

**James & Esther King Biomedical Research Program**

***Judge, Andrew***

*Applied Physiology and Kinesiology  
University of Florida*

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

**Project Title:** Cytokine-Induced Muscle Atrophy Following Exercise Claudication

**Project Summary:** While there are a number of risk factors for the development of Peripheral Arterial Disease (PAD), cigarette smoking is the risk factor most correlated with the onset and progression of PAD. In addition, smoking increases the development of intermittent claudication (or intermittent, activity-induced, leg pain), which is the symptomatic form of PAD, by as much as 8-to 10-fold. This activity-induced pain is a result of muscle ischemia, which we have previously shown causes muscle damage and debilitation in PAD patients. Our long-term goal is to prevent this debilitation by further elucidating the mechanisms causing the damage and debilitation to skeletal muscle and to develop countermeasures. This work will determine if muscle ischemia, associated with PAD, increases the production of cytokines and leads to muscle weakness, atrophy, and dysfunction. This is based on findings from other chronic diseases, such as cancer, chronic heart failure (CHF), sepsis, and AIDS, in which high levels of cytokines have been shown to trigger skeletal muscle breakdown, leading to atrophy, weakness, fatigue, exercise intolerance, and deterioration of the patient prognosis. Incidentally, cigarette smoking also increases the expression of cytokines, which could further amplify these affects. By understanding these processes we will be able to test specific countermeasures to prevent the debilitation.