

Presentations and virtual forum mark Autism Awareness Month at NIEHS

By Eddy Ball

NIEHS hosted lectures by four experts on [autism and the environment](#) the morning of April 22, followed by a virtual community forum webcast in the afternoon, which had 270 pre-registrations.

The speakers in the Minisymposium on Autism and the Environment (see [text box](#)) joined NIEHS and NTP Director Linda Birnbaum, Ph.D., for a question-and-answer session. Cindy Lawler, Ph.D., lead representative for [NIEHS-funded autism activities](#), moderated the symposium and webcast, which coincided with [National Autism Awareness Month](#).

(<http://www.autism-society.org/get-involved/national-autism-awareness-month/>)

Linked Video

[Watch as panelist Heather Volk, Ph.D., describes her findings about gene-environment interactions and autism risk \(01:32\)](#)

The presentations at the minisymposium and the afternoon panel discussion outlined the results of research that underscores the important role of environmental factors in autism and related disorders. According to the forum participants, autism is a complex condition triggered by the intricate interplay of multiple genetic and environmental factors. The events associated with autism may take place before conception or during the especially sensitive time of prenatal development, adding to the difficulty of teasing out specific causes.

Birnbaum set the tone of the forum with her opening remarks. "The rate of autism spectrum disorder [ASD] continues to rise in this country [now approaching 2 percent], and we're really working hard to understand why," she said. "We believe that many factors are behind this increase in rates. It can't just be genetics. Something in our environment may also be playing a role."

Translating research into public health awareness

The virtual forum on autism and the environment was the second virtual forum in a series of [community forums](#) hosted by NIEHS. The first, in 2012, explored [obesity and the environment](#).

(<http://www.niehs.nih.gov/news/video/science/11-29-12/index.cfm>)

"This virtual forum complements an ongoing series of community forums that we've been having for years," Lawler at the beginning of the webcast event. "At some of our recent ones, we've talked about safe seafood in Seattle, traffic pollution in Los Angeles, asthma in Boston, and the Gulf oil spill in New Orleans. With this virtual forum [on autism], we're extending the conversation to a national and even international audience on a topic of global significance."

Exploring the interplay of genetics and environment

Participating in the virtual forum panel with Birnbaum were four leading researchers, who are receive NIEHS funding for their work and are pioneers in efforts to discover environmental contributions to the increasing incidence of autism. Their responses to questions from viewers reflected the intriguing, but still preliminary findings from recent research about what may contribute to ASD and, just as importantly, what may be protective against it.

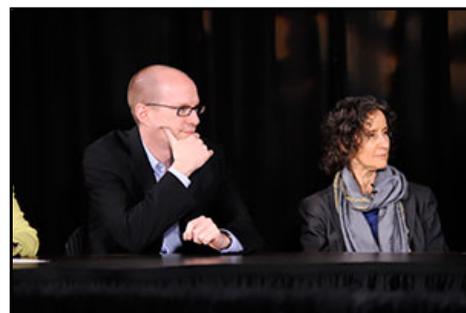
- [Alan Brown, M.D.](#),

(http://asp.cumc.columbia.edu/facdb/profile_list.asp?uni=asb11&DepAffil=Psychiatry)

commented on the role of the immune system and suggested that pregnant mothers exercise special caution about exposure to infection. He also pointed to folic acid supplementation as a possible preventive strategy. Brown has studied a marker of inflammation in mothers, C-reactive protein (CRP), that is significantly associated with autism, especially for mothers with protein levels in the highest 20 percent.



In response to a request from Lawler, right, Volk described the classic autism phenotype of impaired language and social adaptation. (Photo courtesy of Steve McCaw)



Reichenberg, left, and Hertz-Piccotti have looked at parental age as factors in the development of autism in offspring. (Photo courtesy of Steve McCaw)

- [Irva Hertz-Picciotto, Ph.D.](#),
(<http://www.ucdmc.ucdavis.edu/mindinstitute/ourteam/faculty/picciotto.html>)
underscored Birnbaum's remarks by observing, "It's not either [genetics]/or [environment]... In most cases, you can't pin it on one factor." Her research has pointed to birth timing and nutritional deficits as possibly playing a role in autism, and she suggested vitamin supplements before and during pregnancy, as well as a 3-year interval between pregnancies.
- [Avi Reichenberg, Ph.D.](#),
(<http://www.mountsinai.org/profiles/avraham-reichenberg>)
reported on the association of preterm birth and low birth weight with autism. He said large-scale twin studies show a role for heredity, but he also noted that even with identical twins fewer than half of the pairs share an autism diagnosis.
- [Heather Volk, Ph.D.](#),
(http://www.chla.org/site/c.ipINKTOAJsG/b.7970555/k.530F/Heather_Volk_PhD_Lab.htm#.Uov8s6WWvlc)
discussed her findings that a specific genetic variation increases risk for autism, but only when it is combined with high exposure to traffic pollution.

The speakers called for more research to inform more effective preventive measures. According to Birnbaum, the NIEHS funding commitment to autism research has exceeded \$40 million over less than ten years and continues to be a priority.

The virtual forum on autism was organized by the NIEHS Division of Extramural Research and Training, Office of Science Education and Diversity, and Office of Communications and Public Liaison.



The panel, as viewers worldwide saw on the webcast, included, from left, Birnbaum, Reichenberg, Hertz-Picciotti, Brown, Volk, and Lawler. (Photo courtesy of Steve McCaw)

Minisymposium on Autism and the Environment

Also hosted by Lawler, the NIEHS Division of Extramural Research and Training-sponsored minisymposium featured four 20-minute presentations followed by a question-and-answer session:

- Hertz-Picciotto of the University of California, Davis MIND Institute, discussed "Environmental Chemicals, the Intrauterine Environment, and Child Neurodevelopment." She offered insights into early views of a condition caused by mothers who failed to adequately nurture their children, a now-discredited theory most prominent in the work of Bruno Bettelheim, M.D. She reflected on her 13 years researching autism, beginning at a time when little attention was paid to the environment. She said, "Our focus [now] is on modifiable factors."
- Reichenberg, of the Ichan School of Medicine at Mount Sinai and Seaver Center for Autism Research and Treatment, in a talk on "Familial Risk for Autism" described his meta-analysis of studies of twins. He found that genetic factors can't fully explain risk for ASD, and that environmental factors may be responsible for a large percentage of risk. His work has also uncovered a high rate of other conditions that coexist with ASD and an association with parental age.
- In his talk on "The Prenatal Envirome and Autism: New Insights from a National Birth Cohort Study," Brown, a professor at Columbia University, described new potential biomarkers for autism risk, such as elevated C-Reactive Protein, IL-6, and IGF-1, as well as evidence of higher levels of persistent organic pollutants in mothers of ASD children. He has also found an association between the trajectory of childhood head growth and autism.
- Looking forward to her new grant from NIEHS, Volk, of the Keck School of Medicine at the University of Southern California and the Saban Research Institute at Children's Hospital Los Angeles, discussed her work in "Moving From Environmental Effects to Gene and Environment Interaction in ASD." In her study of exposure to air pollution in Los Angeles, Volk geocoded addresses at the time of birth to estimate levels of exposure to traffic pollutants based on local traffic-related sources and regional air quality measures. She found that increased prenatal exposure was associated with language and social adaptation deficits when combined with a common variant in the receptor tyrosine kinase gene, pointing to underlying gene and environment interaction.

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