Can Gut Bacteria Affect Mental Health?

Findings show that a complex community of microorganisms that live in our digestive tract may be linked to depression.

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The relationship between gut microbial metabolism and mental health has been much debated. But now, a new study published in the scientific journal Nature Microbiology hints at a connection between specific gut bacteria, depression and poor quality of life, reports the VIB-KU Leuven Center for Microbiology, a life sciences research institute based in Flanders, Belgium.

For the inquiry, a team from the organization headed by Jeroen Raes, PhD, combined fecal microbiome data with general practitioner diagnoses of depression from 1,054 individuals enrolled in the Flemish Gut Flora Project, one of the world's largest studies on human gut flora.

After a review of the information, scientists identified two bacteria, Coprococcus and Dialister, that were consistently depleted in people with depression—including those undergoing antidepressant treatment.

Two other investigations validated these findings. One was a study of 1,063 participants in the Dutch LifeLinesDeep cohort; the other focused on a group of clinically depressed patients at the University Hospitals Leuven in Belgium.

A previous study Raes's team conducted found a community of microbes with specific qualities among people with Crohn's disease. But the recent discovery associated a similar class of microorganisms with depression and a lower quality of life.

Researchers also created a computational technique that identifies gut bacteria that could potentially interact with the human nervous system. Their results included the genomes of more than 500 bacteria that were isolated from the human gastrointestinal tract based on their ability to produce a set of neuroactive compounds, substances that act on the nervous system.

"Many neuroactive compounds are produced in the human gut," said Mireia Valles-Colomer, a doctoral student at the VIB-KU Leuven Center for Microbiology and first author of the study. "We wanted to see which gut microbes could participate in producing, degrading, or modifying these molecules. Our tool box not only allows [us] to identify the different bacteria that could play a role in mental health conditions, but also the mechanisms potentially involved in this interaction with the host."

Next spring, researchers plan to study another round of samples from the Flemish Gut Flora Project.

Click here to learn how gut bacteria may hold the key to preventing Alzheimer's disease.
