



BABY SIBLINGS RESEARCH CONSORTIUM
2008 ANNUAL REPORT



Executive Summary

1. The BSRC incorporated in November 2005 now includes 23 members on the Committee of Principal Investigators.
2. To date, approximately 2385 siblings at risk for ASD have been enrolled in our research programs. We expect approximately 560 additional siblings will be enrolled in the coming year.
3. In 2008, members of the BSRC published 39 papers or book chapters on topics directly relevant to the mission of the Consortium. A special issue of the journal, *Autism: The International Journal of Research and Practice* was published on Early Detection of Autism, edited by two members of the BSRC CPI (Zwaigenbaum and Stone). In addition, members of the BSRC gave 68 presentations at conferences.
4. 18 new grants were awarded to members of the BSRC in 2008, relating to projects relevant to the BSRC.
5. In 2008, 34 graduate students and nine post-doctoral or clinical fellows were engaged in research programs associated with the BSRC. Through their participation, members of the BSRC CPI have committed to training the next generation of researchers in this critical area.
6. The AS Toddler Treatment Network made significant progress during the year.
7. The GECRA Project (Genetic and Environmental Contributions to the Risk for ASD) was completed culminating in a final report that summarized four novel projects that were highlighted as high priority feasible opportunities for the BSRC to lead.
8. There are three ongoing collaborative projects in the BSRC covering the following topics:
 - a. Prospective study of head circumference in infants at risk
 - b. Prospective study of genetic and environmental factors in infants at risk
 - c. Developmental outcomes in siblings of children with ASD

Baby Sibling Research Consortium (BSRC) - Mission

The BSRC focuses on investigations of infants at risk for autism spectrum disorders (ASD) using a variety of methods, including behavioural and neurobiological measures. The organization respects the integrity of the individual researchers and research groups while at the same time creating a framework for collaborative research activities (with new or existing funding at each site) and data sharing through this new entity. We have agreed to identify new



pool our data for collaborative projects, thereby considerably enhancing the prospects of achieving our research goals.



Members of the BSRC



The organization is made up of a Committee of Principal Investigators (CPI) representing major research groups participating in the BSRC. Each member of the BSRC is a PI on a funded project investigating infants/toddlers at risk for ASD.



Committee of Principal Investigators



Susan Bryson, Ph.D.	Dalhousie University, Halifax, Canada
Alice Carter, Ph.D.	University of Massachusetts, Boston
Leslie Carver, Ph.D.	UCSD
Kasia Chawarska, Ph.D.	Yale University
John Constantino, M.D.	Washington University
Karen Dobkins, Ph.D.	UCSD
Deborah Fein, Ph.D.	University of Connecticut
Jana Iverson, Ph.D.	University of Pittsburgh
Ami Klin, Ph.D.	Yale University
Rebecca Landa, Ph.D.	Kennedy Krieger Institute
Catherine Lord, Ph.D.	University of Michigan
Daniel Messinger, Ph.D.	University of Miami
Sally Ozonoff, Ph.D.	MIND Institute, UC Davis
Joseph Piven, M.D.	University of North Carolina
Sally Rogers, Ph.D.	MIND Institute, UC Davis
Marian Sigman, Ph.D.	UCLA
Wendy Stone, Ph.D.	Vanderbilt University
Mark Strauss, Ph.D.	University of Pittsburgh
Helen Tager-Flusberg, Ph.D.	Boston University
Sara Webb, Ph.D.	University of Washington
Nurit Yirmiya, Ph.D.	Hebrew University, Jerusalem Israel
Lonnie Zwaigenbaum, M.D.	University of Alberta, Edmonton, Canada

One new member was admitted to the BSRC this year: Suzanne Curtin, Ph.D., University of Calgary

Autism Speaks Project Staff

Geraldine Dawson, Ph.D.
Alycia Halladay, Ph.D.
Andy Shih, Ph.D.

NIH Project Staff

NICHD: Alice Kau, Ph.D.





External Advisory Committee

The three year terms of the previous advisory committee had ended in 2008, so new members were elected to our advisory board:



Heidi Feldman, M.D. (Stanford University)

Alan Fogel, Ph.D. (University of Utah)



Nathan Fox, Ph.D. (University of Maryland)

Peter Mundy Ph.D. (UC Davis/MIND Institute) – continuing member

Alison Singer (Autism Science Foundation and parent)



Ezra Susser, M.D. (Columbia University)

BSRC Officers: Executive Committee

The BSRC Executive Committee is responsible for organizing and coordinating all functions of the BSRC. Current officers (for 2008-9) include:

Chair

Lonnie Zwaigenbaum

Co-Chair

Helen Tager-Flusberg

Project Liaison

Sally Ozonoff

Participants in BSRC Projects

We have enrolled 2385 siblings at risk for ASD, the majority of whom are still actively being followed. In addition, almost 500 infants from “low risk” or non-affected families are included in BSRC studies.

In the coming year, we expect to enroll an additional 560 siblings.

Annual Meeting Summary

The BSRC held its annual meeting in San Francisco, Calif. on December 6 and 7 of 2007. This meeting focused on the challenges behind examining developmental trajectories in infants, and eventually led to the creation of a draft primary project for the consortium. In addition, Craig Newschaffer engaged the entire BSRC regarding the newly funded ACE award examining a host of environmental factors during prenatal development in siblings at risk for developing autism.

AutismSpeaks.org





Paper Published in the Journal *Pediatrics*



Under the leadership of Lonnie Zwaigenbaum, members of the BSRC worked collaboratively on a highly significant paper to be published in the May, 2009 issue of the journal *Pediatrics*. This paper titled: "Clinical assessment and management of toddlers with suspected autism spectrum disorder: Insights from studies of high-risk infants" is the first paper to disseminate findings from the BSRC to the wider clinical community.



Publications in 2008



This section of the report presents a summary of the papers and book chapters published by members of the CPI on topics directly related to their research on infants/toddlers at risk for ASD.

In 2008, the journal *Autism* (official publication of the National Autistic Society) published by Sage devoted a special issue to the topic of "Early detection of Autism", Lonnie Zwaigenbaum and Wendy Stone (members, CPI) were the editors of this special issue. The entire issue is offered free of charge by visiting the *Autism* website <http://aut.sagepub.com/content/vol12/issue5/>

(**These publications are authored by more than one member of the BSRC CPI.)

