Summary of Accomplishments

Publications and Presentations
104 articles published
106 abstracts published
52 invited presentations

Awards and Peer Review
7 awards received
11 investigators served on editorial boards of 11 scientific journals
20 investigators review articles for 89 scientific journals
11 investigators review grant applications for 12 granting agencies

Education and Training
36 postdoctoral fellows
28 graduate students
16 undergraduate students

Overview

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 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, medical pharmacology & physiology, and veterinary medicine and surgery 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. 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, biomedical engineering, 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. During the period of this report, our investigators published over 104 manuscripts in nationally recognized journals and books and gave over 50 invited presentations.

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.
Dalton Investigators

Edward H. Blaine, PhD, DSc(Hon): Director of Dalton Cardiovascular Research Center, Professor of Medical Pharmacology & Physiology

Frank W. Booth, PhD: Professor of Biomedical Sciences

Douglas K. Bowles, PhD: Assistant Professor of Biomedical Sciences

Lane L. Clarke, DVM, PhD: Associate Professor of Biomedical Sciences

J. Thomas Cunningham, PhD: Assistant Professor of Medical Pharmacology & Physiology

Joseph L. Dixon, PhD: Research Associate Professor, Dalton Cardiovascular Research Center

C. Michael Foley, DVM, PhD: Research Assistant Professor, Dalton Cardiovascular Research Center

Kevin D. Gillis, DSc: Assistant Professor of Electrical Engineering and of P

Calvin C. Hale, PhD: Associate Professor of Biomedical Sciences

Marc Hamilton, PhD: Assistant Professor of Biomedical Sciences

Eileen M. Hasser, PhD: Associate Professor of Biomedical Sciences

Meredith Hay, PhD: Associate Professor of Biomedical Sciences; Director, Center for Gender Physiology and Environmental Adaptation, University of Missouri School of Medicine

Cheryl M. Heesch, PhD: Associate Professor of Biomedical Sciences

Virginia H. Huxley, PhD: Professor of Medical Pharmacology & Physiology

Tzyh-Chang Hwang, PhD: Associate Professor of Medical Pharmacology & Physiology
Salman M. Hyder, PhD: Associate Professor of Biomedical Sciences, Zalk Missouri Professor of Tumor Angiogenesis

Allan W. Jones, PhD: Associate Director, Dalton Cardiovascular Research Center; Professor and Interim Chair of Medical Pharmacology & Physiology

Joe N. Kornegay, DVM, PhD: Professor and Dean of the College of Veterinary Medicine

M. Harold Laughlin, PhD: Professor and Chair of Biomedical Sciences, Professor of Medical Pharmacology & Physiology

Mark A. Milanick, PhD: Professor of Medical Pharmacology & Physiology

Patrick J. Mueller, PhD: Research Assistant Professor, Dalton Cardiovascular Research Center

Elmer M. Price, PhD: Associate Professor of Biomedical Sciences

Michael J. Rovetto, PhD: Professor of Medical Pharmacology & Physiology

Leona Rubin, PhD: Associate Professor of Biomedical Sciences

James C. Schadt, PhD: Associate Professor of Biomedical Sciences

Ronald L. Terjung, PhD, Dhc: Professor and Associate Chair, Biomedical Sciences

Richard Tsika, PhD: Associate Professor of Biomedical Sciences and of Biochemistry

Xiaojin Zou, PhD: Research Assistant Professor, Dalton Cardiovascular Research Center and Department of Biochemistry
Research Areas

**Biomedical Engineering**
Investigators: Gillis, Huxley, Hwang, Jones, Milanick, Rubin, Zou

**Cystic Fibrosis**
Investigators: Clarke, Hwang, Milanick, Price

**Exercise/Inactivity Including Atherosclerosis, Muscle Biology, Obesity, Type II Diabetes, and Vascular Biology**

**Membrane Transport**
Investigators: Clark, Gillis, Hale, Huxley, Hwang, Milanick, Price, Rovetto, Rubin, Zou

**Muscular Dystrophy**
Investigators: Kornegay

**Neurohumoral Control of the Circulation Including Hypertension, Heart Failure, and Salt and Water Homeostasis**
Investigators: Blaine, Cunningham, Hasser, Heesch, Hay, Milanick, Price, Schadt, Sullivan

**Tumor Angiogenesis**
Investigators: Hyder
Funding

**Fiscal Year 2003 Investigator Funding**

<table>
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<tr>
<th>Funding Category</th>
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**Fiscal Year 2003 Funding Distribution**

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<tr>
<td>Non-Resident Investigators Direct Costs</td>
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<tr>
<td>Total Direct Costs (excludes fellowships)</td>
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</table>

**Fiscal Year 2003 Sources of Funding**

- National Institutes of Health: 76%
- NASA: 3%
- HRSA: 7%
- AHA: 3%
- Other: 8%
- NCI: 3%
Research Grants
Fiscal Year 2003 Total Costs

American Heart Association

“Central Autonomic Regulation Following Exercise” Patrick Mueller $60,500

“Energetics of Ligand-Protein Interactions and Structure-Based Drug Design Against P. Aeruginosa Infections” Xiaojin Zou $60,500

“Pregnancy Induced Changes in GABAA Receptor Subunit Expression in a Brainstem” Michael Foley $30,250

“Role of Ubiquitin-Proteasome Pathway in Vascular Wall Metabolism and Atherosclerosis” Joseph Dixon $19,988

