

Gene x Environment x Development Interactions (GEDI) NIDA Strategic Planning Workgroup

May 12, 2015

Workgroup Meeting 2 of 5

Co-Chairs:

Naimah Weinberg, M.D. (NIDA)

Jonathan Pollock, Ph.D. (NIDA)

GEDI Work Group Members

NAME	AFFILIATION
WORKGROUP CHAIRS	
Naimah Weinberg, MD	NIDA
Jonathan Pollock, PhD	NIDA
EXTRAMURAL WORKGROUP MEMBERS	
Danielle Dick, PhD	Virginia Commonwealth University
Margaret Daniele Fallin, PhD	Johns Hopkins Bloomberg School of Public Health
Hugh Garavan, PhD	The University of Vermont
John Rice, PhD	Washington University School of Medicine
E. Jane Costello, PhD	Duke University Center of Developmental Epidemiology
William G Iacono, PhD	University of Minnesota
Kenneth Kendler, MD	Virginia Commonwealth University
Eric Johnson, PhD	RTI International
Gustavo Turecki, MD, PhD	McGill University
NIDA STAFF	
Maureen Boyle, PhD	NIDA
Hal Gordon, PhD	NIDA
Raul Mandler, MD	NIDA
Michele Rankin, PhD	NIDA
Joni Rutter, PhD	NIDA
John Satterlee, PhD	NIDA

Agenda

- Introductions/Identification of participants
- April 28 meeting summary - approval
- Discussion of GxExD research scientific challenges and priorities based on workgroup member feedback and points of consensus
- Action Items
 - Processes for finalizing research priorities
 - Plans for addressing questions about benchmarks, training, leveraging other fields
 - Any further resources needed?
- 5 Minute Public Comment Period
- Adjourn

Summary of Last Meeting

April 28, 2015

- Research priorities, needed resources, and recommended approaches from Drs. Turecki and Johnson were discussed
- Group discussion topics/concerns included:
 - Paucity of NIDA grants utilizing human GWAS
 - Need for longitudinal studies to determine causation; add biological measure to existing longitudinal data sets
 - Need to examine genetic effects on treatment response; genetic correlates of deleterious cognitive effects of drug use
 - Explore the use of cognitive outcomes or neuroimaging biomarkers as opposed to traditional diagnostic categories of dependency
 - Need to generate good GWAS data from large studies; fund analysis of existing data sets; bridge large-scale genotyping efforts among groups; facilitate data sharing (through funding, incentives, data citation, etc.)
 - Difficult to secure funding for developing methodology (methods grants)
 - Encourage collaboration with investigators outside of genetics to help address how genetic risk unfolds in conjunction with environment and across development
 - Examine post-exposure environmental effects, since not all drug users become addicted
 - Need for data sharing

Slide 5

Scientific challenges and priorities for GxExD research - topics for discussion

- **Consensus priorities:**
 - Improved phenotyping
 - Improved methods for gene identification
 - Epigenetic approaches
 - Deeper characterization of the environment
 - Integration of animal and human studies
- **For each of these, address:**
 - Why is this important?
 - How can this be accomplished? (FOAs? Supplements?)
 - What resources are needed to accomplish this?
 - Pros and Cons

What are the major challenges for GXEXD?

- *(prompt for discussion)*

Slide 7 Scientific challenges and priorities for GxExD research - **Phenotyping**

- **Improved phenotyping, including:**
 - Identification of useful biomarkers (distinguishing state vs. trait biomarkers)
 - Imaging data and integration with genetic data; challenges of developmental imaging data; leveraging ABCD data
 - Addressing heterogeneity of samples and of substance users
- **Address:**
 - Why is this important?
 - How can this be accomplished? (FOAs? Supplements?)
 - What resources are needed to accomplish this?
 - Pros and Cons

Slide 8 Scientific challenges and priorities for GxExD research – **Gene Identification**

- **Improved methods for gene identification, including:**
 - Candidate GxE studies (cGxE)
 - The role of GWAS; need to study less common substances; need for larger sample sizes
 - Family vs. association designs for identifying rare and common variants
 - Whole genome sequencing
 - Missing heritability
- **Address:**
 - Why is this important?
 - How can this be accomplished? (FOAs? Supplements?)
 - What resources are needed to accomplish this?
 - Pros and Cons

Slide 9

Scientific challenges and priorities for GxExD research – **Epigenetics**

- **Integration of animal and human epigenetic studies**
 - eQTLs in animal and human
 - Genome-wide comparison of epigenetics in brain tissue between those addicted to drugs and non-using controls
 - Different epigenetic mechanisms, investigate temporal dimensions and avenues for intervention (i.e, epigenetic mark modification)
 - Epigenetics of brain development
- **Address:**
 - Why is this important?
 - How can this be accomplished? (FOAs? Supplements?)
 - What resources are needed to accomplish this?
 - Pros and Cons

Slide 10

Scientific challenges and priorities for GxExD research – **Environment Characterization**

- Deeper characterization of the environment with enhanced harmonization across studies to improve power
- **Address:**
 - Why is this important?
 - How can this be accomplished? (FOAs? Supplements?)
 - What resources are needed to accomplish this?
 - Pros and Cons

Slide 11

Scientific challenges and priorities for GxExD research – **Animal <-> Human Studies**

- Integration and cross-fertilization between animal and human studies
- **Address:**
 - Why is this important?
 - How can this be accomplished? (FOAs? Supplements?)
 - What resources are needed to accomplish this?
 - Pros and Cons

Reminder: Workgroup Charge

- Develop strategic priorities for increasing our understanding of gene x environment x development interactions in substance use research.
 - Identify measurable objectives for each priority
 - Specify benchmarks for gauging progress toward each objective
- Deliverable: 3-5 page summary of recommendations for NIDA on GEDI research for the next 5 years
- Completion date: by Friday June 26th

Cross-cutting Themes to Consider During Strategic Planning

- The workgroup should also consider these cross cutting themes as appropriate
 - Training needs (training of clinicians common theme in RFI comments)
 - Addressing sex and gender issues
 - How to leverage technology advances
 - Leveraging innovations from other fields

Workgroup Logistics

- Meet biweekly on Tuesdays from 3-4 pm EDT via WebEx
- All correspondence should be sent to:
NIDAOSPCPlanning@mail.nih.gov
- All meeting materials are stored on [Dropbox](#) for members who are able to access it. Feel free to upload your own documents there for the group (bypasses sending emails).

Meeting Wrap-up

- Action items for next meeting
 - Workgroup homework
- Public comment period – 5 minutes
- Adjourn

***Next Meeting – 3:00-4:00 pm EDT,
Tuesday, May 26, 2015**