# Sponsor Projects for Pauley Heart Center 2021 Summer Undergraduate Research Fellowship

| *Sponsor Name* | *Sponsor Research Areas* | *Project* |
|---|---|---|
| **Dr. Justin Canada, PhD**<br>Assistant Professor<br>Department of Internal Medicine<br>Division of Cardiology | cardiopulmonary exercise testing, exercise physiology of heart failure, cardio-oncology, clinical research | **"Association of Exercise Stress Cardiac MRI variables with Clinical Findings"**<br>The coupling of Cardiac magnetic resonance imaging (CMR) with exercise stress testing allows the opportunity to evaluate the structure and function of the heart both at rest and during dynamic movement. The project will identify and collect variables obtained during exercise stress CMR and determine their associations with exercise capacity and cardiovascular risk status. The student will obtain a mentored-learning experience in these procedures, identify a clinical question, collect identified variables to answer their clinical question, analyze results, and present a summary of findings. |
| **Dr. Salvatore Carbone, PhD**<br>Assistant Professor<br>Department of Kinesiology & Health Sciences | diet, nutrition, heart failure, obesity, diabetes, fitness | **"Unsaturated Fatty Acids to Improve Cardiorespiratory Fitness in Patients with Obesity and Heart Failure with Preserved Ejection Fraction"**<br>The project investigates the effects of a diet rich in healthy fats found in food like extra-virgin olive oil, nuts and avocado, in patients with obesity and heart failure. After received adequate training, the student will work with me directly on a daily basis to help with data collection, including collection of medical and nutritional data, and processing of blood samples, and will ultimately learn how to generate a research poster under my supervision. |
| **Dr. Bernard Fuemmeler, PhD, MPH**<br>Professor<br>Department of Health Behavior and Policy | obesity, nutrition, physical activity, sedentary activity, epidemiology, statistical analyses, psychosocial factors | **"Racial and Ethnic Disparities in Childhood Obesity and Obesity-Related Behaviors"**<br>The student will help the laboratory investigate racial and ethnic disparities in childhood obesity and obesity related behaviors, such as sedentary activity and poor nutrition. Students working in the lab will be |

| | | |
|---|---|---|
| | | exposed to epidemiological methods for examining these disparities using existing databases. The goal of this research will be to describe some of the social and/or psychological factors that may contribute to childhood obesity and explain the variation we see between different racial and ethnic groups. |
| **Dr. Jordana Kron, MD**<br>Associate Professor<br>Department of Internal Medicine<br>Division of Cardiology | cardiac arrhythmias, electrophysiology, implantable cardioverter defibrillators, sarcoidosis | **"Cardiac Sarcoidosis Consortium Registry"**<br>The Cardiac Sarcoidosis Consortium is an international multicenter collaboration co-founded in 2011 by VCU, University of Michigan and University of Colorado and has a prospective registry of more than 500 patients with cardiac sarcoidosis from 25 centers. The student will help to update the database for the enrolled patients from VCU and also devise a hypothesis and query the database to try to answer a question with the current data. |
| **Dr. Keyur Shah, MD**<br>Associate Professor<br>Department of Internal Medicine<br>Division of Cardiology | amyloidosis, heart failure, transthyretin, light chain, neuropathy, cardiomyopathy | **"Clinical Presentation and Outcomes of Cardiac Amyloidosis"**<br>The Pauley Heart Center is a destination clinic for patients with the rare disease: cardiac amyloidosis. The purpose of this project is to fully characterize a population of patients with a cardiac amyloidosis and identify clinical predictors of adverse outcomes. The student will spend time creating a database in RedCap and collecting data on these patients. The student will have an opportunity to analyze the data and formulate a mentored abstract for submission to local and national meetings. |
| **Dr. Cory Trankle, MD**<br>Instructor<br>Department of Internal Medicine<br>Division of Cardiology | exercise test, left atrium, cardiac imaging, magnetic resonance imaging (MRI) | **"Atrial Function During Stress Testing"**<br>This project aims to evaluate the ability of the atria (top chambers of the heart) to increase their squeezing function (contractility) during exercise. Prior technological limitations have prevented clear imaging of the atria during exercise. However, with improvements in MRI technology, we are now able to collect images of the atria during exercise-based stress tests. This project will retrospectively evaluate the function of the atria during stress tests and compare that function to the individuals' ability to exercise. The student will trace the atria of the heart |