Association Françoise contre les Myopathies

“Cellular Effects of Prednisone Treatment in Canine Dystrophy” Joe Kornegay $35,802

Baylor College of Medicine

“Role of Growth Hormone Secretagogues and Exercise on Muscle Homeostasis under Microgravity” Frank Booth $24,946

Chiron Corporation

“Collateral Blood Flow Increases with FGF-2: Study 2” Ronald Terjung $41,617

Cystic Fibrosis Foundation

“Alpha Defensins and Cystic Fibrosis” Lane Clarke $16,200

“CF Mouse Intestine: In Vivo Model for Pharmaceutical Testing” Lane Clarke $15,270

“Intramolecular Regulation of CFTR” Elmer Price $15,000

“Ion Transport Deregulations in the Murine Cystic Fibrosis Intestine, Study of Sodium Chloride Absorption” Lane Clarke $9,400
Health Resources & Services Administration

“Dalton Cardiovascular Research Center Construction/Renovation” Edward Blaine $665,735

Muscular Dystrophy Association

“Cellular Effects of Prednisone Treatment in Canine Dystrophy” Joe Kornegay $76,202

NASA

“Gender Differences in Hindlimb Unloaded Rats” Cheryl Heesch $61,875

“Genomics of Human Skeletal Muscle During Bedrest & Exercise” Marc Hamilton $106,229

“Signaling of Muscle Atrophy with Unloading” Frank Booth $97,313

National Cancer Institute

“Progestin Regulation of VEGF in Human Breast Cancer Cells” Salman Hyder $280,096

National Institutes of Health

“Adenosine Nucleotide Metabolism in Skeletal Muscle” Ronald Terjung $232,112

“Altered Mechanical Loads and Skeletal Muscle Phenotype” Richard Tsika $340,750

“Ca Sensing for Exocytosis” Kevin Gillis $181,250

“CA Sensing for Exocytosis: Research Supplement for Underrepresented Minorities” Kevin Gillis $11,794

“Cardiovascular and Renal Physiology, Pharmacology and Biochemistry” Virginia Huxley $232,363

“Cardiovascular Regulation-Hindlimb Unweighted Animals” Eileen Hasser $276,635

“Central Cardiovascular Control During Blood Loss” James Schadt $253,750

“CFTR and Duodenal Anion Transport” Lane Clarke $217,500
“Circumventricular Organs: Gender & Hypertension” Meredith Hay  $287,318

“Control of Sodium Intake in the Hindlimb Unweighted Rat” Thomas Cunningham  $184,875

“Conversion of Shell Space -- Dalton Cardiovascular Research Center” Edward Blaine  $302,167

“Cytosolic Modulation of Plasma Membrane Ion Transport” Mark Milanick  $106,389

“Exercise and Coronary Adenosine Activated K Currents” Douglas Bowles  $48,366

“Exercise Hypertrophy and Control of Myosin Induction” Richard Tsika  $126,688

“Exercise Training and Peripheral Arterial Insufficiency” Ronald Terjung  $362,500

“Exercise-Induced Growth of Skeletal Muscle” Frank Booth  $204,450

“Failed Rescue of Old Skeletal Muscle from Atrophy” Frank Booth  $287,750

“Gating of the CFTR Cl Channel by ATP Hydrolysis” Tzyh-Chang Hwang  $253,750

“Metabotropic Glutamate Receptors and Baroreflex Function” Eileen Hasser  $253,750

“Molecular Pathophysiology of Cystic Fibrosis” Tzyh-Chang Hwang  $184,995

“Neural Regulation of Vasopression Release” Thomas Cunningham  $181,250

“Neural Systems Regulating Vasopressin Release” Thomas Cunningham  $67,500

“Ovarian Hormone Metabolites and Neural Circulatory Control” Cheryl Heesch  $83,532

“Proteomics: Inactivity-induced Muscle Insulin Resistance” Frank Booth  $72,500

“Quantitative Structure and Function of ABC Transporters” Xiaoqin Zou  $106,693
“Regulation of Baroreceptor Afferent Transmission” Meredith Hay  $91,166

“Regulation of Single Capillary Permeability Properties” Virginia Huxley  $210,115

“Regulation of the Secretion of ApoB-Lipoproteins” Joseph Dixon  $253,660

“Satellite Stem Cell Biology” Frank Booth  $188,456

“Training: Muscle Blood Flow and Capillary Dynamics” Harold Laughlin  $246,951

“Vascular Biology: Exercise Training and Coronary Disease” Harold Laughlin  $1,580,971

**National Science Foundation**

“Cellular Electrophysiology on a Chip” Kevin Gillis  $202,595

**Office of Naval Research**

“Neural, Endocrine, and Local Mechanisms in the Effects of Environmental Stressors on the Cardiovascular Response to Blood Loss” James Schadt  $163,607

**Parent Project Muscular Dystrophy**

“Investigative Therapeutics in a Canine Model of Duchenne Muscular Dystrophy” Joe Kornegay  $105,332

**Proctor & Gamble**

“VEGF-mediated Collateral Blood Flow” Ronald Terjung  $32,145

**Susan G. Komen Breast Cancer Foundation**

“Progestin Regulation of VEGF in Breast Cancer Cells” Salman Hyder  $36,803
Fellowships

American Heart Association

“Role of Adenosine on Collagen Deposition and Its Significance in Myocardial Hypertrophy and Heart Failure” Arvinder Dhalla (Leona Rubin, sponsor) $65,000

