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Discovery opens door to preventing diet-induced heart disease

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Four years ago, Stanley Hazen, MD, PhD, Chair of Cellular and Molecular Medicine, and colleagues made a landmark discovery linking intestinal bacteria to heart disease. His team found that when our digestive systems digest the nutrients carnitine and choline (abundant in red meat and eggs, respectively), a bacterial waste product called TMAO is formed. They showed that high levels of TMAO are associated with higher rates of heart attack, stroke and cardiac death.

Now, Dr. Hazen's team has discovered a naturally occurring TMAO inhibitor called DMB, which is found in some coldpressed extra virgin olive oils and grape seed oils. DMB blocks the production of TMAO and reduces atherosclerosis (hardening of the arteries) in mice fed a diet containing high levels of choline. The discovery was published in the December 17, 2015, issue of the prestigious journal *Cell*.

This exciting discovery opens the door to preventing diet-induced heart disease by targeting the intestinal, or "gut," bacteria. Heart disease is the number one killer in the United States, a fact which is commonly associated with the typical "Western" diet. Therefore, a therapeutic intervention may help save the lives of some of the nearly 400,000 Americans who die each year of heart disease.

Interestingly, although DMB targets a bacterial pathway, it is not an antibiotic. Therefore, its use will not contribute to antibiotic overuse or resistance, which is a worldwide health crisis.

"Many chronic diseases like atherosclerosis, obesity and diabetes are linked to gut microbes," said Dr. Hazen. "These studies demonstrate the exciting possibility that we can prevent or retard the progression of diet-induced heart diseases starting in the gut. This opens the door in the future for new types of therapies for atherosclerosis, as well as other metabolic diseases."

Source: Cleveland Clinic Lerner Research Institute

