

New approach discovered to lowering triglycerides

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The blood plasma of obese rats fed a normal diet is murky with higher levels of fat in the vial at left, and much clearer with lower levels of triglycerides in the vial on the right, which is plasma from rats supplemented with lipoic acid.

Studies done with laboratory rats suggest that supplementation of their diet with lipoic acid had a significant effect in lowering triglycerides, which along with cholesterol levels and blood pressure are one of the key risk factors in cardiovascular disease.

In the lab animals, supplements of lipoic acid lowered [triglyceride levels](#) up to 60 percent. If the effect were the same in humans - which is not yet clear - that would be a greater impact than found with other dietary supplements, and similar to the effects of some prescription drugs.

The [results](#) were just published in the *Archives of Biochemistry and Biophysics*, a professional journal.

"The extent of triglyceride reduction was really dramatic, we didn't expect it to be this profound," said Regis Moreau, an assistant professor with the Linus Pauling Institute at Oregon State University. "The potential is good that this could become another way to lower blood triglycerides and help reduce the risk of atherosclerosis. It's pretty exciting."

Lipoic acid is a natural compound found at low levels in some foods, including red meat and green leafy vegetables. A powerful antioxidant, it's been of considerable research interest in recent years for its apparent ability to reduce mitochondrial decay in cells and perhaps slow the process of aging. And it's been used in Europe for decades as a treatment for the neuropathic complications of diabetes.

"Lipoic acid is known to influence glucose uptake, and bring down blood glucose by increasing its transport into skeletal muscle," Moreau said. "Less has been done to study its potential value in reducing triglycerides."

Until about 10 years ago, Moreau said, high blood levels of triglycerides - basically a form of fat - were not thought to be as significant as [cholesterol](#) at predicting atherosclerosis and heart disease. That perspective has changed, he added, and most experts now see triglycerides as a third important risk factor for atherosclerosis, along with levels of "good" HDL and "bad" LDL cholesterol.

Widely prescribed medications are often taken to influence all of these issues, especially when efforts to control them with [diet](#), exercise, and proper weight have not been effective. However, some of these medications have unwanted side effects that remain a concern.

In this research, it was found that supplements of lipoic acid appeared to affect triglyceride levels through two pathways. After eating, lipoic acid supplementation increased the rate of disappearance of triglycerides in the bloodstream. And supplements also reduced the genetic expression of enzymes in the liver that synthesize triglycerides.

This is the first study that has identified the molecular targets by which lipoic acid can lower triglyceride levels, the researchers said, and to show the effect on liver enzymes resulting in less production of triglycerides. It also found that the mechanism of action of how lipoic acid can lower triglycerides appears separate and distinct from that provided by fibrate drugs, a group of prescription medications often used for that purpose.

Lipoic acid supplements have in various studies been shown to be an appetite suppressant, but control groups of laboratory animals were used in this research to ensure that lower triglyceride levels were not the result simply of less food intake.

The rats used in the experiment were obese to begin with, and developed higher triglyceride levels as the experiment proceeded and they aged - but the animals given lipoic acid fared much better. As they grew from five weeks of age to nine weeks, the blood triglyceride levels doubled in rats given the supplement, but went up more than 400 percent in the other group not given supplements.

The amount of lipoic acid supplementation used in these laboratory experiments would equate to about two grams per day for a 150-pound person, researchers said. Lipoic acid has been used by some people for years as a dietary supplement and found to be safe, Moreau said.

Tory Hagen, a principal investigator and holder of the Jamieson Endowed Chair in Healthspan Research at the Linus Pauling Institute,

was a co-author on this study. The work was supported by the National Institutes of Health and the National Center for Complementary and Alternative Medicine.

"We believe that a novel means of controlling triglyceridemia in this animal model has been revealed," researchers wrote in their report.

"Given its strong safety record, lipoic acid may have therapeutic applications for the treatment or prevention of hypertriglyceridemia and diabetic dyslipidemia in humans."

Source: Oregon State University

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