Susan Bryson

**Brian, J., Bryson, S.E., Garon, N., Roberts, W., Smith, I.M., Szatmari, P., Zwaigenbaum, L. (2008). Clinical assessment of autism in high-risk 18-month-olds. *Autism*, 12, 433-456.

**Bryson, S.E., McDermott, C., Rombough, V., Brian, J., & Zwaigenbaum, L. (2008). The Autism Observation Scale for Infants: Scale development and reliability data. *Journal of Autism and Developmental Disorders*, 38, 731-738.

**Kuwaik G, Roberts W, Brian J, Bryson S, Smith IM, Szatmari P, Zwaigenbaum L. Immunization uptake in siblings of children with autism. *Pediatrics*. 2008 Sep;122(3):684-5.





Alice Carter

Davis, N.O., & Carter, A.S. (2008). Parenting stress in mothers and fathers of toddlers with autism spectrum disorders: Associations with child characteristics. *Journal of Autism and Developmental Disorders*, 38(7), 1278-91.

Wachtel, K., & Carter, A.S. (2008). Resolution to diagnosis and parenting styles among mothers of young children with ASDs. *Autism: International Journal of Research and Practice*, 12(5), 575-94.

**Smith, L.E., Seltzer, M.M., Carter, A.S., Tager-Flusberg, H., & Greenberg, J.S. (2008). A comparative analysis of well-being and coping among mothers of toddlers and mothers of adolescents with ASD. *Journal of Autism and Developmental Disorders*, 38, 876-889.

Kasia Chawarska and Ami Klin (Yale Child Study Center)

Klin A, Jones W. Altered face scanning and impaired recognition of biological motion in a 15-month-old infant with autism. *Dev Science*. 2008, 11(1):40-6.

Jones, W., Carr, K., Klin, A. (2008). Absence of preferential looking to the eyes of approaching adults predicts level of social disability in 2-year-olds with autism. *Arch Gen Psychiatry*, 65(8):946-54.

Paul, R., Chawarska, K., Fowler, C., Cichetti, D., & Volkmar, F. (2008). Listen, my children, and you shall hear: Auditory preferences in toddlers with ASD. *Journal of Speech, Language, and Hearing Research*.

Volkmar F., & Chawarska, K. (2008). Autism in Infants: A Review. *World Psychiatry*

**Chawarska, K., Klin, A., Volkmar, F.R. (2008). *Autism spectrum disorders in infants and toddlers: Diagnosis, Assessment and Treatment*. Guilford Press, New York, N.Y.

Chawarska, K., & Bearss, K. F. (2008). Assessment of cognitive and adaptive skills in infants and toddlers with Autism Spectrum Disorders. In: K. Chawarska, A. Klin, & F. Volkmar (Eds). *Autism in Infants and Toddlers: Diagnosis, Assessment and Treatment*. Guilford Press, New York, N.Y.

Klin, A. (2008). In the eye of the beholder: tracking developmental psychopathology. *J Am Acad Child Adolesc Psychiatry*, 47(4):362-3.

Jones, W., Klin, A. (2008). Altered salience in autism: developmental insights, consequences, and questions. In E. McGregor, M. Nunez, K. Cebula, J.C. Gomez (Eds.), *Autism: an*



integrated view from neurocognitive, clinical, and intervention research. Blackwell Publishing, Malden, Mass., pp. 62-82.

**Klin, A., Chawarska, K., & Volkmar, F., (2008). Opportunities for Research: Concepts and Current Directions. In: K. Chawarska, A. Klin, & F. Volkmar (Eds.). *Autism in Infants and Toddlers: Diagnosis, Assessment and Treatment.* Guilford Press, New York, N.Y.

**Klin, A., Saulnier, C., Chawarska, K., Volkmar, F. (2008). Case studies of infants first evaluated in the second year of life. In K. Chawarska, A. Klin, & F.R. Volkmar (Eds.), *Autism spectrum disorders in infants and toddlers: Diagnosis, Assessment and Treatment,* Guilford Press, New York, N.Y., pp. 141-169.

**Volkmar, F.R., Chawarska, K., Klin, A. (2008). Autism spectrum disorders in infants and toddlers: an introduction. In K. Chawarska, A. Klin, & F.R. Volkmar (Eds.), *Autism spectrum disorders in infants and toddlers: Diagnosis, Assessment and Treatment,* New York: Guilford Press, pp. 1-22.

Deborah Fein

**Kleinman, J., Robins, D., Ventola, P., Pandey, J., Boorstein H., Esser, E., Wilson, L., Rosenthal, M., Sutura, S., Verbalis, A., Hodgson, S., Barton, M., Green, J., Dumont-Mathieu, T., Volkmar, F., Klin, A., Chawarska, K., and Fein, D. (2008) The Modified Checklist for Autism in Toddlers: A Follow-up Study Investigating the Early Detection of Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders.* 38, 827-839.

Kleinman, J., Ventola, P., Pandey, J., Verbalis, A., Barton, M., Hodgson, S., Green, J., Dumont-Mathieu, T., Robins, D., and Fein, D. (2008) Diagnostic Stability in Very Young Children with Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders.* 38, 606-615.

**Pandey, J., Verbalis, A., Robins, D., Boorstein, H., Klin, A., Babitz, T., Chawarska, K., Volkmar, F., Green, J., Barton, M., and Fein, D. (2008) Screening for autism in older and younger toddlers with the Modified Checklist for Autism in Toddlers. *Autism: The International Journal of Research and Practice.* 12, 513-535.

Rebecca Landa

Landa R. Diagnosis of autism spectrum disorder in the first three years of life. *Nature Clinical Practice Neurology.* 2008; 4, 138-147.

Daniel Messinger



Ibanez, L., Messinger, D. Newell, L., Sheskin, M. Lambert, B. (2008). [Visual disengagement in the infant siblings of children with an Autism Spectrum Disorder \(ASD\)](#). *Autism: International Journal of Research and Practice*, 12, 523–535.

AutismSpeaks.org



Sally Ozonoff

**Ozonoff, S., Macari, S., Young, G.S., Goldring, S., Thompson, M., & Rogers, S.J. (2008). Atypical object exploration at 12 months of age is associated with autism in a prospective sample. *Autism: The International Journal of Research and Practice*, 12, 557-572.

Ozonoff, S., Heung, K., Byrd, R., Hansen, R., & Hertz-Picciotto, I. (2008). The onset of autism: Patterns of symptom emergence in the first years of life. *Autism Research*, 1, 320-328.