“Modulation of CFTR Gating by Membrane Cholesterol” Tomohiko Ai (Tzyh-Chang Hwang, sponsor) $40,343

Cystic Fibrosis Foundation

“Molecular Biophysics of the CFTR Channel Pore” Zhen Zhou (Tzyh-Chang Hwang, sponsor) $20,509

National Institutes of Health

“Adenosine Activation of Voltage-Dependent K+ Channels” Cristine Heaps (Douglas Bowles, sponsor) $44,136

“Angiogenic Growth Factors in Exercising Skeletal Muscle” Pamela Lloyd (Ronald Terjung, sponsor) $40,196

“Lipids and Gene Regulation in Skeletal Muscle” Theodore Zderic (Marc Hamilton, sponsor) $36,952

“Remodeling of Collateral Vessels After Femoral Occlusion” Barry Prior (Ronald Terjung, sponsor) $51,392

“Molecular Biophysics of CFTR Chloride Channels” Silvia Bompadre (Tzyh-Chang Hwang, sponsor) $20,062

“The Role of Leukemia Inhibitory Factor in Satellite Cell Proliferation and Skeletal Muscle Regrowth” Espen Spangenberg (Frank Booth, sponsor) $16,390

United Negro College Fund

“Regulation of CFTR Gating by cAMP-Dependent Protein Kinase Phosphorylation” Allan C. Powe, Jr (Tzyh-Chang Hwang, sponsor) $5,833
## Postdoctoral Fellows

<table>
<thead>
<tr>
<th>Student</th>
<th>Advisor</th>
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<tbody>
<tr>
<td><strong>Tomohiko Ai</strong></td>
<td>Dr. Tzyh-Chang Hwang</td>
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<tr>
<td>Physiology</td>
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<tr>
<td><strong>Layla Al-Nakkash</strong></td>
<td>Dr. Leona Rubin</td>
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<tr>
<td>Biomedical Sciences</td>
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<tr>
<td><strong>Ranan Aktas</strong></td>
<td>Dr. Joseph Dixon</td>
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<tr>
<td>Biological Sciences</td>
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<tr>
<td><strong>Lionel Bey</strong></td>
<td>Dr. Marc Hamilton</td>
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<tr>
<td>Biomedical Sciences</td>
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<tr>
<td><strong>Silvia Bompadre</strong></td>
<td>Dr. Tzyh-Chang Hwang</td>
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<tr>
<td>Physiology</td>
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<tr>
<td><strong>Julie Bossuyt</strong></td>
<td>Dr. Calvin Hale</td>
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<tr>
<td>Veterinary Biomedical Sciences</td>
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<tr>
<td><strong>Casey Childers</strong></td>
<td>Dr. Joe Kornegay</td>
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<tr>
<td>Veterinary Biomedical Sciences</td>
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<tr>
<td><strong>Zhiqiang Fan</strong></td>
<td>Dr. Frank Booth</td>
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<tr>
<td>Biomedical Sciences</td>
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<tr>
<td><strong>Olga Glinskii</strong></td>
<td>Dr. Virginia Huxley</td>
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<tr>
<td>Physiology</td>
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<tr>
<td><strong>Lara Gawenis</strong></td>
<td>Dr. Lane Clarke</td>
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<tr>
<td>Biomedical Sciences</td>
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<tr>
<td><strong>Cristine Heaps</strong></td>
<td>Dr. Douglas Bowles</td>
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<tr>
<td>Biomedical Sciences</td>
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<tr>
<td><strong>Kyle Henderson</strong></td>
<td>Dr. Harold Laughlin</td>
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<tr>
<td><strong>Shengyou Huang</strong></td>
<td>Dr. Xiaqin Zou</td>
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<tr>
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<tr>
<td><strong>Lyudmyla Kvochina</strong></td>
<td>Dr. Cheryl Heesch</td>
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<tr>
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<tr>
<td><strong>Hao-Yang Liu</strong></td>
<td>Dr. Xiaqin Zou</td>
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<tr>
<td>Dalton Cardiovascular Research Center</td>
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<tr>
<td><strong>Jocelyn Liu</strong></td>
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<tr>
<td><strong>Pam Lloyd</strong></td>
<td>Dr. Ronald Terjung</td>
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<tr>
<td>Biomedical Sciences</td>
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</tbody>
</table>
Shuichi Machida  
Biomedical Sciences  
Dr. Frank Booth

