

Lecithin component may reduce fatty liver, improve insulin sensitivity

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A natural product called DLPC (dilauroyl phosphatidylcholine) increases sensitivity to insulin and reduces fatty liver in mice, leading Baylor College of Medicine researchers to believe it may provide a treatment for prediabetic patients. DLPC is an unusual phospholipid and a trace component of the dietary supplement lecithin.

Dr. David D. Moore, professor of molecular and cellular biology at BCM, and his colleagues at first thought that DLPC would provide a useful tool in studying the function of a receptor protein - liver receptor homolog -1 or LRH-1 - that regulates the production of bile acids in the liver.

Studies in [mice](#) soon showed that DLPC could stimulate LRH-1 activity. In addition to a small increase in bile acid levels, DLPC improved regulation of glucose and fat within the liver. A report on this work appears in the current issue of the journal *Nature*. Moore is collaborating with Dr. Lawrence Chan, director of the Diabetes and Endocrine Research Center at BCM, on a pilot study to find out how well DLPC works in patients with prediabetes.

"We know it works well in mice," said Moore. The link of LRH-1 to bile acids may contribute to its effect on [glucose levels](#) and fat because small, non-toxic increases in bile acid levels can improve metabolic disorders.

Dr. Jae Man Lee, then a graduate student in Moore's laboratory, first proposed screening compounds to see which activated LRH-1. He found

that DLPC, a structurally unusual phosphatidylcholine (a form of phospholipid that is important in the formation of cell membranes) enhanced LRH-1 activity in cells.

In mice, DLPC induced the production of bile acid enzymes and lowered fat in the liver. It also increased levels of [bile acids](#) and regulated glucose or sugar circulating in the blood. In two kinds of mice that had resistance to [insulin](#), DLPC also decreased [fatty liver](#) and lowered glucose levels in the blood. However, DLPC had no effect in mice that had no LRH-1 in the liver.

The effect on the insulin resistant mice was striking.

"Their overall body weight was not changed," said Moore. "But they had improved sensitivity to insulin (which helps keep glucose levels in check) and less fatty livers. We are interested in why it gets rid of the fat in the liver."

DLPC decreased the levels of proteins associated with formation of fatty acids and triglycerides, including a key regulator called SREBP-1c that encourages the deposition of fat in tissues.

"DLPC is a natural product," said Moore. "Lecithin is a mixture of many compounds but DLPC is one of them."

The ongoing clinical study, which involves people who are overweight but not diabetic, employs an approved form of DLPC that is used in liposomes, little globules of fat that take drugs into the body. An initial glucose tolerance test to determine how sensitive the people are to insulin at the start of the study is followed by another after the subjects take DLPC or a placebo for two months. Neither the patients in study nor the physicians know who is getting DLPC and who is getting the placebo.

The study is still enrolling subjects, and there are no results yet.

Provided by Baylor College of Medicine

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