

Carriers of gene variant appear less likely to develop heart disease

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Scientists at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts University have discovered a new gene mechanism that appears to regulate triglyceride levels. This pathway may protect carriers of a gene variant against cardiovascular disease, especially among those with greater intakes of polyunsaturated fat (PUFA). The findings, published online this week in the *American Journal of Human Genetics*, contribute to research efforts to develop gene-specific diets that could potentially improve general health and complement chronic disease prevention and treatment.

The authors analyzed data from more than 27,000 men and women enrolled in ten [epidemiological studies](#) conducted in the United States and Europe that comprise the Cohorts for Heart and Aging Research in Genomic Epidemiology (CHARGE) Consortium. Focusing on the Single Nucleotide Polymorphism (SNP) rs13702, they observed that a type of small RNA known as microRNA (miR), impacts production of lipoprotein lipase (LPL), an enzyme that mediates the metabolism of circulating triglycerides.

"We saw no miR activity in carriers of the gene variant," said senior author José M. Ordovás, senior scientist and director of the Nutritional Genomics Laboratory at the HNRCA at Tufts University. "In the majority of the subjects the miR appeared to attach to the [messenger RNA](#) (mRNA), slowing down the manufacturing of LPL. Without that interference, people with the variant would presumably have more LPL available to breakdown excess triglycerides and prevent them from being

deposited in the arteries, which could eventually lead to atherosclerosis and other cardiovascular diseases."

The authors also noted lower triglyceride levels and higher concentrations of high-density lipoprotein (HDL) cholesterol, the so-called "healthy" cholesterol in association with the gene variant. Furthermore, carriers tended to have even lower triglyceride blood levels if they had higher PUFA intake.

"Based on the data, carriers of the [gene variant](#) may be able to further reduce their risk for cardiovascular disease by increasing their PUFA intake," said Kris Richardson, Ph.D., a USDA Agricultural Research Service (ARS) post-doctoral associate in the Nutritional Genomics Laboratory and a recent graduate of the Sackler School of Graduate Biomedical Sciences at Tufts University. "To build on our observational data, future studies might investigate the effect of treating human cells in culture with PUFA to determine if it will mediate LPL levels through the identified miR."

PUFA, found in foods such as salmon and vegetable oils, is considered a healthier fat. The current U.S. Dietary Guidelines for Americans recommend replacing saturated fats with the more beneficial PUFA and monounsaturated fats whenever possible.

José M. Ordovás is also a professor at the Friedman School of Nutrition Science and Policy at Tufts University and a member of the Pharmacology & Experimental Therapeutics Faculty at the Sackler School.

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