The Infant Brain Imaging Study (IBIS) Network is an NIH funded Autism Center of Excellence project and consists of a consortium of 8 universities in the U.S. and Canada.

Study Sites

University of North Carolina at Chapel Hill
Children’s Hospital of Philadelphia
Washington University in St. Louis
University of Washington
McGill University
University of Utah
University of Alberta
Montreal Neurological Institute
University of Minnesota

http://ibis-network.org

Key Study Publications


http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4035719

About the Study

This research study is examining brain development and behavior in infants who have an older sibling with autism and thus are considered to be at high risk for autism themselves. This is a multi-site study in its 8th year of funding by the National Institute of Health. The study begins following infants as young as 3 months of age and uses some of the most advanced brain imaging technology to examine how brain structure changes during the important period from 6 to 24 months of age. The study also uses developmental and behavioral assessments, parent questionnaires, eye tracking equipment, and genetic testing to assess social communication, repetitive behavior, attention and other behaviors.

Autism Speaks has also provided funding to expand and link the IBIS Network with the Early Autism Risk Longitudinal Investigation (EARLI) to investigate genetic and environmental risk factors for autism from prenatal development through early childhood.

The data gathered in this study will provide important information about early brain development as well as genetic and environmental factors associated with autism.

About the Participants

- 463 Infant siblings of children with autism are enrolled or have completed the study in all sites. 108 of those participated at UNC-CH.
- 191 Infant siblings of typically developing children are currently participating or have completed in all sites. 63 of those participated at UNC-CH.

The IBIS Network is grateful to participating families.
Published Results To Date

Findings on Brain

White Matter/Pathway Differences  Paper 1: The research team reported significant differences in brain development of infants who develop ASD and those who do not. They analyzed scans of 92 at-risk infants (all had older siblings with autism). At 24 months, 30 percent of them met criteria for autism spectrum disorders while 70 percent did not. Findings indicate these two groups differed in white matter fiber tract development—white matter fiber tracts are the pathways that connect brain regions. They evaluated 15 fiber tracts and found significant differences in 12 of these pathways in the infants who went on to develop autism compared to infants who did not develop ASD. These findings indicate variances in connectivity and organization within the brain structure and suggest that autism is a whole-brain phenomenon and is not isolated in any one particular region of the brain.

Paper 2: Data from 24 month olds in the study shows that the children who develop autism have significantly less connectivity (efficiency) than the high-risk infants who didn’t develop autism and infants with no family history of autism.

Brain Volume Previous studies at UNC have observed larger brain volume and head circumference in children with autism as young as two years of age. The team analyzed brain scans of 6 month olds at high risk for autism (with a sibling with ASD) and compared them to babies who did not have a sibling with ASD. The results so far are inconclusive but the researchers plan to continue to investigate these metrics as more data becomes available.

Findings on Behavior

Repetitive Behavior Evident at 12 Months  Restricted interests and repetitive behavior is one of the core features of autism but there is little information about how this behavior manifests in infants and toddlers. The Baby Sibs study is collecting data on repetitive behavior via parent questionnaire and also using a novel behavioral coding approach. One paper reported results from analysis of digital videos of more than 160 12-month old infants participating in 20 minute long, standardized behavioral assessment. The infants who later developed autism show a higher incidence of repetitive movement than the others. A second paper using parent report data yielded similar results. Elevated repetitive behaviors at 12-months may be a ‘red flag’ for autism.