Dalton Cardiovascular Research Center

Annual Report 2003-2004
Summary of Accomplishments

Publications and Presentations
76 articles published
77 abstracts published
26 invited presentations

Funding and Peer Review
$9,910,744 in total direct costs
12 investigators served on editorial boards of 11 scientific journals
21 investigators review articles for 84 scientific journals
9 investigators review grant applications for 13 granting agencies

Education and Training
18 postdoctoral fellows
30 graduate students
9 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, physiology, pharmacology, 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 76 manuscripts in nationally recognized journals and books and gave over 25 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): Professor of Medical Pharmacology & Physiology

Frank W. Booth, PhD: Professor of Biomedical Sciences

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

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

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

Kevin D. Gillis, DSc: Associate Professor of Biological Engineering

Liqun (Andrew) Gu, PhD: Assistant Professor of Biological Engineering

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

Marc Hamilton, PhD: Assistant Professor of Biomedical Sciences

Eileen M. Hasser, PhD: Professor of Biomedical Sciences

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

Cheryl M. Heesch, PhD: Professor of Biomedical Sciences

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

Tzyh-Chang Hwang, PhD: Professor of Medical Pharmacology & Physiology

Salman M. Hyder, PhD: Associate Professor of Biomedical Sciences, Zalk Missouri Professor of Tumor Angiogenesis

Allan W. Jones, PhD: Professor of Medical Pharmacology & Physiology
Joe N. Kornegay, DVM, PhD: Professor and Dean of the College of Veterinary Medicine

Ronald J. Korthuis, PhD: Bolm Distinguished Professor and Chairman of Medical Pharmacology & Physiology

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

Jaya Pamidimukkala, PhD: Research Assistant Professor, Dalton Cardiovascular Research Center

Jeffrey T. Potts, PhD: Associate Professor of Biomedical Sciences

Elmer M. Price, PhD: Interim Director of the Dalton Cardiovascular Research Center, 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

James R. Sowers M.D., FACE, FACP, FAHA: Director of the MU Diabetes and Cardiovascular Center, Associate Dean for Clinical Research Professor of Medicine, Physiology and Pharmacology

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

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

Xiaqin 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, Gu

Cystic Fibrosis
Investigators: Clarke, Hwang, Milanick, Price

Exercise/Inactivity Including Atherosclerosis, Muscle Biology, Obesity, Type II Diabetes, and Vascular Biology
Investigators: Booth, Bowles, Hale, Hamilton, Hasser, Huxley, Jones, Laughlin, Price, Rubin, Terjung, Tsika

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, Hasser, Heesch, Hay, Milanick, Price, Schadt, Potts

Tumor Angiogenesis
Investigators: Hyder
## Funding

### Fiscal Year 2004 Investigator Funding

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant Funds - Direct Costs</td>
<td>7,218,601</td>
</tr>
<tr>
<td>Grant Funds - Indirect Costs</td>
<td>2,437,861</td>
</tr>
<tr>
<td>Fellowships</td>
<td>254,283</td>
</tr>
<tr>
<td>Total Funding</td>
<td>9,910,744</td>
</tr>
</tbody>
</table>

### Fiscal Year 2004 Funding Distribution

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident Investigators Direct Costs</td>
<td>3,721,776</td>
</tr>
<tr>
<td>Non-Resident Investigators Direct Costs</td>
<td>3,496,825</td>
</tr>
<tr>
<td>Total Direct Costs</td>
<td>7,218,601</td>
</tr>
</tbody>
</table>

(excluding fellowships)

### Fiscal Year 2004 Funding Sources

- National Institutes of Health: 78%
- AHA: 3%
- HRSA: 7%
- NASA: 4%
- NCI: 3%
- Other: 5%
Research Grants
Fiscal Year 2004 Total Costs

American Heart Association

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

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

“Frequency Dependent Depression of Exocytosis in Baroreceptor Neurons and Role of Voltage-Gated Calcium Channels” Jayabala Pamidimukkala $39,000

“Pregnancy Induced Changes in GABAA Receptor Subunit Expression in a Brainstem” Charles M. Foley $60,500

Association Francoise contre les Myopathies

“Cellular Effects of Prednisone Treatment in Canine Dystrophy” Joe Kornegay $26,852

Cystic Fibrosis Foundation

“Alpha Defensins and Cystic Fibrosis” Lane L. Clarke $64,800

Health Resources & Services Administration

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

Microheart Inc.

