Environmental Epigenetics and disease

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One Strong Voice
Well established link b/w environment and epigenetics
Epigenetics as the intersection of gxe

- DNA methylation as a mechanism
- Layering on environment in epidemiology studies
  - Assessing exposures and epigenetic expression
  - Generation F2 - multigenerational
  - Generations F3 and F4
- Animal models
- Cancer, Asthma, NDD
Utility of Twin Designs for ASD

Methylocmic analysis of monozygotic twins discordant for autism spectrum disorder and related behavioural traits

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Environmental Epigenetics and ASD – scientific conference

• Meeting March 22-23, 2013
• Autism Speaks, Escher Fund for Autism, MIND Institute
• Goals
• Planning/Steering Committee

www.autismepigenetics.org
Scientific Conference
March 22-23, 2013

• Background and Mechanisms
• Role of the germline
• Neurodevelopment
• Exposures – examples from the field
• Ethical considerations
• Discussion topics
Emerging themes from presentation:

#1: More emphasis on genes **AND** environment, not on genes **VERSUS** environment

- multiple timepoints needed
- different tissues, if possible
- include diversity of exposures
- learn lessons from other disorders or diseases
Emerging themes from presentation

#2 Epigenetics as the moderator of gene/environment interactions

Epigenome-wide association data implicate DNA methylation as an intermediary of genetic risk in rheumatoid arthritis

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#3: Lifecourse should include the germline

- Germ cells susceptible to environmental exposures
- Multigenerational studies finding effects
- Double hit – where is the cause?
Are we looking in the right place?

Endocrine disruptors

Reproductive health

Subfertility?

ART

LINKS TO AUTISM?
Emerging themes from presentation:

#4: These issues cannot be solved by one area of research

- epidemiology
- animal model
- molecular approaches
- genetics
- toxicology
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What does this mean for families with autism, or for future families?

Model of prevention, in addition to intervention