**Ozonoff, S., Young, G.S., Goldring, S., Greiss-Hess, L. Herrera, A.M., Steele, J., Macari, S., Hepburn, S., & Rogers, S.J. (2008). Gross motor development, movement abnormalities, and early identification of autism. *Journal of Autism and Developmental Disorders*, 38, 644 – 656.

Joseph Piven

Gouttard S, Styner M, Prastawa M, Piven J, Gerig G. Assessment of Reliability of multi-site neuroimaging via traveling phantom study. *Med Image* 2008;11 (Pt 2):263-70.

Mosconi M, Reznick JS, Mesibov G, Piven J. The Social Orienting Continuum and Response Scale (SOC-RS): a dimensional measure for preschool-aged children. *J Autism Dev Disord*. 2008 Jul 22. [Epub ahead of print].

Sally Rogers

Liebel, K., Colombi, C., Rogers, S. J., Warneken, F., & Tomasello, M. (2008). Helping and cooperation in children with autism. *Journal of Autism and Developmental Disorders*, 38, :224-38.

Nordahl, C.W., Simon, T.J., Zierhut, C., Solomon, M., Rogers, S.J., & Amaral, D.G. (2008). Brief report: Methods for acquiring structural MRI data in very young children with autism without the use of sedation. *Journal of Autism and Developmental Disorders*, 38, 1581-1590.

Rogers, S.J. and Vismara, L. (2008). Evidence-based comprehensive treatments for early autism. *Journal of Clinical Child and Adolescent Psychology*, 37, 8 – 38.

**Rogers, S.J., Young, G.S., Cook, I., Giolzetti, A., & Ozonoff, S. (2008).

Deferred and immediate imitation in regressive and early onset autism. *Journal of Child Psychology and Psychiatry*, 49(4), 449-457.



**Vivanti, G., Nadig, A., Young, G.S., Ozonoff, S., Rogers, S.J. (2008). What do children with autism attend to during imitation tasks? *Journal of Experimental Child Psychology*, 101(3), 186-205.

Vismara, L.A., & Rogers, S.J. (2008). A new focus for parent education: Bridging the gap between diagnosis and intensive early intervention services. *Perspectives on Language Learning and Education*, 15, 60-66.

Chiang, C.H., Soon, W.T., Lin, T.L., & Rogers, S.J. (2008). Nonverbal communication skills in young children with autism. *Journal of Autism and Developmental Disorders*, 38 (10), 1896 – 1906.

Vismara, L., & Rogers, S.J. (2008). Treating autism in the first year of life: A case study of the Early Start Denver Model. *Journal of Early Intervention*, 31 (1), 91 – 108.

Wendy Stone

Stone, W.L., McMahon, C., & Henderson, L.M. (2008). Use of the Screening Tool for Autism in Two-year-olds (STAT) for children under 24 months: An exploratory study. *Autism: International Journal of Research and Practice*, 12, 573-589.

**Zwaigenbaum L, Stone, W. (2008) Editorial, Special Issue on Early Detection. *Autism: International Journal of Research and Practice*, 12, 427-432.

Helen Tager-Flusberg

Caronna, E., Milunsky, J. & Tager-Flusberg, H. (2008). Autism: Clinical and research frontiers. *Archives of Disease in Childhood*, 93, 518-523.

**Luyster, R., Kadlec, M. B., Connolly, C., Carter, A., & Tager-Flusberg, H. (2008). Language assessment and development in toddlers with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 38, 1426-1438.

Sara Webb

Webb, S.J. (2008). Recognition Memory: Brain Behavior Relations form 0 to 3. In D. Coch, K. Fischer, & G. Dawson (Eds.) *Human Behavior, Learning, and the Developing Brain: Typical Development*. Guilford Publications.



Lonnie Zwaigenbaum

**Brian, J., Bryson, S.E., Garon, N., Roberts, W., Smith, I.M., Szatmari, P., Zwaigenbaum, L. (2008). Clinical assessment of autism in high-risk 18-month-olds. *Autism*, 12, 433-456.

**Bryson, S.E., McDermott, C., Rombough, V., Brian, J., & Zwaigenbaum, L. (2008). The Autism Observation Scale for Infants: Scale development and reliability data. *Journal of Autism and Developmental Disorders*, 38, 731-738.

**Kuwaik G, Roberts W, Brian J, Bryson S, Smith IM, Szatmari P, Zwaigenbaum L. Immunization uptake in siblings of children with autism. *Pediatrics*. 2008 Sep;122(3):684-5.

**Zwaigenbaum L, Stone, W. (2008) Editorial, Special Issue on Early Detection. *Autism: International Journal of Research and Practice*, 12, 427-432.

Conference Presentations in 2008

Susan Bryson

Garon, N., Smith, I. and Bryson, S.E. *The development of executive functions in very young children with Autism*. Paper presented at the Canadian Psychological Association, 69th Annual Convention, Halifax, June 12-14, 2008.

Bryson, S.E., Coolican, J., Vanier, M., Brady, E., Beattie, T. and Smith, I. *The Early Detection and Diagnosis of Autistic Spectrum Disorders: An Initial Step toward Developing Practice Guidelines for Canadian Psychologists*. Paper presented at the Canadian Psychological Association, 69th Annual Convention, Halifax, June 12-14, 2008.

**Thompson, A.P., Dukul, E., Georgiades, S., Bennett, T., Szatmari, P., Bryson, S., Fombonne, E., Mirenda, P., Roberts, W., Smith, I. M., Vaillancourt, T., Volden, J., Waddell, C., Zwaigenbaum, L. and ASD Study Team. *Confirmation of the ADOS Module 1 Revised Algorithm in Young Children with Autism Spectrum Disorder*. Poster presented at the International Meeting for Autism Research, London, UK, May, 2008.

Dodds, L., Fell, D.B., Sheal, S., Allen, A., Armson, B.A. and Bryson, S.E. *Obstetrical and neonatal factors and risk of autism*. Paper presented at the International Meeting for Autism Research, London, UK, May, 2008.

**Drummond, K., Roberts, W., Brian, J., Bryson, S., Roncadin, C., Smith, I.M., Szatmari, P. and Zwaigenbaum, L. *Varying Pathways to Asperger's Syndrome at Age 5: A Prospective*



Case Series. Poster presented at the International Meeting for Autism Research, London, UK, May, 2008.

Smith, I.M., McCleave, C., Putnam, L., Smith, K., Landry, R., Chitty, D. and Bryson, S.E. *Novel Community-Based Early Intervention Program for Autism: One-Year Outcomes*. Paper presented at the International Meeting for Autism Research, London, UK, May, 2008.

