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Gut Bacteria May Manipulate Your Mind

Scientists have evidence to support theory that gut bacteria can influence brain chemistry.

Researchers at McMaster University in Hamilton, Ontario suggest that gut bacteria may influence behavior and cognitive processes such as memory by exerting an effect on gene expression in our brain.

The human gut contains as many as 1,000 different species of microbes that colonize the large intestine in the days following birth and vastly outnumber our own cells. These so-called gut flora helps to neutralize some of the toxic by-products of digestion, reduce harmful substances (such as carcinogens) and influence many bodily functions. Among other things, it also helps to stimulate the digestive process and aid the absorption and metabolism of nutrients, modulate the inflammatory response to infection, and protect the gut from other, hazardous micro-organisms.

According to the authors of study, certain species of gut bacteria can interact with our nervous system in ways that appear to affect our stress responses. Some of this research was published in 2011.

The research team compared behavior and gene expression in two groups of mice — those with normal microorganisms, and those with the absence of microorganisms.

Mice with an absolute deficiency of normal gut flora, including Bifidobacteria, Lactobacillus and E. Coli, were found to engage in "high-risk behavior," and this altered behavior was associated by neurochemical changes in the mouse brain. Brain-derived neurotrophic factor (BDNF) was significantly up-regulated, and that abnormality has been linked to depression and anxiety.

This research has also shown that stress can change the composition of the microbiota; these changes are associated with increased vulnerability to inflammatory stimuli in the the gastrointestinal tract.

All of this suggests that bacterial remedies, such as probiotic supplements, may be useful in treating several types of psychological distress, such as anxiety, depression, sleeping problems, loss of confidence, lack of concentration, chronic pain and more.

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