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All in the DNA? The GENECARD Study

By Pat French

Having a family member with coronary artery disease (CAD), especially when the disease occurs early, has always been a risk factor for CAD for other family members. How much of this risk relates to shared genetic factors is unknown, but a recent Duke study has begun to address this question.

The GENE identification in Early-onset Coronary ARtery Disease (GENECARD) study was led by Dr. Elizabeth Hauser of the Duke [Center for Human Genetics](#) and included the DCRI's Dr. Christopher Granger and Dr. William Kraus. The study examined the genetic makeup of 1168 people from 438 families, including 493 pairs of siblings who developed CAD before age 51 (for men) or age 56 (for women). The results appear in the September [issue](#) of the *American Journal of Human Genetics*.

The researchers divided the participants into 3 subgroups: 1) those with acute coronary syndrome (ACS, unstable angina or heart attack) in at least 2 siblings, 2) those with lipid abnormalities — high triglyceride level and low HDL cholesterol level — in any member of the nuclear family, and 3) those with no Type 2 diabetes in any family member with CAD. They then analyzed the genetic profiles of the participants for 395 regional genetic markers.

Across all 3 subgroups, regions on chromosome 1 (1q25) and chromosome 3 (3q13) were associated with a higher risk of CAD. In the subgroup with ACS, regions on chromosomes 1q25 and 3q13 (ACS) were associated with CAD, as were regions on chromosome 7p14 for the group with abnormal lipid levels and chromosome 19p13 for the group without diabetes.

This study, sponsored by the National Institutes of Health (NIH), is one of the largest analyses of genetics in CAD. As such, it offers a springboard for future analysis of candidate genes. A better understanding of the relation between genetic makeup and CAD occurrence could eventually drive the development of preventive agents for patients at risk for CAD and therapies for those who already have the disease.