# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message from the Director</td>
<td>1</td>
</tr>
<tr>
<td>Faculty Listing</td>
<td>3</td>
</tr>
<tr>
<td>Research and Other Scholarly Activities</td>
<td>5</td>
</tr>
<tr>
<td>Teaching Activities</td>
<td>27</td>
</tr>
<tr>
<td>Three-Year Bibliography</td>
<td>33</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>65</td>
</tr>
</tbody>
</table>
The VMI seeks to expand our understanding of the control of blood flow to organ systems and the development of novel therapies for diseases.

The mission of VMI is to perform rigorous, cutting-edge basic and translational research in vascular biology, guided by a systems biology view of the vasculature, where blood flow is regulated by the vessel, circulating molecules, and blood cells. The research is driven by scientists with expertise in hemostasis, red blood cell biophysics, transfusion medicine, cardiovascular biology, mitochondrial biology, and nitrite-nitric oxide-reactive oxygen species biochemistry and signaling. Training the next generation of scientists in bench-to-bedside translational research is very important to the mission.

The VMI harnesses interdisciplinary teams of researchers in hemostasis, red blood cell biophysics, transfusion medicine, cardiovascular biology, mitochondrial biology and nitrite-nitric oxide and reactive oxygen species biochemistry to expand our understanding of the control of blood flow to organ systems and the development of novel therapies for diseases such as pulmonary hypertension, sickle cell vasculopathy, atherosclerosis, hypertension and heart disease.
The VMI has four goals as it pursues its mission and vision:

- Determine the molecular mechanisms underlying clinically important biomedical problems of hemostasis, thrombosis, transfusion medicine, and vascular biology.
- Develop novel, rationally-designed therapies targeting diseases of hemostasis, thrombosis, transfusion medicine, and vascular biology to improve the quality of life for patients affected by related disorders.
- Foster the development of a multidisciplinary training environment for graduate and medical students, residents, and clinical and postdoctoral fellows, with an emphasis on hemostasis, thrombosis, transfusion medicine, and vascular biology.
- Enhance the reputation and recognition of Vitalant and Hemophilia Center of Western Pennsylvania (HCWP) regionally and nationally as active participants in laboratory-based basic and translational research.
FACULTY

Mark T. Gladwin, MD
Jack D. Myers Professor of Medicine and Chair, Department of Medicine
Director, Vascular Medicine Institute

Imad Al Ghouleh, PhD
Assistant Professor of Medicine, Division of Cardiology

Mark T. Gladwin, MD
Jack D. Myers Professor of Medicine and Chair, Department of Medicine
Director, Vascular Medicine Institute

Imad Al Ghouleh, PhD
Assistant Professor of Medicine, Division of Cardiology

Jason Becker, MD
Associate Professor of Medicine, Division of Cardiology

Dennis Bruemmer, MD, PhD
Associate Professor of Medicine, Division of Cardiology

Stephen Y. Chan, MD, PhD
Professor of Medicine, Division of Cardiology

Eugenia Cifuentes-Pagano, PhD
Research Assistant Professor of Pharmacology and Chemical Biology

Paola Corti, PhD
Assistant Professor of Medicine, Division of Cardiology

Partha Dutta, DVM, PhD
Assistant Professor of Medicine, Division of Cardiology

Ning Feng, MD, PhD
Assistant Professor of Medicine, Division of Cardiology

Samit Ghosh, PhD
Research Assistant Professor of Medicine, Division of Hematology/Oncology

Delphine Gomez, PhD
Assistant Professor of Medicine, Division of Cardiology

Elena A. Goncharova, PhD
Associate Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

Maria Kapetanaki, PhD
Research Assistant Professor of Medicine, Division of PACCM

Gregory J. Kato, MD
Professor of Medicine, Division of Hematology/Oncology

Brett A. Kaufman, PhD
Associate Professor of Medicine, Division of Cardiology

Tatiana V. Kudryashova, PhD
Research Assistant Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

Janet Manning, PhD
Research Assistant Professor of Medicine, Division of Cardiology

Charles F. McTiernan, PhD
Research Associate Professor of Medicine, Division of Cardiology

Quyen L. Nguyen, MD
Assistant Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

Enrico M. Novelli, MD, MS
Associate Professor of Medicine, Division of Hematology/Oncology

Solomon F. Ofori-Acquah, PhD
Associate Professor of Medicine, Division of Hematology/Oncology
Amma T. Owusu-Ansah, PhD
Assistant Professor of Medicine, Division of Hematology/Oncology

Patrick J. Pagano, PhD
Professor of Pharmacology and Chemical Biology

Jason R. Rose, MD, MBA
Assistant Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

Sanghamitra Sahoo, PhD
Research Instructor of Pharmacology and Chemical Biology

Iain Scott, PhD
Assistant Professor of Medicine, Division of Cardiology

Sruti Shiva, PhD
Associate Professor of Pharmacology and Chemical Biology

Courtney E. Sparacino-Watkins, PhD
Research Assistant Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

Cynthia L. St. Hilaire, PhD
Assistant Professor of Medicine, Division of Cardiology

Adam C. Straub, PhD
Associate Professor of Pharmacology and Chemical Biology

Bin Sun, PhD
Research Assistant Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

Prithu Sundd, PhD
Assistant Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

Jesus Tejero, PhD
Assistant Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

Aisha L. Walker, PhD, MPH
Assistant Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

Ling Wang, MD, PhD
Research Assistant Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

Manling Zhang, MD, MS
Clinical Assistant Professor of Medicine, Division of Cardiology
RESEARCH AND OTHER SCHOLARLY ACTIVITIES

It has been eleven years since the foundation of the VMI and, as such, many investigators need continued research funds to advance their high impact investigations. Some research funds have been distributed to highly productive investigators to sustain their innovative research programs. This includes necessary support to retain our most successful investigators, who are often offered positions at other institutions, with competitive seed investments in their program.

One of the major goals of this year was to establish new funded HCWP projects focused on hemostasis and thrombosis that are of relevance to patients with hemophilia. We have developed six projects which have now been approved for funding through FY22:

- Understanding and developing new therapies for heme-mediated joint damage in patients with hemophilia
- Evaluation of the microbiome and hemophilia inhibitor formation
- Pilot Project Grants in Hemostasis and Thrombosis.
- Training in hemophilia research specialized hemophilia clinical care
- Platelet-focused omic approaches for novel molecular targets to prevent bleeding and impaired clot formation in hemophilia
- Understanding and developing new therapies to prevent development of inhibitors to factor VIII (FVIII) in patients with hemophilia A

Additional projects are in development. We have also maintained our support of VMI pilot grants to enhance and catalyze University of Pittsburgh research focused on hemophilia, hemostasis, and thrombosis.

Investigators have also actively and successfully obtained external funding from the NIH, DOD, and foundations for research in blood transfusion, hemophilia, hemostasis, thrombosis and vascular biology. One such collaboration includes VMI faculty working to launch a major clinical trial of erythrocytapheresis for adults with sickle cell disease (SCD) at the highest risk of cardiac death. A large clinical trial has been prepared and submitted to the NHLBI for peer review. The successful funding of this project over the next year will result in major activity in the VMI to support this 22-center clinical trial. This project will provide needed evidence-based support for the use of RBC exchange transfusion for adults with SCD.

