

Proof that a gut-wrenching complaint -- irritable bowel syndrome -- is not in your head

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Irritable bowel syndrome makes life miserable for those affected -- an estimated ten percent or more of the population. And what irritates many of them even more is that they often are labeled as hypochondriacs, since physical causes for irritable bowel syndrome have never been identified. Now, biologists at the Technische Universitaet Muenchen (TUM) have shed new light on the matter: They have discovered mini-inflammations in the mucosa of the gut, which upset the sensitive balance of the bowel and are accompanied by sensitization of the enteric nervous system.

Flatulence, constipation and diarrhea, nausea and stomach cramps: [Irritable bowel syndrome](#) (IBS) can turn digestion into a nightmare. Frequent visits to the bathroom are often accompanied by [sleep disturbances](#), headaches, and backaches. In Germany alone, some seven million people are affected by the disorder -- and by the fact that their irritable bowel syndrome is often deemed psychosomatic. This is because the organic trigger of the disease has never been discovered, and consequently the various therapeutic interventions are disappointing for both the patients and their doctors. That may soon change, however, because now, for the first time, biologists in Munich have nailed down hidden physical causes of this bowel disorder.

Professor Michael Schemann's research team at the TUM Department for Human Biology has managed to demonstrate that micro-

inflammations of the [mucosa](#) cause sensitization of the enteric nervous system, thereby causing irritable bowel syndrome. Using ultrafast optical measuring methods, the researchers were able to demonstrate that mediators from [mast cells](#) and enterochromaffin cells directly activate the [nerve cells](#) in the bowel. This hypersensitivity of the enteric nervous system upsets communication between the gut's mucosa and its nervous system, as project leader Prof. Schemann explains: "The irritated mucosa releases increased amounts of neuroactive substances such as serotonin, histamine and protease. This cocktail produced by the body could be the real cause of the unpleasant IBS complaints."

The TUM researchers in human biology are blazing a trail as they follow this lead. Their current focus is to what extent nerve sensitization correlates with the severity of symptoms. Working with colleagues from Amsterdam, they have already substantiated the clinical relevance of their results: Irritable bowel symptoms improved after treatment with an antihistamine known for its immune-stabilizing effect in the treatment of allergic reactions such as hay fever. Thanks to funding from the German Research Foundation (DFG), the scientists are now investigating whether the improved symptoms are accompanied by a normalization of nerve activity.

Successful identification of the active components could enable the development of effective drugs to treat irritable bowel syndrome. Even now, though, the TUM team have made life easier for many IBS patients, in that they have shown that the chronic disorder does have physical causes and is not merely "in their heads."

More information: Buehner S, Li Q, Vignali S, Barbara G, De Giorgio R, Stanghellini V, Cremon C, Zeller F, Langer R, Daniel H, Michel K, Schemann M.: Activation of human enteric neurons by supernatants of colonic biopsy specimens from patients with irritable bowel syndrome. *Gastroenterology*. 2009 Oct;137(4):1425-34.

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