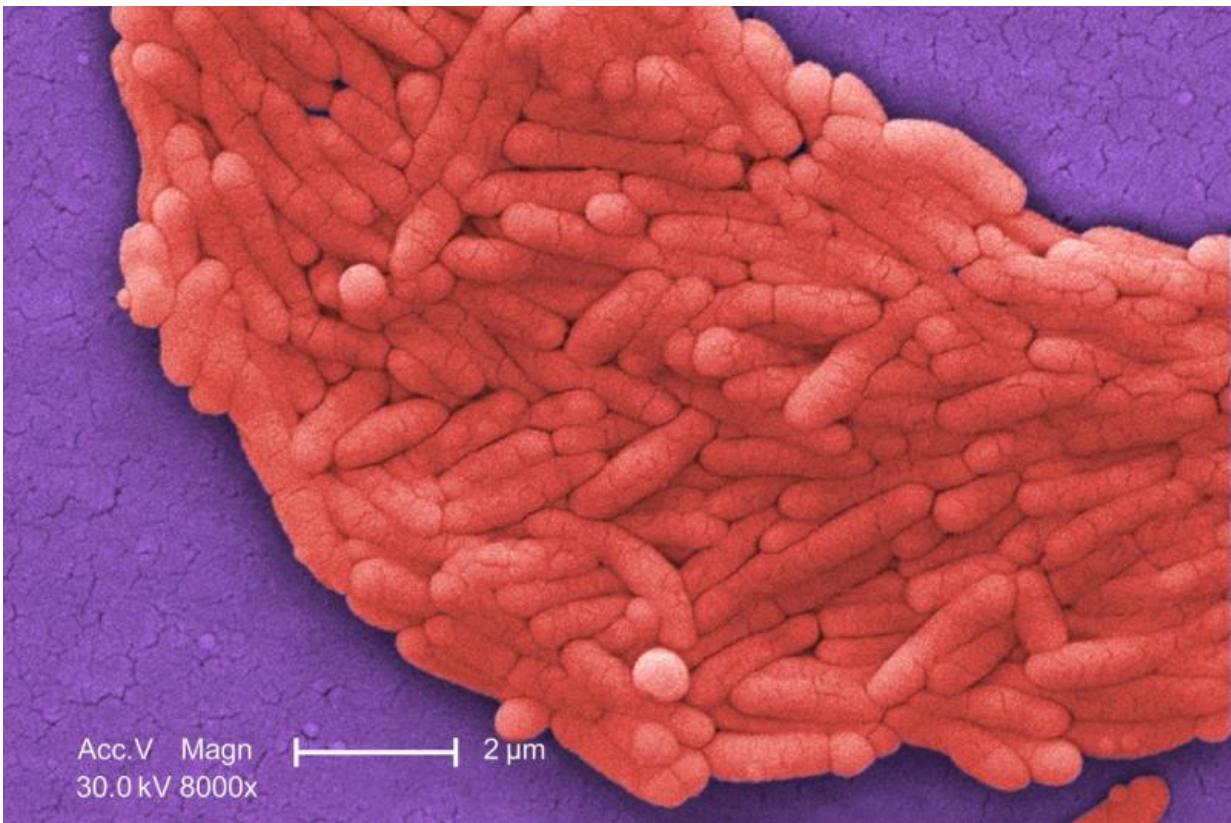


Antibiotics increase availability of nutrients in the gut, enabling growth of pathogens

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Salmonella forms a biofilm. Credit: CDC

Research led by Andreas Bäumlér, professor of medical immunology and microbiology at UC Davis Health System, has identified a new mechanism explaining how antibiotics change the gut microbiota,

increasing nutrients that benefit the growth of pathogens, like *Salmonella*.

The research, published June 15 in the journal *Nature*, is important because changes in the [gut microbiota](#) underpin many human diseases and identifying a mechanism responsible for altering microbial communities opens the door to the development of new therapies designed to interrupt the chain of events that give these pathogens a growth advantage after [antibiotic treatments](#).

"Research has traditionally focused on the mechanisms by which antibiotics help control the growth of bacteria or inform the development of new formulations when bacteria become resistant to existing drugs," Franziska Faber, first author of the study, said. "But our research study is the first to show that *Salmonella* was able to flourish in the gut after antibiotic treatment because of the increased availability of oxidized sugars."

Gastroenteritis is a common side effect of taking antibiotics. While diarrhea may be mild and clear up after [antibiotic therapy](#) is completed, in some cases, it can lead to colitis, an inflammation of the colon, or more serious conditions that cause abdominal pain, fever and [bloody diarrhea](#).

Bäumler's research found that oral antibiotic treatment increased the synthesis of a host enzyme that generates nitric oxide radicals, which can oxidize sugars into sugar acids, such as galactarate, a key driver of *Salmonella* growth.

"Taxonomists identified galactarate utilization empirically as a characteristic of *Salmonella* isolates causing gastroenteritis. The new study suggests that this property is part of a 'business plan' *Salmonella* uses to grow in the host intestine," Bäumler said.

More information: Franziska Faber et al, Host-mediated sugar oxidation promotes post-antibiotic pathogen expansion, *Nature* (2016).
[DOI: 10.1038/nature18597](https://doi.org/10.1038/nature18597)

Provided by UC Davis

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