



Eunice Kennedy Shriver National Institute
of Child Health and Human Development




Autism Research Update

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Eunice Kennedy Shriver National Institute of Child
Health and Human Development (NICHD)
National Institutes of Health (NIH)

National Autism Conference

State College, Pennsylvania
August 4, 2014



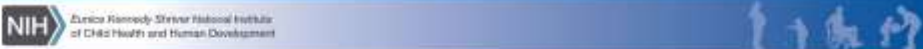
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Presentation Outline

- NIH ACE Centers and Networks embarking on critical projects (minimal verbal ASD, females with ASD, diverse population)
- Changing demographics on individuals with ASD according to new CDC prevalence data
- IACC released 2013 strategic plan
- NIH workshop exploring mental health needs in IDD

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ACE Program

NIH awards \$100 million for Autism Centers of Excellence Program

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Autism Centers of Excellence Program



■ = ACE Centers and Principal Investigators (3)
 ■ = ACE Networks and Principal Investigators (8)

University of California, Davis
 Sally J. Rogers, Ph.D.

University of California, Los Angeles
 Susan Bootheimer, Ph.D.
 Corinne Kasari, Ph.D.
 Daniel Geschwind, M.D., Ph.D.

Boston University
 Helen Tager-Flusberg, Ph.D.

Children's Hospital of Boston
 Mustafa Sahin, M.D., Ph.D.

Yale University
 Kevin Pelphrey, Ph.D.

Mount Sinai School of Medicine
 Abraham Reichenberg, Ph.D.

University of North Carolina
 Joseph Piven, M.D.
 Lianease Sikich, M.D.

Emory University
 Ami Klin, Ph.D.

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ACE Centers

- Susan Bookheimer, Ph.D. UCLA
Biomarkers of Developmental Trajectories and Treatment in ASD
- Ami Klin, Ph.D. Emory University,
Mechanisms of Risks and Resilience in ASD: Ontogeny, Phylogeny and Gene Disruption
- Helen Tager-Flusberg, Ph.D. Boston University
Minimally Verbal ASD: From Basic Mechanisms to Innovative Intervention



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ACE Networks





NIH ACE Centers and Networks embarking on critical projects

- Minimally verbal ASD:

Who are these children? How can we assess their skills and knowledge? What treatment or interventions are effective?

- Females with ASD:

Is ASD underdiagnosed in females? What accounts for the gender gap?

- ASD from diverse background:

Can the current genetic findings in ASD be generalized to individuals of African descent?




Minimally Verbal School-Aged Children with ASD: the Neglected End of the Spectrum

- Two review articles (Autism Research 2013):
stemming from NIH Workshop in 2010
- Highly heterogeneous group
- Need for novel technologies for assessing receptive
language and cognition
- About 30% of individuals with ASD
- Fully nonverbal individuals are rare

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ACE Centers

Helen Tager-Flusberg, Ph.D.
Boston University
Minimally Verbal ASD: From Basic Mechanisms to Innovative Interventions




- Examine heterogeneous phenotypes of a subset of ASD who fails to acquire spoken language
- Develop methods for assessing cognition, language, and behavior
- RCT- Auditory-Motor Mapping Training (AMMT)
- Study Speech mechanisms using a neurocomputational model of speech production and imaging
- Study auditory processing focusing on the segregation of inputs into meaningful units

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Adaptive Interventions for Minimally Verbal Children with ASD in the Community

(Connie Kasari, Ph.D., Principal Investigator)




University of Michigan (Statistical)
Susan Murphy, Ph.D., Daniel Annals, Ph.D.

University of Rochester
Thomas Smith, Ph.D.

Wash Medical College of Cornell University
Catherine Lord, Ph.D.

Vanderbilt University
Ann Kaiser, Ph.D.

University of California, Los Angeles
Connie Kasari, Ph.D.

University of California, Los Angeles (DCC)
Catherine Sugar, Ph.D.

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Adaptive Interventions for Minimally Verbal Children with ASD in the Community

(Connie Kasari, Ph.D., Principal Investigator)

- Defining response and measuring change in minimally verbal children (up to 20 words)
- Using a sequential intervention approach—individualized, considering early successes, adapting to indications of slow response
- Study the effects of adding parent training for early responders
- Two intervention methods—JASP-EMT (Joint Attention, Symbolic Play-Enhanced Milieu Teaching) & CORE-DTT (Discrete Trial Training)

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Multimodal Developmental Neurogenetics of Females with ASD

(Kevin Pelphrey, Ph.D., Principal Investigator)

University of Washington
Sara Webb, Ph.D.

University of California, Los Angeles
Susan Bookheimer, Ph.D.

Children's Hospital of Boston
Charles Nelson, Ph.D.

Yale University
Kevin Pelphrey, Ph.D.

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Multimodal Developmental Neurogenetics of Females with ASD


(Kevin Pelphrey, Ph.D., Principal Investigator)

- 1 in 42 boys and 1 in 189 girls were identified with ASD
- Aims to identify sex differences in behavior phenotypes, brain structure, connectivity, and temporal dynamics for children with ASD
- Uses samples in the Simons Simplex Collection- including 304 females and 2,114 males with autism
- Can sex-specific factors or patterns of gene expression be identifies?

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Autism Genetics, Phase II: Increasing Representation of Human Diversity

(Daniel Geschwind, M.D., Ph.D., Principal Investigator)



University of California, Los Angeles
Daniel Geschwind, M.D., Ph.D.

