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# Lack of gut bacteria may lead to type 2 diabetes

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**Losing Akk led to less butyrate production, Bodogai's team found. In turn, loss of butyrate triggered a chainreaction of immune cell dysfunction that ended with mice's cells ignoring the insulin.**


Researchers reported that old mice have less *Akkermansia muciniphila* bacteria than young mice do. That loss triggers inflammation, which eventually leads cells to ignore signals from the hormone insulin. Such disregard for insulin's message to take in glucose is known as insulin resistance and is a hallmark of type 2 diabetes.

Researchers have suspected that bacteria and other microbes in the gut are involved in aging, but how the microbes influence the process hasn't been clear. Monica Bodogai of the U.S. National Institute on Aging in Baltimore and colleagues examined what happens to mice's gut bacteria as the rodents age.

The mice lose *A. muciniphila*, also called Akk, and other friendly microbes that help break down dietary fiber into short-chain fatty acids, such as butyrate and acetate. Those fatty acids signal bacteria and human cells to perform certain functions.

Losing Akk led to less butyrate production, Bodogai's team found. In turn, loss of butyrate triggered a chain reaction of immune cell dysfunction that ended with mice's cells ignoring the insulin.

Treating old mice and elderly rhesus macaques with an antibiotic called enrofloxacin increased the abundance of Akk in the animals' guts and made cells respond to insulin again. Giving old animals butyrate had the same effect, suggesting that there may be multiple ways to head off insulin resistance in older people in the future.