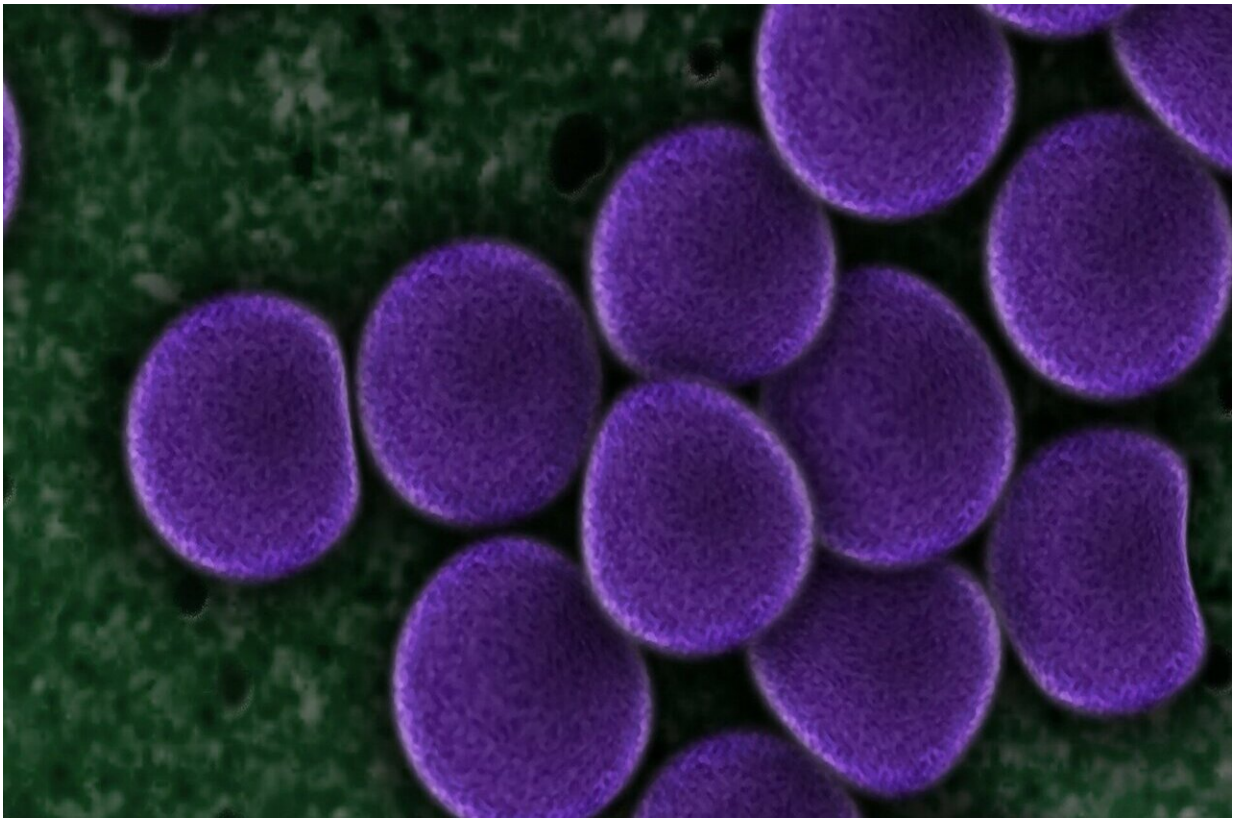
Using the gut-brain connection to impact brain health and disease

October 22 2019



Credit: CC0 Public Domain

Research on gut-brain communication via the immune system may help in the development of novel treatments for neurodegenerative diseases. The findings were presented at Neuroscience 2019, the annual meeting

of the Society for Neuroscience and the world's largest source of emerging news about brain science and health.

There is now an increased understanding of the connection between the almost 100 trillion microbes in the intestine (i.e., the "gut" microbiome) and the brain. Recent studies suggest that intestinal bacterial imbalance is connected to disorders like allergies, obesity, cancer, and neurodegenerative diseases like Alzheimer's disease (AD) and traumatic brain injury (TBI). As this relationship becomes better understood, so too does the potential to use this connection to ameliorate the pathology of neurological diseases.

Today's new findings show that:

- Changes to the gut microbiome induced by antibiotic treatment reduce amyloid beta plaque in the brain and alters the brain's microglia, suggesting a relationship between changes in the microbiome and AD pathology. (Hemraj Dodiya, University of Chicago Medicine)
- Intestinal imbalances in mice with AD improve with a health-promoting probiotic that affects bacterial byproducts and brain activity. (Harpreet Kaur, University of North Dakota)
- A novel therapy for TBI uses a probiotic treatment to prevent gut bacteria loss as well as memory deficits in mice. (Wellington Amaral, University of California, Los Angeles)
- Diet-induced obesity in mice alters immune signaling that controls the permeability of the blood-brain barrier and may be a key mediator in AD neuroinflammation and neurodegeneration. (Malu Tansey, University of Florida Health)

"These are important contributions to our understanding of the complex relationship between the gut and the brain," said press conference moderator Jane A. Foster, Ph.D., an associate professor at McMaster

University who studies the role of immune-brain and gut-brain interactions on neurodevelopment. "The evidence suggests that manipulating gut health can also impact brain health in relevant ways, and that microbiome balance corresponds to improved immune functioning. Continued research in this area has the potential to give us more treatment options for neurodegenerative diseases in the future."

Provided by Society for Neuroscience