

Cholesterol-Metabolizing Bacteria May Potentially Benefit Lipid Homeostasis, Cardiovascular Health

Key Takeaways

- Oscillibacter genus is associated with lower cholesterol levels, impacting cardiovascular disease risk.
- The study analyzed stool and blood samples from 1,429 participants to identify bacteria linked to CVD markers.
- Oscillibacter strains metabolize cholesterol, indicating their potential role in reducing blood cholesterol.
- Findings suggest the gut microbiome's significant role in managing cholesterol and offer new therapeutic avenues for CVD risk reduction.

High levels of the Oscillibacter genus of bacteria were associated with reduced cholesterol.

Study findings suggest that the Oscillibacter genus of bacteria found in the gut was strongly associated with lower levels of cholesterol, both in stool and blood samples. The study results have deepened clinical understanding of how gut microbes process compounds like cholesterol, which impact risk of cardiovascular disease (CVD).

There is little understanding of the role the gut microbiome plays in various aspects of health and across disease states. Prior studies indicate that supporting gut health can improve responses to immunotherapies in patients with cancer, as well as reduce risk of obesity, heart disease, and diabetes. Experts have questioned what role the gut plays in CVD, but compiling evidence suggests a direct association between CVD and an altered gut microbiome.^{1,2}



Gut microbiota under magnifying glass

High levels of low-density lipoprotein cholesterol are a significant risk factor for developing CVD, thereby therapies and lifestyle modifications to reduce cholesterol are crucial for prevention of disease. Since the early 1900s, investigators have been aware of the capabilities of specific gut bacteria to break down cholesterol in the intestines. However, they lacked knowledge of the specific species that were involved in this process.³

In the study published in Cell, the researchers were able to identify the specific species of bacteria that help manage blood lipids and cholesterol levels. This was done through generation of stool metagenomics and metabolomics from 1429 participants from the Framingham Heart Study. They analyzed the bacterial genomes of stool and blood samples, as well as the cardiovascular

health measurements, of the patients to identify bacteria and metabolic pathways that are associated with CVD.^{4,5}

According to their analyses, there were several species of bacteria that were associated with blood markers of CVD including cholesterol, triglycerides, and blood glucose levels. The researchers found that higher levels of bacteria in the *Oscillibacter* genus were strongly linked to lower levels of fecal and plasma cholesterol, as well as reduced triglycerides and glucose and higher high-density lipoprotein. The study results suggest that improved break down of cholesterol in the intestines may lead to less cholesterol in the blood.^{4,5}

To confirm their findings, they grew several *Oscillibacter* strains from the stool samples and then fed them cholesterol. The in vitro study showed that the *Oscillibacter* strains maintained the ability to metabolize cholesterol through processes like glycosylation and dehydrogenation, indicating these bacteria's potential role in breaking down cholesterol in the body.^{4,5}

The study highlights the significant role of the *Oscillibacter* genus in managing cholesterol levels in the gut and blood, suggesting a direct association with cardiovascular health and offering new avenues for therapies that reduce CVD risk. Further research is needed to explore how these findings can be applied clinically to improve health outcomes.

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