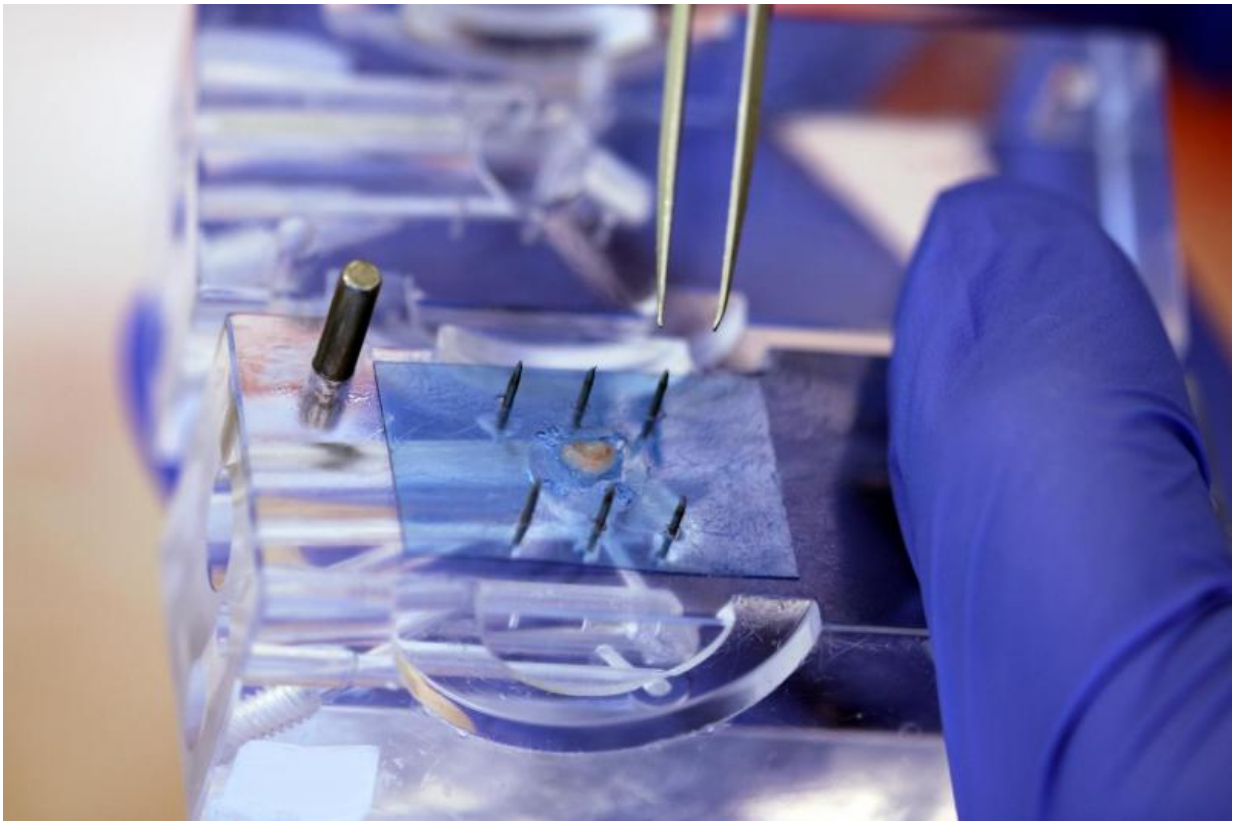


The colons of patients with IBS react differently to bacteria

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The researchers have investigated human colon biopsies in Ussing chambers.
Credit: Karin Söderlund Leifler/LiU

The intestinal barrier of patients with the gastrointestinal disease IBS allows bacteria to pass more freely than in healthy people, according to a

study led by researchers at Linköping University in Sweden. The study, published in the scientific journal *Gastroenterology*, is the first to investigate IBS using living bacteria.

IBS, or [irritable bowel syndrome](#), disturbs bowel function. The condition leads to repeated episodes of abdominal pain, and usually gives rise to constipation or diarrhoea. Around 10% of people in Sweden suffer from IBS, and it is twice as common among women as among men.

"People affected by IBS have been regarded as a rather diffuse group. Our study has shown that people with IBS are clearly different from [healthy people](#) in the way in which the part of the intestine known as the colon (or large intestine) reacts to [bacteria](#)," says Åsa Keita, researcher at the Department of Clinical and Experimental Medicine (IKE). She has led the study together with Susanna Walter, specialist in gastrointestinal diseases at Linköping University Hospital and also a researcher at IKE.

It is still unclear why the condition arises, but there is increasing evidence that changes in the way in which the brain interacts with the bacterial flora in the gut play a role. The large intestine has a layer of mucous, which constitutes the first line of defence against the bacteria in the intestine. Behind this, there is a layer of [epithelial cells](#) known as enterocytes, and behind these is tissue that contains immune [cells](#). The present study has looked at this layer of epithelial cells, and examined how permeable it is to bacteria.



Salmonella bacterium interacting with microvilli in human colon. Credit: Maria Vicario, Universitat Autònoma de Barcelona

The researchers investigated small samples of tissue taken from the [large](#)

[intestine](#) of 37 women with IBS, and compared them with samples from women with no intestinal symptoms. They studied the membranes in an instrument known as a Ussing chamber, in which it is possible to measure the transport of substances and bacteria through living tissue.

Infection with the pathogenic bacterium *Salmonella typhimurium* is a risk factor for developing IBS, and this led the researchers to investigate how this *Salmonella* strain interacts with the intestinal membrane. They also studied a strain of *E. coli* (*Escherichia coli* HS), which is usually present in the [intestine](#). Both bacteria passed through the intestinal mucosa of patients with IBS around twice as rapidly as was the case for healthy subjects.

"Patients with IBS in our study had a higher passage of bacteria in the model system. But we cannot transfer this result directly to clinical practice, and further research is needed. What we can say, however, is that there is something that makes one layer of the [intestinal mucosa](#) of patients with IBS more sensitive to bacteria than in healthy subjects," says Åsa Keita.

The researchers also looked at mast cells, a type of immune cell that is an important component of the innate immune defence, which protects against micro-organisms. They found that mast cells appear to play a significant role in regulating the passage of bacteria across the intestinal membrane, in both healthy subjects and in people with IBS. The mechanism seems, however, to be more active in those with IBS.

More information: Olga Bednarska et al. VIP and Mast Cells Regulate Increased Passage of Colonic Bacteria in Patients With Irritable Bowel Syndrome, *Gastroenterology* (2017). [DOI: 10.1053/j.gastro.2017.06.051](https://doi.org/10.1053/j.gastro.2017.06.051)

Provided by Linköping University

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