Meeting of the IACC

Science Update

Thomas R. Insel, M.D.
Director, National Institute of Mental Health and Chair, IACC
IACC Full Committee Meeting – April 9, 2013

These slides do not reflect decisions of the IACC and are for discussion purposes only.
So there is this enormous mystery waiting to be unlocked, and the BRAIN Initiative will change that by giving scientists the tools they need to get a dynamic picture of the brain in action and better understand how we think and how we learn and how we remember. And that knowledge could be -- will be -- transformative.

Proposal:
$100M in 2014 to launch a sustained effort
Integrating Nanotechnology, Neurobiology, Informatics
Partner with DARPA, NSF, foundations (Allen Brain Inst, HHMI, Kavli)
“The next great American project”
Q1. When should I be concerned?

**A novel method for assessing the development of speech motor function in toddlers with autism spectrum disorders.**
Katherine Sullivan, Megha Sharda, Jessica Greenson, Geraldine Dawson, Nandini C. Singh.

**Reduced neural sensitivity to social stimuli in infants at risk for autism**
S. Lloyd-Fox, A. Blasi, C.E. Elwell, T. Charman, D. Murphy, M.H. Johnson

**Autism before diagnosis: crying, feeding and sleeping problems in the first two years of life**
M. Barnevik Olsson, L. Höglund Carlsson, J. Westerlund, C. Gillberg, E. Fernell

**White Matter Microstructure and Atypical Visual Orienting in 7-Month-Olds at Risk for Autism**

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Q1. When should I be concerned?

Sensitivity and Specificity of Proposed DSM-5 Criteria for Autism Spectrum Disorder in Toddlers
Barton ML, Robins DL, Jashar D, Brennan L, Fein D

Comparison of ICD-10R, DSM-IV-TR and DSM-5 in an Adult Autism Spectrum Disorder Diagnostic Clinic

March 2013

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Reduced neural sensitivity to social stimuli in infants at risk for autism

S. Lloyd-Fox\textsuperscript{1}, A. Blasi\textsuperscript{1}, C. E. Elwell\textsuperscript{2}, T. Charman\textsuperscript{3}, D. Murphy\textsuperscript{4}
and M. H. Johnson\textsuperscript{1}

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Q2. How can I understand what is happening?

Autism Spectrum Disorder Is Associated with Ventricular Enlargement in a Low Birth Weight Population
Tammy Z. Movsas, Jennifer A. Pinto-Martin, Agnes H. Whitaker, Judith F. Feldman, John M. Lorenz, Steven J. Korzeniewski, Susan E. Levy, Nigel Paneth

Brain functional networks in syndromic and non-syndromic autism: a graph theoretical study of EEG connectivity
Peters JM, Taquet M, Vega C, Jeste SS, Sanchez Fernandez I, Tan J, Nelson CA 3rd, Sahin M, Warfield SK

Brain Function Differences in Language Processing in Children and Adults with Autism
Williams DL, Cherkassky VL, Mason RA, Keller TA, Minshew NJ, Just MA

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Q2. How can I understand what is happening?

**Biological Psychiatry**

Shared and Distinct Intrinsic Functional Network Centrality in Autism and Attention-Deficit/Hyperactivity Disorder

**The Journal of Pediatrics**

Predictors of Phrase and Fluent Speech in Children With Autism and Severe Language Delay.

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Brain Function Differences in Language Processing in Children and Adults with Autism
Williams DL, Cherkassky VL, Mason RA, Keller TA, Minshew NJ, Just MA
Q3. What caused this to happen and can it be prevented?

Increasing exposure to antibody-stimulating proteins and polysaccharides in vaccines is not associated with risk of autism
Frank DeStefano, Cristofer S. Price, and Eric S. Weintraub

Association of Maternal Exposure to Childhood Abuse With Elevated Risk for Autism in Offspring
Andrea L. Roberts, Kristen Lyall, Janet W. Rich-Edwards, Alberto Ascherio, Marc G. Weisskopf

Autism Risk Across Generations: A Population-Based Study of Advancing Grandpaternal and Paternal Age
Emma M. Frans, Sven Sandin, Abraham Reichenberg, Niklas Långström, Paul Lichtenstein, John J. McGrath, Christina M. Hultman

Association between maternal use of folic acid supplements and risk of autism in children
Pål Surén, Christine Roth, Michaeline Bresnahan, Margaretha Haugen, Mady Hornig, Deborah Hirtz, Kari Kveim Lie, W. Ian Lipkin, Per Magnus, Ted Reichborn-Kjennerud, Synnve Schjølberg, George Davey Smith, Anne-Siri Øyen, Ezra Susser, Camilla Stoltenberg

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Q3. What caused this to happen and can it be prevented?

