

# Spring 2009 SEMINAR SERIES

## F21C Bioprocessing & Biosensing Center

• DIVISION OF FOOD SYSTEMS & BIOENGINEERING •

**PRESENTER:**

**Dr. Steven S. Segal**

**Department of Medical Pharmacology and Physiology**  
University of Missouri

**TITLE:**

**Electrical and Calcium Signaling along Microvascular Endothelium: Integral Roles in Blood Flow Control**

**ABSTRACT:**

The microvessels that control blood flow are constantly dilating and constricting as they regulate their diameter according to the metabolic needs of the tissues they supply. The goal of my research is to determine how the cells that actually comprise these microvessels are able to coordinate their activity in order to control vessel diameter and thereby regulate tissue blood flow. These microvessels are lined by a continuous layer of endothelial cells which, in turn, are surrounded by smooth muscle cells that can relax (causing "vasodilation") or contract causing "vasoconstriction"). In response to physical activity, smooth muscle and endothelial cells in the microcirculation of skeletal muscles are stimulated to produce electrical and chemical signals. These signals are essential for coordinating the activity of entire branches and networks of the microcirculation to orchestrate the delivery of oxygen and nutrients as well as to remove metabolic products in such active tissues. The research in my laboratory is concerned with understanding the cellular and molecular events that initiate the signals involved in controlling blood flow, how such signals are transmitted from cell to cell to orchestrate vasodilation and vasoconstriction in an organized manner, and how these integrative processes are governed by the nervous system. Understanding these basic processes that are integral to the microcirculation provides new insight for developing novel approaches to treating vascular disease associated with hypertension and diabetes and help to combat the adverse effects aging on physical performance.

**BIOGRAPHY:**

Dr. Segal received both his B.A. (1976, Physical Education) and M.A. (1978, Exercise Physiology) from the University of California, Berkley, CA. He received his Ph.D. from the University of Michigan, Ann Arbor, MI (1984, Physiology & Education). Before coming to the University of Missouri, Dr. Segal was associated with the University of Virginia, Charlottesville (1984-1987); Pennsylvania State University, University Park (1987-1992), and Cellular and Molecular Physiology, Yale University (1992-2006). As a Professor/Investigator of Medical Pharmacology and Physiology with the University of Missouri at the Dalton Cardiovascular Research Center, he has adjunct appointments with Internal Medicine as well as Biomedical Sciences.

**DATE • TIME • LOCATION:**

**Tuesday, May 5, 2009, 4:00 pm • Ag Eng Bldg 105**