Image Courtesy of **Shinghua Ding, PhD** Professor of Biomedical, Biological and Chemical Engineering (BBCE), Dalton Resident Investigator

NAD+ salvage pathway in mitochondria in neurons. Background shows an neurons transfec with mRFP in mitochondria.

Research Interests: Ischemic stroke, neural degeneration and regeneration, glial function, glia-neuron interactions, in vivo two-photon imaging.
From the **Director**

The Dalton Cardiovascular Research Center (DCRC) supports the objectives of the University of Missouri in its mission of teaching, research and service. Yet it is unique in its commitment to interdisciplinary collaborative research and teaching among various colleges, schools and departments across the Columbia campus. Under the auspices of DCRC, scientists from the fields of biochemistry, biological engineering, biological sciences, biomedical sciences, electrical engineering, medicine, pharmacology, physiology, physics, and veterinary medicine and surgery all come together and apply their particular expertise to research problems.

Our commitment to collaboration is grounded in the belief that interactions among scientists of diverse backgrounds will lead to multidisciplinary research producing meaningful, far-reaching results. Our commitment to collaboration is grounded in the belief that interactions among scientists of diverse backgrounds will lead to multidisciplinary research producing meaningful, far-reaching results. Research programs at DCRC include investigations into cardiac functions, cystic fibrosis, exercise, kidney failure, membrane transport, muscular dystrophy, neurohumoral control of the circulation, shock, vascular wall biology, diabetes, hypertension, biomedical engineering, protein-protein interactions, and tumor angiogenesis. Because the mission of DCRC is to promote interaction and collaboration, no single group completely defines the research activity of its members.

The center is committed to excellence in cardiovascular research and in the education of students and fellows. Our investigators provide service to the University, the State of Missouri, and the nation through memberships on committees, peer review panels and editorial boards of scientific journals.

The Dalton Cardiovascular Research Center is accredited by both the American Association for the Advancement of Laboratory Animal Care and the American Association of Laboratory Animal Sciences.

Michael A. Hill, PhD  
Interim Director, Dalton Cardiovascular Research Center  
Professor, Medical Pharmacology & Physiology
CORE TECHNOLOGIES
Atomic Force microscopy
Confocal/multiphoton microscopy
In vivo video microscopy
Chronic instrumentation
Electrophysiology
Quantitative PCR
Nanofabrication
Cell tissue culture
Gene expression
Manipulation of protein expression
Fluorescence spectroscopy
Cardiovascular and microvascular models
High Frequency Ultrasound Imaging

CORE FACILITIES
Leica SP5 confocal multiphoton system
FV 1000 Olympus confocal systems
High Speed Spinning disk confocal
Atomic Force Microscopy Systems
Research grade florescence microscopes
Molecular and cellular technology core
Information technology core
Vevo LAZR Photoacoustic Imaging System
Telemetry
Laser Speckle Imaging
Any-Maze System
Ivis Imaging
Metabolic Cages

Interdisciplinary Research
Interest Groups
Biomedical Engineering
Microcirculation
Exercise/Inactivity
Vascular Biology
Membrane Transport
Cystic Fibrosis
Tumor Angiogenesis
Neurohumoral Control of Circulation
Cardiac Muscle, Development & Disease

Facilities
Erected 1967-1969
33,456 Square Feet
21 Research Labs
Christopher P. Baines, PhD plates cells on a petri dish to grow both fibroblasts and cardiac cells.

Dr Baines is a Resident Dalton Investigator and Associate Professor, Department of Biomedical Sciences, College of Veterinary Medicine


**Academic Partners**

College of Arts and Science  
Physics & Astronomy

College of Engineering  
Bioengineering, Electrical &  
Computer Engineering

College of Veterinary Medicine  
Biomedical Sciences

School of Medicine  
Biochemistry  
Center for Gender Physiology  
Medical Pharmacology & Physiology  
Internal Medicine  
Pathology and Anatomical Sciences