Brad Noble  
Physical Medicine & Rehabilitation  
Dr. Marc Hamilton

Carol Okamura  
Biomedical Sciences  
Dr. Joe Kornegay

Jayabala Pamidimukkala  
Biomedical Sciences  
Dr. Meredith Hay

Allan Powe  
Physiology  
Dr. Joseph Dixon  
Dr. Tzyh-Chang Hwang

Barry Prior  
Biomedical Sciences  
Dr. Ronald Terjung

Jie Ren  
Biomedical Sciences  
Dr. Ronald Terjung

Espen Spangenberg  
Biomedical Sciences  
Dr. Frank Booth

Xavier Stien  
Dalton Cardiovascular Research Center  
Dr. Lane Clarke

Dharmesh Vyas  
Biomedical Sciences  
Dr. Frank Booth

Christopher Woodman  
Biomedical Sciences  
Dr. Elmer Price

Jianbo Wu  
Biomedical Sciences  
Dr. Marc Hamilton

Bao Jian Xue  
Biomedical Science  
Dr. Meredith Hay

Yan Yang  
Biomedical Sciences  
Dr. Kevin Gillis

Theodore Zderic  
Biomedical Sciences  
Dr. Marc Hamilton

Zhen Zhou  
Physiology  
Dr. Tzyh-Chang Hwang
Graduate Students

<table>
<thead>
<tr>
<th>Student</th>
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<tbody>
<tr>
<td>Kirk Abraham</td>
<td>Dr. Ronald Terjung</td>
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<td>Biomedical Sciences</td>
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<td>Kathryn Arns</td>
<td>Dr. Lane Clarke</td>
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<td>Jeffrey Brault</td>
<td>Dr. Ronald Terjung</td>
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<td>Peng Chen</td>
<td>Dr. Kevin Gillis</td>
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<tr>
<td>Xiaohui Chen</td>
<td>Dr. Kevin Gillis</td>
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<td>Sathya Chinnadurai</td>
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<tr>
<td>Veterinary student</td>
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<td>Philip Fabrizio</td>
<td>Dr. Marc Hamilton</td>
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<td>Physiology</td>
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<td>Chad Hancock</td>
<td>Dr. Ronald Terjung</td>
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<td>Biomedical Sciences</td>
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<tr>
<td>Bradley Harrison</td>
<td>Dr. Thomas Cunningham</td>
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<td>(Med student)</td>
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<tr>
<td>Meghana Honnatti</td>
<td>Dr. Kevin Gillis</td>
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<tr>
<td>Electrical Engineering</td>
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<td>Sonia Houston</td>
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<td>B. Matthew Howe</td>
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<td>David Kump</td>
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<td>Mechele Lewis</td>
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<td>Kalyani Maddalli</td>
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<td>R. Tyler Morris</td>
<td>Dr. Frank Booth</td>
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</tbody>
</table>
Lee Ann Newman
Biomedical Sciences
Dr. Leona Rubin

Nicole Patino
Biological Engineering
Dr. Kevin Gillis

J. Scott Pattison
Physiology
Dr. Frank Booth

Chris Rathbone
Physiology
Dr. Frank Booth

Rei Sasaki
Physiology
Dr. Virginia Huxley

Heidi Shafford
Biomedical Sciences
Dr. James Schadt

Wonchul Shin
Biological Engineering
Dr. Kevin Gillis

Brian Steffen
Physiology
Dr. Frank Booth

Jay Taylor
Veterinary Medicine
Dr. Elmer Price

Mark A. Thompson
Medicine
Dr. Harold Laughlin

Sangeetha Udayasankar
Electrical Engineering
Dr. Kevin Gillis

Jianjie Wang
Physiology
Dr. Virginia Huxley
Dr. Leona Rubin
## Undergraduate Students

<table>
<thead>
<tr>
<th>Student</th>
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<tbody>
<tr>
<td>Beth Bauman</td>
<td>Dr. Marc Hamilton</td>
</tr>
<tr>
<td>Christopher Bethel</td>
<td>Dr. Lane Clarke</td>
</tr>
<tr>
<td>Emily Bradford</td>
<td>Dr. Lane Clarke</td>
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<tr>
<td>Anthony Cova</td>
<td>Dr. Lane Clarke</td>
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<tr>
<td>Jessica Cox</td>
<td>Dr. Michael Rovetto</td>
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<tr>
<td>Tyler Foreman</td>
<td>Dr. Marc Hamilton</td>
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<tr>
<td>Alicia Haught</td>
<td>Dr. Eileen Hasser</td>
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<tr>
<td>Jamie Joshua</td>
<td>Dr. Mark Milanick</td>
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<tr>
<td>Michael Lawrence</td>
<td>Dr. Mark Milanick</td>
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<tr>
<td>Melissa Page</td>
<td>Dr. Marc Hamilton</td>
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<tr>
<td>Anamika Pandya</td>
<td>Dr. Lane Clarke</td>
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<tr>
<td>Justin Sponaugle</td>
<td>Dr. Kevin Gillis</td>
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<tr>
<td>Shengxin Sun</td>
<td>Dr. Virginia Huxley</td>
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<tr>
<td>Bonnie Taylor</td>
<td>Dr. Calvin Hale</td>
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<tr>
<td>Andrew Wheeler</td>
<td>Dr. Leona Rubin</td>
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<tr>
<td>Jennifer Wolf</td>
<td>Dr. Marc Hamilton</td>
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</table>
Seminar Series

“The Na, K-ATPase: from Cardiovascular Physiology to Molecular Biochemistry and Back”
Craig Gatto, Ph.D.
Department of Physiology & Biophysics
Illinois State University
Co-sponsored by the Department of Medical Pharmacology & Physiology

“Genotype/Phenotype Relationship of Ion Channel Mutations causing Long QT Syndrome”
Minoru Horie, M.D.
Department of Cardiovascular Medicine
Kyoto University School of Medicine
Co-sponsored by the Department of Medical Pharmacology & Physiology

“Central Causes of Varying Responsivity to Cocaine or Stress and the Relationship to Hypertension, Heart Disease, and Endotoxemia”
Mark Kneupfer, Ph.D.
Department of Pharmacological and Physiological Science
St. Louis University School of Medicine
Co-sponsored with the Department of Biomedical Sciences

