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Scientists work to break apart cases of autism

Studies aim to divide cases of autism into specific categories.

By **HOLLY VILLINES**

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Researchers with MU's Thompson Center for Autism and Neurodevelopmental Disorders are taking on a big problem by looking small.

Since the center's creation in April 2005, specialists have been recruited in an effort to understand autism by studying slight variations among patients diagnosed with the disorder.

By dividing research into individual projects, Judith Miles, the director of the center's autism clinic, hopes to amplify the results once they are integrated.

"Our research mission is to sort out the heterogeneity within the autism diagnosis," Miles said.

This collaboration goes beyond the MU campus. Miles is working on a proposal to share resources with Baylor and Harvard universities to study the causes and treatment of the disorder.

Under the proposal, the universities would share information from willing patients from the MU clinic and divide them into subgroups based on the genetic differences they find.

Miles said the approach is akin to the "childhood leukemia model" where scientists discovered the disease was a group of disorders with different causes and requires individualized therapies.

"Geneticists are sometimes called the 'splitters of the world' because we really split diseases into subgroups," she said.

One researcher at the center is Ye Duan. Since June 1, Duan, a specialist in medical imaging, has been working under a six-month grant, a \$7,500 gift from the MU Research Council to start his research. He said he will seek additional funding after the six months.

Duan's project focuses on finding structural differences in the brains of those with essential autism.

At the Thompson Center, autism is classified into two categories: essential and complex. Essential is the more common of the two, making up 70 to 80 percent of those diagnosed with the disorder. People with essential autism are more likely to be male — the sex ratio is seven or eight males to every female — compared to the fairly even sex ratio among those with complex autism. Essential autism also has a higher recurrence risk of 8 to 10 percent.

Complex autism is diagnosed on the basis of evidence of insult to development within the two to three months of pregnancy. This is not found in essential autism.

Duan's subjects also come from the autism clinic, which treats patients and conducts research on the disorder.

Miles said she has never seen a group of families so eager to help.

“We wouldn’t be able to do any of this without the families,” she said.

Using MRIs from the clinic’s database, Duan is specifying the differences in cerebral structure among three groups of 3- to 18-year-olds. Thirty have been diagnosed with essential autism, 30 with essential autism and hypertelorism — that is, widely-set eyes — and 30 with neither. Miles said all subjects are matched for age and gender.

“The better classification we can get, the better outcome we can get, hopefully,” Duan said.

Those with hypertelorism, Duan said, may prove to have a more asymmetrical cerebral structure and abnormal growth than the control groups.

Duan said he is restricting his study to North American caucasians in order to keep the results of his research more consistent because the space between patients eyes may vary based on ethnicity. These findings, he said, can be generalized.

Duan hopes to extend his grant and continue searching for similar subgroups within the complex and essential categories. Duan said using a new MRI called diffusion tensor would help him because it has a significantly greater resolution. With the procedure, he would be able to examine more closely white matter structures such as fiber tract and the thalamus nuclei, which aid communication among areas of the brain.

“It’s real life science, and it has a big significance in society,” Duan said.

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