

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

BRAIN INITIATIVE

BRAIN RESEARCH
THROUGH ADVANCING
INNOVATIVE
NEUROTECHNOLOGIES

The New York Times

Obama Seeking to Boost Study of Human Brain

By JOHN MARKOFF
Published: February 17, 2013



East Room Announcement
April 2, 2013

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?

 **frontiers in**
INTEGRATIVE NEUROSCIENCE

March 2013, Volume 7, Article 17

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.

PROCEEDINGS THE ROYAL **B** **BIOLOGICAL**
OF SOCIETY **SCIENCES**

May 2013, Volume 280, No. 1758

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

ACTA PÆDIATRICA
NURTURING THE CHILD

March 2013

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

THE AMERICAN JOURNAL OF
PSYCHIATRY

March 2013

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

Elison JT, Paterson SJ, Wolff JJ, Reznick JS, Sasson NJ, Gu H, Botteron KN, Dager SR, Estes AM, Evans AC, Gerig G, Hazlett HC, Schultz RT, Styner M, Zwaigenbaum L, Piven J; for the IBIS Network

These slides do not reflect decisions of the IACC and are for discussion purposes only.

Q1. When should I be concerned?

*Journal of Autism
and Developmental Disorders*

March 2013

Sensitivity and Specificity of Proposed DSM-5 Criteria for Autism Spectrum Disorder in Toddlers

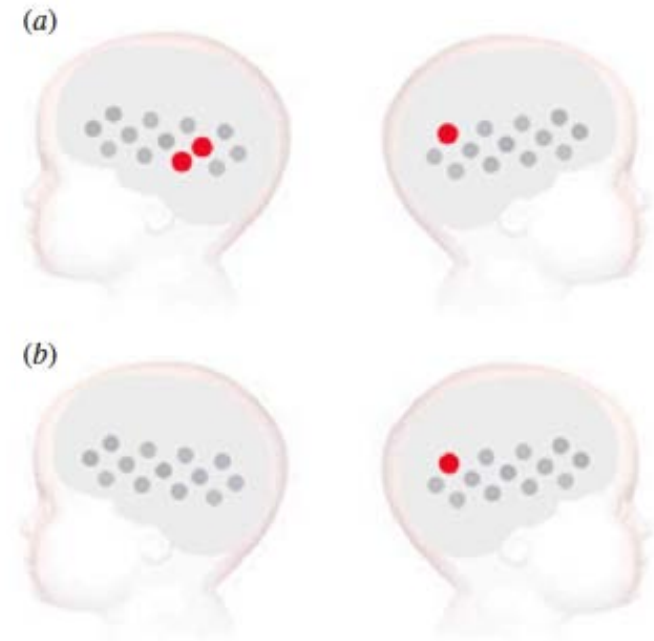
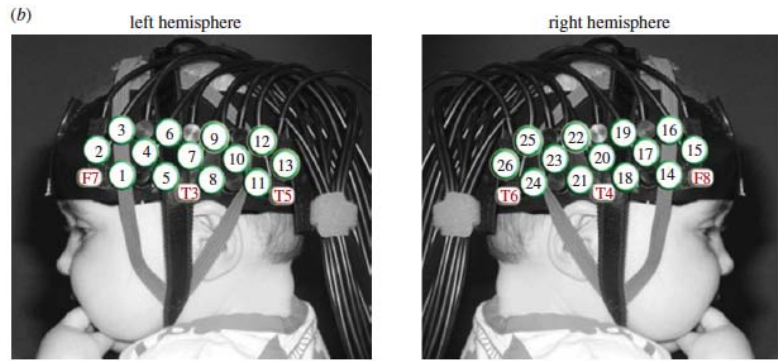
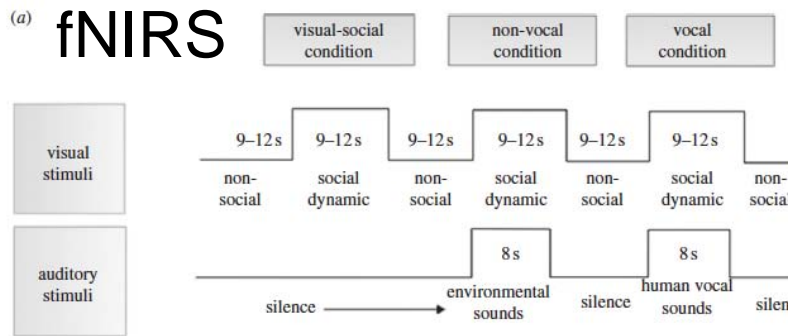
Barton ML, Robins DL, Jashar D, Brennan L, Fein D