“Efficacy of PR11” Ronald Terjung $89,068

Muscular Dystrophy Association

“Cellular Effects of Prednisone Treatment in Canine Dystrophy” Joe Kornegay $38,963

NASA

“GABA Transmission in CV Function Following Simulated Microgravity in Male and Female Rats” Charles M. Foley $25,666

“Gender Differences in Hindlimb Unloaded Rats” Cheryl M. Heesch $317,680

“Genomics of Human Skeletal Muscle During Bedrest & Exercise” Marc Hamilton $31,409
“Signaling of Muscle Atrophy with Unloading” Frank W. Booth $17,938

National Cancer Institute

“Progestin Regulation of VEGF in Human Breast Cancer Cells” Salman M. Hyder $279,721

National Institutes of Health

“Adenosine Nucleotide Metabolism in Skeletal Muscle” Ronald Terjung $348,624
“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 $30,733
“Cardiovascular and Renal Physiology, Pharmacology and Biochemistry” Virginia Huxley $233,393
“Cardiovascular Regulation-Hindlimb Unweighted Animals” Eileen Hasser $253,750
“Central Cardiovascular Control During Blood Loss” James C. Schadt $253,750
“CFTR and Duodenal Anion Transport” Lane L. Clarke $217,500
“Circumventricular Organs: Gender & Hypertension” Meredith Hay $70,498
“Conversion of Shell Space -- Dalton Cardiovascular Research Center” Edward H. Blaine $302,167
“Cytosolic Modulation of Plasma Membrane Ion Transport” Mark Milanick $8,866
“Cytosolic Modulation of Plasma Membrane Ion Transport” Mark Milanick $359,190
“eNOS: Metabolism & Vascular Biology in Health & Disease” Harold Laughlin $546,619
“Exercise and Health: Integration from Molecule to Patient” Ronald Terjung $174,045
“Exercise Hypertrophy and Control of Myosin Induction” Richard Tsika $106,700
“Exercise Training and Peripheral Arterial Insufficiency” Ronald Terjung $362,500
“Exercise-Induced Growth of Skeletal Muscle” Frank W. Booth $170,375
“Failed Rescue of Old Skeletal Muscle from Atrophy” Frank W. Booth $290,000
“Gating of the CFTR C1 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  $253,937

“Neural Circulatory Control: Pregnancy & Ovarian Hormones” Cheryl M. Heesch  $120,404

“Neural Systems Regulating Vasopressin Release” Thomas Cunningham  5,625

“Proteomics: Inactivity-induced Muscle Insulin Resistance” Frank W. Booth  $12,083

“Quantitative Structure and Function of ABC Transporters” Xiaojin Zou  $108,369

“Regulation of Barareceptor Afferent Transmission” Meredith Hay  $37,986

“Regulation of Single Capillary Permeability Properties” Virginia Huxley  $214,820

“Regulation of the Secretion of ApoB-Lipoproteins” Joseph Dixon  $63,370

“Satellite Stem Cell Biology” Frank W. Booth  $144,497

“Training: Muscle Blood Flow and Capillary Dynamics” Harold Laughlin  $103,925

“Vascular Biology: Exercise Training and Coronary Disease” Harold Laughlin  $1,634,861

Office of Naval Research


Parent Project/Muscular Dystrophy

“Investigative Therapeutics in a Canine Model of Duchenne Muscular Dystrophy” Joe Kornegay  $52,666

Proctor & Gamble

“VEGF-mediated Collateral Blood Flow” Ronald Terjung  $8,036

Susan G. Komen Breast Cancer Foundation

“Progestin Regulation of VEGF in Breast Cancer Cells” Salman Hyder  $12,268
University of Pittsburgh/Muscular Dystrophy Association

