**Division Details**

**Division Data Summary**

**Research and Training Details**

<table>
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<th>Details</th>
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<td>Number of Joint Appointment Faculty</td>
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**Division Photo**

No Photo information has been entered yet.

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**Significant Publications**


The results of the current study suggest that L-type calcium channel inhibitors, that are widely used to treat hypertension, are pathologic for the heart and induce secondary remodeling and hypertrophy long-term through a myocyte autonomous function. Such results suggest caution when prescribing L-type calcium channel blockers in heart failure patients.


The time of day or night has a dramatic influence on the frequency at which sudden death occurs. In this paper, we provide molecular evidence that links circadian rhythms to vulnerability in ventricular arrhythmias. Our findings identify circadian transcription of ion channels as a mechanism for cardiac arrhythmogenesis.


Previous studies from the Yutzey lab reported that the transcription factor Twist1 regulates heart valve progenitor cell proliferation, migration, and differentiation. In addition, Twist1 expression is reactivated in pediatric and adult valve disease, but its function is unknown. The current study identifies genes regulated directly by Twist1 that are involved in valve progenitor cell proliferation and migration. This finding establishes Twist1 as a master regulatory gene in the early stages of valve progenitor cell development with implications for molecular mechanisms of heart valve disease progression.

Thrombospondin (Thbs) proteins are induced during tissue damage or active remodeling in coordination with the endoplasmic reticulum (ER) stress response in all tissues and cell types. Here we described a novel function for Thbs' as ER resident effectors of an adaptive ER stress response. Thbs4 cardiac-specific transgenic mice were protected from myocardial injury while Thbs4-/- mice were sensitized to cardiac maladaptation. The results suggest that upregulation of Thbs proteins will protect any cell or tissue undergoing ER stress or healing. Numerous medical applications are under investigation.


Cardiovascular disease, particularly ischemia, myocardial infarction, and heart failure, constitutes a growing health and economic problem, afflicting approximately five million people in the United States each year at an estimated cost of $29.6 billion. Here we show that modification of a protein that is important in cardiac muscle function can dramatically impact on how the heart is able to respond to environmental stress.

**Division Publications**

Cardiac contractility caveolae-targeted L-type Ca(2) channel antagonist inhibits hypertrophic signaling without reducing
Makarewich CA
Pathway for a Protective ER Stress Response
Osinska H
Lynch JM
Cardiac Hypertrophy and Pathological Remodeling
51
Liu Q
Macrophage autophagy plays a protective role in advanced atherosclerosis
Liao X
vasopressin V1A receptor causes reversible left ventricular dysfunction through Galphaq-mediated cell
Li X
investigation
Li J
developing heart valves
American Association of Anatomists
signaling during early mouse lens development
Circulation research
PKCalpha/beta With Ruboxistaurin Antagonizes Heart Failure in Pigs After Myocardial Infarction Injury
Ladage D
cardiomyopathy: importance of genetic and metabolic evaluation
Kindel SJ
Nature
Rosenbaum DS
MJ
Jeyaraj D
Neuromuscular disorders: NMD
very young Duchenne muscular dystrophy patients precede the onset of cardiac dysfunction
James J
American Heart Association
Molkentin JD
Developmental cell
Hom JR
Robbins J
Circulation research
Protein kinase Calpha as a heart failure therapeutic target
Kranias EG
2011
Gupta R
Ishikawa K
Wan X
McCauley MD
Ripperger JA
Hu K
Lu Y
Eapen BL
Sharma N
Ficker E
Cutler MJ
Gulick J
Sanbe A
Robbins J
Demolombe S
Kondratov RV
Shea SA
Albrecht U
Wehrens XH
Rosenbaum DS
Jain MK
Circadian rhythms govern cardiac repolarization and arrhythmogenesis
Nature
2012
483:96-9.
Kindel SJ
Miller EM
Gao H
Subramanian M
Zhang XQ
Zhang H
The human phospholamban Arg14-deletion mutant localizes to plasma membrane and interacts with the Na/K-ATPase
Journal of molecular and cellular cardiology
2012; 52:773-82.
12. Hom JR, Quintanilla RA, Hoffman DL, de Mesy Bentley KL, Molkentin JD, Sheu SS, Porter GA, Jr. The permeability transition pore controls cardiac mitochondrial maturation and myocyte differentiation
Developmental cell
2011; 21:469-78.
14. James J, Kinnett K, Wang Y, Ittenbach RF, Benson DW, Cripe L. Electrocardiographic abnormalities in very young Duchenne muscular dystrophy patients precede the onset of cardiac dysfunction


44. Tariq M, Belmont JW, Lalani S, Smolarek T, Ware SM. SHROOM3 is a novel candidate for heterotaxy identified by whole exome sequencing. Genome Biol. 2011; 12:R91.