VMI researchers have been equally effective in establishing industry relationships. For instance, the VMI’s research and development alliances with the pharmaceutical industry are particularly strong, as we entered the third year of our alliance with Bayer, supporting a major clinical trial of riociguat for patients with SCD.

In FY19, the VMI received over $12mil in research funding, a 4.7% increase since last year.
More recently, VMI investigators, led by Dr. Stephen Chan, began a new alliance partnership with Pfizer focused on pulmonary disease research. Additionally, VMI investigators have launched a new pharmaceutical company, Globin Solutions. This company will be incubated at the University of Pittsburgh within the VMI, bringing $1,000,000 of research and development funding to VMI investigators.

Other research awards and collaborations included:

- Mark Gladwin, MD, was awarded an $18 million UG3 clinical trial from NHLBI titled “Sickle Cell Disease and Cardiovascular Risk - Red cell Exchange Trial (SCD-CARRE Trial)” as well as a renewal of his NHLBI R01, “Antidote for Inhaled CO Poisoning Based on Mutationally Engineered Neuroglobin.”
- Sruti Shiva, PhD, started an industry collaboration with Fera Pharmaceuticals titled “Investigation of the effects of naproxcinod in the Townes sickle cell mouse model.”
- Prithu Sundd, PhD, was awarded an R01 from NHLBI titled “Mechanisms of Platelet Exosome-Mediated Acute Chest Syndrome in Sickle Cell Disease.”
- Enrico Novelli, MD, MS, and Carolyn Anderson, PhD, received a $500,000 grant over 2 years to develop an imaging strategy to clearly visualize molecular events occurring during sickle cell disease pain crises.

Our continued funding success and generous support from Vitalant and HCWP have enabled VMI core facilities, such as the NO and ROS metabolomics core facility, the mouse phenotyping facility, and other cores, to provide services to VMI investigators. For instance, this past year, VMI investigators secured a $390,000 NIH S10 equipment grant to purchase a VEVO 3100 echocardiography machine for preclinical studies of heart disease within the VMI’s echocardiography mouse core facility. The VMI has hired an echo technician to run the core and the machine in support of VMI investigators.

In September 2018, the VMI established two new Centers to further advance our mission. The Center for Microvascular Research (CMR), directed by Adam Straub, PhD, will initiate, facilitate, and support ongoing basic, translational, and clinical research focused on microvascular physiology, pharmacology, and disease. Through incorporation of cross-disciplinary studies and access to large clinical cohorts, the mission of the CMR is to test new ideas and pioneer novel strategies that rapidly translate into new therapies to treat microvascular complications associated with various diseases, such as cardiovascular disease, diabetes, Alzheimer’s, and sickle cell disease. The CMR will recruit new faculty to the VMI under Dr. Straub’s guidance.

The other new center—the Center for Vascular Signaling and Precision Medicine—will be overseen by Elena Goncharova, PhD. As director, Dr. Goncharova will forward the center’s mission to foster innovative research in signaling mechanisms that control the function of pulmonary vasculature in health and disease with special emphasis on translational science and personalized medicine. The center will have two primary...
goals: (1) identifying major signaling hubs driving vascular phenotypic reprogramming in human pulmonary vascular disease and dissecting new molecular target pathways for group-based and personalized therapeutic intervention and (2) designing and implementing patient cell-based, in vitro platforms to guide personalized treatment choices. The center will attract specialists in multi-“omics” integrative bioinformatics, biomedical data science, and translational bioinformatics as applied to studies of complex diseases.

The VMI has also been instrumental in the continued success of numerous other collaborative centers. The Center for Metabolism and Mitochondrial Medicine (C3M), a joint initiative sponsored and funded by the Division of Endocrinology and Metabolism, the Division of Cardiology, and the Vascular Medicine Institute facilitates and supports ongoing research and initiate novel research that address the role of metabolism and mitochondria in physiology and their contribution to disease pathology, with the goal of translating this knowledge into strategies for diagnosis and treatment of disease. The Center is jointly led by Drs. Sruti Shiva (Pharmacology and Chemical Biology/Vascular Medicine Institute) and Robert O’Doherty (Endocrinology).

The Center for Pulmonary Vascular Biology and Medicine at the University of Pittsburgh and UPMC is a multi-disciplinary clinical and research center for pulmonary vascular disease with a focus on comprehensive and state-of-the-art care of our patients. The Center is devoted to accelerating discoveries about pulmonary hypertension disease and ensuring these discoveries are applied directly to improve the lives of our patients, focusing its efforts on innovative ways to identify this disease early such that prevention of this disease may be a reality, to identify the elusive molecules that lie at the beginning origins of this disease, and to develop new treatments that could reverse or cure this disease. Inherent to this mission is improving PH awareness and partnership within our community so that we can combat this disease together.

The Montefiore University Hospital Clinical & Translational Research Center (MUH-CTRC) features a state-of-the-art vascular studies unit to provide a comprehensive assessment of pulmonary and peripheral endothelial function, blood flow, and cardiopulmonary function in research participants evaluated in protocols through the CTSI. MUH-CTRC nursing personnel can provide patient/family care and research protocol assistance and are available for consult during protocol development to review protocols for feasibility and conduct. A vascular sonographer is available to perform all vascular testing, image interpretation and data analysis.

The HHT Center of Excellence of UPMC and the University of Pittsburgh was established to provide comprehensive care of patients and families with hereditary hemorrhagic telangiectasia (HHT). Also known as Osler-Weber-Rendu syndrome, HHT is an inherited disorder characterized by a predisposition to development of direct connections between arteries and veins. When these connections occur in small vessels, such as in the skin or in the gastrointestinal tract, they are called telangiectasias. When they occur in larger vessels, most commonly in the brain, lungs, and liver of HHT patients, they are called arteriovenous malformations, or AVMs. Telangiectasias and AVMs tend to be very fragile and may easily rupture, leading to complications ranging from minor nosebleeds to hypoxemia (low oxygen levels in arterial blood) to hemorrhagic (bleeding) stroke, depending on the size and location of the vascular malformation. Our team of physicians, genetic counselors, and basic scientists are committed to integrating our clinical, genetic testing,
and research strengths to increase awareness of HHT, enhance HHT diagnosis, and raise the bar on the standard of care and support provided to HHT patients.