| | | |
|---|---|---|
| | | on the MRI videos during rest and exercise, as well as build databases with obtained measurements. |
| **Dr. John Wilson, MD, PhD**<br>Assistant Professor<br>Department of Biomedical Engineering | magnetic resonance imaging, biomechanics, aortic aneurysms and dissections, translational research, computational analysis | **"Which patient needs immediate surgery? Personalizing the risk assessment of aortic aneurysms and dissections using quantitative biomechanical magnetic resonance imaging"**<br>This project will include quantifying and regionally correlating aortic wall mechanics, local flow-induced shear stress, and/or biocompositional metrics from MRIs in patients with aortic aneurysms, dissections, or other pathologies with the goal of improving early diagnostics and clinical risk assessment. The student will be trained in the use of custom and commercial software packages to process MRI data, quantify relevant metrics, and conduct statistical comparisons between imaging metrics and clinical data/outcomes in select patient groups. |
| **Dr. Wendy Bottinor, MD, MSCI**<br>Assistant Professor<br>Department of Internal Medicine | Cardio-Oncology, Childhood Cancer, Adolescent and Young Adult Cancer, Heart Failure, Medical Imaging, Clinical Research | **"Understanding Risk Factors that Potentiate Cardiovascular Disease Among Survivors of Childhood, Adolescent, and Young Adult Onset Cancer"**<br>Our team is investigating the underpinnings of cardiovascular disease in survivors of childhood, adolescent and young adult onset cancer. While heart disease is a leading cause of death among survivors, the reasons for this are not fully understood. Our team uses cardiovascular magnetic resonance imaging and clinical data extraction programming to understand the factors that influence the development of cardiovascular disease among survivors of childhood, adolescent, and young adult cancer. Team members will learn about the use of cardiac magnetic resonance imaging studies for detecting cardiovascular disease in survivors by participating in image analysis. Team members will develop skills in data acquisition and quality assurance by validating automated algorithms for electronic health record data extraction. Team members will also learn principles behind electronic clinical research database design and electronic |

| | | |
|---|---|---|
| | | database management through direct involvement in our database development. |
| **Dr. Alex Lucas, PhD**<br>Instructor<br>Department of Health Behavior and Policy | Cardio-Oncology, Cancer survivorship, Behavioral Lifestyle Interventions, Physical Activity, Quality of Life | **Cardiovascular fitness and body composition in prostate cancer patients undergoing androgen deprivation therapy"**<br>This project will be focused on examining the feasibility, reliability and validity of conducting cardiopulmonary exercise testing in conjunction with imaging studies to examine cardiorespiratory fitness and body composition in prostate cancer patients being actively treated with androgen deprivation therapy. Student responsibilities will be a) participation in the collection of study samples, including image analyses b) evaluating components of body composition and distribution and c) exploring relationships between activity levels, fitness levels, and body composition. |
| **Dr. Sangeeta Shah, MD**<br>Associate Professor<br>Department of Internal Medicine | Preventive Health, Middle School Education, Health awareness, Hypertension | **"Teach a Girl Blood Pressure"**<br>Children present a window of opportunity for promoting health within their community. We are educating Junior Girl Scout in 4 sessions on how to take blood pressure, what is hypertension, complications of the disease, how to be a scientist, and then helping them do a take action project. The primary goal is awareness about HTN with a secondary goal of take action project. (b) The student will help with teaching sessions with the girls. help with data collection, and helping with the development of the "take action project" |