**Bryson, S.E., Garon, N., Brian, J., Smith, I.M., McCormick, T., Roberts, W., Szatmari, P., and Zwaigenbaum, L. *Impaired Disengagement and its Relationship to Temperament in Infants at High Risk for ASD*. Paper presented at the International Meeting for Autism Research, London, UK, May, 2008.

**Brian, J., Bryson, S., Garon, N., Roberts, W., Smith, I.M., Szatmari, P. and Zwaigenbaum, L. *Clinical Assessment of Autism in High-Risk 18-Month-Olds*. Paper presented at the International Meeting for Autism Research, London, UK, May, 2008.

Smith, I.M., Bryson, S.E., Chitty, D., Landry, R., Openden, D., Koegel, L.K., & Koegel, R.L.. *PRT-based early intervention program for autism: One-year outcomes*. Paper presented at the Association for Behavior Analysis International 2nd Autism Conference. Atlanta GA, February, 2008.

Alice Carter

Carter, A.S.,(May, 2008). *Young Children with Autism Spectrum Disorders and Parental Well Being*. 29th Annual TEACCH Conference, Clinical and Research Issues in Autism: Changes over time, Chapel Hill, North Carolina.

Carter, A.S., & Kadlec, M.B. (August, 2008). *Longitudinal Correlational Studies Can Inform Early Autism Spectrum Disorder Interventions*. Invited paper presented at the American Psychological Association, Boston, MA.

Kasia Chawarska and Ami Klin (Yale Child Study Center)

**Chawarska, K., Shic, F., Macari, S., Bradshaw, J., Klin, A., & Volkmar, F. *Action and speech monitoring delays in 3-month-old infants at risk for ASD* (2008, May). Paper presented at the annual International Meeting for Autism Research. London, UK.

**Macari, S., Chawarska, K., Klin, A., & Volkmar, F. (2008, May). *Diagnostic and developmental trajectories in toddlers with ASD*. Paper presented at the annual International Meeting for Autism Research, London, UK.

Klin, A. (2008, May) *Perception of physical and social contingencies in infants with autism*” International Meeting for Autism Research (IMFAR), London



Klin, A. (2008, May) *Altered face scanning and impaired recognition of biological motion in 2-year-olds with autism*. International Meeting for Autism Research (IMFAR), London

Karen Dobkins and Leslie Carver (UCSD)

**Dobkins KR, Carver, JL, McCleery JM, Akshoomoff, N (2008). *Atypical Face Processing in Infants At Risk for Autism Spectrum Disorders (ASD)*. International Conference on Infant Studies, Vancouver, BC.

**McCleery JP, Dobkins KR, Geal-Touhy S, & Carver LJ (2008). *Facial emotion processing in 10-month-old infants: Happy versus disgust*. International Conference on Infant Studies, Vancouver, BC.

**Dobkins KR, Akshoomoff N, Carver LJ, Dorhmann E, & McCleery JP (2008). *Early Cognitive, Communicative and Social Development in Infants Siblings of Children with Autism Spectrum Disorders (ASD)*. International Meeting for Autism Research, London, England.

Deborah Fein

Tek, S., Jaffery, R., Fein, D., and Naigles, L. *Predictors of Language Development in Young Children with Autism*, Feb. 2008 INS, Waikoloa, Hawaii.

Dancel, M., Troyb, E., Wilson, L. and Fein, D. *Ethnic Differences in Performance on the M-CHAT*. Feb. 2008 INS, Waikoloa, Hawaii.

Boorstein, H., Verbalis, A., Wilson, L., Barton, M., Hodgson, S., Dumont-Mathieu, T., & Fein, D. (2008, February) *Diagnostic Stability in Young Children with PDD-NOS Examining Early Characteristics and Differences*. Paper presented at the meeting of the International Neuropsychological Society, Waikoloa, HI.

Troyb, E., Boorstein, H.C., Helt, M.S., Carr, K., Dumont-Mathieu, T., Hodgson, S., Barton, M., & Fein, D. (2008, February). *Parental Age as a Risk Factor for Autism*. Poster presented at the meeting of the International Neuropsychological Society, Waikoloa, HI.

Verbalis, A.D., Boorstein, H., Sutera, S., Hodgson, S., Dumont-Mathieu, T., Barton, M., & Fein, D. (2008, February). *Symptom Expression Differences in Young High Functioning Autism and Autism with Cognitive Delay*. Poster presented at the meeting of the International Neuropsychological Society, Waikoloa, HI.

Wilson, L., Boorstein, H., Pandey, J., Maltempo, A., Green, J., Dumont-Mathieu, T., Hodgson, S., Barton, M., & Fein, D. (2008,



February) *Differentiating ASD from other developmental delays in young children*. Poster presented at the meeting of the International Neuropsychological Society, Waikoloa, HI.

Karaja, J., Swensen, L., Jaffery, R., Fein, D. and Naigles, L. *Maternal rate of speaking predicts later language in children with ASD*, May, 08. Presented at International Meeting for Autism Research, London.

Troyb, E., Maltempo, A., Boorstein, H., Dumont-Mathieu, T., Hodgson, S., Barton, M. and Fein, D. *The influence of ethnicity and SES on age at diagnosis of autism*, May, 08. Presented at International Meeting for Autism Research, London.

Carr, K., Troyb, E., Hodgson, S., Barton, M. Green, J. and Fein, D. *Diagnostic Stability Over Two Years Among Younger Siblings of Children with Autism Spectrum Disorders*, May, 08. Presented at International Meeting for Autism Research, London.

Boorstein, H., Helt, M., Troyb, E., Barton, M., Dumont-Mathieu, T., Hodgson, S., & Fein, D. *No evidence for higher rates of gastrointestinal problems in young children with ASDs versus those with other developmental delays*. May, 08. Presented at International Meeting for Autism Research, London.

Jana Iverson

Iverson, J.M., Poulos-Hopkins, S., & Wozniak, R.H. (2008, March). *Gesture, Vocalization, and Toy Play in 13-Month-Old Infant Siblings of Children with Autism*. Poster presented at the 16th International Conference on Infant Studies, Vancouver, BC, Canada.

Koterba, E.A., Paradé, M.V., & Iverson, J.M. (2008, March). *Early Joint Attention and Relations to Preschool Socioemotional Competence in Infant Siblings of Children with Autism*. Poster presented at the 16th International Conference on Infant Studies, Vancouver, BC, Canada.

