

Helicobacter pylori infection permanently changes gastric environment

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Bacterium displaces all other bacteria in the gastrointestinal tract, leaving only Helicobacter bacteria in the stomach. Credit: Medical University of Vienna

The make-up of the human gut flora is highly individual and extremely diverse. However, when a Helicobacter pylori infection is present, this bacterium displaces all other bacteria in the gastrointestinal tract, leaving only Helicobacter bacteria in the stomach. This was demonstrated in a recently published study conducted by a research team led by infectionologist Christoph Steininger from MedUni Vienna's Division of Infectious Diseases and Tropical Medicine. If the gut flora are disrupted, it is advisable to consider the possibility of a Helicobacter infection when making a diagnosis.

The modern methods used in medical research are increasingly demonstrating the importance of the human [microbiome](#) for a person's general health. The microbiome refers to all the [bacteria](#) that live in an organ system or ecosystem. It is constantly adapting to changes in the ecosystem, such as changes in lifestyle or eating habits, for example.

A few months ago, working in collaboration with the Austrian Society of Gastroenterology and Hepatology, a team of researchers led by infectionologist Christoph Steininger from the Division of Infectious Diseases and Tropical Medicine at MedUni Vienna's Department of Medicine I conducted a large-scale study into antibiotic resistance of Helicobacter pylori in Austria.

Helicobacter pylori is a common bacterium that can cause gastritis and stomach cancer. Symptoms can vary a great deal, ranging from loss of appetite and nausea through to upper abdominal pain. It was found that Helicobacter pylori [infection](#) is often resistant to standard antibiotics and therefore requires alternative forms of treatment. These recent findings

are currently being used to draw up new guidelines for treating *Helicobacter* infections.

The research team is now conducting a follow-up study to investigate how the gastric environment, and hence the flora, change in the presence of a *Helicobacter pylori* infection. The oral cavity is a breeding ground for many bacteria, which are then swallowed down into the stomach. Under normal circumstances, the acidic gastric environment acts as a gatekeeper for the gut and kills a lot of unwanted bacteria. Despite this acidic environment, the gastric microbiome is surprisingly diverse and this helps to ensure diversity of the microbiome in the colon. However, this diversity is significantly impaired when a *Helicobacter* infection is present. Depending upon the extent of the infection, the *Helicobacter* bacteria can force all other bacteria out so that only *Helicobacter* bacteria are to be found in the stomach. So far, it is not clear exactly how infection with *Helicobacter pylori* comes about. Although we know that it is transferred from one person to another, we do not yet know the precise mechanism.

This finding suggests that it would be sensible to consider the possibility of a *Helicobacter* infection in the stomach when treating pathological changes in the gut microbiome.

More information: Ingeborg Klymiuk et al. The Human Gastric Microbiome Is Predicated upon Infection with *Helicobacter pylori*, *Frontiers in Microbiology* (2017). DOI: [10.3389/fmicb.2017.02508](https://doi.org/10.3389/fmicb.2017.02508)

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