“Purinergic Transmission & Central Autonomic Regulation: The 100% Hypothesis Revisited”
Andrew M. Lawrence, Ph.D.
Department of Pharmacology
Monash University, Clayton, Australia
Co-sponsored with the Department of Biomedical Sciences
“Neurotransmission of the Chemoreflex in the Nucleus Tractus Solitarii of Awake Rats”
Benedito Machado, Ph.D.
Department of Physiology
School of Medicine of Ribeirão Preto, University of São Paulo, Brazil
Co-sponsored with the Department of Biomedical Sciences

“Cardiac Phenotypes in MyBP-C Knock-out Mice”
Richard Moss, Ph.D.
Department of Physiology, University of Wisconsin Medical School
Director, University of Wisconsin Cardiovascular Research Center.
Co-sponsored with the Department of Medical Pharmacology & Physiology

“The Na, K-ATPase: From Cardiovascular Physiology to Molecular Biochemistry and Back”
Glen Toney, Ph.D.
Department of Physiology
University of Texas Health Science Center, San Antonio
Co-sponsored with the Department of Medical Pharmacology & Physiology
Abstracts

Booth


Bowles


Clarke


Cunningham


Dixon


Foley


Hale


Hamilton
Hamilton, MT. The Exercise Training Dose-Response Relationship: An Integrative View From Molecular Biology, Physiology, And Epidemiology. MSSE, April Supplement, 2002.

Hasser
Mueller, PJ, Cunningham JT, Grindstaff RR, Laughlin MH, Hasser EM. Hypotension-Induced Fos Expression in the Hypothalamus of Endurance Trained Rats. FASEB J. 2002

Hay

Heesch


Huxley


Hwang


Hyder

Jones

Kornegay

Laughlin
Laughlin, M. H., T. Strawn, and P. K. Throne. Interval sprint training (IST) does not increase acetylcholine-induced dilation of arterioles in the white portion of rat


Milanick

Gatto, C, CT Barkulis, WR. Schneider, JH Holden, KL Arnett and MA Milanick. Inhibition of the Na,K-ATPase by the antiarrhythmic drug, Bretylium. Annals NY Acad Sciences, in press.

Mueller


Mueller, P.J. Cunningham, J.T., Grindstaff, R.R., Laughlin, M.H. and Hasser E.M.


Price


Rovetto


Rubin


Schadt

Terjung
Journal Articles

Booth
Vyas, D, EE Spangenburg, WA Tsghe, TE Childs, and FW Booth GSK-3β negatively regulates skeletal myotube hypertrophy. Am J Physiol.: Cell physiol. 283:C545-C551, 2002

Bowles

Clarke
Clarke, LL, and Harline, MC. CFTR and HCO3- Dependent Cl- Secretion Across Murine Proximal Duodenum. Am. J. Physiol. (Submitted).
Cunningham

Dixon


Mueller PM, Foley CM, Vogl HW, Hay M, and Hasser EM. Response to group III mGluR activation in NTS does not involve actions at glycine sites on NMDA channels. Am. J. Physiol. (Heart Circ. Physiol.) In Revision.

**Gillis**


**Hale**


**Hamilton**


Bey, L. and Hamilton M.T. A molecular reason to maintain daily low-intensity activity: Suppression of skeletal muscle lipoprotein lipase activity during physical inactivity. J. Physiol., in second review

Dalton Cardiovascular Research Center 29
Hasser
Mueller PJ, Foley CM, Vogl HW, Hay M and Hasser EM. Response to Group III mGluR Activation in NTS does not Involve Actions at Glycine Sites on NMDA Channels. Submitted to Am. J. Physiol. (Heart Circ. Physiol.)
Foley CM, Stanton JJ, Price EM, Cunningham JT, Hasser EM, and Heesch CM. GABA_A α_1 and α_2 Receptor Subunit Expression in Rostral Ventrolateral Medulla in Nonpregnant and Pregnant Rats. In Press. Brain Research 2003

Hay
Xue, B. and Hay, M. Estradiol inhibits excitatory amino acid effects on NTS neurons. Accepted, Brain Res., 2003.

Heesch
Foley, C.M., J.J. Stanton, E.M. Price, J.T. Cunningham, E.M. Hasser, and C.M. Heesch. GABAA α_1 and α_2 receptor subunit expression in rostral ventrolateral medulla in nonpregnant and pregnant rats. Accepted, Brain Research.
Regional hemodynamic effects of acute carbon monoxide hypoxia in the anesthetized rat. In Revision, Amer. J. Physiol.


**Huxley**


Huxley, V.H, Gender-differences in the permeability response of pig coronary microvessels to adenosine. J. Appl. Physiol.

Huxley, V.H, Gender-differences in adaptation to endurance exercise training of pig coronary microvessel permeability to albumin. J. Appl. Physiol.


**Hwang**


**Hyder**


Jones

Kornegay
Kornegay JN, DD Cundiff, DJ Bogan, JR Bogan, CS Okamura: The cranial sartorius muscle undergoes true hypertrophy in dogs with golden retriever muscular dystrophy. Neuromuscular Disorders, in press.

Laughlin

Milanick
Mueller
Hay, M., Mueller, P.J., Foley, C.M., Bishop, V.S. and Hasser, E.M. Glutamate receptors in the nucleus tractus solitarius are involved in area postrema mediated sympathoinhibition. Am. J. Physiol. (under revision).