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

Wilson CE, Gillan N, Spain D, Robertson D, Roberts G, Murphy CM, Maltezos S, Zinkstok J, Johnston K, Dardani C, Ohlsen C, Deeley PQ, Craig M, Mendez MA, Happé F, Murphy DG

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

S. Lloyd-Fox¹, A. Blasi¹, C. E. Elwell², T. Charman³, D. Murphy⁴
and M. H. Johnson¹



Visual social vs non-social in low risk (a) vs high risk (b)

Q2. How can I understand what is happening?

The JOURNAL
of PEDIATRICS

February 2013

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

 **BioMed Central**
The Open Access Publisher

February 2013. Volume 11, Issue 54

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

 **AUTISM
RESEARCH**

March 2013

Brain Function Differences in Language Processing in Children and Adults with Autism

Williams DL, Cherkassky VL, Mason RA, Keller TA, Minshew NJ, Just MA

Q2. How can I understand what is happening?

**Biological
Psychiatry**

March 2013

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

Di Martino A, Zuo XN, Kelly C, Grzadzinski R, Mennes M, Schvarcz A, Rodman J, Lord C, Castellanos FX, Milham MP

**The JOURNAL
of PEDIATRICS**

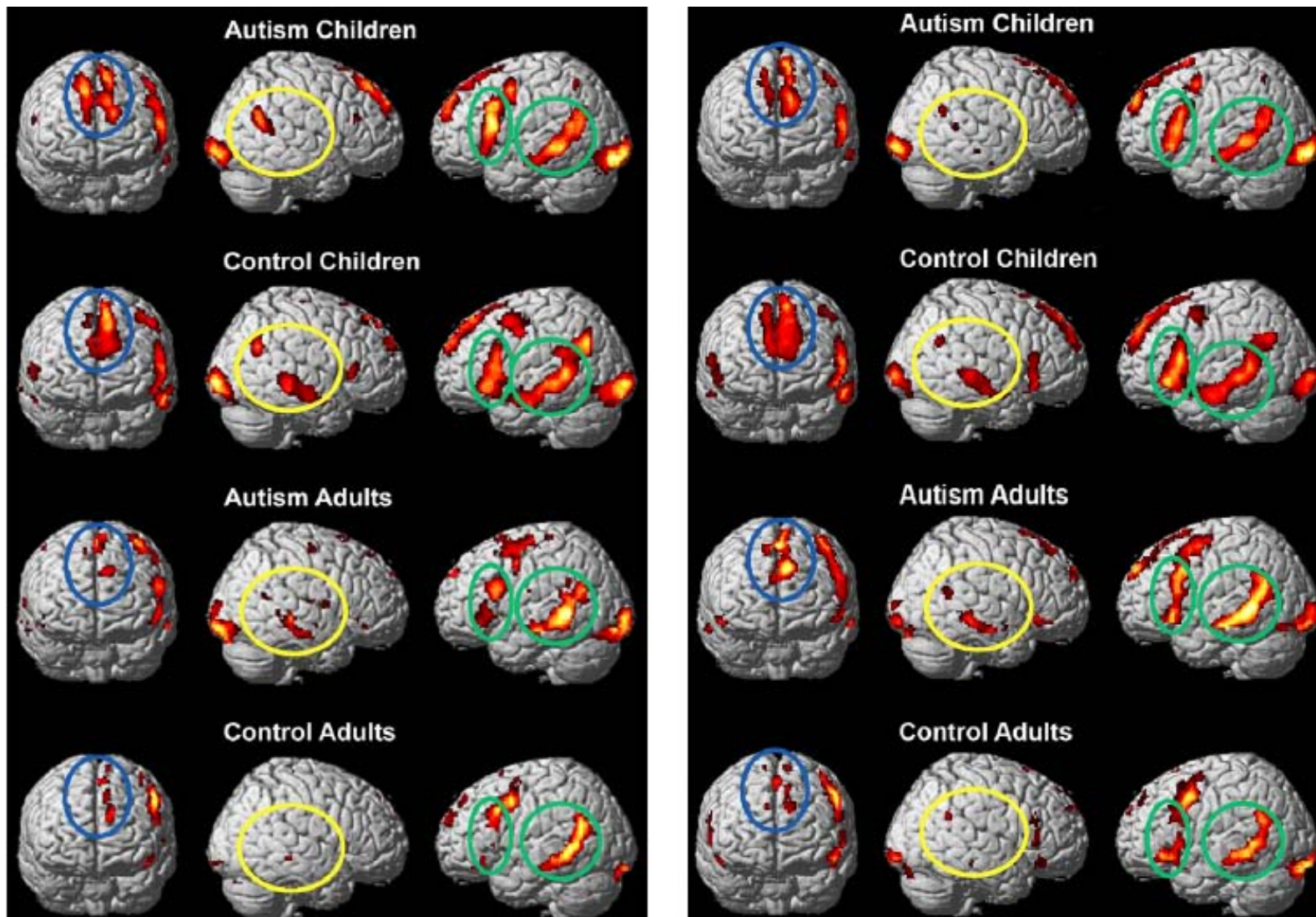
March 4, 2013

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

Erica L. Wodka, Pamela Mathy, and Luther Kalb. *Pediatrics*, March 4, 2013

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?

The **JOURNAL**
of **PEDIATRICS**

April 2013

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

JAMA Psychiatry

March 2013

Association of Maternal Exposure to Childhood Abuse With Elevated Risk for Autism in Offspring Autism and Maternal Exposure to Childhood Abuse

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

February 2013, Volume 309, No. 6

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

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

THE LANCET

February 2013

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

March 2013

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

March 2013

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

Girirajan S, Johnson RL, Tassone F, Balciuniene J, Katiyar N, Fox K, Baker C, Srikanth A, Yeoh KH, Khoo SJ, Nauth TB, Hansen R, Ritchie M, Hertz-Picciotto I, Eichler EE, Pessah IN, Selleck SB

