what is needed to help frame future directions for environmental epidemiology studies.

HENRY FALK, *Session Chair*

Director

Coordinating Center for Environmental Health and Injury Prevention
Centers for Disease Control and Prevention

8:00 a.m. Environmental Epidemiology Studies: New techniques and technologies to use epidemiology to find environmental triggers.

IRVA HERTZ-PICCIOTTO

Professor of Epidemiology and Preventive Medicine
University of California, Davis

8:20 a.m. Environmental Exposures in Autism: International studies

CRAIG NEWSCHAFER

Professor and Chairman of Epidemiology and Biostatistics
Drexel University

8:40 a.m. Environmental Epidemiology Studies: CADDRE

DIANA SCHENDEL

National Center on Birth Defects and Developmental Disabilities
Centers for Disease Control and Prevention

9:00 a.m. Prenatal and Perinatal Exposures

ALLEN WILCOX
Chief, Epidemiology Branch
NIEHS

9:20 a.m. Discussion

HENRY FALK, *Session Chair*
Director
Coordinating Center for Environmental Health and Injury Prevention
Centers for Disease Control and Prevention

SESSION VI: TECHNOLOGY AND INFRASTRUCTURE NEEDS FOR FUTURE RESEARCH

Session Objective: Discuss and identify what tools are currently available to assess environmental exposure, and what additional scientific tools and technologies are needed in the short- and long-term.

HENRY FALK, *Session Chair*
Director
Coordinating Center for Environmental Health and Injury Prevention
Centers for Disease Control and Prevention

9:50 a.m. CDC Environmental Health Lab – Body Burden Measures

LARRY NEEDHAM
Chief, Organic Analytical Toxicology Branch
National Center for Environmental Health, CDC

10:10 a.m. Personalized Environmental Sensors

DAVID WALT
Professor of Chemistry
Tufts University

10:30 a.m. Discussion

HENRY FALK, *Session Chair*
Director
Coordinating Center for Environmental Health and Injury Prevention
Centers for Disease Control and Prevention

11:00 a.m. **BREAK**

**SESSION VII: FUTURE RESEARCH DIRECTIONS – DISCUSSION WITH
WORKSHOP SPEAKERS**

Session Objective: Discuss what a research agenda for autism and the environment might look like.

11:00 a.m. FERNANDO MARTINEZ
Swift-McNear Professor of Pediatrics
Director, Arizona Respiratory Center
University of Arizona

ISAAC PESSAH
Director, Children’s Center for Environmental Health and Disease
Prevention
University of California, Davis M.I.N.D. Institute

12:30 p.m. **LUNCH**

SESSION VIII: PUBLIC-PRIVATE PARTNERSHIPS

Session Objective: Identify the unique strengths that the public and private sectors provide to the autism research. Discuss how each of these sectors can most effectively compliment each others efforts.

ALAN LESHNER, *Moderator*
Workshop and Forum Chair
Chief Executive Officer, AAAS

1:00 p.m. Panel Discussion

SALLIE BERNARD
Board Member, Autism Speaks
Co-Founder, SafeMinds

HENRY FALK
Director
Coordinating Center for Environmental Health and Injury Prevention
Centers for Disease Control and Prevention

TOM INSEL
Director
National Institute of Mental Health, NIH

GARY GOLDSTEIN
Chair, Autism Speaks Scientific Affairs Committee
President and Chief Executive Officer, Kennedy Krieger Institute

LYN REDWOOD
Board Member and Science Committee Chair
National Autism Association

DAVID SCHWARTZ
Director
National Institute of Environmental Health Sciences, NIH

1:45 p.m. General Panel Discussion

ALAN LESHNER, *Moderator*
Workshop and Forum Chair
Chief Executive Officer, AAAS

SESSION IX: DISCUSSION WITH MEETING PARTICIPANTS AND AUDIENCE

2:15 p.m. ALAN LESHNER, *Moderator*
Workshop and Forum Chair
Chief Executive Officer, AAAS
Executive Publisher, *Science*

3:00 p.m. **ADJOURN**