The **University of Pittsburgh Sickle Cell Center of Excellence** provides medical and psychosocial care for children and adults with sickle cell disease. Home to a robust program of interdisciplinary clinical and laboratory research that works toward a common goal of improving the lives of people living with sickle cell disease, its medical programs include more than 15 physicians and staff caring for more than 500 patients with sickle cell disease across the life span at Children’s Hospital of Pittsburgh of UPMC and at the Hematology Clinic at the UPMC Hillman Cancer Center. Its sickle cell specialists are nationally and internationally renowned for patient care and research. The sickle cell research program, which includes over 40 faculty and staff members with strong expertise in laboratory and clinical-translational research, is centered at the Pittsburgh Heart, Lung, Blood and Vascular Medicine Institute (VMI). The local sickle cell clinical research effort is coordinated by UPMC Hillman Cancer Center Clinical Protocol and Data Management. The program also leads multicenter clinical trials with biostatistical, data management and web service support from the University of Pittsburgh Center for Research on Health Care Data Center. The sickle cell research program has ongoing grant-funded research projects in pain, acute lung disease, pulmonary hypertension and brain function. Its members have published nearly 400 articles on sickle cell disease, with grant funding from the National Institutes of Health, Patient-Centered Outcomes Research Institute, American Society of Hematology, Bayer Pharmaceuticals and others. They are frequent speakers at national and international conferences, reviewers for NIH study sections, and consultants for the pharmaceutical industry.

The sickle cell program also has a growing global impact though the **Center for Translational and International Hematology**, which has launched a major NIH-funded program in Africa, the H3Africa Collaborative Center. The Center for Translational and International Hematology also runs the Pittsburgh Intensive Training in Hematology Research, the first NIH R25-funded program of its kind focused on Experimental Hematology, Hemolysis Related Vascular Biology, and Sickle Cell Disease. The mission of the Center for Translational and International Hematology is to promote timely translation of scientific discoveries into precision hematological care globally, by conducting patient-centered fundamental and applied research, foster the training of hematology scientists and clinicians and enhance the implementation of effective practices, through an integrated approach shaped by a diversity in enduring resources. The Center has seen a great deal of progression in furthering its mission of mentorship and international
collaboration. For instance, the Center recently assisted sickle cell programs in Tanzania to prepare an NIH U24 grant. And, the Pittsburgh Intensive Training in Hematology Research (R25), which successfully completed its third year with three trainees, providing each with specialized skills in hematology research. The Center also played a pivotal role in the Pittsburgh Undergraduate Research Diversity Program (R25), whose third cohort of 15 students from across the country worked in VMI labs during the summer of 2019.

The VMI has also welcomed a new faculty member, having recently recruited Jason Becker, MD, from Vanderbilt University. An NIH-funded highly successful physician-scientist, Dr. Becker studies genetic and acquired cardiomyopathies in an effort to identify novel methods to prevent and treat hypertrophic cardiomyopathy and heart failure. His presence will further advance the VMI’s exceptional research in the field.

In the upcoming fiscal year, we will continue to nurture and facilitate relationships of scientific leaders bridging the VMI and HVI research groups. In order to sustain strong leadership in the VMI, we have established an executive council of tenured faculty, who will provide advice and leadership support to the VMI director, Dr. Gladwin.

**Faculty Research Interests and Activities**

**Mark T. Gladwin, MD  Institute Director**

The Gladwin lab investigates the role and mechanisms of nitrite in pulmonary and cardiovascular cell signaling, as well as pulmonary hypertension and pulmonary complications of sickle cell disease. Dr. Gladwin’s research activities have led to four fundamental scientific hypotheses: (1) The discovery that the nitrite anion is a circulating storage pool for NO bioactivity (PNAS 2000) that regulates hypoxic vasodilation (Nature Medicine 2003) and the cellular resilience to low oxygen and ischemia (JCI 2005). (2) The discovery of a novel physiological function for hemoglobin as an electronically and allosterically-regulated nitrite reductase (Nature Medicine 2003; Huang JCI 2005). These studies reveal that nitrite is a potent vasodilator in humans and is bioactivated by reaction with deoxyhemoglobin (and myoglobin) to generate NO preferentially under hypoxic conditions; they also suggest that hemoglobin has an "enzymatic" property as a nitrite reductase that participates in hypoxic vasodilatation. In related translational studies, Dr. Gladwin has demonstrated that inhaled nitrite reverses hypoxic neonatal pulmonary hypertension in sheep (Nature Medicine 2004) and that infused nitrite solutions prevent post-subarachnoid hemorrhage-induced vasospasm in primates (JAMA 2005) and prevent hepatic and cardiac ischemia-reperfusion injury and infarction in mice (JCI 2005). Recently, he has characterized the role of both myoglobin and neuroglobin as functional nitrite reductases and “NO synthases.” (3) The characterization of a novel mechanism of disease, hemolysis-associated endothelial dysfunction (Nature Medicine 2002; JAMA 2005; JCI 2005). This work has described a state of resistance to NO in patients with sickle cell disease caused by scavenging of nitric oxide by hemoglobin that is released into plasma during hemolysis. (4) The mechanistic, clinical, and epidemiological description of a human disease syndrome, hemolysis-associated pulmonary hypertension (NEJM 2004). He has found that pulmonary hypertension occurs in 10-30% of patients with sickle cell disease, is a major cause of mortality in this population, and is strongly associated with high hemolytic rate, iron overload, and kidney disease.

**Study Sections**

- Ad hoc Member, NIH MIM Study Section, 2015-present
-  
  *Advisory Committee Memberships and Leadership Positions*
• Elected Council Member, American Society of Clinical Investigations, 2010-present
• Member, LiveLikeLou.Org Advisory Council, 2013-present
• Program Director, VMI T32 Training Grant, 2013-present
• Member, University of Pittsburgh Senior Vice Chancellor for Research Search Committee, 2016-present
• Member, Board of Directors, Beckwith Institute, 2016-present
• Elected Council Member, American Society of Clinical Investigations, 2010-present
• Member, UPSOM Distinguished Professor Nominating Committee, 2016-present
• Member, Science Advisory and Coordinating Committee, American Heart Association, 2017-2019
• Chairperson, 3CPR Nominating & Awards Committee, American Heart Association/American Stroke Association, 2017-2019
• Member, External Advisory Board, University of Pittsburgh Healthy Lifestyle Institute, 2017-present
• Member, Steering Committee, Enhancing Treatments for Pulmonary Vascular Diseases (PVD) Through Precision Medicine, 2017-Present
• Member, Advisory Board, Acceleron PAH (Pulmonary Arterial Hypertension), 2017-present
• Member, Scientific Advisory Board, Complexa Inc., 2017-present
• PVRI Institute Pulmonary Hypertension Precision Medicine Project Steering Committee, 2018-present
• Member, DSMB, BAL for CO ARDS trial, Harvard University, 2018
• American Society of Hematology (ASH) Sickle Cell Disease Clinical Endpoints Workshop Panel on End Organ Considerations, 2018-Present
• Member, UPMC Immune Transplant and Therapy Center (ITTC) Advisory Committee, 2018-present
• Chair, Harvard Medical School committee to review the Department of Medicine at Brigham and Women’s Hospital, November 28-30, 2018
• Chair, External Review Committee, University of Michigan Medical School, Department of Internal Medicine, December 4-5, 2018
• Chair, Bayer Advisory Board, Heart and Vascular Disease Research, March 12-13, 2019 and June 13, 2019

Professional Affiliations and Society Memberships
• Member, American Thoracic Society, 1998-present
• Member, American Society of Hematology, 2002-present
• Member, Society for Free Radical Biology and Medicine, 2002-present
• Member, American Heart Association, 2008-present
• Member, American Association of Blood Banks, 2012-present
• Member, American Association for the Advancement of Science (AAAS), 2012-present
• Member, American Society for Pharmacology and Experimental Therapeutics (ASPET), 2013-present
• Fellow, Pulmonary Vascular Research Institute (PVRI), 2013-present
• Member, Pulmonary Hypertension Association, 2013-present
• American Physiological Society, 2017-present

Editorships
Dr. Becker's research focuses on the molecular processes central to inherited and acquired cardiomyopathies.