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^a

Variable	No. (%) of Participants in Models 1-3		OR (95% CI) by Model			
	Controls	Cases	1	2	3	4
Maternal grandfather age, y						
<20	675 (2.2)	122 (2.1)	0.96 (0.79-1.18)	0.91 (0.74-1.12)	0.91 (0.73-1.12)	0.90 (0.73-1.11)
20-24	6721 (21.7)	1253 (21.1)	1.00	1.00	1.00	
25-29	9801 (31.7)	1787 (30.1)	0.98 (0.91-1.06)	1.07 (0.98-1.17)	1.07 (0.98-1.17)	1.08 (0.99-1.18)
30-34	7082 (22.9)	1334 (22.5)	1.01 (0.93-1.10)	1.18 (1.06-1.31)	1.18 (1.06-1.31)	1.19 (1.07-1.32)
35-39	3868 (12.5)	808 (13.6)	1.10 (1.00-1.22)	1.33 (1.17-1.50)	1.32 (1.16-1.50)	1.31 (1.15-1.49)
40-44	1843 (6.0)	393 (6.6)	1.12 (0.99-1.27)	1.32 (1.13-1.55)	1.31 (1.11-1.53)	1.32 (1.12-1.54)
45-49	666 (2.2)	154 (2.6)	1.22 (1.01-1.46)	1.39 (1.12-1.73)	1.37 (1.10-1.71)	1.34 (1.07-1.67)
≥50	267 (0.9)	85 (1.4)	1.67 (1.30-2.15)	1.90 (1.44-2.51)	1.87 (1.42-2.48)	1.79 (1.35-2.37)
Paternal grandfather age, y						
<20	702 (2.3)	123 (2.1)	0.96 (0.79-1.18)	0.88 (0.72-1.09)	0.88 (0.72-1.09)	0.91 (0.73-1.12)
20-24	6293 (20.4)	1139 (19.2)	1.00	1.00	1.00	
25-29	9694 (31.4)	1793 (30.2)	1.02 (0.94-1.11)	1.09 (1.00-1.19)	1.09 (0.99-1.19)	1.10 (1.00-1.20)
30-34	7046 (22.8)	1387 (23.4)	1.08 (0.99-1.17)	1.18 (1.06-1.31)	1.17 (1.05-1.30)	1.17 (1.05-1.30)
35-39	4277 (13.8)	831 (14.0)	1.05 (0.95-1.16)	1.17 (1.04-1.33)	1.17 (1.03-1.32)	1.15 (1.02-1.31)
40-44	1971 (6.4)	405 (6.8)	1.11 (0.98-1.26)	1.26 (1.08-1.47)	1.24 (1.06-1.46)	1.23 (1.05-1.44)
45-49	672 (2.2)	180 (3.0)	1.45 (1.22-1.74)	1.64 (1.34-2.02)	1.62 (1.32-1.99)	1.60 (1.30-1.97)
≥50	268 (0.9)	78 (1.3)	1.56 (1.20-2.02)	1.76 (1.32-2.35)	1.72 (1.29-2.30)	1.67 (1.25-2.24)

Q4. Which treatments and interventions will help?



March 2013, Volume 8, Issue 3

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



March 2013, Volume 36, Issue 2

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



March 2013

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

Frye RE, Delatorre R, Taylor HB, Slattery J, Melnyk S, Chowdhury N, James SJ

Q5. Where can I turn for services?

Journal of
**Communication
Disorders**

January 2013

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



February 2013, Volume 22, Issue 3

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

Irene Vaz

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

The **JOURNAL**
of **PEDIATRICS**

March 2013, Volume 131, Issue 3

Disparities in Transition Planning for Youth With Autism Spectrum Disorder

N. C. Cheak-Zamora, X. Yang, J. E. Farmer, M. Clark

*Journal of Autism
and Developmental Disorders*

February 2013

Brief Report: Is Cognitive Rehabilitation Needed in Verbal Adults with Autism? Insights from Initial Enrollment in a Trial of Cognitive Enhancement Therapy

Eack SM, Bahorik AL, Hogarty SS, Greenwald DP, Litschge MY, Mazefsky CA, Minshew NJ March 2013

JobTIPS: A Transition to Employment Program for Individuals with Autism Spectrum Disorders

Strickland DC, Coles CD, Southern LB

JGIM

November 2012

Comparison of Healthcare Experiences in Autistic and Non-Autistic Adults: A Cross-Sectional Online Survey Facilitated by an Academic-Community Partnership.

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

March 20, 2013, No. 65

Changes in Prevalence of Parent-reported Autism Spectrum Disorder in School-aged U.S. Children: 2007 to 2011-2012

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



March 2013, Volume 8, Issue 3

SHRINE: Enabling Nationally Scalable Multi-Site Disease Studies

McMurry AJ, Murphy SN, Macfadden D, Weber G, Simons WW, Orechia J, Bickel J, Wattanasin N, Gilbert C, Trevvett P, Churchill S, Kohane IS

The JOURNAL
of PEDIATRICS

March 2013

Large-Scale Use of the Modified Checklist for Autism in Low-Risk Toddlers

Chlebowski C, Robins DL, Barton ML, Fein D