“Preclinical Gene Therapy in a Large Animal Model of DMD” Joe Kornegay $20,252

University of Pittsburgh/National Institutes of Health

“Preclinical Gene Therapy in a Large Animal Model of DMD” Joe Kornegay $49,567

University of Rochester

“Inflammatory Mechanisms in Arterioles and Venules” Virginia Huxley $82,868
Fellowships

**American Heart Association**

“Basis of Physical-Inactivity-Induced Insulin Resistance” David Kump (sponsor, Frank Booth) $21,000

“Angiotensin II dependent hypertension and the effects of gender: Baojian Xue (sponsor, Meredith Hay) $43,583

“Modulation of CFTR Gating by Membrane Cholesterol” Tomohiko Ai (sponsor, Tzyh-Chang Hwang) $19,450

**Cystic Fibrosis Foundation**

“Molecular Biophysics of the CFTR Channel Pore” Zhen Zhou (Tzyh-Chang Hwang) $23,724

**National Institutes of Health**

“Adenosine Activation of Voltage-Dependent K+ Channels” Christine Heaps (sponsor, Douglas Bowles) $24,074

“Lipids and Gene Regulation in Skeletal Muscle” Theodore Zderic (sponsor, Marc Hamilton) $38,140

“Molecular Biophysics of CFTR Chloride Channels” Silvia Bompadre (sponsor, Tzyh-Chang Hwang) $48,968

“Remodeling of Collateral Vessels After Femoral Occlusion” Barry Prior (sponsor, Ronald Terjung) $35,342
### Postdoctoral Fellows

<table>
<thead>
<tr>
<th>Student</th>
<th>Advisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomohiko Ai</td>
<td>Dr. Tzyh-Chang Hwang</td>
</tr>
<tr>
<td>Physiology</td>
<td></td>
</tr>
<tr>
<td>Layla Al Nakkash</td>
<td>Dr. Leona J. Rubin</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Silvia Bompadre</td>
<td>Dr. Tzyh-Chang Hwang</td>
</tr>
<tr>
<td>Physiology</td>
<td></td>
</tr>
<tr>
<td>Olga Glinskii</td>
<td>Dr. Virginia H. Huxley</td>
</tr>
<tr>
<td>Physiology</td>
<td></td>
</tr>
<tr>
<td>Kyle Henderson</td>
<td>Dr. Harold Laughlin</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Natalia Karasseva</td>
<td>Dr. Richard Tsika</td>
</tr>
<tr>
<td>Molecular Biology</td>
<td></td>
</tr>
<tr>
<td>Simon Lees</td>
<td>Dr. Frank W. Booth</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Jocelyn Liu</td>
<td>Dr. Joe Kornegay</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Shuichi Machida</td>
<td>Dr. Frank W. Booth</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Marli Martins-Pinge</td>
<td>Dr. Eileen M. Hasser</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Brad Noble</td>
<td>Dr. Marc T. Hamilton</td>
</tr>
<tr>
<td>Physical Medicine &amp;</td>
<td></td>
</tr>
<tr>
<td>Rehabilitation</td>
<td></td>
</tr>
<tr>
<td>Barry Prior</td>
<td>Dr. Ronald Terjung</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Andrew Shanely</td>
<td>Dr. Frank W. Booth</td>
</tr>
<tr>
<td>Molecular Biology</td>
<td></td>
</tr>
<tr>
<td>Jianbo Wu</td>
<td>Dr. Salman M. Hyder</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Baojian Xue</td>
<td>Dr. Meredith Hay</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Theodore Zderic</td>
<td>Dr. Marc T. Hamilton</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
</tbody>
</table>
Zhen Zhou
Physiology

