Investigator:	**Charles Searles** Phone: (404) 321-6111 ext. 205091 Email: csearle@emory.edu
Primary Research Interest:	Internal Medicine
Description of Research:	My laboratory has focused on molecular mechanisms by which different physiologic and pathophysiologic stimuli modulate vascular gene expression. In particular, we have been interested in the ability of endothelial cells to integrate signals from both hemodynamic and biochemical stimuli to regulate vascular homeostasis and how this regulation changes during the development of cardiovascular disease. The recognition of microRNAs as important regulators of gene expression has led to an exciting avenue of research for my group, and we were among the first to show the effect of mechanical forces on microRNAs and their target genes in endothelial cells. The discovery of extracellular microRNAs has prompted an expansion of my research program to include in vitro, in vivo, and clinical studies aimed at identifying the role of extracellular microRNAs in cardiovascular disease as well as the use of extracellular microRNAs as disease biomarkers. Our recent work has taught us valuable lessons in the complexity of intra- and extracellular microRNA biology, and we have now gained considerable expertise in microvesicle biology and extracellular microRNA transport. My clinical experience has impressed on me the need for novel diagnostic and therapeutic strategies for atherosclerosis. This recognition underscores the importance of our work, which will potentially identify new therapeutic targets and assist in the development of innovative approaches to treat cardiovascular disease.
Relevance to VA:	Atherosclerosis is a chronic inflammatory disease of blood vessels that leads to heart attack and stroke, two major causes of morbidity and mortality in our nation’s Veteran population. Unfortunately, we are currently rather limited in our ability to identify patients with atherosclerosis who are at high risk for heart attack and stroke. In addition, therapeutic options for Veterans with atherosclerosis are often insufficient. Through a combination of basic and translational research, my group is trying to understand molecular mechanisms responsible for the development of atherosclerosis as well as identify novel circulating biomarkers that can be used clinically to predict disease severity. To this end, we have been particularly focused on the role of microRNAs in atherosclerosis. MicroRNAs are small regulatory molecules that are found inside cells and in blood, and our work involves studies of cultured cells, animal models of vascular inflammation, and human blood samples. Ultimately, we believe our work will lead to innovative therapies to treat atherosclerosis and improve Veteran health.