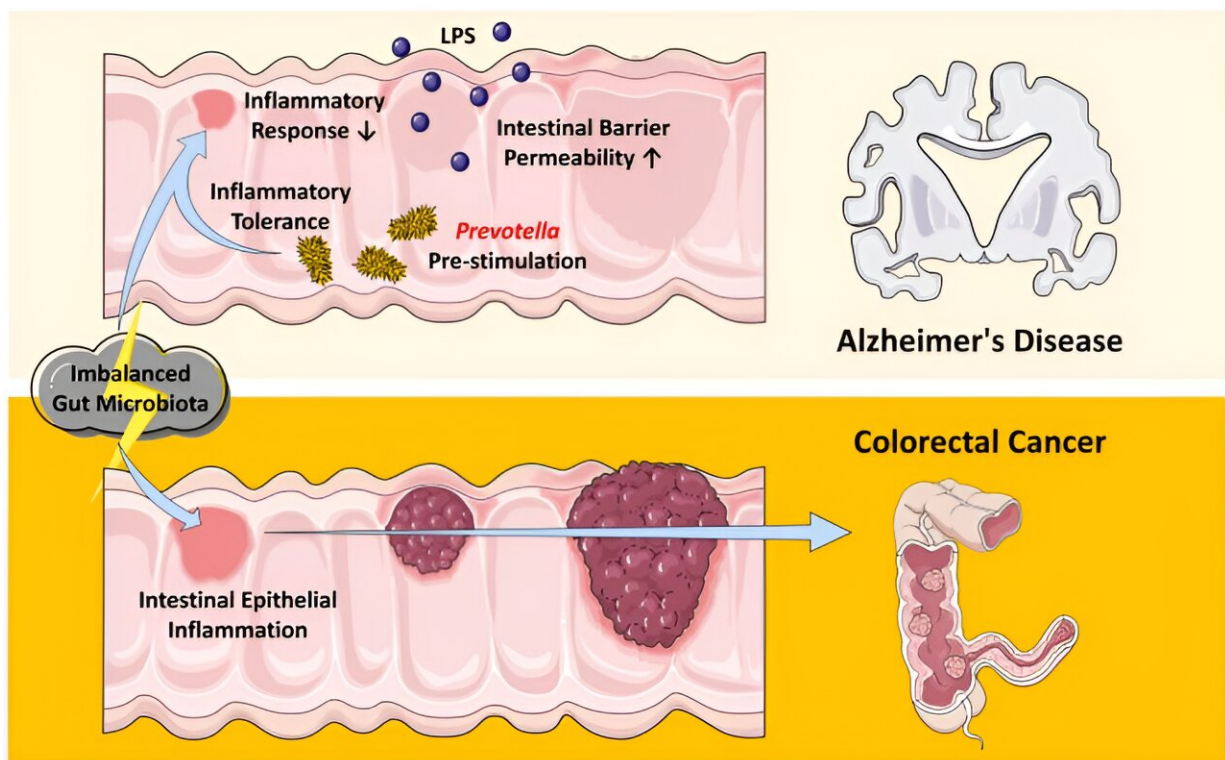


Evidence of inverse relationship between incidence of Alzheimer's disease and colorectal cancer

September 17 2024, by Bob Yirka



Hypothesis illustrates how the aging-related imbalance of gut microbiota contributes to the inverse relationship between the incidence of AD and CRC. Credit: *Proceedings of the National Academy of Sciences* (2024). DOI: 10.1073/pnas.2314337121. <https://doi.org/10.1073/pnas.2314337121>

A team of epidemiologists at the First Hospital of Hebei Medical University, in China, has shown experimental evidence of an inverse relationship between incidences of Alzheimer's disease and colorectal cancer.

In their [study](#), published in the *Proceedings of the National Academy of Sciences*, the group found that mice with Alzheimer's-like symptoms were less likely than control colorectal mouse models to develop [colorectal cancer](#).

For several years, doctors have been noticing that people who develop Alzheimer's are less likely to develop certain types of cancers, mostly particularly, colon cancer. They have also noticed the reverse; colorectal patients seem to be less likely to develop Alzheimer's disease.

For this new study, the researchers ran experiments with mice to find out whether the anecdotal evidence was merely chance or if an association exists.

The researchers administered drugs to lab mice to induce colorectal cancer. Some of the mice had Alzheimer's symptoms beforehand and some did not. The team found that the mice with Alzheimer's were less likely to develop colorectal cancer.

Next, the researchers gave mice with Alzheimer's symptoms stool [transplants](#) from healthy mice and then tried to give them colorectal cancer. They found that those who had received the stool transplant were just as likely as healthy mice to develop tumors.

The researchers also tested the [gut bacteria](#) of all the mice in the study and found that those with Alzheimer's symptoms also had higher levels of *Prevotella*, a genus of Gram-negative bacteria. They found the same to be the case with humans diagnosed with [mild cognitive impairment](#).

And they found that people with colorectal cancer had lower levels of Prevotella than people who did not have [cognitive impairment](#).

The researchers then fed healthy mice lipopolysaccharides taken from Prevotella and found that it led to cognitive decline. Giving the same mice standard cancer treatment afterward resulted in the development of fewer tumors. This, the team contends, suggests that mice with less natural Prevotella are less prone to cognitive decline and more prone to [colon cancer](#).

The researchers believe their work shows evidence of an inverse relationship between the incidence of [cognitive decline](#) and colorectal cancer.

More information: Xu, Shunjiang, Inhibition of colorectal cancer in Alzheimer's disease is mediated by gut microbiota via induction of inflammatory tolerance, *Proceedings of the National Academy of Sciences* (2024). [DOI: 10.1073/pnas.2314337121](https://doi.org/10.1073/pnas.2314337121).
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