Iverson, J.M., Poulos-Hopkins, S., Winder, B., & Wozniak, R.H. (2008, May). *Gestures and Words in the Early Communication of Infant Siblings of Children with Autism*. Poster presented at the International Meeting for Autism Research, London, UK.

Sheinkopf, S.J., Iverson, J.M., & Lester, B. (2008, May). *Atypical Cry Characteristics in Infants at Risk for Autism*. Paper presented at the International Meeting for Autism Research, London, UK.



Rebecca Landa

Flanagan J, LaVesser P, Landa R. *Implications for Early Intervention Based on Indicators of Autism in High Risk Infants*. April 2008. Paper presented at the American Occupational Therapy Association Annual Conference, Long Beach, CA. Role: Presenter.

Landa R, Stuart E, O'Neill A. *Diagnostic Indicators for ASD in 14-Month-Olds*. May 15, 2008. International Meeting for Autism Research. London, England.

Landa, R. *The Progression of ASD from Infancy: Evidence from Prospective Research*. January, 2008. General session NAPSEC Annual Conference. Hawks Cay, Florida.

Landa, R. *Intervention Considerations in Children with Autism: Lessons from Toddlers with Autism*. January 23, 2008. NAPSEC Annual Conference. Hawks Cay, Florida.

Landa, R. *Early Predictors of Communication Disorders*. April 3, 2008. International Meeting for Early Detection of Communication Disorders. Collier Center University of Texas at Dallas. Dallas, Texas.

Daniel Messinger

Haltigan, J.D., Messinger, D.S., MacDonald, N. (2008). *Empathic Responding and Attachment Security in Young Children At Risk for an Autism Spectrum Disorder*. Presented at the International Meeting for Autism Research (IMFAR). London, UK.

Messinger, D. Cassel, T., Ibanez, L. Haltigan, J.D., Acosta, S. & Kelley, K. (2008). *Emotion, Attention, and Joint Attention in Infants at Risk for Autism*. Presented at the International Meeting for Autism Research (IMFAR). London, UK.

Ibanez, L., Grantz, C., Messinger, D., Cassel, T., Haltigan, J., Acosta, S., & Kelley, K. (2008, March). *Early Gaze Shifting and Joint Attention in Infants at-risk for Autism*. Poster presented at the biennial meeting of the International Conference on Infant Studies, Vancouver, Canada.

Sally Rogers

Rogers, S.J. *Jumpstarting early development in autism through engagement in everyday life*. Keynote Address: 20th Annual Occupational Science Symposium: *Autism in Everyday Life*. University of Southern California, March 2008.

Rogers, S.J. *Searching for Markers of Autism in Infancy*. 8th Nationaal Autisme Congres, UMC Utrecht, Rotterdam, Holland, March 2008.



Rogers, S.J., Hepburn, S., Philofsky, A., Most, D., & Fidler, D. *Predicting social competence in ASD from age 2-age 8*. International Meeting for Autism Research, London, England, May 15-17, 2008.

Vismara, L., & Rogers, S.J. *The PAIRS project: Partners in Autism Research Studies: A University Community Alliance Program*. International Meeting for Autism Research, London, England, May 15-17, 2008.

Rogers, S.J., & Colombi, C. *Il trattamento precoce dell'autismo e dei disturbi pervasivi di sviluppo secondo un approccio cognitivo-comportamentale evolutivo*. Reggio Emilia, Italy, May 22-23, 2008.

Rogers, S.J. and Vivanti, G. *Autism in the first years of life: early identification, diagnosis, and treatment*. Autismo Italia-Onlus, Prato, Italy, May 24, 2008.

Rogers, S.J. *Autism: identification and treatment before age 2*. Associazione Italiana per la Ricerca Prevenzione e Cura degli Handicap-ONLUS. Genova, Italy, May 28, 2008

Rogers, S.J. *Autism: identification and treatment before age 2*. Associazione Italiana per la Ricerca Prevenzione e Cura degli Handicap-ONLUS. Torino, Italy, May 28, 2008

Rogers, S.J. *Diagnosis of autism and developmental factors*. Fondation de France & Centre National de la Recherche Scientifique. Paris, France, October 9-10, 2008

**Rozga, A., Young, G.S., Sigman, M., Ozonoff, S., & Rogers, S. J. (2008). *Early risk for autism: Contribution of measures of mother-infant interaction, nonverbal communication, and language*. Presentation at the International Meeting for Autism Research, London, UK., May 2008.

Marian Sigman/Ted Hutman (UCLA)

Christensen, L., Rozga, A., Gomez, L., Sigman, M. (2008). *Play Trajectories and Developmental Outcomes in Infant Siblings of Children with Autism*, Roundtable at UC SPEEDR Conference, Santa Barbara, January 2008.

Christensen, L., Rozga, A., Gomez, L., Sigman, M. (2008). *Play Trajectories and Developmental Outcomes in Infant Siblings of Children with Autism*, Poster Presentation at Gatlinberg Conference, March 2008.

Rozga, A., Young, G.S., Sigman, M., Ozonoff, S., & Rogers, S. J. (2008). *Early risk for autism: Contribution of measures of mother-infant interaction, nonverbal communication, and language*. Presentation at the International Meeting for Autism Research, London, UK., May 2008.



Wendy Stone

Malesa, E.E., McMahon, C.R., Foss-Feig, J.H., Walden, T.A., Yoder, P.J., & Stone, W.L. *Predicting language in younger siblings of children with autism spectrum disorder*. Presented at the Gatlinburg Conference on Research and Theory in Mental Retardation and Developmental Disabilities, San Diego, March, 2008.

Foss-Feig, J.H., Nahmias, A.S., Malesa, E.E., & Stone, W.L. *Language patterns in later-born siblings of children with ASD*. Presented at the Gatlinburg Conference on Research and Theory in Mental Retardation and Developmental Disabilities, San Diego, March, 2008.

McMahon, C., Thompson, B., & Stone, W.L. *The Continuous STAT: Investigation of a new coding system for the Screening Tool for Autism in Two-year-olds*. Presented at the International Meeting for Autism Research (IMFAR), London, UK, May, 2008.

Yoder, P.J., Stone, W.L., & Walden, T. *Weighted frequency of triadic communication growth predicts endpoint atypicality within a sample of infant siblings of children with ASD*. Presented at the International Meeting for Autism Research (IMFAR), London, UK, May, 2008.

