

New evidence of gene-environment interaction in autism

By Kelly Lenox

Children possessing a specific genetic risk factor appear more likely to develop autism spectrum disorder (ASD) when prenatal exposure to air pollution occurs, according to a study led by NIEHS-funded researchers at the Keck School of Medicine at the University of Southern California (USC). The [study](http://www.ncbi.nlm.nih.gov/pubmed/24240654), (<http://www.ncbi.nlm.nih.gov/pubmed/24240654>) published online in the journal *Epidemiology*, establishes a synergistic interaction between a genetic risk factor, the MET rs1858830 genotype, and an environmental factor, air pollution.

"Our research shows that children with both the risk genotype and exposure to high air pollutant levels were at increased risk of autism spectrum disorder, compared to those without the risk genotype and [with] lower air pollution exposure," explained [Heather Volk, Ph.D.](http://www.chla.org/site/c.ipINKTOAJsG/b.7970555/k.530F/Heather_Volk_PhD_Lab.htm#_UrCf9qVe7lc), (http://www.chla.org/site/c.ipINKTOAJsG/b.7970555/k.530F/Heather_Volk_PhD_Lab.htm#_UrCf9qVe7lc) assistant professor of research in preventive medicine and pediatrics at USC.

The study builds on earlier research demonstrating independent contributions to autism risk from MET and from exposure to air pollutants.

Results may clarify effect of allele on risk of autism

The finding that factors such as air pollution exposure may be involved in ASD is significant, because gene-only analyses have shown inconsistent evidence of a link between common alleles, or alternative forms of a gene, and development of ASD.

Linked Video

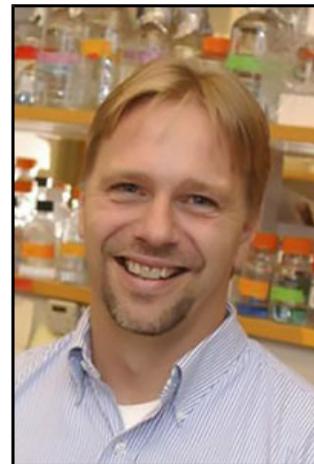
[Watch Volk discuss her research on how environmental factors work together with genetics to increase risk of disorders such as ASD. \(1:32\)](#)

"Although gene-environment interactions are widely believed to contribute to autism risk, this is the first demonstration of a specific interaction between a well-established genetic risk factor and an environmental factor that independently contribute to autism risk," noted study co-author [Daniel Campbell, Ph.D.](http://www.usc.edu/programs/neuroscience/faculty/profile.php?fid=125), (<http://www.usc.edu/programs/neuroscience/faculty/profile.php?fid=125>) assistant professor of psychiatry and the behavioral sciences at USC.

The authors call for independent replication of their findings and note the need for a more detailed understanding of the underlying mechanisms.

Citation: [Volk, HE, Kerin T, Lurmann F, Hertz-Picciotto I, McConnell R, Campbell DB.](http://www.ncbi.nlm.nih.gov/pubmed/24240654) (<http://www.ncbi.nlm.nih.gov/pubmed/24240654>)

2014. Autism Spectrum Disorder: Interaction of Air Pollution with the MET Receptor Tyrosine Kinase Gene. *Epidemiology* 25(1):44-47.



Campbell noted that much work is yet to be done. "It will be important to replicate this finding and to determine the mechanisms by which these genetic and environmental factors interact to increase the risk for autism." (Photo courtesy of Don Milici)



Volk is lead author of the study finding that children with both a genetic risk factor and prenatal exposure to air pollutants experienced increased risk for ASD. (Photo courtesy of Heather Volk)

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