Zhifang Zhu
Biomedical Sciences

Dr. Tzyh-Chang Hwang

Dr. Marc T. Hamilton
# Graduate Students

<table>
<thead>
<tr>
<th>Student</th>
<th>Advisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kirk Abraham</td>
<td>Dr. Ronald Terjung</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Nagabhavani Akunuri</td>
<td>Dr. Marc T. Hamilton</td>
</tr>
<tr>
<td>Computer Science</td>
<td></td>
</tr>
<tr>
<td>Kathryn Arns</td>
<td>Dr. Lane L. Clarke</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>James Austgen</td>
<td>Dr. Cheryl M. Heesch</td>
</tr>
<tr>
<td>Pharmacology &amp; Physiology</td>
<td></td>
</tr>
<tr>
<td>Jeffrey Brault</td>
<td>Dr. Ronald Terjung</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Xiaohui Chen</td>
<td>Dr. Kevin D. Gillis</td>
</tr>
<tr>
<td>Biological Engineering</td>
<td></td>
</tr>
<tr>
<td>Jeong Han Cho</td>
<td>Dr. Tzyh-Chang Hwang</td>
</tr>
<tr>
<td>Bioengineering</td>
<td></td>
</tr>
<tr>
<td>Matt Dixon</td>
<td>Leona J. Rubin</td>
</tr>
<tr>
<td>Veterinary Medicine</td>
<td></td>
</tr>
<tr>
<td>Perminder Gulani</td>
<td>Dr. Marc. T. Hamilton</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Chad Hancock</td>
<td>Dr. Ronald Terjung</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td></td>
</tr>
<tr>
<td>Meghanah Honnati</td>
<td>Dr. Kevin D. Gillis</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td></td>
</tr>
<tr>
<td>Kristen Hutchins</td>
<td>Dr. Marc. T. Hamilton</td>
</tr>
<tr>
<td>Physiology</td>
<td></td>
</tr>
<tr>
<td>David Kump</td>
<td>Dr. Frank W. Booth</td>
</tr>
<tr>
<td>Physiology</td>
<td></td>
</tr>
<tr>
<td>Catherine Lenox</td>
<td>Dr. James C. Schadt</td>
</tr>
<tr>
<td>Veterinary Medicine</td>
<td></td>
</tr>
<tr>
<td>Kalyani Maddali</td>
<td>Dr. Douglas K. Bowles</td>
</tr>
<tr>
<td>Physiology</td>
<td></td>
</tr>
<tr>
<td>Greg Miller</td>
<td>Dr. Mark Milanick</td>
</tr>
<tr>
<td>Medicine</td>
<td></td>
</tr>
</tbody>
</table>
R. Tyler Morris  
Physiology  
Dr. Frank W. Booth

Chris Rathbone  
Physiology  
Dr. Frank W. Booth

Nicole Patino  
Biological Engineering  
Dr. Kevin D. Gillis

J. Scott Pattison  
Physiology  
Dr. Frank W. Booth

Rie Sasaki  
Physiology  
Dr. Virginia Huxley

Heidi Shafford  
Biomedical Sciences  
Dr. James C. Schadt

Wonchul Shin  
Biological Engineering  
Dr. Kevin D. Gillis

Janet Simpson  
Biomedical Sciences  
Dr. Lane. L. Clarke

Brian Steffen  
Physiology  
Dr. Frank W. Booth

Darla L. Tharp  
Physiology  
Dr. Douglas K. Bowles  
Dr. Elmer Price

Julie Throop  
Veterinary Pathobiology  
Dr. Virginia H. Huxley

Jianjie Wang  
Medical Pharmacology & Physiology  
Dr. Virginia H. Huxley  
Dr. Leona J. Rubin

Aijing Zhang  
Biochemistry  
Dr. Richard Tsika

Terese Zidon  
Biomedical Sciences  
Dr. Cheryl M. Heesch  
Dr. Elmer Price
## Undergraduate Students

