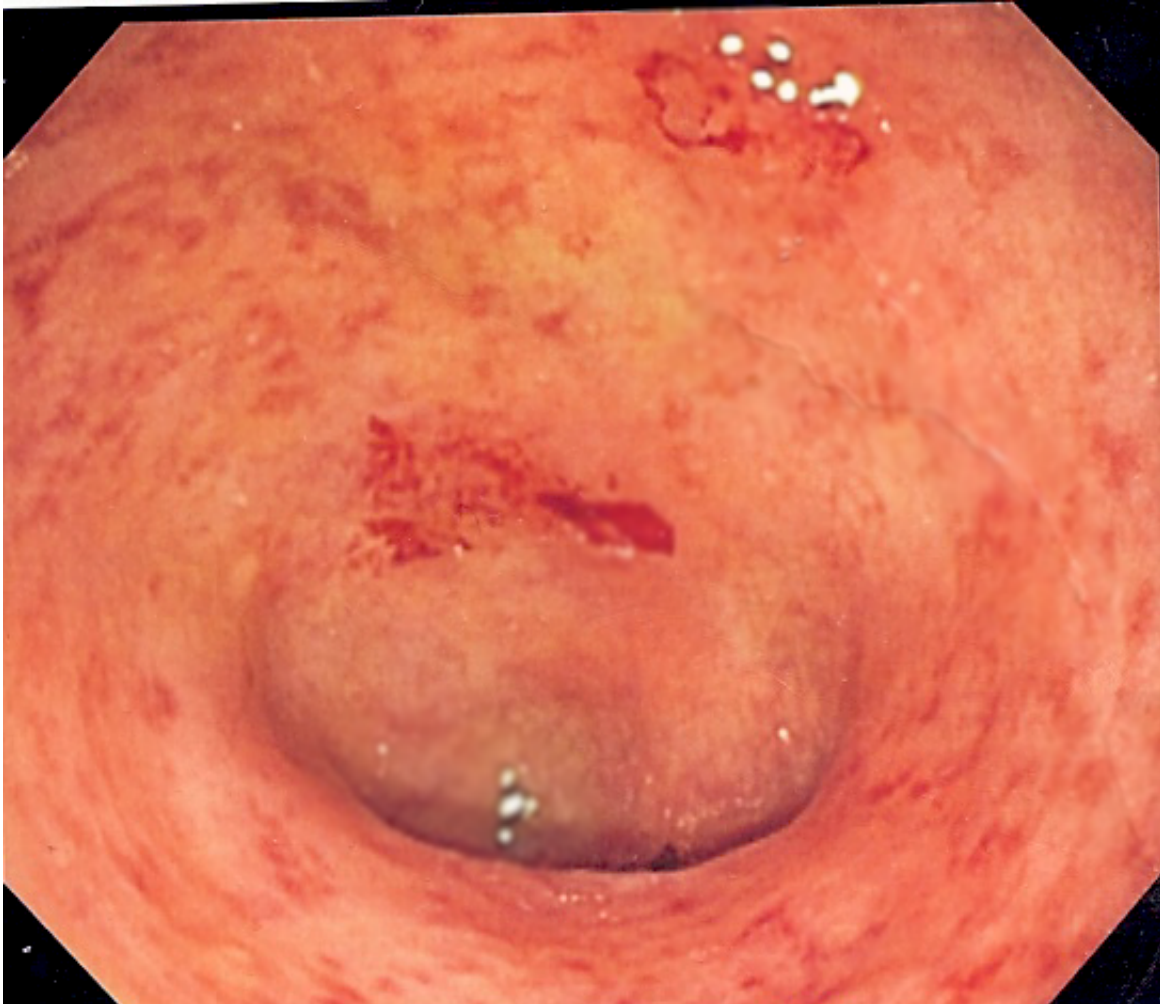


Researchers identify enzyme linked to colitis

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Endoscopic image of a bowel section known as the sigmoid colon afflicted with ulcerative colitis. The internal surface of the colon is blotchy and broken in places. Credit: Samir/Wikipedia

An enzyme that usually stops bacterial growth in the large intestine stimulates inflammation in some people, resulting in ulcerative colitis—a chronic digestive disease that affects more than 750,000 Americans, according to scientists at Rutgers University-Newark.

In a new study published in *Immunity*, lead author Nan Gao, Associate Professor of Cell Biology in the Department of Biological Sciences, School of Arts and Sciences-Newark, reports that in people with [ulcerative colitis](#), the gut enzyme lysozyme which normally functions to restrain [bacterial growth](#), instead stimulates inflammation.

This results in the formation of ulcers and sores in the large intestine and rectum, hallmarks of the inflammatory bowel disease. Detecting these [cells](#) in the inner lining of the colon and rectum is a standard diagnostic feature of chronic intestinal inflammation.

"This study demonstrated the existence of a delicate balance between inflammatory and anti-inflammatory factors in our intestines," said Gao, who conducted it with postdoctoral researcher Richard Yu and doctoral student Iyshwarya Balasubramanian. "Insights about how to gain such beneficial immune balance may be useful for future intervention of inflammatory bowel disease."

In biochemical and genetic mouse laboratory studies, Gao and his team focused on Paneth cells, the main producers of lysozyme, which are typically found in the small intestine and rarely observed in the [large intestine](#) or healthy colon. In cases of patients with inflammatory bowel disease, which affects 1.6 million people in the US, Paneth cells are often seen in the colon and rectum.

"The frequent appearance of Paneth cells in the inflamed tissues of patients colons is highly unusual and poorly understood," Gao said.

In the Rutgers-Newark study, scientists discovered that lysozyme secreted by Paneth cells located in colon results in suppressing the growth of certain bacterial species and results in an imbalance in the [gut microbiome](#) which leads to intestinal inflammation.

In healthy individuals that have normal production of gut lysozyme, these bacteria flourish enabling an individual immune response that prevents colitis.

"This delicate balance is achieved and maintained by a constant interaction between our body and the commensal microorganisms that play a significant role in digestion, metabolism, and the immune system," Gao said.

Provided by Rutgers University

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