

James & Esther King Biomedical Research Program

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*Surgery
University of Florida*

*2009 Program
New Investigator (3-year project)*

Project Title: Interleukin-1 Beta and KLF2 Cross-Talk in Shear Mediated Intimal Hyperplasia

Project Summary: Smoking causes blood vessels to constrict or narrow. Tobacco use is a critical risk factor for occlusive artery disease, a leading cause of death in the U.S. Tobacco use accounts for seventy-five percent of all cases of peripheral vascular disease, with smokers having 16 times greater risk than nonsmokers. Treatment for these vascular diseases often requires surgery to re-open the blood vessels, which is called surgical revascularization. These revascularizations frequently fail due to intimal hyperplasia, which is a substantial increase in the intimal (innermost) cells lining the blood vessel, causing it to re-close. Despite the understanding that intimal hyperplasia contributes to the failure of arterial revascularizations, there are no effective treatment strategies to prevent it. We have previously demonstrated that loss of interleukin 1, a growth factor, significantly reduces intimal hyperplasia in mice. Tobacco smokers exhibit amplified levels of interleukin-1, which can act cooperatively with tobacco to increase inflammation. The studies in this grant are targeted to further understand the mechanism by which interleukin-1 mediates intimal hyperplasia both independently and with other molecules, which is of particular interest to tobacco smokers given their higher incidence of vascular disease, higher revascularization failure, as well as their increased levels of interleukin-1. Our objective is to develop therapies to reduce intimal hyperplasia following vascular interventions in order to improve outcomes from these surgeries.