College of Human Environmental Sciences  
Nutrition & Exercise Physiology

**External Sector Collaborations**

**International**

Univ of Calgary (CA),  
Univ of Sheffield (UK)  
Univ of Oxford (UK)  
International University of Health and Welfare, Japan  
National Yang Ming Chiao Tung University, Taiwan  
Southwest Medical Univ(CN)  
National Taiwan University

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University of IL Urbana, Champaign  
Pennington Biomed Research Ctr,  
Washington University, St. Louis  
Proteostasis Therapeutics, Inc  
University of IL, Chicago

Phenotype Facility  
with VisualSonics Vevo 2100 System
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Kevin D. Gillis, DSc, Professor Biological Engineering
Professor Medical Pharmacology and Physiology

Olga Glinskii, MD
Assistant Research Professor
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Xiaqin Zou, PhD
Professor, Department of Physics and Department of Biochemistry
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Edward H. Blaine, PhD, DSc(Hon)
Professor, Department of Medical Pharmacology & Physiology
Former Director, Dalton Cardiovascular Research Center 1990-2005
"Hypertension, heart failure, and salt and water balance."

Discovery of Angiotensin converting enzyme inhibitor

1962 NFL Draft, Offensive Line Green Bay Packers, retired after 5th season with the Philadelphia Eagles to come back to Mizzou for his doctorate. (5 years, a promise to mentor, Clint Conaway)

Distinguished Eagle Scout by the Boy Scouts of America, 2009
Missouri Sports Hall of Fame, 2011

Gerald A. Meininger, PhD, Emeritus Professor
Margaret Proctor Mulligan Professor in Medical Research
Professor, Department of Medical Pharmacology and Physiology
Former Director, Dalton Cardiovascular Research Center 2005-2015
Adjunct Professor, Department of Biomedical Sciences
Adjunct Professor, Department of Biological Engineering


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Adjunct Professor, Department of Medical Pharmacology and Physiology

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Adjunct Dalton Investigator
Sheffield Cancer Research Centre

Chandrasekar Bysani, D.V.M., Ph.D.
Margaret Proctor Mulligan Endowed Professor

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Professor and Associate Department Head, Department of Medical Pharmacology and Physiology
Non-Resident Investigators

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LaPierre Chair and Joint Professor, Departments of Electrical Engineering, Biological Engineering and Physics

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Nicole L. Nichols, Ph.D.
Assistant Professor, Department of Biomedical Sciences

Steven S. Segal, PhD
Professor of Medical Pharmacology and Physiology

Yoshiro Sohma, MD, PhD
Visiting Professor, Dalton Cardiovascular Research Center


Melanocortin-4 receptor antagonist TCMCB07 ameliorates cancer- and chronic kidney disease-associated cachexia. Zhu X, Callahan MF, Gruber KA, Szumowski M, Marks DL. J Clin Invest. 2020 Sep 1;130(9):4921-4934. doi: 10.1172/JCI138392. PMID: 32544087


Image above courtesy of Chetan P. Hans, PhD. The cover image of this issue of Clinical Science (volume 134, issue 22) features representative transmission electron microscopy images of normal (top panel; AngII + DAPT) and abnormal collagen fibrils (bottom panel; AngII + vehicle) in the mouse aorta. In their study, Hans et al. highlight the novel therapeutic potentials of Notch inhibitor (DAPT) to regress an actively growing abdominal aortic aneurysm via divergent pathways.
Investigators at Dalton Cardiovascular Research Center seek understanding and information about some of the most prevalent health issues of the day - hypertension; heart disease; adult-onset (Type II) diabetes; obesity; muscular dystrophy; cystic fibrosis; and breast, uterine and prostate cancer. Teams of investigators from medicine, engineering, biomedical sciences, veterinary medicine, physiology and other disciplines work together to find answers to questions that will directly affect the understanding of disease prevention and treatment. Your contribution to Dalton supports this work.

You can now give directly to Dalton Cardiovascular Research Center and the Franklin Lecture Endowment by going to our Giving to Mizzou page.

Dalton welcomes partnerships with the private sector. Please contact Dr. Michael Hill at hillmi@missouri.edu or 573-882-9482 to learn more.