

## Sometimes, viruses make us healthy

When we talk about viruses, usually we focus on the suffering caused by Ebola, [influenza](#) and the like. But our bodies are home to trillions of viruses, and new research hints that some of them may actually be keeping us healthy.

“Viruses have gotten a bad rap,” said Ken Cadwell, an immunologist at New York University School of Medicine. “They don’t always cause disease.”

Dr. Cadwell stumbled by accident onto the first clues about the healing power of viruses. At the time, he was studying the microbiome, the community of 100 trillion microbes living in our bodies. Scientists have long known that the microbiome is important to our health.

One of its crucial functions is ensuring that our intestines develop normally. In a healthy gut, the inner wall is lined with a dense mat of fingerlike projections called villi. When scientists raise germ-free mice in sterile cages, their intestinal villi turn out to be sparse and thin.

Germ-free mice also fail to develop a normal supply of the immune cells nestled in the lining of the gut, which attack pathogens but not harmless microbes. As a result, the germ-free mouse’s gut becomes vulnerable to injuries and infections.

In order for the gut to develop normally, an intimate chemical conversation must take place between the microbiome and host cells. Genetic mutations can disrupt this tête-à-tête, causing immune cells in the gut to attack beneficial bacteria as if they were enemies. A number of experiments suggest that ailments like [inflammatory bowel disease](#) may be the result of discord between microbes and their hosts.

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