Price


Rubin


Schadt

Terjung


Zou
Hao-Yang Liu, Min Li, and Tzyh-Chang Hwang, Xiaoqin Zou. A Dimeric Structural Model of the Nucleotide Binding Domains of CFTR Based on the Crystal Structures of MalK and HisP. To be submitted to Biochemistry.
Ronald A. Siegel and Xiaoqin Zou. Membrane hysteresis of a simple Hill model system. To be submitted to Journal of Chemical Physics.

Patents

Price
U.S. Provisional Patent Application No. UVMO:024USP1 entitled "Method of Treatment of Endothelial Dysfunction and Engineered Proteins for Same”, Elmer M. Price (Inventor), Miles Tanner, Harold Laughlin, Mike Sturek (Co-Inventors)
Awards, Honors and Offices

Booth
Associate Editor, Journal of Applied Physiology
Editorial Board, American Journal of Physiology: Cell Physiology

Foley
Caroline tum Suden/ Frances A. Hellebrandt Professional Opportunity Award, American Physiological Society

Hasser
Inaugural Lecturer, University of Western Ontario
Golden Aesculapius Teaching Award
Associate Editor, Am. Journal of Physiology: Heart Circ. Physiology

Hay
Board Member, American Heart Association: Missouri Affiliate
Fellowship to attend Center for Creative Leadership – Leadership Development Program
Chair, Study-Section, CV-Reg.2, AHA National Center
FASEB Science Policy Committee

Heesch
Editorial Board, American Journal of Physiology: Heart and Circulatory Physiology
Consulting Editor, American Journal of Physiology: Heart and Circulatory Physiology
Guest Editor, Advances in Physiology Education

Huxley
National Organizing Committee for the 2005 meeting of IUPS
Hugh Stephenson Award: Research, American Heart Association-Heartland Affiliate
Associate Editor, Microcirculation
Editorial Board, American Journal of Physiology: Heart & Circulatory Physiology
Editorial Board, Microvascular Research
Editorial Board, Journal of Vascular Research

Hyder
Editorial Board, Histology & Histopathology

Laughlin
Sigma Xi Excellence in Graduate Research Mentoring Award, University of Missouri
Editorial Board, Journal of Applied Physiology
Associate Editor, Medicine & Science in Sports & Exercise

Milanick
Editorial Board, Journal of Membrane Biology
Rubin
Editorial Board, Shock
Honorary Member, Phi Zeta Veterinary Honor Society

Schadt
Editorial Board, American Journal of Physiology: Heart and Circulatory Physiology
Editorial Board, Journal of Applied Physiology

Terjung
Editorial Board, Journal of Applied Physiology
Peer Review

Booth
Health & Science Policy Committee, American College of Sports Medicine
Planning committee of Normative Measures of Musculoskeletal Fitness, NIH Workshop
Member International Union of Physiological Sciences commission on Work and
Exercise Physiology

Bowles
Study section member, American Heart Association Peer Review Study Group,
Association/Professional Organization Service
Ad-hoc Member, NIH Skeletal Muscle Biology Study Section.

Clarke
Reviewer, American Journal of Physiology: Gastrointestinal and Liver Physiology
Reviewer, American Journal of Physiology: Cell Physiology
Reviewer, Gastroenterology
Reviewer, Journal of General Physiology
Reviewer, American Journal of Respiratory Cell and Molecular Biology
Reviewer, American Journal of Veterinary Research
Grant Review, Missouri Research Board
Grant Review, Cystic Fibrosis Foundation - Research and Research Training Committee

Dixon
NIH Metabolism Study Section, Nutritional and Metabolic Sciences Integrated Review
Group. Special Reviewer, October, 2001 to present
Reviewer, Journal of Lipid Research
Reviewer, Journal of Biological Chemistry
Reviewer, Biochimica et Biophysica Acta
Reviewer, Atherosclerosis

Foley
Reviewer, Brain Research
Reviewer, American Journal of Physiology
Reviewer, Heart and Circulatory

Gillis
Reviewer, Nature
Reviewer, Reviewer, Science
Reviewer, Neuron
Reviewer, EMBO Journal
Reviewer, Biophysical Journal
Reviewer, Journal of Theoretical Biology
Reviewer, Journal of Neuroscience
Grant Review, NIH: ad hoc reviewer
Grant Review, National Science Foundation panel “Biochips”

Dalton Cardiovascular Research Center 38
Hale
Reviewer, National Science Foundation
Reviewer, American Heart Association – Great American Consortium
Reviewer, Biochimica et Biophysica Acta
Reviewer, Metabolism - Clinical and Experimental

Hamilton
Reviewer, Journal of Applied Physiology
Reviewer, Physiological Genomics
Reviewer, Biochemistry and Cell Biology
Reviewer, Medicine in Science and Sports and Exercise
Reviewer, Journal of Gravitational Physiology
Reviewer, European Journal of Lipid Science and Technology
Grant Review, NIH study section/NINDS
Grant Review, University of Missouri Research Board

Hasser
Reviewer, American Journal of Physiology, Heart and Circulation
Reviewer, American Journal of Physiology, Regulatory, Integrative
Reviewer, Brain Research
Reviewer, Canadian Journal of Physiology and Pharmacology
Reviewer, Hypertension
Reviewer, Journal of Applied Physiology
Reviewer, Journal of Physiology
Reviewer, Journal of the Autonomic Nervous System
Reviewer, Medicine and Science in Sports and Exercise
Reviewer, Neuroscience
Grant Review, American Heart Association, Heartland Section

