

**James & Esther King Biomedical Research Program**

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*2008 Program  
New Investigator (3-year project)*

**Project Title:** Validation of Coronary Calcium Scoring Using Dual Energy CT

**Project Summary:** Smoking is a known contributor and risk factor for coronary artery disease (CAD), the leading cause of death in the United States. One early diagnostic test used in the diagnosis of CAD is the quantification of coronary calcium. This test has repeatedly been shown to be a strong indicator of CAD and a predictor of future CAD development. The current protocol used for coronary calcium quantification and assessment of the coronary arteries for stenotic disease requires two separate CT scans, the first without contrast media and the latter with contrast media. A new technology known as dual energy CT allows the separation of a single scan into a contrast image and a virtual non-contrast image. If this technique could be employed to quantify coronary calcium from a CT angiography scan, significant improvements in examination time and radiation dose to the patient would be attained. Our hypothesis is that dual energy CT will allow accurate quantification of coronary calcium and CT angiography examination of the coronary arteries in a single scan. This hypothesis is being tested first using a heart phantom with calcified lesions of known size and then in a patient population. Then we plan to compare calcium scores from the conventional method with the dual energy CT technique.