THE LANCET
Identification of risk loci with shared effects on five major psychiatric disorders: a genome-wide analysis
Cross-Disorder Group of the Psychiatric Genomics Consortium

Molecular Psychiatry
Genes for endosomal NHE6 and NHE9 are misregulated in autism brains
M Schwede, K Garbett, K Mirnics, D H Geschwind, E M Morrow

Human Molecular Genetics
Global increases in both common and rare copy number load associated with autism

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# Autism Risk Across Generations

A Population-Based Study of Advancing Grandpaternal and Paternal Age

Emma M. Frans, MSc; Sven Sandin, MSc; Abraham Reichenberg, PhD; Niklas Långström, MD, PhD; Paul Lichtenstein, PhD; John J. McGrath, MD, PhD; Christina M. Hultman, PhD

## Table 1. Results From Logistic Regression Analyses on Grandpaternal Ages and Autism Risk

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. (%) of Participants in Models 1-3</th>
<th>OR (95% CI) by Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Controls</td>
<td>Cases</td>
</tr>
<tr>
<td>Maternal grandfather age, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>675 (2.2)</td>
<td>122 (2.1)</td>
</tr>
<tr>
<td>20-24</td>
<td>6721 (21.7)</td>
<td>1253 (21.1)</td>
</tr>
<tr>
<td>25-29</td>
<td>9801 (31.7)</td>
<td>1787 (30.1)</td>
</tr>
<tr>
<td>30-34</td>
<td>7082 (22.9)</td>
<td>1334 (22.5)</td>
</tr>
<tr>
<td>35-39</td>
<td>3868 (12.5)</td>
<td>308 (13.6)</td>
</tr>
<tr>
<td>40-44</td>
<td>1843 (6.0)</td>
<td>393 (6.6)</td>
</tr>
<tr>
<td>45-49</td>
<td>666 (2.2)</td>
<td>154 (2.6)</td>
</tr>
<tr>
<td>≥50</td>
<td>267 (0.9)</td>
<td>85 (1.4)</td>
</tr>
<tr>
<td>Paternal grandfather age, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>702 (2.3)</td>
<td>123 (2.1)</td>
</tr>
<tr>
<td>20-24</td>
<td>6293 (20.4)</td>
<td>1139 (19.2)</td>
</tr>
<tr>
<td>25-29</td>
<td>9694 (31.4)</td>
<td>1793 (30.2)</td>
</tr>
<tr>
<td>30-34</td>
<td>7046 (22.8)</td>
<td>1387 (23.4)</td>
</tr>
<tr>
<td>35-39</td>
<td>4777 (13.8)</td>
<td>831 (14.0)</td>
</tr>
<tr>
<td>40-44</td>
<td>1971 (6.4)</td>
<td>405 (6.8)</td>
</tr>
<tr>
<td>45-49</td>
<td>672 (2.2)</td>
<td>180 (3.0)</td>
</tr>
<tr>
<td>≥50</td>
<td>268 (0.9)</td>
<td>78 (1.3)</td>
</tr>
</tbody>
</table>
Q4. Which treatments and interventions will help?

**Antipurinergic Therapy Corrects the Autism-Like Features in the Poly(IC) Mouse Model**
Robert K. Naviaux, Zarazuela Zolkipli, Lin Wang, Tomohiro Nakayama, Jane C. Naviaux, Thuy P. Le, Michael A. Schuchbauer, Mihael Rogac, Qingbo Tang, Laura L. Dugan, Susan B. Powell

**Reboxetine treatment for autistic spectrum disorder of pediatric patients with depressive and inattentive/hyperactive symptoms: an open-label trial**
Golubchik P, Sever J, Weizman A

**Metabolic effects of sapropterin treatment in autism spectrum disorder: a preliminary study**

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Q5. Where can I turn for services?

Familiarity breeds support: Speech-language pathologists' perceptions of bullying of students with autism spectrum disorders.
Blood GW, Blood IM, Coniglio AD, Finke EH, Boyle MP

Visual symbols in healthcare settings for children with learning disabilities and autism spectrum disorder
Irene Vaz

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Q6. What does the future hold, particularly for adults?

Disparities in Transition Planning for Youth With Autism Spectrum Disorder
N. C. Cheak-Zamora, X. Yang, J. E. Farmer, M. Clark

Eack SM, Bahorik AL, Hogarty SS, Greenwald DP, Litschge MY, Mazefsky CA, Minshew NJ

JobTIPS: A Transition to Employment Program for Individuals with Autism Spectrum Disorders
Strickland DC, Coles CD, Southern LB

Nicolaidis C, Raymaker D, McDonald K, Dern S, Boisclair WC, Ashkenazy E, Baggs A
Q7. What other infrastructure and surveillance needs must be met?

National Health Statistics Reports

Stephen J. Blumberg, Matthew D. Bramlett, National Center for Health Statistics; Michael D. Kogan, Maternal and Child Health Bureau; Laura A. Schieve, National Center on Birth Defects and Developmental Disabilities; Jessica R. Jones and Michael C. Lu, Maternal and Child Health Bureau

PLOS ONE

SHRINE: Enabling Nationally Scalable Multi-Site Disease Studies

Journal of Pediatrics

Large-Scale Use of the Modified Checklist for Autism in Low-Risk Toddlers
Chlebowski C, Robins DL, Barton ML, Fein D

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