

New gene variants present opportunities in nutrigenomics

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A new study uncovers 11 gene variants associated with three blood lipids measured to determine cardiovascular disease risk: low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) and triglycerides. The discovery opens up new opportunities for nutrigenomics researchers looking for links between diet and genetics that will optimize health and lower chronic disease risk.

"Practically all genes related to lipid levels in the bloodstream respond to changes in the diet," says Jose M. Ordovas, PhD, one of five senior authors of the study and director of the Nutrition and Genomics Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University (USDA HNRCA).

"With this new knowledge, we are closer to identifying precise dietary recommendations for people at risk for cardiovascular disease. For instance, carriers of a certain variant gene could reduce their risk of disease with a low-cholesterol diet, carriers of another variant gene may benefit from the Mediterranean diet, while a high-fiber diet may be the healthiest option for carriers of yet another variant gene."

In addition to the 11 new genes, the authors' findings strengthen the association of 19 previously identified genes with LDL and HDL cholesterol and triglycerides. Ordovas collaborated with 60 authors, led by corresponding author Sekar Kathiresan, MD, of Massachusetts General Hospital, for the study published December 7 online in *Nature Genetics* December 7. The study is a meta-analysis of over 20,000

subjects in genome-wide association studies of humans in the United States and Europe with The Framingham Heart Study accounting for the largest number of samples.

"Having identified a total of 30 gene variants is a landmark in lipid research," says Ordovas, also a professor at the Friedman School of Nutrition and Science Policy at Tufts and Tufts University School of Medicine "It suggests people can have multiple variant genes contributing to dyslipidemia, a combination of spiked LDL and triglyceride levels and extremely low HDL-cholesterol signaling cardiovascular disease risk.

"It is possible there are even more variant genes contributing to dyslipidemia, but even larger studies and more complete genomic characterization based on sequencing are necessary to provide a more complete picture, including interactions with dietary components" Ordovas adds.

More information: Kathiresan, S. et al. *Nature Genetics*. Dec. 7, 2008 (online). "Common variants at 30 loci contribute to polygenic dyslipidemia."

Source: Tufts University

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