Jason Becker, MD

Dr. Becker’s research focuses on the molecular processes central to inherited and acquired cardiomyopathies.
He is currently studying cell state specific modifiers of pathological cardiac remodeling and is the principal investigator in clinical trials to determine treatment for cardiomyopathy.

**Advisory Committee Memberships and Leadership Positions**
- Zebrafish Advisory Committee, 2012-present
- Cardiology Fellowship Interview Committee, 2015-present
- Graduate Student Qualifying Committee, Cell and Developmental Biology, 2015-present

**Professional Affiliations and Society Memberships**
- American Heart Association, 2003-present

**Dennis Bruemmer, MD, PhD**
Dr. Bruemmer’s research program centered on the basic investigation of mechanisms underlying tissue remodeling during atherosclerosis and neointima formation. His laboratory investigated the role of telomerase and telomere attrition in obesity, diabetes, and cardiovascular disease. Specifically, he sought to determine the transcriptional mechanisms by which telomere biology impacts cell proliferation and inflammation in diabetes and cardiovascular disease.

**Study Sections**
- Member, Permanent Grant Review Panel, American Diabetes Association, 2003-present

**Advisory Committee Memberships and Leadership Positions**
- Permanent Member, Region I Vascular Wall Biology Peer Review Committee, American Heart Association, 2008-present
- Member, Great Rivers Affiliate Research Committee, American Heart Association, 2015-present

**Professional Affiliations and Society Memberships**
- Member, American Heart Association, 2001-present
- Member, National Committee, American Diabetes Association, 2003-present
- Member, American Society of Hypertension, 2004-present
- Member, American College of Endocrinology, 2008-present
- Member, Endocrine Society, 2011-present
- Member, American College of Cardiology, 2013-present

**Editorships**
- Editorial Board Member, *Clinical Sciences*, 2009-present
- Editorial Board Member, *Arteriosclerosis, Thrombosis, and Vascular Biology*, 2012-present
- Editorial Board Member, *Molecular Metabolism*, 2012-present

**Stephen Y. Chan, MD, PhD**
Dr. Chan leads a basic science and translational research group that is studying the molecular mechanisms of pulmonary vascular disease and pulmonary hypertension (PH)—an example of an enigmatic disease where reductionist studies have focused primarily on end-stage molecular effectors. To capitalize on the emerging discipline of network medicine, the group’s research uses a combination of network-based bioinformatics and unique experimental reagents derived from genetically altered rodent and human subjects to accelerate systems-wide discovery in PH. The group’s published findings were among the first to identify the systems-level functions of microRNAs (miRNAs), which are small, non-coding RNAs that negatively regulate gene expression, as a root cause of PH. Dr. Chen’s lab developed novel in silico approaches to analyzing gene network architecture coupled with in vivo experimentation. The results now offer methods to identify persons...
at risk for PH and to develop therapeutic RNA targets. This work is the cornerstone of the lab's evolving applications of network theory to the discovery of RNA-based origins of human diseases, in general.

**Study Sections**
- Permanent Member, RIBT Study Section, NHLBI, NIH, 2018-2022

**Advisory Committee Memberships and Leadership Positions**
- Member, Advisory Board, Simpatica Medicine, 2016-present
- Member, 3CPR Early Career Committee, American Heart Association, 2016-present
- Associate Program Director, Clinical Fellowship Research, Division of Cardiology, 2016-present

**Professional Affiliations and Society Memberships**
- Member, American Heart Association, 2008-present
- Member, American College of Cardiology, 2008-present
- Fellow, Pulmonary Vascular Research Institute, 2012-present
- Fellow, American Heart Association, 2012-present

**Editorships**
- Editorial Board Member, *microRNA Diagnostics and Therapeutics*, 2013-present
- Editorial Board Member, *Pulmonary Circulation*, 2015-present
- Consulting Editor, *JCI Insight*, 2015-present
- Editorial Board Member, *Scientific Reports*, 2016-present

**Honors and Awards**
- Fellow, American Society for Clinical Investigation, 2016-present

**Eugenia Cifuentes-Pagano, PhD**
Dr. Cifuentes-Pagano's research interests focus on the understanding of the molecular mechanisms of action of novel NADPH oxidase isoforms and their regulation in the vasculature. The phagocyte NADPH oxidase (or respiratory burst oxidase) is a well-characterized reactive oxygen species (ROS)-generating system that catalyzes the one-electron reduction of oxygen to O2-, the precursor to a variety of other reactive oxygen species. The NADPH oxidase paradigm is a multi-subunit enzyme complex that includes two membrane-spanning subunits, p22-phox and nox2, and three cytoplasmic subunits, p40-phox, p47-phox and p67-phox. Our laboratory was the first to discover a nox2-based oxidase in the vasculature and to develop specific inhibitors targeting this robust source of ROS. Since that initial discovery, various isoforms of NADPH oxidase have been described which differ from the nox2 system in unique modifications of their nox-subunit amino acid sequence as well as the cytoplasmic components that they require. Besides their structural differences, the various isoforms present differential tissue and cellular distribution. The multi-level complexity of this family of proteins provides an opportunity to develop new tools to dissect the role of each of the isoforms in vascular function and pathology.