<table>
<thead>
<tr>
<th>Student</th>
<th>Advisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beth Baumann</td>
<td>Dr. Marc T. Hamilton</td>
</tr>
<tr>
<td>Jamie Custer</td>
<td>Dr. Lane L. Clarke</td>
</tr>
<tr>
<td>R. Boyd Field</td>
<td>Dr. Patrick J. Mueller</td>
</tr>
<tr>
<td>Divya Goddapudi</td>
<td>Dr. Lane L. Clarke</td>
</tr>
<tr>
<td>Alicia Haught</td>
<td>Dr. Eileen M. Hasser</td>
</tr>
<tr>
<td>Christine Hoeman</td>
<td>Dr. Leona J. Rubin</td>
</tr>
<tr>
<td>Ashley Mahon</td>
<td>Dr. Elmer Price</td>
</tr>
<tr>
<td>Shengxin (Sunni) Sun</td>
<td>Dr. Virginia H. Huxley</td>
</tr>
<tr>
<td>Lia Thornberry</td>
<td>Dr. Richard Tsika</td>
</tr>
</tbody>
</table>
Abstracts

Bowles
Maddali, K. K., D.H. Korzick and D.K. Bowles. Testosterone effects on PKCδ and Ca,1.2 expression in coronary arteries. Presented at MU Cardiovascular Day, Feb. 9th, 2004


Clarke


Foley

Foley CM, Price EM, and Heesch CM. 2004. GABAα1 and α2 mRNA expression in nucleus tractus solitarius in nonpregnant and pregnant rats. FASEB J.


Hasser

Heesch CM, Foley CM, Phaup GJ, Hasser EM. Gender Differences in Autonomic Determinants of Heart Rate (HR) in Cardiovascular (CV) Deconditioning. FASEB J. 2004


Mueller PJ, Hasser, EM. Alterations in control of sympathetic nerve activity (SNA) by the nucleus tractus solitarius (NTS) in exercise trained (ExTr) rats. FASEB J. 2004

Kvochina L, Foley CM, Hasser EM, Heesch CM. Tonic Excitation and Inhibition of the Paraventricular Nucleus (PVN) in Pregnant Rats

Hay


Pamidimukkala, J., C.J. Hoang and M. Hay, Role of presynaptic GABAB receptors in baroreceptor synaptic transmission. FASEB J. A 577.16, 21003.


Heesch


Huxley


Hyder


Laughlin


Milanick

Mueller


Pamidimukkala


Rovetto

Rubin

Schadt

Sohma

Terjung

**Zou**


Journal Articles

Booth

Bowles


Clarke


Foley
Foley CM, Stanton JJ, Price EM, Cunningham JT, Hasser EM, and Heech, CM. 2003. GABA\textsubscript{A} α\textsubscript{1} and α\textsubscript{2} receptor subunit expression in rostral ventrolateral medulla in nonpregnant and pregnant rats. Brain Res. 975: 196-206.

Gillis

Hamilton

Hassler

Hay

Heesch

Huxley
Hwang

Hyder

Jones

Kornegay

Laughlin


Milanick


Mueller

Pamidimukkala

Rubin

Schadt

Sohma

Terjung
Tsika
Awards, Honors, Offices

Booth
Associate Editor, Journal of Applied Physiology, 1993B1994;
Editorial Board, American Journal of Physiology: Cell Physiology
Editorial Board, Medicine & Sports

Gillis
Elected Chair, Exocytosis and Endocytosis subgroup, Biophysical Society

Hamilton
Editorial Board: Journal of Applied Physiology

Hasser
Associate Editor, Am. J. Physiol. Heart Circ. Physiol.

Hay
Member, NASA- Human and Animal Research Policy Committee
Member, NIH-Hypertension & Microcirculation Study Section
Member, NIH-Experimental Cardiovascular Sciences Study Section
FASEB Science Policy Committee
Education Committee, American Physiological Society

Heesch
Editorial Board, American Journal of Physiology: Heart and Circulatory Physiology
Consulting Editor, American Journal of Physiology: Heart & Circulatory Physiology
Mentor, APS Career Mentoring Program in Physiology

Huxley
Associate Editor, Microcirculation
Editorial Board, American Journal of Physiology: Heart & Circulatory Physiology
Editorial Board, Journal of Vascular Research

