

NEWS

Genetics: Gene variants can predict autism severity

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19 AUGUST 2011

Machine learning: Computer algorithms can detect patterns of gene variants and predict whether they are associated with autism severity.

Children with autism who carry a certain variant of a protein involved in inhibitory signaling have more severe symptoms than those with another variant of the same gene, according to a study published 24 July in the *Journal of Autism and Developmental Disorders*¹. The results suggest that single DNA base changes, called single nucleotide polymorphisms, or SNPs, can predict autism severity.

Every individual has a unique set of SNPs, but only a subset of these have been associated with diseases. Several studies have linked individual SNPs to a higher-than-average **risk of autism**.

In the new study, researchers used computer algorithms, called machine-learning methods, to compare 29 SNPs in nine autism candidate genes among 65 children characterized with mild to moderate autism and 53 children with a more severe form of the disorder. The researchers classified autism severity based on the participants' score on the **Childhood Autism Rating Scale**

, a checklist used to rate the degree of autism symptoms.

The researchers selected autism candidate genes that are involved in the gamma-aminobutyric acid (GABA) pathway, which inhibits signals in the brain in response to the GABA neurotransmitter. Several studies suggest that autism **stems from an imbalance** between excitatory and inhibitory signals.

Individuals with severe autism are more likely than those with mild to moderate autism to have one form of the rs878960 variant of **GABRB3**, the study found. GABRB3 is a component of GABA receptors that transmit inhibitory signals.

Other variants of GABRB3 are also **known to be more common** in individuals who have autism than they are in controls².

The researchers looked at only a small number of autism candidate genes, but the results suggest that a larger analysis could identify a pattern of SNPs that contributes to autism severity.

References:

Jiao Y. *et al. J. Autism Dev. Disord.* Epub ahead of print (2011) [PubMed](#)

Delahanty R.J. *et al. Mol. Psychiatry* **16**, 86-96 (2011) [PubMed](#)