**Paola Corti, PhD**
Dr. Corti is studying the role of the cellular globins and the nitrite signaling in vertebrate metabolism and cardiac signaling. He is investigating the description of the chemical biology, signaling, and biological function of the globins, as well as their interactions with nitrite during the embryonic development and during the regeneration of the heart after amputation.
Partha Dutta, DVM, PhD
Dr. Dutta researches cardiovascular disease, which is the leading cause of death in developed countries. Inflammation aggravates outcome of cardiovascular disease, including atherosclerosis and infarct healing after myocardial infarction (MI). During progression of atherosclerosis, myeloid cells destabilize lipid-rich plaques in the arterial wall and cause their rupture, thus triggering myocardial infarction and stroke. Survivors of acute coronary syndromes have a high risk of recurrent events for unknown reasons. Another area of research interest is the differentiation of hematopoietic stem and progenitor cells in cardiovascular disease. Hematopoietic stem cells get activated after acute or chronic inflammation and give rise to exaggerated myelopoiesis. However, most hematopoietic stem cells (HSC) are quiescent, and it is currently unknown whether they respond to ischemic organ injury. We identified a CCR2+HSC subset, which has a four-fold higher proliferative rate than CCR2-HSC, as the most upstream contributor to myelopoiesis after myocardial infarction. CCR2+HSC display bias toward the myeloid lineage and dominate the migratory HSC population after myocardial infarction and in steady-state. These data shed new light on the regulation of emergency hematopoiesis after ischemic injury and identify novel therapeutic targets to modulate leukocyte output after myocardial infarction. Another area of interest is the role Inflammatory macrophage expansion in pulmonary hypertension. Pulmonary inflammation, characterized by the presence of perivascular macrophages, has been proposed as a key pathogenic driver of pulmonary hypertension (PH), a vascular disease with increasing global significance. However, the mechanisms of expansion of lung macrophages and the role of blood-borne monocytes in PH are poorly understood. Using multicolor flow cytometric analysis of blood in mouse and rat models of PH and patients with PH, an increase in blood monocytes was observed. We found chemotaxis of blood monocytes and their subsequent recruitment into lung perivascular space leads to macrophage expansion and inflammation. This study defines a direct mechanism by which interstitial macrophages expand in PH. It also demonstrates a pathway for pulmonary vascular remodeling in PH that depends upon interstitial macrophage-dependent inflammation yet at least is partially dissociated from hemodynamic consequences, thus offering guidance on future anti-inflammatory therapeutic strategies in this disease.

Professional Affiliations and Society Memberships
- Member, American Heart Association, 2017-present

Ning Feng, MD, PhD
Dr. Feng’s research focuses on cardiac epigenetics in heart failure development. Specifically, he investigates the impact of dynamic DNA methylation and mRNA methylation in transcriptional genes reprogramming in heart failure using genetic mouse models.

Samit Ghosh, PhD
Dr. Ghosh’s research goal is to delineate a translational pathway and to design platforms to expedite repair and regenerative therapeutics for the treatment of pulmonary complications of sickle cell disease (SCD). He investigates the underlying mechanisms that lead to acute or chronic pulmonary complications of SCD. His research involves two major components of SCD. One is to determine the role of TLR4 signaling and vascular adhesion machinery in the development of Acute Chest Syndrome in SCD. The other component is to define Nrf2 regulated redox mechanisms that can be targeted therapeutically to prevent chronic disease progression leading to end organ damage in SCD. His research could provide a solid foundation identifying precision drugs for protection and/or attenuation of acute and chronic lung complications in SCD. In addition, his studies offer the potential of identifying the sub-group of SCD patients at higher risk of end-
organ damage, who will be more suitable for high-risk experimental therapy.

**Delphine A. H. Gomez, PhD**
The Gomez lab is focused on studying the functional role of epigenetic and transcriptional mechanisms in controlling key properties of vascular cells including cell differentiation, lineage memory and plasticity in the context of major cardiovascular diseases including atherosclerosis and peripheral artery disease. We developed an integrated approach combining epigenetic and transcriptional profiling, epigenome editing and in vivo lineage tracing and fate mapping to decipher epigenetic and transcription mechanisms regulating SMC phenotype.

**Advisory Committee Memberships and Leadership Positions**
- Member, American Heart Association, Council on Arteriosclerosis, Thrombosis, and Vascular Biology, 2009-present
- Member, Awards and Membership Committee, Histochemical Society, 2014-present

**Professional Affiliations and Society Memberships**
- Member, American Heart Association, 2009-present
- Member, Histochemical Society, 2014-present
- Member, North American Vascular Biology Organization, 2015-present

**Major Lectureships and Seminars**
- Invited Lecturer, ATVB meeting, San Francisco, CA, 2018
- Invited Lecturer, International MADS Box Conference. Lake Placid, NY, 2018

**Elena A. Goncharova, PhD**
The Goncharova Lab continues to pursue the studies on the molecular and cellular mechanisms of pulmonary arterial hypertension (PAH) with long-term goal to dissect novel signaling mechanisms driving PAH pathogenesis and identify novel molecular targets for therapeutic intervention. PAH is life-threatening progressive disease with high mortality rates, poor prognosis (2.5-5 years without treatment) and no cure. In PAH, remodeling of small pulmonary arteries (PA) leads to elevated pulmonary arterial (PA) pressure that increases right ventricle (RV) afterload, RV failure and death. Available therapies fail to reverse established pulmonary vascular remodeling or prevent disease progression; and new remodeling-focused disease-modifying therapeutic strategies is an area of unmet important need. Over the past year, the major projects of our lab have been focused on the novel signaling mechanisms of pulmonary vascular remodeling and PAH with specific focus on HIPPO components MST1/2 and Smad 2 as a cross-talk between TGFbeta, Yap/Taz and Akt signaling pathways.

**Study Sections**
- Reviewer, FWF Austrian Science Fund, 2017-2018

**Advisory Committee Memberships and Leadership Positions**
- Member, ATS International Conference Committee, 2019-present
- Chair, Mini-symposium “Station to Station: Unraveling the Molecular Pathogenesis of PAH” ATS International Conference, 2019
- Member, 14th Pulmonary Vascular Research Institute (PVRI) Annual Meeting Scientific Organizing Committee, 2019
- Judge, AHA Fellows Research Day, Pittsburgh, PA, 2019
- Abstract Grader, AHA Fellows Research Day, Pittsburgh, PA, 2019
Akt signaling pathways, with specific focus on HIPPO components MST1/2 and Smad 2 as a cross-talk between TGFbeta, Yap/Taz and... of our lab have been focused on the novel signaling mechanisms of pulmonary vascular remodeling and PAH modifying therapeutic strategies is an area of unmet important need. Over the past year, the major projects... increases right ventricle (RV) afterload, RV failure and death. Available therapies fail to reverse established PAH, remodeling of small pulmonary arteries (PA) leads to elevated pulmonary arterial (PA) pressure that... pathogenesis and identify novel molecular targets for therapeutic intervention. PAH is life-threatening arterial hypertension (PAH) with long-term goal to dissect novel signaling mechanisms driving PAH... The Goncharova Lab continues to pursue the studies on the molecular and cellular mechanisms of pulmonary SMC phenotype.

The Gomez lab is focused on studying the functional role of epigenetic and transcriptional mechanisms in... controlling key properties of vascular cells including cell differentiation, lineage memory and plasticity in the... organ damage, who will be more suitable for high-risk experimental therapy.

Dr. Kapetanaki is a molecular biologist with a long-standing interest in the regulation of gene expression in human diseases affecting normal lung function. Her research focuses on identifying the molecular pathways underlying pulmonary hypertension, which is a common complication in the sickle cell patient population. Her current projects include the study of the regulatory mechanism of heme-induced Placenta Growth Factor (PIGF) and the role of heme-induced genes in hematopoietic cells. More specifically, she investigates the role of oxidant response pathways, especially the Nrf-2 transcription factor and its upstream regulators. She employs cell culture and murine models where she applies techniques, such as gene silencing, gene editing and drug treatment to describe the steps of heme activation.

