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Synthetic Peptide Mimics Good Cholesterol

Scientists at The Scripps Research Institute (TSRI) have successfully created a synthetic molecule that has the ability to mimic good cholesterol. The new molecule has been shown to reduce plaque build-up in the arteries of animal models and if taken orally, it is able to improve cholesterol in only two weeks.

The research has been published in the *Journal of Lipid Research* and was supported by the National Institutes of Health and the American Heart Association Western States Affiliate. The findings have the potential to provide healthcare professionals with a new method for treating atherosclerosis. This is especially useful since atherosclerosis is the number one killer in the developed world.

According to TSRI Professor M. Reza Ghadiri, also the senior author of this study with TSRI Assistant Professor Luke Leman, "This research clears a big step toward clinical implication of new therapies."

Researchers have been searching for new ways to combat low-density lipoprotein (LDL) cholesterol from the body since high levels of LDL cholesterol can lead to dangerous plaque build-ups. High-density lipoproteins (HDL) on the other hand have protective effects on the body and are responsible for taking the LDL cholesterol out of the blood and delivering it to the liver, thus eliminating it from the body.

The TSRI researcher team, which also included Linda Curtiss and Bruce Maryanoff, created a nanopetide to have three arm-like structures that can wrap around cholesterol and fats in the blood. Once it is wrapped around the LDL cholesterol, it removes it by mimicking the behaviour of apoA-1, a protein of HDL, and carrying it to the liver for elimination.

The synthetic peptide was given to mice in their drinking water. The researchers did not expect it to work and thought that the digestive acids might break the peptide before it interacted with its target and modified LDL cholesterol. They were surprised to find that the peptide actually worked.

After ten weeks of treatment, it was found that the mice had a 40 percent reduction in LDL cholesterol in their blood and a 50 percent reduction in the size of plaque lesions in their hearts. There were also no signs of inflammation in the blood supply or toxicity of the peptide treatment after the ten weeks. The researchers were pleasantly surprised at the results and have repeated it several times since then. Dr. Ghadiri believes that with this new development, researchers may be closer to developing an accessible therapy for atherosclerosis.

The research team is now investigating how the synthetic peptide works in the intestines and whether there is the possibly that it interacts with beneficial microbes. They believe that if they are able to find new targets in the GI tract, it could possibly lead to new therapies for other diseases. “That’s one of the fun things in science—now we get to follow up on these different avenues,” said Leman.

In addition to Ghadiri, Leman, Zhao, Curtiss and Maryanoff, other contributors to the study include Audrey S. Black and David J. Bonnet of TSRI.

Source: The Scripps Research Institute

Image Credit: The Scripps Research Institute

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