

Research linking autism symptoms to gut microbes called 'groundbreaking'

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A new study showing that feeding mice a beneficial type of bacteria can ameliorate autism-like symptoms is "groundbreaking," according to University of Colorado Boulder Professor Rob Knight, who co-authored a commentary piece about the research appearing in the current issue of the journal *Cell*.

The autism study, published today in the same issue of *Cell*, strengthens the recent scientific understanding that the [microbes](#) that live in your gut may affect what goes on in your brain. It is also the first to show that a specific probiotic may be capable of reversing autism-like behaviors in mice.

"The broader potential of this research is obviously an analogous probiotic that could treat subsets of individuals with [autism spectrum disorder](#)," wrote the commentary authors, who also included CU-Boulder Research Associate Dorota Porazinska and doctoral student Sophie Weiss.

The study underscores the importance of the work being undertaken by the newly formed Autism Microbiome Consortium, which includes Knight as well as commentary co-authors Jack Gilbert of the University of Chicago and Rosa Krajmalnik-Brown of Arizona State University. The interdisciplinary consortium—which taps experts in a range of disciplines from psychology to epidemiology—is investigating the autism-gut microbiome link.

For the new Cell study, led by Elaine Hsiao of the California Institute of Technology, the researchers used a technique called maternal immune activation in pregnant mice to induce autism-like behavior and neurology in their offspring. The researchers found that the gut microbial community of the offspring differed markedly compared with a control group of mice. When the mice with autism-like symptoms were fed *Bacteriodes fragilis*, a microbe known to bolster the immune system, the aberrant behaviors were reduced.

Scientific evidence is mounting that the trillions of microbes that call the human body home can influence our gut-linked health, affecting our risk of obesity, diabetes and colon cancer, for example. But more recently, researchers are discovering that gut microbes also may affect neurology—possibly impacting a person's cognition, emotions and mental health, said Knight, also a Howard Hughes Medical Institute Early Career Scientist and an investigator at CU-Boulder's BioFrontiers Institute.

The Autism Microbiome Consortium hopes to broaden this understanding by further studying the microbial community of autistic people, who tend to suffer from more gastrointestinal problems than the general public.

People with autism spectrum disorder who would like to have their [gut microbes](#) sequenced can do so now through the American Gut Project, a crowdfunded research effort led by Knight.

The consortium also includes Catherine Lozupone and Kimberly Johnson of CU-Boulder, James Adams of Arizona State University, Mady Hornig of Columbia University, Sarkis Mazmanian of the California Institute of Technology, John Alverdy of the University of Chicago and Janet Jansson of Lawrence Berkeley Lab.

Provided by University of Colorado at Boulder

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