



The City

Nashville is vibrant, youthful city with a creative culture, ever-present live music, and award-winning food venues. It is a large enough city to have ample museums, parks, and live theatre, music, and art events year-round.



Training Environment

Vanderbilt University Medical Center (VUMC) ranks 8th among US academic medical centers in awarded NIH funding and the Department of Anesthesiology ranks 9th. Much of this success is the result of an extensive network of core facilities at VUMC that provide easy access to complex scientific methods and associated expertise. VUMC is an excellent training location for young doctors and medical researchers, and has multiple programs for early career training, mentorship, and support for these members of our academic community.

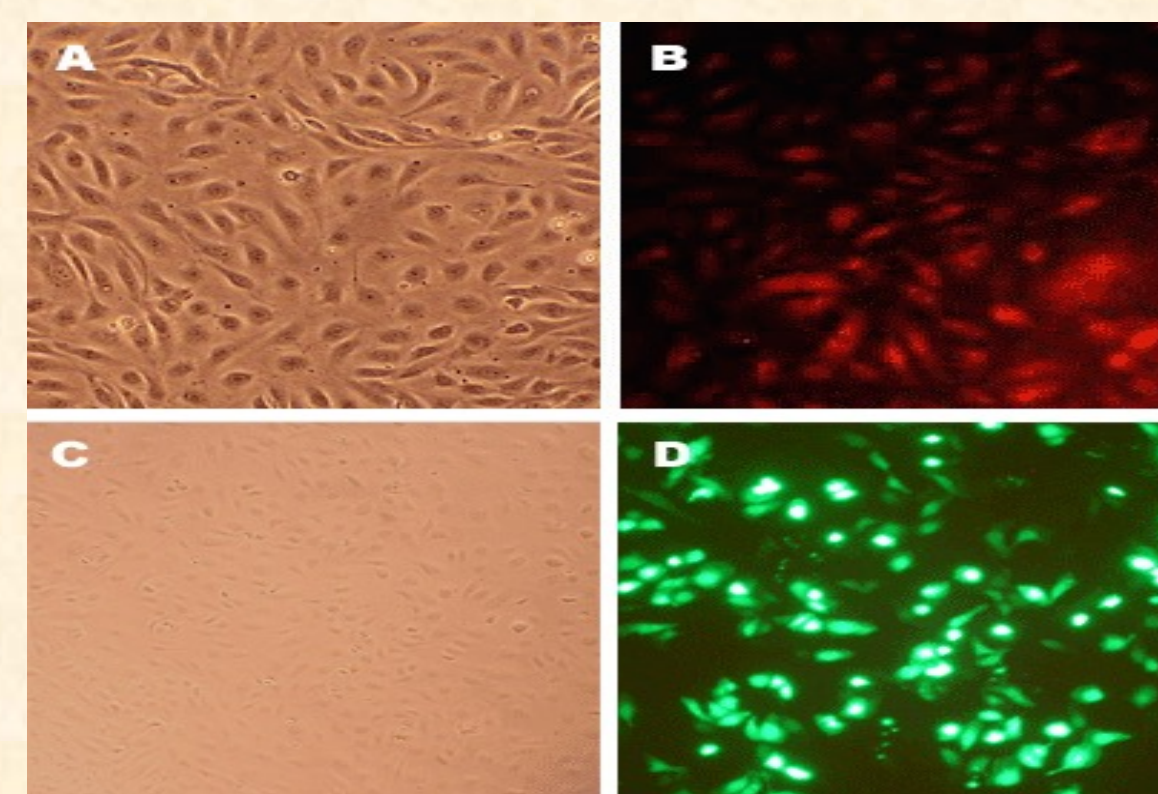
Riess Lab

Prof. Riess' team investigates novel strategies such as ischemic and pharmacologic postconditioning to improve outcome and survival after cardiac arrest and resuscitation.