Dr. Kato's research specialties comprise blood flow physiology studies, clinical trials, and proteomic analysis of plasma to unravel new mechanisms contributing to pulmonary hypertension and other complications of sickle cell disease. He has formulated a model to suggest that pulmonary hypertension, stroke, leg ulcers and priapism share features of vasculopathy and more severe hemolytic anemia, and that pain crisis, acute chest syndrome, and avascular necrosis share evidence of poor blood circulation due to viscosity. These two groups overlap and are not completely distinct.

Maria Kapetanaki, PhD

Gregory J. Kato, MD

Advisory Committee Memberships and Leadership Positions

- Member, Steering Committee, Evaluation of Purified Poloxamer 188 in Vaso-Occlusive Crisis of Sickle Cell Disease (EPIC), 2014-present
- Medical Director, Children’s Sickle Cell Foundation, Pittsburgh, PA, 2014-present
- Consultant, CSL Behring, King of Prussia, PA, 2015-present
- Chair, Africa Clinical Trials Data and Safety Monitoring Board, National Heart, Blood and Lung Institute: Sickle Cell, 2017-2021
Dr. Manning's research is focused on potential development of treatment, which can attenuate pulmonary vascular remodeling in PAH. She is currently studying the impact of HIPPO and mTOR signaling pathways on pathobiology of pulmonary vascular cells from patients with pulmonary arterial hypertension, and her long-standing research interests are focused on investigation of molecular and cellular mechanisms of pulmonary arterial hypertension (PAH) especially mechanisms of pulmonary vascular remodeling. She is also interested in exploring the mechanistic pathways that lead to cognitive impairments in patients with SCD. The study's goal is to explore small vessel disease biomarkers with SCD. The study’s goal is to explore small vessel disease biomarkers with SCD.

Dr. Kudryashova’s research interests are focused on investigation of molecular and cellular mechanisms of pulmonary arterial hypertension (PAH) especially mechanisms of pulmonary vascular remodeling. She is currently studying the impact of HIPPO and mTOR signaling pathways on pathobiology of pulmonary vascular cells from patients with pulmonary arterial hypertension, and her long-standing research interests are focused on potential development of treatment, which can attenuate pulmonary vascular remodeling in PAH.

Dr. Manning’s research is focused on the enzymatic acetylation of proteins localized to the mitochondria and endoplasmic reticulum, and the subsequent impact of mitochondrial dysfunction on the recovery of the myocardium from ischemic injury.

Dr. McTiernan’s laboratory studies the molecular basis of cardiac remodeling in heart failure, as well as the expression and function of specific cytoskeletal proteins. The lab’s publications have appeared in *Circulation*, *Journal of Applied Physiology*, *Arthritis and Rheumatism*, *American Heart Journal*, *Pneumology*, *Cardiology*, and *American Journal of Pathology*, among others. One of the primary areas of Dr. McTiernan’s research has focused on the role of cytokines and matrix metalloproteinase (MMP) in the pathobiology of heart failure.

Dr. Kaufman’s major research goals are 1) to define the biochemical events responsible for the maintenance of mtDNA content, 2) to understand how distinct pathways influence mtDNA maintenance, and 3) to understand mechanisms of mtDNA damage and resistance to damage in the context of disease.

Dr. Novelli focuses on elucidating the fundamental mechanisms underlying vascular dysfunction in sickle cell disease. His research has recently focused on the role of mitophagy in the pathobiology of sickle cell disease, and he has also been investigating the role of mitophagy in the pathobiology of pulmonary hypertension. Dr. Novelli is conducting an R01-funded longitudinal study of disease. Dr. Novelli is conducting an R01-funded longitudinal study of disease.
of these acetylated proteins on metabolism, calcium handling, and survival signaling in the heart.

Charles F. McTiernan, PhD
Dr. McTiernan’s laboratory studies the molecular basis of cardiac remodeling in heart failure, as well as a the use of cardiac function, cellular, molecular biology, and microscopic techniques. The lab’s publications have appeared in Circulation Research, Circulation, Journal of the American College of Cardiology, Cardiovascular Research, and PNAS, among others. One of the primary areas of Dr. McTiernan’s research has focused on proinflammatory cytokines in heart failure. His lab demonstrated that transgenic overexpression of TNF generated a heart failure phenotype resembling that observed in human heart failure. Additional studies examined TNF effects on fibrosis and calcium handling. Dr. McTiernan is also interested in TIMPs and MMPs in cardiac remodeling. Dr. McTiernan's team reported that a) altered expression of TIMPs and MMPs occurs in failing human hearts, b) is responsive to mechanical unloading by ventricular assist devices, c) MMP-inhibition limits cardiac remodeling in a murine heart failure model, and d) the profile of TIMP and MMP expression varies with heart failure progression.

Study Sections
- Ad hoc Grant Reviewer, National Institutes of Health, 2004-present

Quyen L. Nguyen, MD
Dr. Nguyen’s research focuses on how pulmonary hypertension leads to right ventricular failure, which results in death. The subcellular mechanisms underlying right ventricular dysfunction in pulmonary hypertension are incompletely understood. Previous studies have shown derangements in cardiac cellular energy metabolism in human and experimental pulmonary hypertension. Mitochondria play a central role in cellular metabolism, particularly in cardiac muscle cells. Her lab hypothesizes that mitochondrial dysfunction underlies right ventricular failure in pulmonary hypertension. She proposes a comprehensive investigation of mitochondrial function over the time course to right ventricular failure in pulmonary artery banding animal model of pulmonary hypertension.

Enrico M. Novelli, MD, MS
The Novelli Lab focuses on elucidating the fundamental mechanisms underlying vascular dysfunction in sickle cell disease (SCD). Dr. Novelli’s initial research sought to clarify the mechanisms underlying pulmonary hypertension in sickle cell disease. Most recently, his research has focused on the risk factors and mechanisms of cognitive impairment in sickle cell disease. Dr. Novelli is conducting an R01-funded longitudinal study of cognitive impairment and its neuroradiological correlates in adult patients with SCD. The study's goal is to explore small vessel disease biomarkers by MRI and how they predict the trajectory of cognitive impairment. A parallel study in sickle mice is also being conducted in Dr. Novelli’s lab to explore the mechanistic pathways that lead to cognitive impairments in patients with SCD.

