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Team examines impact of diet intervention on autoimmunity in mice

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Could a change in diet be beneficial to people with autoimmune diseases such as lupus? A Yale-led team of researchers have revealed how a dietary intervention can help prevent the development of this autoimmune disease in susceptible mice. The study was published in *Cell Host & Microbe*.

For the study, led by Yale immunobiologist Martin Kriegel, the research team used mouse models of lupus. They first identified a single bacterium, Lactobacillus reuteri, in the gut of the mice that triggered an immune response leading to the disease. Specifically, in lupus-prone mice, L. reuteri stimulated immune cells known as dendritic cells, as well as immune system pathways that exacerbated disease development.

To investigate the potential impact of diet on this process, first author Daniel Zegarra-Ruiz fed the mice "resistant starch"—a diet that mimics a high-fiber diet in humans. The resistant starch is not absorbed in the small intestine but ferments in the large intestine, enriching good bacteria and causing the secretion of short-chain fatty acids. This, in turn, suppresses both the growth and movement of L. reuteri bacteria outside the gut that would otherwise lead to autoimmune disease.

While more research is needed to discern how the findings translate to humans, the study details an important link between diet, gut bacteria, and autoimmunity. "We dissected, molecularly, how diets can work on the gut microbiome," said Kriegel. "We identified a pathway that is driving autoimmune disease and mitigated by the diet."

The study also found an imbalance of gut microbes in a subset of lupus patients that was similar to what they observed in lupus-prone mice not given the starch diet. In this subset of lupus patients, the high-fiber diet could potentially be beneficial to prevent or ameliorate the condition, in addition to other diseases that activate the same immune pathway, Kriegel noted. "It may have implications beyond lupus."

Provided by Yale University

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