Hay
Reviewer, American Journal of Physiology, Heart and Circulation
Reviewer, American Journal of Physiology, Regulatory, Integrative
Reviewer, Hypertension
Reviewer, Journal of Neurophysiology
Reviewer, Brain Research
Reviewer, Journal of Autonomic Nervous System
Reviewer, Journal of Applied Physiology
Grant Review, NIH Study Section, ECS
Grant Review, AHA Study Section Chair, Cardiovascular Regulation II, American Heart Association, National (Dallas)

Heesch
Reviewer, Journal of Applied Physiology
Reviewer, American Journal of Physiology
Reviewer, Heart & Circulatory Physiology
Reviewer, Regulatory, Integrative, and Comparative
Reviewer, Medicine & Science in Sports & Exercise
Grant Review, NIH, Respiratory Physiology Study Section, Ad Hoc

Huxley
Reviewer, American Journal of Physiology (Heart & Circulation; Cell; Regulatory, Integrative & Comparative; Endocrine & Metabolism)
Reviewer, Circulation Research
Reviewer, Biorheology
Reviewer, Biophys. Biochem. Acta
Reviewer, Journal of Applied Physiology
Reviewer, Journal of Physiology (London)
Reviewer, Annals of Biomedical Engineering
Reviewer, Hypertension
Grant Review, NIH DDK Special Study Section

Hwang
Reviewer, American Journal of Physiology (cell physiology)
Reviewer, American Journal of Physiology (heart and circulation)
Reviewer, Journal of General Physiology
Reviewer, Neuron
Reviewer, Journal of Membrane Biology
Reviewer, Journal of Biological Chemistry
Reviewer, Journal of Pharmacology and Experimental Therapeutics
Reviewer, Journal of Molecular and Cellular Cardiology
Reviewer, Canadian Journal of Physiology and Pharmacology
Reviewer, Biophysical Journal
Reviewer, Journal of Physiology
Reviewer, Brain Research
Reviewer, American Journal of Physiology (Lung, Cell and Molecular)
Grant Review, Cystic Fibrosis Trust (United Kingdom)
Grant Review, Cystic Fibrosis Foundation
Grant Review, Cystic Fibrosis Research Inc.
Grant Review, MU Research Board
Grant Review, Veteran Affairs
Grant Review, NIH (CVA special reviewer, GMB ad hoc member, MCDN3 regular member

Hyder
Reviewer, Breast Cancer Research
Reviewer, Br. J. Pharmacology
Reviewer, Cancer Research
Reviewer, Clinical Cancer Research
Reviewer, Clinical Chemistry
Reviewer, Endocrine
Reviewer, Endocrinology
Reviewer, Fertility and Sterility
Reviewer, Histology and Histopathology
Reviewer, Hormone Research
Reviewer, Human Reproduction
Reviewer, J. Pharmacol. Expt. Therapeutics
Reviewer, J. REPRODUCTION and fertility
Reviewer, Life Sciences
Reviewer, Molecular and Cellular Biology
Reviewer, Molecular Human Reproduction
Reviewer, Pediatric Research
Reviewer, Tumor Biology
Grant Review, Susan G Komen Breast Cancer Foundation
Grant Review, Department of Defense Breast Cancer Program
Grant Review, University of Missouri Research Board

Kornegay
Reviewer, Journal of the American Veterinary Medical Association
Reviewer, Journal of the American Animal Hospital Association
Reviewer, Journal of Neurological Sciences
Reviewer, Neuromuscular Disorders
Reviewer, Journal of Veterinary Internal Medicine

Laughlin
Reviewer, Avia. Space Environ. Med
Reviewer, J. Applied Physiol
Reviewer, Med. Sci. Sports Exercise
Reviewer, Am. J. Physiol.
Reviewer, Hypertension
Reviewer, Blood Vessels
Reviewer, Microvascular Research
Reviewer, Circulation
Reviewer, Circulation Research
Reviewer, Microcirculation
Grant Review, National Institutes of Health

Milanick
Reviewer, American Journal of Physiology: Cell Physiology
Reviewer, Biochimica Biophysica Acta: Biomembranes
Reviewer, Biophysics Journal
Reviewer, Journal of Biological Chemistry
Reviewer, Journal of General Physiology
Reviewer, Journal of Membrane Biology
Reviewer, Journal of Theoretical Biology
Reviewer, Science

Mueller
Reviewer, American Journal of Physiology: Heart and Circulatory Physiology
Reviewer, Journal of Applied Physiology
Reviewer, Medicine and Science in Sports and Exercise
Price
Reviewer, Molecular Pharmacology
Reviewer, Biochimica et Biophysica Acta
Reviewer, Biochemistry
Reviewer, Journal of Applied Physiology

Rubin
Reviewer, American Journal of Physiology, Heart and Circulatory Physiology
Reviewer, Journal Molecular and Cellular Cardiology
Reviewer, Journal Applied Physiology (1 in 2002)
Reviewer, Shock
Grant Review, University of Missouri Research Board
Grant Review, Tobacco Related Disease Research Program, State of California

