James & Esther King Biomedical Research Program

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Medicine/Cardiology
University of Florida

2010 Program
New Investigator Research
(3-year project)

Project Title: Effects of Cigarette Smoking on Clopidogrel-Induced Antiplatelet Effects in Patients with Coronary Artery Disease

Project Summary: Cardiovascular disease affects over 80 million people in the U.S. and is the most important cause of mortality. Smoking is a strong risk factor for cardiovascular disease as it has a number of adverse effects, including increasing platelet activation, which in turn increases blood clots. The P2Y12 receptor is a key platelet receptor that influences blood clots as shown by studies in high-risk patients with coronary artery disease (CAD). Thus, there is a clinical benefit associated with antiplatelet agents that block this receptor as it plays a pivotal role in patients with CAD. Importantly, smoking affects the response to inhibitors of P2Y12 receptor. This project will use comprehensive and innovative functional assessments to better elucidate how smoking affects P2Y12 response. The project will test the central hypothesis that cigarette smoking enhances chemical alterations of clopidogrel (medication to prevent blood clots) and that the inhibition of platelet P2Y12 effects are greater in smokers compared to non-smokers. The studies are clinically significant since they advance our knowledge of how smoking influences P2Y12, a key therapeutic target for the treatment of CAD patients. These investigations are part of our long-term goal of defining the best antiplatelet treatment strategy in high-risk patients with CAD.