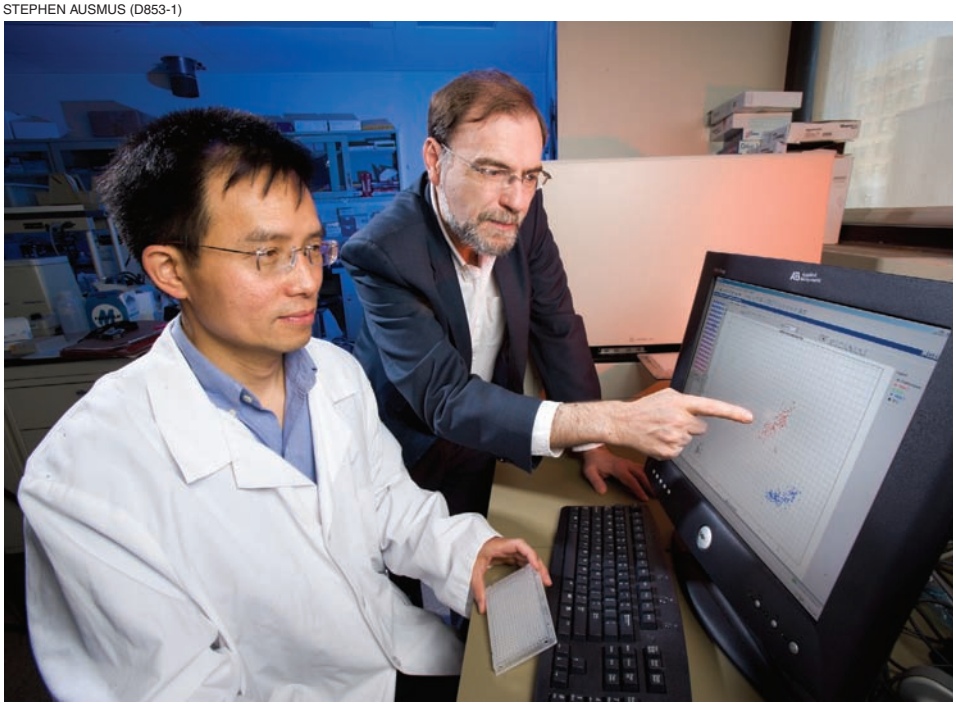
Gene Variant and Risk of Heart Disease

STEPHEN AUSMUS (D853-1)



Molecular biologist Chao Qiang Lai (left) and geneticist Jose Ordovas use a DNA sequence system to identify which individuals carry a specific mutation associated with high triglycerides or obesity.

A genetic makeup study shows that it may be more important for some people to make preventive dietary and lifestyle changes than others. The study, which was headed by Jose M. Ordovas, a biochemist at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts University in Boston, Massachusetts, sheds light on how obesity modifies the risk of heart disease among carriers of a particular gene variant.

Ordovas is director of the ARS-funded HNRCA Nutrition and Genomics Laboratory (NGL). A pioneer in the field of nutrigenomics, Ordovas's research focuses on genes that control blood levels of lipids, or fats, that affect heart disease risks.

Different genes or gene combinations respond differently to changes in diet, exercise, and medications. As more and more genomic information becomes available, recommendations for lifestyle changes become more reliable.

The study, which was published in the *Journal of Lipid Research,* sought to appraise the relationship of carriers of variants of the *APOA5* gene to atherosclerosis, or hardening of the arteries. The first author is Roberto Elosua, a former Fulbright-Generalitat de Catalunya fellow who worked with Ordovas and molecular biologist Chao Qiang Lai, also with the NGL, and colleagues with other institutes.

The researchers found that among 2,273 Framingham Offspring Study participants, those who had a particular variant of *APOA5* had higher levels of arterial plaque, as measured by carotid artery lining thickness.

Although obesity is a known contributing factor to heart disease, the problem was shown to be even worse among the 13 percent of both men and women who carry the less common gene variant.

Among all the participants who were obese, those who carried the *APOA5* gene variant showed a significantly greater buildup of arterial plaque than those who did not carry the gene. In addition, among all of the *APOA5* gene carriers, those who were obese had significantly greater plaque buildup than those who were not obese.

Even if obese carriers of the *APOA5* gene variant didn't smoke or have high fat and cholesterol, blood sugar, or blood pressure levels—or were younger than non-obese carriers—they still had higher levels of arterial plaque.

High blood lipids, such as total and LDL cholesterol and triglycerides, are among the main genetically controlled contributors to coronary artery disease risk. Other risk factors are impaired glucose tolerance, diabetes, high blood pressure, and abdominal obesity.

The association between the gene variant and hardening of the arteries requires further study. But the comparatively high levels of arterial plaque among carriers is consistent with levels associated with symptoms of heart disease.—By **Rosalie Marion Bliss,** ARS.

This research is part of Human Nutrition, an ARS national program (#107) described on the World Wide Web at www.nps.ars.usda.gov.

Jose M. Ordovas is with the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, 711 Washington St., Boston, MA 02111-1524; phone (617) 556-3102, fax (617) 556-3211, e-mail jose.ordovas@tufts.edu. ✸