

James & Esther King Biomedical Research Program

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*Neurology
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*2011 Program
New Investigator Research
(3-year project)*

Project Title: Gene-smoking Interactions and Atherosclerosis

Project Summary: Despite the decline in mortality rate, cardiovascular disease (CVD) and stroke remain the leading causes of death in the United States, accounting for 34 percent of all deaths in 2006. In most cases, these clinical vascular diseases result from atherosclerosis. Cigarette smoking is one of the most important modifiable risk factors for CVD and stroke and impacts all phases of atherosclerosis. However, the degree of the cigarette smoking-induced damage also varies from individual to individual. This inter-subject variability in response to the effects of smoking may be largely due to the between-individual difference in genetic susceptibility, in addition to the variability in the presence of other environmental risk factors. The overall objective of the proposed study is to identify the genetic factors that modify the effects of smoking on the risks for precursors of atherosclerosis and clinical vascular diseases. Specifically, we will first conduct a genome-wide association scan for new genetic variants that influence the effects of smoking on the precursor conditions of atherosclerosis, then replicate the observed smoking-gene interactions in an independent sample, finally, apply the identified genetic moderators to risk stratification for stroke, myocardial infarct, and vascular death. The information obtained from this project will contribute to our understanding of race-ethnic disparities in cardiovascular disorders and the development of more effective prevention strategies.