Schadt
Reviewer, American Journal of Physiology: Regulatory, Integrative and Comparative Physiology
Reviewer, American Journal of Physiology: Physiological Genomics
Reviewer, Cardiovascular Research
Reviewer, European Journal of Pharmacology
Reviewer, Hypertension
Reviewer, Life Sciences
Reviewer, Medicine and Science in Sports and Exercise
Reviewer, Neuroendocrinology
Reviewer, Proceedings of the Society for Experimental Biology and Medicine
Reviewer, Regulatory Peptides
Reviewer, Shock
Grant Review, American Heart Association National (Cardiovascular Regulation II Study Group)
Grant Review, U.S. Army

Zou
Reviewer, Physical Review Letters.
Reviewer, Physical Review E.
Presentations and Lectures

Bowles
ACSM Annual Meeting
Medical College of Georgia, Vascular Biology Center

Clarke
Acid-base transporters in the CFTR-null intestine. Department of Physiology. University of Southern Alabama, Mobile, AL.
Pathophysiology of intestinal obstruction in the CF mouse. Williamsburg Cystic Fibrosis Conference, Williamsburg, VA.
Intestinal obstructive syndrome in cystic fibrosis mice. Vertex Corp., San Diego, CA.

Dixon
Hepatic Free Cholesterol is Highly Correlated with Coronary Atheroma in Diabetic Dyslipidemic Pigs. University of Missouri, Cardiovascular Day IX, February 4, 2002
Swine models of Increased Atherosclerosis in Diabetes. Symposium: Mechanisms of Macrovascular Disease in Diabetes. Diabetes Endocrinology Research Center, University of Washington, Seattle, May 21, 2002

Gillis
The relationship between cAMP, Ca$^{2+}$, and transport of CFTR to the plasma membrane. Oregon Health Sciences University, Vollum Institute, Portland, OR, 02/2002
The relationship between cAMP, Ca$^{2+}$, and transport of CFTR to the plasma membrane. Case Western Reserve University, Dept. of Physiology, Cleveland, OH, 03/2002
Protein kinase C enhances a highly Ca-sensitive mode of exocytosis in chromaffin cells. University of Southern California, Dept. of Physiology, Los Angeles, CA, 11/2002

Hale
Cardiac Sodium-Calcium Exchange: Large-Scale Expression and Possible Role in Transmembrane Signaling. Department of Physiology and Biophysics, Finch University of Health Sciences, The Chicago Medical School, Chicago, IL, January 2002.
Cardiac Sodium-Calcium Exchange and Caveolae. Department of Biochemistry and Molecular Biology, St. Louis University School of Medicine, St. Louis, MO December 2002.

Hamilton
Bey L, Wu JB, Zderic T, Hamilton D, Hamilton MT. Suppression of lipoprotein lipase in skeletal muscle during inactivity requires the transcription of a sedentary factor.
American College Sport of Medicine, Central States Symposium, October 2002, Kansas City.


Hamilton, MT. Molecular and metabolic responses to exercise and inactivity. National Meeting of The American College of Sports Medicine St. Louis, MO. 05/02


Hamilton, MT. Technical and theoretical advantages and limitations to microarray studies in assessing candidate genes for countermeasures. National Space Biomedical Research Symposium. Houston, TX. 01/02.

Hasser
Central Mechanisms of Cardiovascular Control after Cardiovascular Deconditioning. FASEB Summer Conference on Neural Control of the Circulation

Hay


Circumventricular Organs; Sex and Hypertension. Department of Physiology, Georgetown University , Washington, D.C., 2002.

Heesch

University of Missouri – Kansas City, School of Pharmacy/ Kansas City, MO. CNS Effects of Ovarian Hormones on Cardiovascular Regulation.


Huxley
Eli Lily and Company, Cardiovascular Toxicology Division, Physiological Adaptation of Microvascular Permeability.
University of Rochester School of Medicine: Rochester, NY: Department of Pharmacology & Physiology, Despite what the Textbooks say Microvascular Barrier Properties Adapt to Changes in their Environment.

University of Rochester Matrix Journal Club. Adaptation of the Microvascular Glycocalyx: a Mechanism Participating in the Regulation of the Microvascular Barrier to Water and Solute.

American Heart Association, Chicago, IL. Co-chair session on Vasodilator Mechanisms in the Microcirculation

Hwang
Department of Physiology, University of California, Davis
Department of Physiology, Robert Wood Johnson Medical School
Institute of Human Gene Therapy, University of Pennsylvania
Department of Physiology, Johns Hopkins Medical School

Kornegay
Breed specific meningitis. Recent Advances in Animal Health and Production. Faculty of Veterinary Medicine, Universiti Putra Malaysia. Serdang, MALAYSIA, 2002.

Laughlin

Milanick
The Na pump and Stress, Illinois State University.

Mueller
Hypotension-Induced Fos Expression in the Hypothalamus of Endurance Trained Rats. Cardiovascular Day, Columbia, MO
Physical Activity, Inactivity and Neural Control of the Circulation. Dept. of Physiology, University of Missouri-Columbia

Price

Rubin
HELIX2002: Teaching, Transformation & Technology April, Tan-Tar-A, Osage Beach, Missouri
24th Annual Meeting of the International Society for Heart Research, North American Chapter. Translational Approaches to Cardiovascular Disease. Madison, WI.
Society for Women’s Health Research, Scientific Advisory Meeting on Sex Differences in Cardiovascular Health and Disease. Madison, WI.

Schadt

Terjung

Zou
School of Physical Sciences, Wuhan University, P.R. China
Department of Chemistry, University of Missouri-Columbia