Linking the microbiome to memory

Jian-Hua Mao
Young-Mo Kim
Yan-Xia Zhou
Dehong Hu
Chenhan Zhong
Hang Chang
Colin Brislawn
Sasha Langley
Yunshan Wang
B.Y. Loulou Peisl
Susan E Celniker
David Threadgill
Paul Wilmes
Galya Orr
Thomas O Metz
Janet K Jansson
Antoine Snijders

Video Byte

Keywords: Collaborative Cross mouse model, memory, gut-brain axis, Lactobacillus, Germ-free, metabolites, lactate, GABA, mouse, Microbiome, memory

Posted Date: June 23rd, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-37694/v1>

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
[Read Full License](#)

Abstract

The phrase “you are what you eat” is becoming increasingly true. Tiny residents of our GI tracts – gut microbes – affect more than just our digestion. Gut microbiota have recently been linked to host health and behavior through a connection called the “gut-brain axis,” but exactly how our gut microbes affect our brain function remains unclear. A recent study examined the links between host genetics, the gut microbiome, and memory. Using specialized mice, researchers performed genome-wide association analysis to identify variations in DNA that were linked to short-term memory. They then performed association analyses between memory and the gut microbial community in the same mice. The results showed that specific microorganisms, in particular *Lactobacillus*, were correlated with better memory retention, and inoculating germ-free mice with *Lactobacillus* species improved their memory compared to controls. Treatment with a *Lactobacillus* metabolite, lactate, also boosted memory on its own. Although more research is needed to translate these findings to humans, the results provide evidence for a link between *Lactobacillus* species and memory, opening new avenues for treating memory impairment disorders.