My research focuses on uncovering the molecular/cellular mechanisms of central nervous system (CNS) control of glucose homeostasis and cardiovascular function, and determining the consequences of parental obesity on offspring cardiometabolic and cognitive functions. Specifically, we are examining the powerful CNS-mediated beneficial effects of the leptin-melanocortin system pathway on the heart’s ability to maintain good contractile function after myocardial infarction (MI) induced by left descending coronary artery ligation, as well as on the antidiabetic actions of the leptin-melanocortin system that are capable of maintaining euglycemia even in the absence of normal beta-cell function. In addition, in collaboration with Dr. do Carmo we began a series of studies to unravel the impact of parental (maternal + paternal) obesity on developmental programming of cardiac dysfunction and cognitive disorders in the offspring of obese parents. I utilize *in vitro* and *ex vivo* techniques coupled with genetic mouse and rat models for *in vivo* long-term integrative physiological monitoring of many metabolic and cardiovascular parameters, including cardiac function, to carry out these studies.