

How niacin fights high cholesterol: New research gets to the heart of the problem

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High blood lipids are a big risk factor for developing heart disease, which is the leading cause of death in the United States. Approximately one of every six adult Americans has high blood cholesterol and about every 25 seconds, an American will have a heart attack, and nearly one every minute will die from it, according to the Centers for Disease Control and Prevention.

In a paper published in [Cell Metabolism](#), researchers at the University of Michigan Life Sciences Institute get to the heart of exactly how niacin works in lowering blood [triglycerides](#) and finds that this drug influences lipid metabolism beyond its action in fat tissues.

By connecting the known therapeutic effect of niacin with a new molecular pathway that responds to niacin, Lin and his team can now explore how to target this specific pathway to help control lipid levels in the body. Lin contemplates the next steps that these findings point to.

"If we can target PGC-1beta or apoC3 with small molecules or siRNA therapeutics, we may capture the benefits of niacin without its side effects," he said.

Blood lipids are made up of cholesterol and triglycerides that circulate in the body as lipoproteins. Statins are most commonly prescribed to treat patients with [high cholesterol](#) and fibrates and niacin are used to reduce blood triglyceride levels.

Niacin, also known as vitamin B3, is effective in lowering blood triglycerides and elevating HDLs, or good cholesterol. It is believed that niacin does this through suppressing the release of [fatty acids](#) by fat tissues. Fatty acids are essential for the synthesis of triglycerides in the liver. Lowering the level of fatty acids leads to less triglycerides that get released into the bloodstream.

Jiandie Lin, research assistant professor and assistant professor of cell and developmental biology, and colleagues found that niacin works through suppressing a pathway in the liver that involves a protein called PGC-1beta, and its newly discovered target molecule, which is called apoC3. apoC3 is an abundant protein in the human body that controls how fast triglycerides are used by tissues—and broken down—in the bloodstream. A high level of apoC3 results in a high lipid level since apoC3 blocks the process of triglyceride hydrolysis, whereas less apoC3 brings about a faster removal of lipids in the body and a lower overall level.

Lin's paper provides not only new information about how niacin works, but also may provide additional targets for treating high blood lipid levels.

Provided by University of Michigan

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