Key, A., Stone, W.L., & Williams, S. *What do infants see in faces? Evidence from infants at low and high risk for autism*. Presented at the International Meeting for Autism Research (IMFAR), London, UK, May, 2008.

Malesa, E.E., Foss-Feig, J.H., McMahon, C.R., Walden, T.A., Yoder, P.J., & Stone, W.L. *Developmental trajectories of social-communication abilities in younger siblings of children with ASD*. Presented at the International Meeting for Autism Research (IMFAR), London, UK, May, 2008.

Foss-Feig, J., McMahon, C.R., Yoder, P.J., & Stone, W.L. *Trajectories of cognitive development in later-born siblings of children with ASD*. Presented at the International Meeting for Autism Research (IMFAR), London, UK, May, 2008.

Mark Strauss

Strauss, M.S. *The development of categorization and facial knowledge: Implications for the study of autism.*, Invited presentation at the International Conference of Infant Studies, Vancouver, March 2008.

Helen Tager-Flusberg



**Tager-Flusberg, H., Carter, A., Casner, L., Leezenbaum, N., Seery, A. & Zuluaga, A. *Using parental diary data to detect early signs of communication delays in infants at risk for ASD.* International Conference on Infant Studies, Vancouver, CA March 2008.

Nelson, C.A., Tager-Flusberg, H., & Vogel-Farley, V. *Electrophysiological assessment of the processing of familiar and unfamiliar stimuli in infants at risk for ASD or language impairment.* International Conference on Infant Studies, Vancouver, CA March 2008.

Edelson, L., Fine, A., & Tager-Flusberg, H. *Comprehension of nouns and verbs in toddlers with autism: An eye-tracking study.* International Meeting for Autism Research, London, England, May 2008.

**Seery, A., Casner, L., Leezenbaum, N., Zuluagea, A., Carter, A., & Tager-Flusberg, H. *Use of structure home video diaries to track the development of infants at risk for ASD.* International Meeting for Autism Research, London, England, May 2008.

Nelson, C.A., Tager-Flusberg, H., Vogel-Farley, V., Levin, A., Casner, L., & Leezenbaum, N. *Neural correlates of processing of familiar and unfamiliar visual stimuli in infants at risk for ASD.* International Meeting for Autism Research, London, England, May 2008

Vogel-Farley, V., Nelson, C.A., Tager-Flusberg, H., Levin, A., Casner, L., & Leezenbaum, N. *Electrophysiological correlates of processing native and non-native speech contacts in infants at risk for ASD or language impairment.* International Meeting for Autism Research, London, England, May 2008.



Nurit Yirmiya

**Gamliel, I., Yirmiya, N., Jaffe, D. H., Manor, O., & Sigman, M. (2008). *Developmental trajectories in siblings of children with autism: Cognition and language from 4 months to 7 years*. Poster presented at the International Meeting for Autism Research. London, UK. May.

Lonnie Zwaigenbaum

**Thompson, A.P., Dukul, E., Georgiades, S., Bennett, T., Szatmari, P., Bryson, S., Fombonne, E., Mirenda, P., Roberts, W., Smith, I. M., Vaillancourt, T., Volden, J., Waddell, C., Zwaigenbaum, L. and ASD Study Team. *Confirmation of the ADOS Module 1 Revised Algorithm in Young Children with Autism Spectrum Disorder*. Poster presented at the International Meeting for Autism Research, London, UK, May, 2008.

**Drummond, K., Roberts, W., Brian, J., Bryson, S., Roncadin, C., Smith, I.M., Szatmari, P. and Zwaigenbaum, L. *Varying Pathways to Asperger's Syndrome at Age 5: A Prospective Case Series*. Poster presented at the International Meeting for Autism Research, London, UK, May, 2008.

**Bryson, S.E., Garon, N., Brian, J., Smith, I.M., McCormick, T., Roberts, W., Szatmari, P., and Zwaigenbaum, L. *Impaired Disengagement and its Relationship to Temperament in Infants at High Risk for ASD*. Paper presented at the International Meeting for Autism Research, London, UK, May, 2008.

**Brian, J., Bryson, S., Garon, N., Roberts, W., Smith, I.M., Szatmari, P. and Zwaigenbaum, L. *Clinical Assessment of Autism in High-Risk 18-Month-Olds*. Paper presented at the International Meeting for Autism Research, London, UK, May, 2008.

Zwaigenbaum, L., Navigating the New Autism screening Guidelines. Invited Speaker. Canadian Pediatric Society Annual Conference, Victoria, B.C. June, 2008.

**Zwaigenbaum, L., Stone, W.L., Dobkins, K., Urbano, R., Lambert, W., Bryson, S., Chawarska, K., Constantino, J.N., Dawson, G., Klin, A., Landa, R., Ozonoff, S., Rogers, S.J., Sigman, M. (BSRC). *Prospective Evaluation of Head Growth in Infants at Increased Risk of Autism*. Paper presented at the International Meeting for Autism Research, London, UK, May, 2008.



Newly Funded Grants in 2008

The following grants were awarded to members of the CPI during 2008 to support their research on infants at risk for ASD.

Susan Bryson

**Bryson, S.E. (Co-investigator with PI C. Roncadin)

Ontario Mental Health Foundation.

Title: Discriminating Autism from Other Atypical Patterns of Development in a Community Sample

\$142,005 (2008-10)

Karen Dobkins

NIH/NICHD R01 HD052804-01A2

Title: Development of Neural Pathways in Infants at Risk for Autism Spectrum Disorders

Total Funding Amount: \$1,313,252 (1/1/08 – 1/1/12)

Ami Klin and Kasia Chawarska

National Institute of Mental Health RO1 MH 083727

Title: "The Ontogeny of Social Visual Engagement in Infants at Risk for Autism"

\$3,547,500 (07/01/2008 - 06/30/2013)

Daniel Messinger (Wendy Stone Co-PI)

NICHD RO1HD057284

Title: [Social-Emotional Development of Infants At Risk for Autism Spectrum](#).

\$1,250,000 to U. Miami (2008-2013).

Joseph Piven

NIH Supplement to ACE Network

RO1 HD055741-S1

Title: A Longitudinal MRI Study of Infants at Risk for Autism

\$512,358 (7/1/08-6/30/13)

Autism Speaks Supplement

Title: CROSS: The IBIS-EARLI Collaboration

\$449,886 (1/1/09-12/31/11)

Simons Foundation Supplement

Title: A Longitudinal MRI Study of Infants at Risk for Autism

\$150,000 (7/1/08-6/30/13)



Wendy Stone

** NICHD R01 HD057284 (Stone & Messinger – Co-PIs)

Title: Social-Emotional Development of Infants At-Risk for ASD

\$2,424,332 (2008-2013)

Mark Strauss

NICHD (P50)

Title: Biological and Information Processing Mechanisms Underlying Autism.