Our Scientific Problem of Interest

Every year, more than 380,000 people suffer sudden cardiac arrest in the USA and similarly in Europe, with a survival rate of only 5-10%. It is not just the length of the treatment-free interval that has a decisive influence on mortality: the damage to the organs also occurs secondary to ischemia after blood circulation has been restored. This reperfusion damage can even be greater than the primary ischemic damage itself. The focus of research in the Riess Lab is on treating this secondary damage. A particular focus at the moment is: Post-conditioning with noble gases such as argon or helium and the influence of diabetes mellitus. In the Riess Lab a wide variety of methods to research possible therapies for reperfusion damage are used:

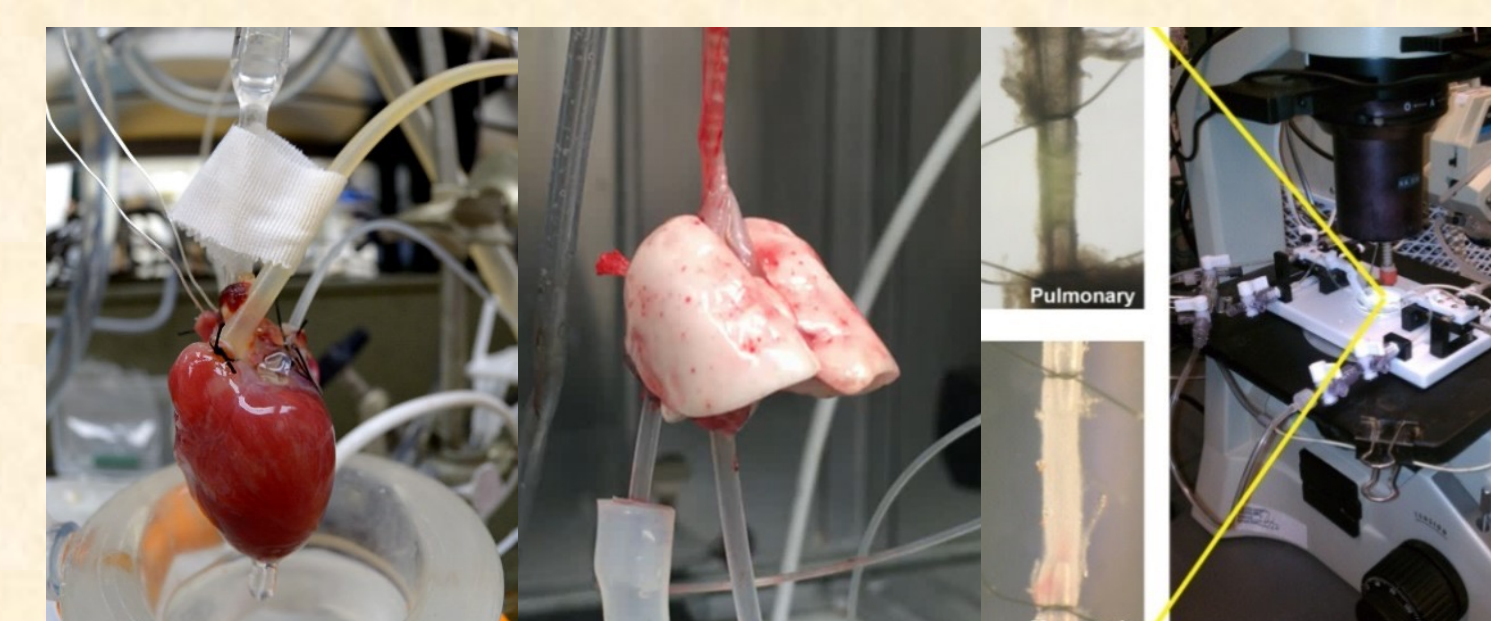


1. Cell Culture In-Vitro

Cardiomyocytes, Neurons, Endothelial Cells, Mitochondrial Function

2. Isolated Organs

Langendorff-Heart-Modell, Isolated Lung

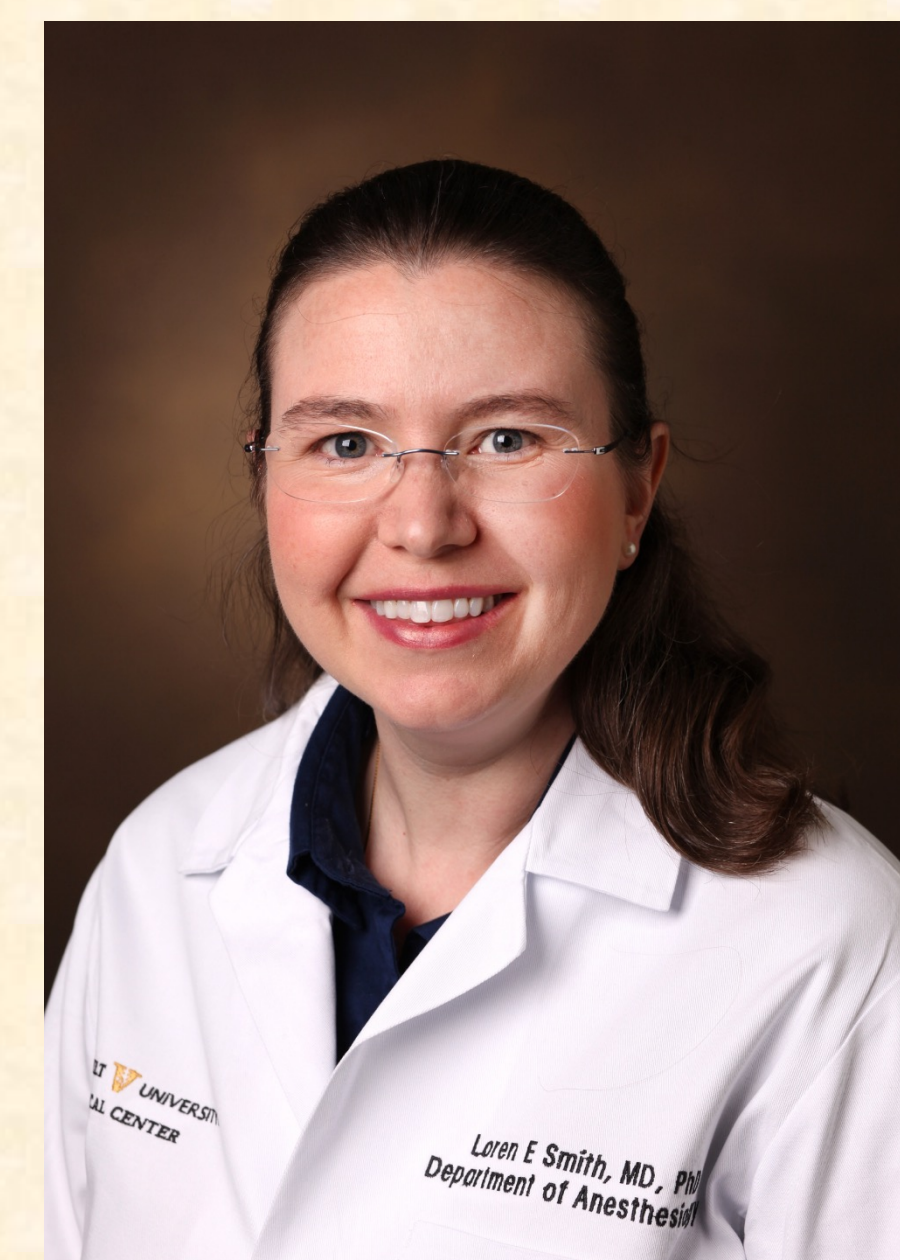


3. Ischemia In vivo

global Ischemia, Myocardia Ischemia, Hemorrhagic shock

Smith Lab

The lab conducts bench to bedside research investigating the role of high-density lipoproteins (HDL) in organ injury with a focus on acute kidney injury (AKI).



Our Scientific Problem of Interest

AKI affects up to 40% of some surgical patient populations and increases the risk of rapid chronic kidney disease development or advancement, and death. Treatments for AKI are limited. In animal models, administering intravenous HDL before renal ischemia, sepsis, or hemorrhage reduces AKI by inhibiting endothelial adhesion molecule expression. In humans, higher preoperative HDL is associated with less postoperative AKI. Our lab has shown that the association between higher HDL and lower AKI after surgery can be pharmacologically potentiated with preoperative atorvastatin. However perioperative statin treatment does not prevent AKI. We are currently studying the contributions of apolipoprotein (apo) A-I, the primary protein in HDL, and HDL microRNAs (miRNAs) in this process of HDL suppression of ICAM-1 as a first step in developing HDL-based therapeutics for AKI prevention.