Study Sections
- Member, AHA Study Section, 2013-present
- Member, SBIR/STTR Study Section, NIH, 2015-present

In collaboration with Dr. Carolyn Anderson (Cardiology), Dr. Novelli is using PET imaging in murine models to determine underlying mechanisms of vascular dysfunction in sickle cell disease.
Solomon F. Ofori-Acquah, PhD

Dr. Ofori-Acquah has a research interest in molecular hematology, endothelial barrier function, sickle cell disease (SCD), and global health. His basic science research is on the mechanisms of neutralizing erythroid danger associated molecular pattern (eDAMP) molecules. This work encompasses studies of developmental, genetic, and epigenetic regulation of hemopexin and heme oxygenase-1—the key neutralizing molecules of extracellular heme the prototypical eDAMP. His basic research is translated to understanding the role and mechanism of extracellular heme in the pathobiology of vascular complications in SCD. A major translational focus is acute chest syndrome, the leading cause of premature death in SCD. The Ofori-Acquah lab developed the first mouse model of acute chest syndrome. This preclinical model is currently being used to find targeted therapies for this syndrome. His global health research centers on a longitudinal observational study of a large newborn cohort in Ghana to define markers of end-organ damage in SCD. Additional global health work focused also on SCD is performed under the auspices of the H3Africa consortium with a multi-disciplinary team of collaborators in Cameroon, Tanzania, and South Africa. Dr. Ofori-Acquah directs a research education NIH-funded R25 program aimed at catalyzing the training of graduates, postdocs, and junior faculty in blood science research. He is Visiting Professor and Director of a Human Genetics graduate course in a Wellcome Trust-funded DELTAS (Developing Excellence in Leadership, Training and Science) program at the University of Ghana in collaboration with the Pitt Graduate School of Public Health.

Study Sections

- Member, Respiratory Integrative Biology and Translational (RIBT) Science Study Section, NIH, 2013-2019
- Member, Ad Hoc Grant Review Committee, Minority Medical Student Award, American Society of Hematology, 2010-present

Advisory Committee Memberships and Leadership Positions

- Member, Medical Advisory Board, Parent’s Guide to Cord Blood Foundation, 2009-present
- Member, Medical Research Advisory Committee, Sickle Cell Disease Association of America, 2009-present
- Member, Executive Planning Committee, Sickle Cell National Annual Symposium, 2009-present
- Consultant, Newborn Screening Quality Assurance Program, Centers for Disease Control and Prevention, 2010-present
- Chair, Minority Graduate Student Abstract Achievement Award Committee, American Society of Hematology, 2011-present

Professional Affiliations and Society Memberships

- Member, American Thoracic Society, 2004-present
• Member, American Association for Cancer Research, 2005-present
• Member, American Society of Hematology, 2004-present
• Member, Ghana Biomedical Convention, 2008-present

Amma T. Owusu-Ansah, MD
Dr. Owusu-Ansah's primary research interest is in translating novel or repurposed therapeutics into clinical settings to prevent or halt the progression of complications of sickle cell disease. Her other interests are in global health and implementation research, specifically identifying strategies to improve access to state-of-the-art medical care for individuals with benign hematologic disorders in different demographic regions of the world.

Advisory Committee Memberships and Leadership Positions
• Career Development Mentor, American Society of Hematology 2018 Minority Resident Hematology Award Program, 2018
• Panelist, Documentary on pediatric cancer in low and middle-income countries, Global Health Programs, Graduate School of Public Health, 2018

Professional Affiliations and Society Memberships
• Member, Global Sickle Cell Disease Network, 2010-present
• Member, American Society of Hematology, 2011-present
• Member, American Society of Pediatric Hematology and Oncology, 2011-present

Major Lectureships and Seminars
• Presenter, Panelist, East meets West-Accelerating Sickle Cell Research from Africa, 12th Annual Sickle Cell Disease Research and Educational Symposium, Washington DC, 2018

Patrick J. Pagano, PhD
Dr. Pagano’s research focuses on the modulatory role of the adventitia in vascular function and structure under both physiological and pathophysiological conditions. He is recognized for his pioneering work examining the role of adventitia-derived reactive oxygen species (ROS) in the modulation of vascular tone, inflammation and remodeling.

Study Sections
• Member, Special Emphasis Panel: Vascular Biology, NIH/NHLBI, November 2018

Jason J. Rose, MD, MBA
Dr. Rose's research interests focus on discovering and developing new human therapeutics. His group is working to identify and develop a novel carbon monoxide poisoning antidote. They are also characterizing the mechanisms of severe CO poisoning from a molecular basis and in novel animal models. Dr. Rose's research focuses on studying the mitochondrial effects of carbon monoxide and the ability to reverse the toxicity of carbon monoxide in vitro. He is interested in the drug development process, including nonclinical toxicology, pharmacodynamic and pharmacokinetic assessment, drug manufacturing, and clinical study design.

Professional Affiliations and Society Memberships
• Member, American Mensa, 2006-present
• Member, American College of Physicians, 2010-present
• Member, American College of Chest Physicians, 2010-present
Scott’s lab is interested in the coordination between acetylation levels and mitophagy, a quality control process that eliminates dysfunctional mitochondria, which cannot be used for energetic or synthetic purposes. In particular, Dr. Scott’s research focuses on the intrinsic mechanisms that regulate mitochondrial protein acetylation and how this fundamental alteration affects organelle function at the cellular and tissue level. Mitochondria are highly susceptible to homeostasis. Their activity needs to be tightly regulated, as evidenced by the growing number of pathologies in which mitochondrial dysfunction is a causative factor. Mitochondria are highly susceptible to nutritional inputs, GCN5L1-mediated lysine acetylation, and mitochondrial quality control pathways that link nutritional inputs, GCN5L1-mediated lysine acetylation, and mitochondrial quality control transcriptional machinery of mitophagy. Dr. Scott and his team’s future work will aim to elucidate the mechanism that mediates the removal of dysfunctional mitochondrial organelles. Researchers recently discovered that GCN5L1, a mitochondrial protein that promotes lysine acetylation, regulates the mitochondrial homeostasis. These findings will then be translated into studies involving metabolically-relevant disease models, such as heart failure and diabetes, to achieve a better understanding of the role played by dysfunctional mitochondria in these processes.

Sruti Shiva, PhD

Drs. Sahoo’s research is focused on microRNA-mediated pathogenesis of cardiovascular diseases, particularly pulmonary hypertension. MicroRNAs (miRNAs or miRs) are small (~19-25 nucleotides), non-coding endogenous RNA molecules that negatively regulate the expression of proteins via post-transcriptional modifications. A single miR can regulate multiple targets simultaneously and several miRs may modulate the function of a protein. The objective of these studies is to advance our understanding of molecular and signaling mechanisms in pulmonary vascular endothelial and smooth muscle cells; primary cells involved in vascular remodeling of the pulmonary microcirculation. The outcomes from these studies will provide insights into newer therapeutic targets for the management of cardiovascular diseases.

Iain Scott, PhD

Dr. Scott’s research focuses on the intrinsic mechanisms that regulate mitochondrial protein acetylation and how this fundamental alteration affects organelle function at the cellular and tissue level. Mitochondria are ubiquitous organelles, playing a vital role in bioenergetics, metabolite biosynthesis, and overall cellular homeostasis. Their activity needs to be tightly regulated, as evidenced by the growing number of pathologies in which mitochondrial dysfunction is a causative factor. Mitochondria are highly susceptible to environmental stresses, with overnutrition being a particular problem in the developed world. A high caloric intake leads to a surge in available acetyl-CoA (the final breakdown product of fats, carbohydrates, and proteins in the mitochondria), which cannot be used for energetic or synthetic purposes. In particular, Dr. Scott’s lab is interested in the coordination between acetylation levels and mitophagy, a quality control process that eliminates dysfunctional mitochondria, which cannot be used for energetic or synthetic purposes.
mechanism that mediates the removal of dysfunctional mitochondrial organelles. Researchers recently discovered that GCN5L1, a mitochondrial protein that promotes lysine acetylation, regulates the transcriptional machinery of mitophagy. Dr. Scott and his team's future work will aim to elucidate the pathways that link nutritional inputs, GCN5L1-mediated lysine acetylation, and mitochondrial quality control systems. These findings will then be translated into studies involving metabolically-relevant disease models, such as heart failure and diabetes, to achieve a better understanding of the role played by dysfunctional mitochondria in these processes.