Faculty, Staff, and Trainees

**Faculty Members**

**Jeffrey Robbins, PhD, Professor**

- **Leadership** Executive Co-Director, The Heart Institute; Associate Chair of the Cincinnati Children's Hospital Medical Center; Endowed Chair for Molecular Cardiovascular Biology
- **Research Interests** Mechanisms of Normal and Abnormal Cardiovascular function

**James Gulick, MS, Instructor**

- **Research Interests** Molecular interactions between certain cardiac contractile proteins and how such interactions can be altered by mutations that are associated with cardiomyopathies

**Jeanne James, MD, Associate Professor**

- **Leadership** Director, Pediatric Cardiology Fellowship Program
- **Research Interests** Manifestations and etiologies of misfolded protein response and echocardiography

**Zaza Khuchua, PhD, Associate Professor**

- **Research Interests** Congenital cardiac disorders caused by inborn errors in mitochondrial energy-producing enzymes, and model systems to study molecular mechanisms of these diseases

**Marjorie Maillet, PhD, Instructor**

- **Research Interests** Understanding signaling pathways that lead to heart disease

**Jeffery Molkentin, PhD, Professor**

- **Leadership** Howard Hughes Medical Institute Investigator
- **Research Interests** Molecular pathways that underlie heart disease and muscular dystrophy

**Sudarsan Rajan, PhD, Assistant Professor**

- **Research Interests** Understanding contractile and regulatory proteins’ gene expression and their role in maintaining normal cardiovascular function

**Johannes van Berlo, MD, PhD, Instructor**

**Stephanie Ware, MD, PhD, Associate Professor**
Leadership
Director of Research and Development, Associate Medical Director, The Heart Institute Diagnostic Laboratory; Co-Director, Cardiovascular Genetics

Research Interests Genetics of pediatric heart disease

Joshua Waxman, PhD, Assistant Professor
Research Interests Molecular Genetics of Heart Development

Katherine Yutzey, PhD, Professor
Research Interests Heart development and disease mechanisms

Joint Appointment Faculty Members
D Woodrow Benson, MD, PhD, Professor (Cardiology)
Research Interests Genetic basis of pediatric heart disease

Trainees
- Federica Accornero, PhD, University of Turin, Italy
- Md. Shenuarin Bhuiyan, PhD, Tohoku University, Japan
- Caitlin Braitsh, BS, Xavier University
- Adam Burr, BS, University of Minnesota, Twin Cities
- Santanu Chakraborty, PhD, Miami University
- Rajshekhar Chatterjee, PhD, Washington University
- Charles Cole, MD, University of Cincinnati
- Robert Nathan Correll, PhD, University of Kentucky
- Jason Cowan, MS, University of Miami
- Enrico D’Aniello, PhD, Marine Zoological Station Anton Dohrn, Italy
- Jennifer Davis, PhD, University of Michigan, Ann Arbor
- Tracy Dohn, BS, Wittenberg University
- Petra Eder, PhD, University of Graz, Austria
- John Elrod, PhD, Albert Einstein College of Medicine
- Ming Fang, MS, Boise State University
- Maria Gomez, BS, Xavier University
- Ambrose Goonasekera, PhD, University of Rochester
- Manish Gupta, PhD, University of Cincinnati
- Onur Kanisicak, PhD, University of Connecticut
- Jason Karch, BA, Dakota Wesleyan University
- Jennifer Kwong, PhD, Weill Medical College of Cornell University
- Julie Lander, BS, Brigham Young University
- Mary Lee, MS, Ball State University
- Ruijie Liu, PhD, University of Illinois at Urbana Champaign
- Jeffrey Lynch, PhD, University of Alberta, Canada
- Patrick McLendon, PhD, Virginia Polytechnical Institute and State University
- Md. Abdur Razzaque, PhD, Tokyo Women’s Medical University, Japan
- Ariel Rydeen, BS, University of Minnesota
- Tobias Schips, PhD, Ulm University, Germany
- Arunima Sengupta, PhD, Miami University
- Mardi Sutherland, BS, University of Massachusetts, Boston
- Muhammad Tariq, PhD, Quaid-I-Azam University, Pakistan
- Andoria Tjondrokoesoemo, PhD, University of Medicine & Dentistry of New Jersey
Grants, Contracts, and Industry Agreements

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**Current Year Direct** $5,296,767

**Total** $5,296,767