Hwang
Gordon Research Conference, invited speaker
Molecular, Cellular and Developmental Neurosciences 3 Study Section, NIH, regular member
Editorial Board, Journal of General Physiology

Hyder
Editorial Board Histology & Histopathology
Kornegay
Outstanding Alumnus Award College of Veterinary Medicine, Texas A&M University

Laughlin
Editorial Board, Journal of Applied Physiology
Associate Editor, Medicine & Science in Sports & Exercise

Milanick
Editorial Board: Journal of Membrane Biology

Rubin
Editorial Board, Shock

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

Terjung
Chair, elected by Environmental and Exercise Physiology Section, American Physiological Society
Books and Chapters

**Booth**

**Huxley**

**Kornegay**

**Terjung**
Peer Review

Bowles
Reviewer, Journal of Physiology
Reviewer, Cardiovascular Research
Reviewer, Medicine & Science in Sports & Exercise
Grant Reviewer, Research Board Grants, University of Missouri System
Grant Reviewer, Regular Member, American Heart Association CV Regulation II Peer Review Study Group
Grant Reviewer, 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, American Journal of Veterinary Research
Reviewer, British Journal of Pharmacology
Grant Reviewer, Missouri Research Board
Grant Reviewer, Cystic Fibrosis Foundation - Research and Research Training
Grant Reviewer, Committee Cystic Fibrosis Foundation - Functional Genomics RFA Committee
Grant Reviewer, National Institutes of Health - Renal Transport/Function Study Sections (Ad Hoc)
Grant Reviewer, Broad Medical Research Foundation (Ad Hoc)

Foley
Reviewer, American Journal of Physiology, Heart and Circulatory
Reviewer, Brain Research
Reviewer, Medicine and Science in Sport and Exercise

Gillis
Reviewer, Nature, Science, Neuron,
Reviewer, EMBO Journal,
Reviewer, Biophysical Journal
Reviewer, Journal of Theoretical Biology
Reviewer, Journal of Neuroscience

Hale
Reviewer, Biochimica et Biophysica Acta (Amsterdam, The Netherlands) manuscript review

Hamilton
Reviewer, Physiological Genomics, American Journal of Physiology (Cell)
Reviewer, American Journal of Physiology (Endo and Metab)
Reviewer, Journal of Applied Physiology
Reviewer, Medicine & Science in Sports & Exercise
Reviewer, Journal of Molecular and Cellular Cardiology
Reviewer, Biochimica et Biophysica Acta, J. of Gravitational Physiology
Reviewer, International J of Spts Med
Reviewer, International J of Spts Nutrition
Reviewer, European J of Lipid Science and Tech
Reviewer, Microvascular Research
Reviewer, Biochemistry and Cell Biology

Hasser
Reviewer, American Journal of Physiology (Heart Circ. Physiol.)
Reviewer, American Journal of Physiology (Reg. Integ. Physiol.)
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, LA Board of Regents Research Competitiveness Program

Hay
Reviewer, American Journal of Physiology, Heart and Circulation
Reviewer, American Journal of Physiology, Regulatory, Integrative Hypertension
Reviewer, Journal of Neurophysiology
Reviewer, Brain Research
Reviewer, Journal of Autonomic Nervous System
Reviewer, Journal of Applied Physiology
Grant Review, NIH Study Section, HM, chartered member

Heesch
Reviewer, Journal of Applied Physiology, guest reviewer
Reviewer, American Journal of Physiology: Heart & Circulatory Physiology
Reviewer, American Journal of Physiology: Regulatory, Integrative, and Comparative
Reviewer, Medicine & Science in Sports & Exercise

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
Hwang
Reviewer, Proceedings of National Academy of Sciences, USA
Reviewer, Nature
Reviewer, FEBS Lett.
Grant Review, NIH (MCDN3, regular member), Philip Morris External Research Program