Study Sections
- Member, P3HVB Award Study Section, University of Pittsburgh, 2017-present

Advisory Committee Memberships and Leadership Positions
- Co-Director, Vascular Medicine Institute Postdoctoral Program, 2016-present

Professional Affiliations and Society Memberships
- Member, United Mitochondrial Disease Foundation, 2011-present
- Member, American Physiological Society, 2014-present
- Member, American Heart Association, 2014-present
- Member, Society for Redox Biology and Medicine, 2015-present
- Member, American Diabetes Association, 2016-present
- Member, International Society for Heart Research, 2015-present

Editorships
- Ad hoc Reviewer, *Journal of Molecular and Cellular Cardiology*, 2008-present
- Ad hoc Reviewer, *Cell Research*, 2008-present
- Ad hoc Reviewer, *Infectious Diseases-Drug Target*, 2008-present
- Ad hoc Reviewer, *Mitochondrion*, 2008-present

Sruti Shiva, PhD
Dr. Shiva's research focuses on pulmonary hypertension and its causes and potential treatments. Specifically, the goals are to determine if hemolysis accelerates the pathogenesis of pulmonary hypertension through the propagation of platelet mitochondrial ROS generation and thrombospondin-1 release; to understand the mechanisms by which molecules released by the erythrocyte (e.g., heme, adenosine, arginase) modulate vascular responses in sepsis; and to determine the effects of naproxcinod on NO signaling and platelet function in a transgenic murine model of sickle cell disease at baseline and during hypoxic stress.

Study Sections
- Member, Membrane and Subcellular Organelle II Study Section, American Heart Association, 2009-present
- Member, Grant Review Panel, American Diabetes Association, 2014-present
- Standing Member, Vascular Cell and Molecular Biology Study Section, NIH, 2017-present

Advisory Committee Memberships and Leadership Positions
- Member, Internal Advisory Board, Vascular Medicine Institute, University of Pittsburgh, 2009-present
- Member, Graduate Executive Committee, Department of Pharmacology & Chemical Biology,
2009-present
• Member, Fellows Research Day Task Force, American Heart Association Pittsburgh, 2011-present
• Vice President of Finance, Society for Redox Biology and Medicine Council, 2012-present
• Member, University of Pittsburgh Interdisciplinary Graduate Program Admissions Committee, 2015-present
• Director, Vascular Medicine Institute Postdoctoral Program, 2016-present
• Elected Chair, Gordon Research Conference on Nitric Oxide, 2017-present
• Co-Director, VMI T32 Training Grant, 2018-present

Professional Affiliations and Society Memberships
• Member, Society for Redox Biology and Medicine Council, 2011-present

Editorships
• Associate Editor, Nitric Oxide in Biology and Medicine, 2017-present
• Editorial Board, Redox Biology Journal, 2012-present
• Editorial Board, British Journal of Pharmacology, 2015-present

Courtney E. Sparacino-Watkins, PhD
Dr. Sparacino-Watkins's research seeks to elucidate the role of novel molybdenum-dependent oxidoreductase enzymes in humanphysiology and pathophysiology with particular emphasis on vascular-related diseases of the lung and liver. Current research centers on the role of mitochondrial amidoxime reducing component (mARC) enzymes in pulmonary arterial hypertension pathophysiology, the role of mARC-2 nitrite reduction to nitric oxide (NO) on PAH Nitrite therapy using several models, and the role of mARC enzymes in liver disease.

Professional Affiliations and Society Memberships
• Member, American Heart Association, 2015-present
• Member, Society for Free Radical Biology in Medicine (SFRBM), 2015-present

Cynthia L. St. Hilaire, PhD
The St. Hilaire lab research program stems from the previous discovery of the genetic disease Calcification due to Deficiency of CD73 (ACDC), which identified a novel role for the enzyme CD73, and its substrate adenosine, in vascular calcification and vascular remodeling. Moving forward, research in the St. Hilaire lab will explore the role of CD73 and adenosine signaling in more complex vascular pathologies, such as atherosclerosis, calcific aortic valve disease, and aneurysms using in vitro (primary human and mouse cells and patient-specific induced-pluripotent stem cells) and in vivo (genetically defined murine models and surgical manipulations), with the goal of translating findings in ACDC to more common vascular diseases and pathologies.

Advisory Committee Memberships and Leadership Positions
• Member, Early Career Committee, Council on Arteriosclerosis, Thrombosis, and Vascular Biology, American Heart Association, 2014-present
• Member, ATVB (Arteriosclerosis, Thrombosis and Vascular Biology) Nomination and Awards Committee, 2016-2018

Professional Affiliations and Society Memberships
• Member, International Society for Applied Cardiovascular Biology, 2016-present
• Member, Women in Bio, Pittsburgh Chapter, 2015-present
American Physiological Society, 2017-present

Major Lectureships and Seminars

- Lecturer, International Society for Applied Cardiovascular Biology, Bordeaux, France, 2018
- Moderator, Vascular Research Initiatives Conference, Society for Vascular Surgery, Boston, MA, 2019
- Lecturer, Heart Valve Society Annual Meeting, Sitges, Spain, 2019

Honors and Awards

- Lab of the Month, North American Vascular Biology Organization, July 2018
- Outstanding New PI, New PI Slack – a community for new faculty, December 2018

Adam C. Straub, PhD

Dr. Straub’s research focuses on the molecular, cellular, and in-vivo contribution of somatic hemoglobins and CytB5Rs as it pertains to vascular physiology and disease, as well as the roles of nicotinamide adenine dinucleotide regulation and the NAMPT (pre-B cell colony factor (PBEF) or visfatin) pathway in vascular physiology and disease.

Study Sections

- Member, Grant Review, Vascular Wall Biology, Blood Pressure, American Heart Association, 2014-present

Advisory Committee Memberships and Leadership Positions

- Member, American Heart Association Summer Undergraduate Research Program Steering Committee, University of Pittsburgh, 2016-present

Professional Affiliations and Society Memberships

- Member, Microcirculation Society, 2009-present
- Member, American Physiological Society, 2009-present
- Member, Arteriosclerosis, Thrombosis and Vascular Biology and Hypertension councils, American Heart Association, 2012-present
- Member, Nitric Oxide Society, 2012-present
- Member, North American Vascular Biology Organization, 2016-present

Bin Sun, PhD

A member of Dr. Mark Gladwin’s laboratory, Dr. