

# Gut microbiome: Meet *Ruminococcus gnavus*, the bacteria with a sweet tooth

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Having a sweet tooth isn't just a human characteristic. It turns out our gut

microbes can have a preference for sweets, tooâ&#128;"and one of these selfish, sugar-loving bacteria is *Ruminococcus gnavus*.

*Ruminococcus gnavus* (R gnavus for short) is one of the many bacterial species [normally found in the human gut](#). While it doesn't typically cause us harm, a growing body of evidence indicates that an overgrowth of R gnavus may be linked with certain intestinal diseasesâ&#128;"including [inflammatory bowel disease](#) (IBD), irritable bowel syndrome (IBS) and colon cancer.

Additionally, research has also found that people with health problems affecting [other parts of the body](#)â&#128;"including skin allergies, [heart disease](#), stroke, [liver disease](#) and brain disordersâ&#128;"have higher levels of these [bacteria](#) in their gut.

This association does not necessarily mean that R gnavus is a cause of these diseases. Rather, it may simply indicate that these diseases create favorable conditions for R gnavus to grow in the gut. Researchers are currently working to find the answer to this question, so that we better understand how R gnavus influences health and disease. This may also help us find new ways of diagnosing and treating certain diseases.

## Sweet tooth

Not all R gnavus strains are equal. As with other bacteria, the name covers a multitude of strains with different characteristics, which may drive different health outcomes.

Some strains live in the [lining of our gut](#) and are therefore well positioned to sense changes in the gut environment and communicate them with the rest of the body. These play a role in our underlying

immune system and can also have an effect on the function of other organs in the body. Other *R. gnavus* strains live in the gut lumen (the inside of the large intestine) where they digest any food components that reached the large intestine undigested.

Almost all of the bacteria living in the gut use complex carbohydrates (which come from plant foods, such as fruits, vegetables and legumes) as their main source of food. These provide bacteria with the [sugar](#) they need to survive and grow.

But not all of the sugars found in the gut come from the food we eat. Our body can produce its own type of sugars (such as mucin glycans, which make up most of the gut lining). Sugars can also be found covering the surface of bacteria themselves.

While *Ruminococcus gnavus* can use the sugars found in plant foods for sustenance, some strains have developed a [sweet tooth](#) for the sugars found in the gut's lining. These strains have even [evolved selfish survival strategies](#) which ensure they can always access these sugars—regardless of our age, how our diet fluctuates or even when we're suffering from health problems.

Also, when these sugars are used by *R. gnavus*, the bacteria produce [small molecules](#) called metabolites which can then travel to different areas of the body and [influence how different organs](#) (such as the brain) function.

While other types of gut bacteria can produce metabolites too, *Ruminococcus gnavus* is shown to produce [certain metabolites](#) that are [unique to it](#). For example, one of the metabolites *R. gnavus* produces has been shown to affect digestion. This could explain why people with IBS experience symptoms such as stomach pain and discomfort.

Finally, sugars coating *R. gnavus* can differ depending on the strain. On

some occasions, these may [generate an inflammatory response](#) (which means the body's immune system is primed to attack) as seen in the case of inflammatory bowel disease (IBD).

But some studies done in mice have shown some strains of *R. gnavus* may actually have a [protective effect](#) against colitis or atopic eczema for example.

This illustrates the complex relationship *Ruminococcus gnavus* has when it comes to our health.

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