

Body's bacteria affect atherosclerosis

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New findings suggesting that bacteria in the mouth and/or intestine can affect the the outcome pathogenesis of atherosclerosis and lead to new treatment strategies, reveals research from the University of Gothenburg, Sweden.

The results are to be published in the distinguished journal [Proceedings of the National Academy of Sciences](#) (*PNAS*).

"The causes of [atherosclerosis](#) have recently become clearer, but we know less about why the [plaque](#) in the arteries ruptures and contributes to clot formation," says Fredrik Bäckhed, researcher at the Sahlgrenska Academy's Department of Molecular and Clinical Medicine.

Inflammation increases the risk of the plaque rupture in the arteries, but the underlying mechanisms for inflammation are not clear. Our bodies are home to ten times more bacteria than cells, and research in recent years has shown that our gut flora is altered in obesity , which over time may lead to cardiovascular disease. Poor dental health and periodontitis have also been linked to atherosclerosis, which would indicate that the bacteria in the mouth or gut could affect the condition.

"We tested the hypothesis that bacteria from the mouth and/or the gut could end up in the atherosclerotic plaque and thus contribute to the development of cardiovascular disease."

The researchers initially found that the number of bacteria in the plaque correlated with the number of white blood cells, a measure of inflammation. Next they used modern sequencing methods to determine the composition of the bacteria in the mouth, gut and arterial plaque of 15 patients, and in the mouth and gut of 15 healthy control subjects. They found that several bacteria were found in the atherosclerotic plaques and, primarily, the mouth, but also the gut, of the same patient and that the bacteria *Pseudomonas luteola* and *Chlamydia pneumoniae* were present in all atherosclerotic

plaques. These results would suggest that the bacteria can enter the body from the mouth and gut and end up in the plaque where they ultimately may contribute to inflammation and rupture of the plaque. The researchers also found that some of the bacteria in the mouth and gut correlated with biomarkers associated with cardiovascular disease.

"Finding the same bacteria in atherosclerotic plaque as in the [mouth](#) and [gut](#) of the same individual paves the way for new diagnosis and treatment strategies that work on the body's bacteria," says Bäckhed. "However, our findings must be backed up by larger studies, and a direct causal relationship established between the [bacteria](#) identified and atherosclerosis."

Provided by University of Gothenburg

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