\$1.5 million (8/2007-7/2012)

Autism Speaks

Title: Mentor Grant: Development of categorization and facial knowledge in infants at-risk for autism

\$62,000 (5/2008-4/2010)

Helen Tager-Flusberg

Autism Speaks

Title: Novel Measures for Testing Language Comprehension in Children with Autism Spectrum

\$450,000 (7/1/08-6/30/11)

Sara Webb

Washington State Legislative Initiative: Developmental Disabilities Project

Title: Electrophysiological risk markers in infant at risk for autism

6/09-9/09

Washington State Legislative Initiative: Developmental Disabilities Project

Title: Does atypical head growth predict autism symptoms and severity?

6/09-9/09

NIH 5-P30 ES007033-14, Eaton (PI)

Title: Infant exposure to plasticizers as potential contributors to autism spectrum disorders

4/08-3/09

Autism Speaks Mentors' Program, Postdoctoral Fellowship, Webb/Murias (PI)

Title: The use of ERPs to investigate outcome in children with autism

3/08-2/10



Nurit Yirmiya

United States-Israel Binational Science Foundation.

Title: Characteristics of the broad autism phenotype (BAP) in siblings of children with autism.

\$142,000 (2008-2010)

Lonnie Zwaigenbaum

Ontario Mental Health Foundation. (Co-investigator with PI C. Roncadin)

Title: Discriminating Autism from Other Atypical Patterns of Development in a Community Sample

\$142,005 (2008-10)

Canadian Institutes of Health Research. (co-PI with D Nicholas).

Title: A Synthesis Review of Interventional Outcomes in Childhood Autism.

\$100,000 (2008-09)

Doctoral and Post-Doctoral Training on BSRC Projects

The following graduate students and post-doctoral fellows were actively involved in the research programs directed by members of the CPI that focused on high risk infants.

PI: Susan Bryson, Dalhousie University

Graduate Students

Shelley Mitchell, MSLP (speech language pathology – at Toronto site)

Post-doctoral Fellow

Nancy Garon, Ph.D (developmental psychology)

Ghassan Kuwaik, M.D. (developmental pediatrics – at Toronto site)

PI: Leslie Carver, UCSD

Graduate Student

Lauren Cornew

PI: Suzanne Curtin, University of Calgary

Graduate Student

Danielle Droucker (Applied Psychology)

PI: Deborah Fein, University of Connecticut

Graduate Students



Katelin Carr
Kelley Knoch

PI: Jana Iverson, University of Pittsburgh

Graduate Students

Nina Leezenbaum (Psychology)
Erin Koterba (Psychology)
Meaghan Parladé (Psychology)
Jana Rea (Psychology)

PI: Rebecca Landa, Kennedy Krieger Institute/Johns Hopkins

University

Postdoctoral Fellow

Anjana Bhat, M.D.

PI: Catherine Lord, University of Michigan

Graduate Students

Kristina Lopez (Psychology)
Themba Carr (Psychology)
Meghan McDonald (Kinesiology)
Melissa Carrusco (MD/PhD)
Sarah Luchansky (Social Work)

PI: Daniel Messinger. University of Miami

Graduate Students

Lisa Ibanez, (Psychology)
J.D. Haltigan, (Psychology)
Caroline Grantz, (Psychology)
Nicole McDonald, (Psychology)
Steven Cadavid, (Psychology)

Postdoctoral Fellows

Mohammad Mahoor, M.D.
Jason Baker, M.D.

PI: Sally Ozonoff, UC Davis/MIND Institute

Postdoctoral Fellows

AJ Schwichtenberg, Ph.D
Giacomo Vivanti, Ph.D

PI: Joseph Piven, University of North Carolina

Graduate Student

Jed Elison (Psychology)

Postdoctoral Fellow

Deb Childress, Ph.D.



PI: Marian Sigman, UCLA

Graduate Students

Lisa Christensen (Psychology)
Mari Davies (Psychology)
Kristen Gillespie-Lynch (Psychology)
Leigh Sepeta (Psychology)

Postdoctoral Fellow

Ted Hutman, Ph.D.

PI: Wendy Stone, Vanderbilt University

Graduate Students

Allison Presmanes (Psychology)
Lauren Turner Brown (Psychology)
Caitlin McMahon (Psychology)
Jennifer Foss-Feig (Psychology)
Elizabeth Malesa (Psychology)
Cara Damiano (Psychology)
Allison Nahmias (Psychology)

Postdoctoral Fellows

Lynnette Henderson, Ph.D
Elizabeth Catania, Ph.D

PI: Mark Strauss, University of Pittsburgh

Graduate Students

Catherine Best (Psychology)
Holly Gastgeb (Psychology)
Keiran Rump (Psychology)
Desiree Wilkinson (Psychology)
Sarah Hannigen (Psychology)

PI: Helen Tager-Flusberg, Boston University

Graduate Students

Meaghan Thompson (Psychology)
Anne Seery (Psychology)

PI: Nurit Yirmiya, The Hebrew University of Jerusalem

Graduate Students

Ifat Gamliel (School of Education)
Raaya Alon (School of Education)

PI: Lonnie Zwaigenbaum, University of Alberta

Graduate Students



Shelley Mitchell, MSLP (speech language pathology – at Toronto site)

Post-doctoral Fellow

Ghassan Kuwaik, M.D. (developmental pediatrics – at Toronto site)

AutismSpeaks.org



AS Toddler Treatment Network: Report Update

In February of 2008, the Toddler Treatment Network, which includes some but not all members of the BSRC, met in San Diego, Calif. to discuss the goals, objectives and directions of the network. There are two major commonalities across the studies: (1) they are parent-implemented, and (2) they all involve naturalistic delivery of interventions addressing the earliest autism behavioral phenotype and thus are heavily focused on communication: joint attention, imitation, gestures and language. The projects use different intervention models, most of which involve adaptations of existing preschool interventions to make them more infant-appropriate. Investigators in the TTN are working on improving or expanding on diagnostic and outcome measures so that comparisons across the studies can be made. The intervention involve techniques that can be implemented outside the clinic, allowing parents and caregivers to use these techniques in different settings, decreasing the time between parent's initial concern and beginning intervention, thus hopefully improving developmental outcome in the long run. Because they require less "in clinic" time, they may also be very cost effective. A summary of each of these projects can be found under "science initiatives" at www.autismspeaks.org. In 2008, the network established a set of common overarching goals, which includes, but was not limited to:

