

The Jones Laboratory explores the relationship between metabolism and cardiac remodeling. Their projects focus on the interplay among key cell types—cardiomyocytes, fibroblasts, and macrophages—in the failing heart. This group leverages their *in vivo* expertise with other experts in the Center to uncover fundamental insights into heart failure.

Representative publications:

<https://pubmed.ncbi.nlm.nih.gov/32442025/>

<https://pubmed.ncbi.nlm.nih.gov/31152247/>

<https://pubmed.ncbi.nlm.nih.gov/25627821/>

The Moore laboratory is broadly focused on extracellular matrix (ECM) biology and its role in cardiac development, homeostasis & disease, and cell therapy-mediated cardiac repair. Germane to this overarching theme, active areas of investigation include understanding the role of matricellular proteins in driving pathological fibrosis and cardiomyocyte hypertrophy, fibrin-associated collagens in the regulation of cardiomyocyte growth, and cell therapy-mediated regulation of myocardial collagen deposition and ECM organization in ischemic injury.

Representative publications:

<https://pubmed.ncbi.nlm.nih.gov/30446837/>

<https://pubmed.ncbi.nlm.nih.gov/32042319/>

<https://pubmed.ncbi.nlm.nih.gov/32362246/>

The focus of the Wysoczynski laboratory is to understand how the immune system governs the pathophysiology of heart failure. Integrated themes of the ongoing projects in my laboratory include: i) immunomodulatory mechanisms of infarct healing after myocardial infarction; ii) mechanisms controlling the initiation and resolution of inflammation in the heart; iii) the impact of heart failure on medullary and extramedullary hematopoiesis; and iv) the effects of cardiovascular risk factors on immune homeostasis.

Representative publications:

<https://pubmed.ncbi.nlm.nih.gov/32664594/>

<https://pubmed.ncbi.nlm.nih.gov/29976684/>

<https://pubmed.ncbi.nlm.nih.gov/31102187/>

The Hellmann Laboratory is interested in understanding fundamental mechanisms that alter inflammatory tone and duration in obesity, diabetes, and exercise. In particular, our group is interested in regulatory pathways that control the biosynthesis of pro-resolving lipid mediators that actively quell inflammatory signaling and promote resolution of inflammation.

Representative publications:

<https://pubmed.ncbi.nlm.nih.gov/31653685/>

<https://pubmed.ncbi.nlm.nih.gov/27659679/>

<https://pubmed.ncbi.nlm.nih.gov/23043160/>

The Conklin Laboratory is focused on mechanisms by which environmental agents cause cardiovascular injury and disease – an area of research known as “*Environmental Cardiology*.” Our research topics include air pollution, tobacco products including electronic cigarettes, and volatile organic compounds (VOC) with CVD outcomes including endothelial dysfunction, atherosclerosis and thrombosis in animal and human studies.

Representative publications:

<https://pubmed.ncbi.nlm.nih.gov/32634517/>

<https://pubmed.ncbi.nlm.nih.gov/31891598/>

<https://pubmed.ncbi.nlm.nih.gov/31518667/>

The Hill Laboratory examines metabolic mechanisms of cardiac remodeling and repair. Projects focus on understanding how healthy stressors such as exercise prompt metabolic cues that promote cardiac growth as well as how myocardial infarction and pressure overload influence metabolism and pathological remodeling. Our group leverages their expertise in metabolism and the Center’s expertise in (electro)physiology, inflammation, and molecular biology to uncover fundamental insights on metabolic regulation of heart health.

Representative publications:

<https://pubmed.ncbi.nlm.nih.gov/28860122/>

<https://pubmed.ncbi.nlm.nih.gov/30353243/>

<https://pubmed.ncbi.nlm.nih.gov/29721328/>

The newly established Collins Laboratory focuses on understanding the underlying mechanisms that contribute to sex differences in cardiovascular physiology, the increased risk of adverse cardiovascular events in vulnerable female populations, and deciphering the underlying signaling processes that contribute to pregnancy-induced cardiac growth and Peripartum Cardiomyopathy. Dr Collins also has an interest in cardiomyocyte calcium signaling as outlined in her respective publications.

Representative publications:

<https://pubmed.ncbi.nlm.nih.gov/30575437/>

<https://pubmed.ncbi.nlm.nih.gov/24585777/>

<https://pubmed.ncbi.nlm.nih.gov/20167926/>

The Baba laboratory seeks to understand the role of metabolic defects in cardiac and skeletal muscle dysfunction. Using genetically altered mice models, the projects focus to determine how changes in intracellular pH contribute to heart failure, peripheral arterial disease, and exercise capacity.

Representative publications:

<https://pubmed.ncbi.nlm.nih.gov/32515247/>

<https://pubmed.ncbi.nlm.nih.gov/31312142/>

<https://pubmed.ncbi.nlm.nih.gov/29627295/>

The Carll Laboratory investigates how inhaled toxins affect cardiac function and regulation, and identifies factors that alter susceptibility to these inhalation exposures, to guide risk estimates and regulatory policies. This group applies in vivo physiology to provide translational insight to the cardiac effects of air pollutants and electronic cigarettes, while determining the chemical constituents and biological mechanisms underlying these effects, with emphasis on the autonomic nervous system and electrophysiology.

Representative publications:

<https://pubmed.ncbi.nlm.nih.gov/31996220/>

<https://pubmed.ncbi.nlm.nih.gov/28545487/>

<https://pubmed.ncbi.nlm.nih.gov/23872579/>

The Nystoriak laboratory aims to improve our understanding of how metabolic signals influence cellular excitability in the cardiovascular system. In particular, projects are focused on identifying novel molecular processes that underlie the regulation of transmembrane ion channels by intermediary metabolism, and how these processes are impacted during the development and progression of disease. To accomplish this, the team applies techniques that span multiple disciplines such as electrophysiology, molecular biology, biochemistry, and advanced cellular and in vivo imaging.

Representative publications:

<https://pubmed.ncbi.nlm.nih.gov/31639389/>

<https://pubmed.ncbi.nlm.nih.gov/28119464/>

<https://pubmed.ncbi.nlm.nih.gov/29110409/>

Research in the Haberzettl laboratory focuses on the mechanisms by which exposure to environmental air pollution induces vascular and cardiometabolic injury. One of our projects examines the effects of fine particulate matter (PM_{2.5}) exposure on vascular circadian rhythms and its contribution to cardiometabolic injury in the susceptibility state of circadian dyssynchrony. In our second project we investigate, in collaboration with the Hill laboratory, whether PM_{2.5} exposure by inducing metabolic dysfunction in EPCs impairs the capability of EPCs to promote vascular repair.

Representative publications:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5132639/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5746456/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6438195/>

The Dassanayaka Laboratory is a basic science laboratory that focuses on the relationship between metabolism and cardiac remodeling during heart failure. Their projects focus on the interplay between cardiac metabolism, the extracellular matrix, and different cells that reside within the heart—fibroblasts, endothelial cells, and cardiomyocytes—to elucidate their contribution to remodeling process.

Representative publications:

<https://pubmed.ncbi.nlm.nih.gov/29885625/>

<https://pubmed.ncbi.nlm.nih.gov/31152247/>

<https://pubmed.ncbi.nlm.nih.gov/28299467/>