Autism Speaks, University of Southern California
Christi Lajchere, Ph.D.


Yale University
Matt State, M.D., Ph.D.


Albert Einstein College of Medicine of Yeshiva University
Bert Abraham, Ph.D.

Johns Hopkins University
Dan Arking, Ph.D.


Washington University in St. Louis
Afin Constantino, M.D.

Emory University
Ari Kitz, Ph.D.






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Autism Genetics, Phase II: Increasing Representation of Human Diversity

(Daniel Geschwind, M.D., Ph.D., Principal Investigator)

- Build on earlier work finding genetic variants associate with autism susceptibility
- Plan to recruit African-American families with a child with ASD (N=600)
- Identify gene variants associated with autism in Americans with self-reported African ancestry
- Evaluate disparities in diagnosis and access to care



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Changing Demographics on Individuals with ASD

CDC Released New Prevalence Data

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Methodology:

- Eight-year-old children from 2010 Data
- In 11 of the 14 Autism and Developmental Disabilities Monitoring (ADDM) Network sites
- Record (health and special education) review by trained clinicians
- Identified children with an ASD diagnosis and documented behaviors consistent with ASD
- Based on DSM-IV-TR




Community Report on Autism 2014

From Diagnosis and Developmental Disabilities Tracking Network

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ADDM Network Sites for 2010 Data



Tracking Year 2010 Sites


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Community Report on **Autism** 2014

From the National Developmental Disabilities Monitoring Network

Key Findings:

- 1 in 68 children identified with ASD
- Great variability across sites
- -1 in 42 boys versus 1 in 189 girls
- -1 in 63 white versus 1 in 81 black versus 1 in 93 Hispanic children
- $IQ \leq 70$ (31%), $IQ = 71-85$ (23%), $IQ > 85$ (46%)
- 72% with documented ASD diagnosis
- Average age of diagnosis: age 4 for AD & PDD, age 6 for Asperger Disorder



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Interagency Autism Coordinating Committee (IACC)

Federal advisory committee that coordinates all efforts within the Department of Health and Human Services (HHS)



Interagency Autism Coordinating Committee (IACC) update

- Established in 2006-- Combating Autism Act
- Reauthorized in 2011--Combating Autism Reauthorization Act (CARA), expiring on September 30, 2014
- Workshop on co-occurring conditions--September 23, 2014, Porter Neuroscience Center, NIH
- Workshop will focusing on psychiatric disorders, sleep and neurological disorders, metabolic and immune disorders




Autism Collaboration, Accountability, Research, Education and Support Act

- Or the Autism CARES Act of 2014
- A five-year reauthorization of autism research and screening programs
- Requiring a report to Congress on young adults with ASD and the transition from school-based services to services available to adults
- Requiring an official within DHHS to oversee national ASD research, services, and support activities

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IACC Released the 2013 strategic plan update

- Encouraged more attention to the needs of adults with ASD
- More focus on the most disabled individuals and underserved populations
- Need for interventions for co-occurring conditions
- Developing efficacious, efficient, scalable, and cost-effective interventions, tools, and practices
- Need for interventions that can improve quality of life for individuals with ASD and their families



The image shows the cover of the 2013 Strategic Plan for Autism Spectrum Disorders. It features three circular portraits of individuals at the top. The text on the cover includes 'THE NATIONAL INSTITUTE OF MENTAL HEALTH', 'STRATEGIC PLAN FOR AUTISM SPECTRUM DISORDERS', and '2013 UPDATE'. The NIMH logo is visible at the bottom left of the cover.

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NIH Workshop: Mental Health in Intellectual and Developmental Disabilities

Research Challenges and opportunities
June 2-3, 2014



Mental Health in IDD Workshop- Background

- Funders: NICHD, NIMH, and Special Olympics International
- 2001 meeting “Emotional and Behavioral Health in Persons with MR/DD: Research Challenges and Opportunities”
- Higher prevalence than the general population (Anxiety, Depression, ADHD)
- Unrecognized, undiagnosed, and untreated
- Individuals with IDD routinely excluded in NIH research



Mental Health in IDD Workshop-What we know

- Rare IDD syndromes with known genetic causes are associated with mental health disorders (e.g., social anxiety and fragile X syndrome)
- ABA approach (single-case, functional analysis) effective for self-injury, aggression, and others
- Promising family-centered interventions
- Promising novel treatment strategies: multimodal treatments and technology-aided cognitive training
- Successful evidence-based services provision models



Mental Health in IDD's Workshop-what we need

- Better tools for diagnosis
- Outcome measures targeting phenotypic symptoms (e.g. irritability, repetitive behavior, mood instability) and fundamental process (e.g., memory, sleep/wake cycle)
- Methods to address heterogeneity issues
- Treatment that involves innovative technology
- Research addressing transition to adulthood, community integration, and family adversity
- Study designs and consent processes to allow inclusion of individuals with low IQs




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NIH Director's Blog
Autism Architecture; Unrolling the Genetic Blueprint

- NIH-funded study published in Nature Genetics (J. Buxbaum et al July 2014)
- Large sample of individuals with autism (n=3000) from Sweden's universal health registry
- Most genetic risk for autism resides with common variation



<http://director.sblog.nih.gov/>

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Thank you!

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