1. Improving measurement regarding outcomes for toddlers with autism and their families on both comprehensive outcome measures and core deficits of autism. This includes adding and refining measurements, identifying common and unique measures, and facilitating training across sites. This was accomplished through a group training on the ADOS for toddlers (facilitated by Cathy Lord) as well as the completion of a non-common measures table. This non-common measures table shares with others new or unique measurements that allow each group to provide a unique insight into aspects of successful intervention.
2. Defining best practices for designing and delivering parent-implemented interventions with autism. The groups have shared a number of common measurements or novel intervention techniques, posted privately and accessed by all TTN members.
3. Improving research designs and analytical approaches for early intervention studies. With the help of Paul Yoder, groups participated in a questionnaire to share randomization procedures which was shared across sites, and Hannah Schertz polled the group and provided information on how sites are conducting fidelity measurements.
4. Facilitating young researchers in the field. Michael Siller from Hunter College wrote and finalized a publication agreement that will be used



from the site to share information that can be shared with a larger audience.

This group meets via teleconference bi-monthly to discuss challenges, ideas, and potential opportunities for sharing of information. In addition, in 2008 Autism Speaks announced an RFA in treatment research that will enhance, improve, or expand these existing studies, or perhaps build on existing collaborations within the group. While the findings of the group are still preliminary, they are promising and provide a possible cost-effective, efficient and effective way of providing much needed services to toddlers from the ages of 18-24 months.

Collaborative Projects (2008)

A: Prospective Study of Head Circumference in Infants at Risk for ASD

Project Leader: Lonnie Zwaigenbaum

Steering committee: Lonnie Zwaigenbaum, Wendy Stone, Karen Dobkins, Rick Urbano, Warren Lambert

This was the first collaborative data project of the BSRC. Supplemental funds were provided by AS to set up the data management team and database at Vanderbilt University. The initial set of analyses have been completed, demonstrating atypical patterns of growth in head circumference toward the end of the first year of life, especially in those infants who later meet criteria for a diagnosis of autism. An abstract was presented at IMFAR 2008. An additional funding supplement has been awarded by AS to update the data to reflect current outcome status in participating high-risk and low-risk infants, finalize quality control, and conduct additional analyses. It is expected that a draft of a manuscript from this project will be completed and submitted for publication in 2009.

B: Gene Environment Contributions to Risk for Autism (GECRA)

Project Leader: Lonnie Zwaigenbaum

Steering Committee: Lonnie Zwaigenbaum, Helen Tager-Flusberg, Ezra Susser (Columbia U), Alycia Halladay (AS), Andy Shih (AS), Geraldine Dawson (AS)

With support of the planning/feasibility grant from Autism Speaks, a two-day meeting was convened between the steering committee, external advisors, and BSRC investigators and invited collaborators from their home institutions identified as potential contributors to the GECRA research agenda. Observers from Autism Speaks (including scientific leadership) also participated.



The first day of the meeting was devoted to scientific presentations and small group discussions. Presentations covered a wide range of topics relevant to environmental risk research, delivered by External Advisors to GECRA who include leading experts in their respective fields:

Dr. Glenn Rall – immunology
Dr. Salvatore DiMauro - mitochondrial disorders
Dr. Carolyn Schanen – epigenetics
Dr. Roberta White – environmental toxicology
Dr. Peter Szatmari – genetics
Dr. Lisa Croen – risk factors in high-risk cohorts – retrospective design
Dr. Craig Newschaffer – risk factors in high-risk cohorts – prospective design

Following these presentations, conference participants broke into small groups for more focused discussion focusing on methodology, feasibility and potential research questions. The groups were divided into: genetics, immunology, and environmental risks. The Steering Committee collated the summaries of the small group discussions, and synthesized the scientific ideas that were generated into a set of projects.

The second day of the meeting began with a detailed presentation of the BSRC studies and cohorts, followed by a summary presentation of eight potential project ideas that emerged from the previous day's presentations and discussion groups. Based on the uniqueness of the infant sib/high risk cohort for answering these questions, state of the current science, expertise of members and/or collaborators, as well as enthusiasm of the CPIs in participating, four projects were chosen for further examination

Projects:

1. Collection and banking of DNA samples
2. Screening for mitochondrial mutations and diseases
3. Investigation of vaccination rates and association with diagnostic outcomes
4. Pre- and peri-natal risk factors associated with ASD

The remainder of the meeting was devoted to more detailed group discussion of these ideas, refining the hypotheses and methodologies that could be fruitfully explored, in the context of the BSRC cohorts. A feasibility report was generated at the end of 2008 which included possible sample sizes, logistical issues, and budget scenarios based on interested participating sites.

C. Developmental Outcomes in Later-born Siblings of Children with ASD

Project Leaders: Sally Ozonoff and Nurit Yirmiya



At the December 2007 Meeting, several BSRC sites presented data on developmental outcomes of siblings at risk. It was agreed that this topic would be the focus of a collaborative project, as a primary project for the Consortium. During 2008, data were collected from all sites that had outcome data on at least a portion of their sample. This project is now in progress – data are currently being cleaned and checked and preliminary statistical analyses are underway.

Goals for 2009

At the December, 2007 Meeting, several BSRC sites presented data on developmental outcomes of siblings at risk. It was agreed that this topic would be the focus of a collaborative project, as a primary project for the Consortium. During 2008, data were collected from all sites that had outcome data on at least a portion of their sample. This project is now in progress – data are currently being cleaned and checked and preliminary statistical analyses are underway.

- (i) Complete the Head Circumference and Developmental Outcomes collaborative projects. Dissemination of the findings from these projects.
- (ii) Progress on the Treatment network
- (iii) Application for funding to support component projects of GECRA
- (iv) Establish a long-term database that will support all current and future projects of the BSRC.

Acknowledgments

The research conducted by members of the BSRC is largely supported by funds from Autism Speaks and the National Institutes of Health. We gratefully acknowledge the support of these and several other agencies and foundations for our individual research programs. We thank members of our External Advisory Board for their advice on our current programs. The activities of the BSRC are made possible by the generous support of Autism Speaks. We are especially grateful to Alycia Halladay and Andy Shih for their encouragement and tireless activity on our behalf.

