



Interagency Autism Coordinating Committee October 22, 2010

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Identify novel opportunities to accelerate research on environmental factors in autism.

Planning Committee

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Final report will be available on NIEHS website: www.niehs.nih.gov





Questions addressed

- What are the primary challenges to progress?
- How can environmental health sciences contribute?
- What strategies are available for moving forward?

Environment is defined broadly:

Industrial, agricultural chemicals

Microbial toxins, Pathogens

Nutrition, Gut Microbiome

Pharmaceuticals



Challenges

- **Lack of chemical exposure data from humans**
 - Prospective and international epidemiological studies
 - Brief exposures can have lasting impacts on brain structure
- **Lack of cellular and molecular phenotypes in humans**
 - Imaging studies of human neural activity
 - Recent genetic association studies
- **Lack of animal models and cellular assays for high-throughput screening of toxicants**
 - Behavioral correlates in mice; Collaborative Cross
 - Tox 21, a partnership between NTP, EPA, FDA and NCGC
 - Pluripotent stem cells



Lessons learned from studies of other environmentally-mediated disorders

Benefits of considering both broad and narrow phenotypes; understanding the role of comorbidities.

Convergence of genetics and environment on common pathways.

Benefits from using a full range of model organisms.

Advantages of prospective epidemiological studies, including international studies.

Creating and sustaining inter- and trans- disciplinary teams.



Strategies for moving forward

Better exposure data

Prospective epi studies and personal exposure sensors

Better bioinformatics

of genetic and exposure data to identify epigenetic and toxicogenomic influences on susceptibility

Better model systems

to allow mechanistic studies of the effects of toxicants on synapses and immune responses

Better infrastructure

for sharing large data sets and for training and supporting multidisciplinary teams