

Webinar highlights advances in the study of autism

By Audrey Pinto

As investigators continue to search for clues that may help explain the causes of [autism spectrum disorders \(ASD\)](#),

(<http://www.cdc.gov/ncbddd/autism/facts.html>)

a group of complex developmental disorders, two NIEHS-funded scientists - [Judy Van de Water, Ph.D.](#), and [Rebecca Schmidt, Ph.D.](#) - are making significant strides in unraveling the mystery surrounding them.

In an Aug. 14 webinar, both scientists highlighted new findings from their studies conducted at the University of California, Davis (UCD) Center for Children's Environmental Health and MIND (Medical Investigation of Neurodevelopmental Disorders) Institute. Their research is clearly demonstrating that ASD goes beyond genetics.

Van de Water and Schmidt are part of a nationwide network of [children's centers](#) (<http://www.niehs.nih.gov/news/newsletter/2013/9/science-autism/file517835.pdf>) (6MB) supported by funding from NIEHS and the U.S. Environmental Protection Agency (EPA). Their presentations were part of the [EPA/NIEHS Children's Centers 2013 Webinar Series](#). (<http://www.epa.gov/ncer/childrenscenenters/webinar/2013/overview.html>)

Mother's autoantibodies may play a role in autism

Van de Water's research team has pinpointed evidence that specific antibodies target fetal brain proteins in the blood of some women whose children are diagnosed with autism. This finding may lead to a biomarker for early diagnosis and could also suggest targets for drug development. The researchers have named the autism related to these antibodies maternal autoantibody-related (MAR) autism. In July, their findings were published online in the journal [Translational Psychiatry](#).

(<http://www.nature.com/tp/journal/v3/n7/full/tp201350a.html>)

In earlier studies, Van de Water and her colleagues discovered that women with certain autoantibodies in their blood were at much greater risk of having a child with autism, and those children were much more likely to have severe symptoms of the disorder.

As Van de Water explained, "Antibodies interfere with normal protein function - the more antibodies, the more points of developmental interference, and the likelihood of autism increases." She went on to note that what triggers the autoantibodies leading to autism is unknown, but the work of her team indicates that these antibodies are a specific cause for a significant portion of autism cases. The next step is to develop an MAR diagnostic test that would show a near-certain risk of autism. This objective is now within reach.

Linked Video

[Watch an interview with Van de Water about her latest findings \(04:00\).](#)

New findings suggest that maternal iron deficiency may be linked to autism

Schmidt and her colleagues, who were the first to report that women who take the recommended daily dosage of folic acid, or vitamin B-9, during the first month of pregnancy had a reduced risk of having a child with ASD, continue to provide more clues toward building a better understanding of autism.

In ongoing work, her team was first to find evidence of an association between maternal iron deficiency and ASD. Schmidt explained, "Iron is crucial to early neurodevelopment, and early life deficiency impairs cognition, as well as motor, social, and language development."

"In the brain, iron contributes to neurotransmitter production, myelination, and immune function," Schmidt continued. Her recent research suggests that dysregulation of all three of these pathways is associated with ASD, and these findings confirm



Van de Water, left, thinks that an MAR test could become an important tool in family planning. (Photo courtesy of UCD)



Schmidt's research has focused on the association of nutrient and nutritional supplement levels in mothers, with development of autism in their children. (Photo courtesy of Rebecca Schmidt)

what other studies have consistently shown - a higher prevalence of iron deficiency is found in association with ASD.

In future studies, Schmidt and her team plan to look at other nutritional factors that could potentially play a role in the development of autism, to identify mechanisms and pathways, and develop nutrient and dietary strategies that could prevent, and possibly treat, ASDs.

Citation: Braunschweig D, Krakowiak P, Duncanson P, Boyce R, Hansen RL, Ashwood P, Hertz-Picciotto I, Pessah IN, Van de Water J.

(<http://www.ncbi.nlm.nih.gov/pubmed/23838888>)

2013. Autism-specific maternal autoantibodies recognize critical proteins in developing brain. *Transl Psychiatry* 3(7):e277.

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