Our long-term research goal is to develop a strategy to decrease the excess myocardial injury in elderly patients following an acute myocardial infarction. We have developed an approach to study this problem in the elderly Fischer 344 rat model.

The isolated, buffer perfused elderly heart sustains greater injury after ischemia and reperfusion compared to the adult heart. At baseline, aging-defects in the mitochondrial electron transport chain occur in only one population of heart mitochondrial (interfibrillar) in elderly Fischer 344 rats. Following ischemia there is further damage to the interfibrillar mitochondria. We have demonstrated that aging-related defects in mitochondrial oxidative metabolism present at baseline in the elderly heart predispose to the subsequent increase in injury during ischemia compared to the adult heart, and that the decrease in the energy charge and an excess of oxidative damage accounts for an increase in injury observed in the aging heart. We have devised a therapy that corrects the mitochondrial defect in the aged heart. The hearts from these treated rats only sustain ischemic injury similar to the young, adult rats. The mechanism of this effect is proposed to involve acetylation of a key mitochondrial ribosomal protein resulting in increased mitochondrial protein synthesis.

We offer a series of clinical diagnostic tests for the evaluations of mitochondrial diseases and for disorders of fatty acid oxidation. A unique procedure is the isolation of intact mitochondria from skeletal muscle in patients suspected of having a mitochondrial disease. We study oxidation phosphorylation and metabolite pathways followed by detail enzymatic studies of the components of the electron transport chain.

Charles Hoppel, MD
CLINICAL PHARMACOLOGY
DIVISION CHIEF

People come from all over the world to spend time with us learning, from an educational standpoint, our many unique applications.>>