



New Project: Aging and Autism

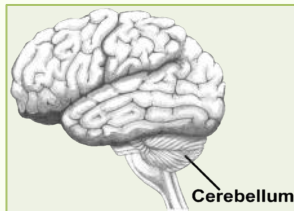
BDIL recently received a ~\$3.5M grant from the National Institutes of Health to study aging in people with autism spectrum disorders (ASD). The 5-year project will fill a large gap in our current knowledge of ASD: Virtually nothing is known about changes in brain and behavior after age 40 years. Although many children and

adolescents show improvements in symptoms as they enter adulthood, there is concern about cognitive or neurological decline in late adulthood. For KPBS media coverage of the project click [here](#). We are now seeking participants (ages 40 to 65 years) for this study.

See the blue box on the next page for details.

Research Update: Recent findings from our lab

Autism and the 'little brain'. The cerebellum is a structure at the back of the head. Although called the 'little brain', it is actually heavily folded and – when unfolded – roughly as big as the main part of the brain. It has long been thought of as a structure involved in movement, but more recently its role in higher social and thinking abilities (language, memory) has been recognized.



Abnormalities of the cerebellum in ASD have been suspected for many years. Our recent [study](#), published online in the journal *Biological Psychiatry*, examined functional connectivity between cerebral cortex (the surface gray matter of the brain) and cerebellum. 'Functional connectivity' tests how much different parts of the brain 'talk to each other' or cooperate. Contrary to our expectations, this cooperation with the cerebellum was very much increased in

children and adolescents with ASD, compared to typically developing participants. However, there was a distinctive pattern. The *overconnectivity* was mainly found for relatively simple sensory and motor functions (e.g., tactile perception, hearing, movement), whereas the role of the cerebellum in higher cognitive systems (language, social etc.) was relatively *reduced*. This pattern of findings may suggest that sensory connections supporting vision, hearing etc. may overdevelop early in life and may 'occupy' brain regions that are typically dedicated to higher thinking abilities later in life. However, the findings from this study are only a small piece in the puzzle and additional research will be needed before firm conclusions can be drawn. For media coverage of the study, click [here](#).

Where in the brain is autism? Although ASD has been considered to be primarily a brain-based (neurological) disorder for decades, we still do not know what brain patterns exactly cause the behavioral problems in children with ASD. Brain imaging techniques, especially the different types of MRI (magnetic resonance



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Research Update (cont.)

imaging) have advanced a lot over the years, but there is still no scan or test that allows us to pinpoint autism in someone's brain. BDIL has collaborated with faculty and students from Computational Science and Biomedical Informatics programs at SDSU in order to approach the question. The hope is that so-called 'machine learning' (and other) techniques can reveal hidden and complex patterns that may uniquely distinguish brains of people with ASD from typically developing ones. In our recent [study](#) we applied such techniques to functional connectivity data from large samples of people with ASD and typically developing people. Based on a very complex pattern of 100 different connections, we were able to predict with >90% accuracy whether a person had ASD or not. Although the connections involved many different parts of the brain, regions involved in tactile (and possibly pain) perception played a remarkably strong role. We are currently pursuing these approaches including additional data from other types of MRI (anatomical, structural connectivity [diffusion tensor imaging]).

Know someone with ASD, age 40-65 years?

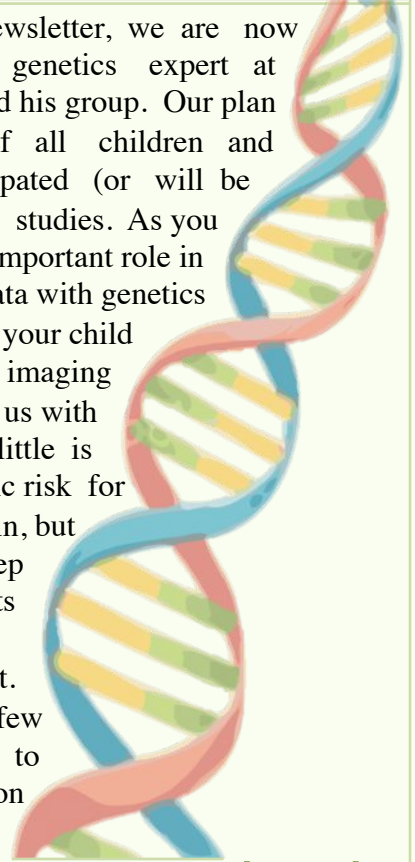
We're looking for people who have a diagnosis of Autism Spectrum Disorder or Asperger's Syndrome to participate in our new study. The study involves cognitive testing and an MRI scan and participants will be paid for participating. Participants must be able to follow verbal instructions and hold still for an MRI scan.

To find out more, call or e-mail us at:
619-594-0176 or bdil@mail.sdsu.edu

Genetics Collaboration: *Your help is needed!*

As announced in our last newsletter, we are now collaborating with an autism genetics expert at UCSD, Dr. Jonathan [Sebat](#), and his group. Our plan is to 'sequence' the DNA of all children and adolescents who have participated (or will be participating) in our imaging studies. As you know, genetic factors play an important role in ASD and combining imaging data with genetics is therefore crucial. If you and your child have participated in one of our imaging studies, please consider helping us with this part of the study! Very little is known today about how genetic risk for ASD affects the developing brain, but such knowledge is the first step towards developing treatments that may prevent brain disturbances during development. We may contact you in the next few weeks asking you to allow us to share your contact information with Dr. Sebat's group.

If you have questions about genotyping in this study, please contact us at 619-594-0176 or bdil@mail.sdsu.edu



Help spread the word!

We are constantly looking for families who will help our efforts by taking part in our ongoing studies. We would like to nominate you as our Ambassadors- if you have friends whose children are between 7 and 17 years old, whether they have a child with autism spectrum disorder or not - tell them about our research so that they can get involved in our studies, and help in advancing science towards a better understanding and better treatments of ASD.

If you and your child (or your friends) are interested in learning more, or getting involved in our research, please call us at **(619) 594-0176** or email bdil@mail.sdsu.edu