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 Carcinogenesis
Reviewer, Molecular and Cellular Biology
Reviewer, Molecular Human Reproduction
Reviewer, Pediatric Research
Reviewer, Tumor Biology
Grant review, University of Missouri-Columbia, College of Veterinary Medicine, Committee on Research Grants
Grant review, Susan G Komen Breast Cancer Foundation (2002-2005), (Peer-Review Process Recognized by NCI)
Grant review, Department of Defense Breast Cancer Program (2003 pgm)

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 Study Section: National Institute of Child Health and Human Development: Pediatrics Subcommittee

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
Reviewer, British Journal of Pharmacology
Reviewer, Shock
Grant Review, Tobacco Related Disease Research Program, State of California

Schadt
Reviewer, American Journal of Physiology: Regulatory, Integrative and Comparative Physiology
Reviewer, Hypertension
Grant Review, American Heart Association, National (Cardiovascular Regulation II Study Group)
Grant Review, National Institutes of Health/U.S. Army
Grant Review, NHLBI-Special Emphasis Panel-184

Sohma
Reviewer, Journal of General Physiology
Tsika
Reviewer, Journal of Biological Chemistry
Reviewer, Molecular and Cellular Biology
Reviewer, Journal of Applied Physiology
Reviewer, American Journal of Physiology (Cell Physiology)
Grant Review, National Institutes of Health
Invited Presentations and Lectures

Clarke
Anion exchange activity of the duodenal villus epithelium in wild-type (WT) and cystic fibrosis (CF) mice. Williamsburg Cystic Fibrosis Conference, Williamsburg, VA, May 30-June, 3, 2003.

Hale
"A Vision of Science - What Biology Departments Must Do". Department of Biological Sciences, Hampton University, Hampton, VA, March 2003.

Hay
NASA Sex/Gender Inclusion Workshop, Washington D.C.
Thought Leaders Workshop on Sex Based Biology Society for Women’s Health Research, Washington, D.C.
“Sex, Space and Environmental Adaptation” Presentation to the Office of Science and Technology Policy, Office of the President of the United States, White House Conference Center, Washington, D.C.
“Sex, Aging and Angiotensin II” Workshop, Georgetown University
“Sex and Hypertension”, St. Louis University

Huxley
International Symposium & Workshops on Advanced Experimental Physiology: Excitable Cells, Pancreatic Beta Cells, and Endothelial Cells, Bangkok, Thailand, “The Role of Gender in the Adaptation of Coronary Microvascular Permeability to Exercise: Lessons Learned from Pigs”
Pennsylvania State University: Noll Physiological Research Laboratory Colloquium, "Is sex a value worth considering in studies of physiological adaptation to exercise?"
Department of Medical Pharmacology & Physiology, University of Missouri School of Medicine: “So, ya thought you knew all about albumin?”
NIH RFA Symposium on Arteriole and Venular Function, Bethesda, MD
I H Sarelius and VH Huxley, "Inflammatory mechanisms in arterioles and venules
Dalton Cardiovascular Research Center Investigators Series: "Control of the interface between blood and tissue."

Hwang
Department of Biological Engineering, University of Missouri-Columbia
Department of Physics, University of Missouri-Columbia
Gordon Conference

Hyder
85th Annual Endocrine Society Meeting, Philadelphia
16th Intl. Symposium of the Journal of Steroid Biochemistry and Molecular Biology, Tyrol, Austria, (Steroids and Cancer)
Kornegay

Laughlin

Milanick
Moving Molecules Through Membranes - Up, Down, and Around the Corner
Mount Holyoke College

Mueller
“Effects of Exercise on Neurohumoral Control of the Cardiovascular System”
Dept. of Biomedical Sciences, University of Missouri-Columbia

Rubin

Terjung
Role of Exercise, Angiogenic Growth Factors & Nitric Oxide in Vascular Remodeling.

Tsika
October 2003: TEF-1 interactions at A/T-rich and MEF2 like cis-elements: Functional implications for skeletal and cardiac muscle hypertrophy. Children’s Hospital Medical Center. Molecular Cardiovascular Biology, Cincinnati, OH.

Zou
Department of Chemistry, University of Missouri-Columbia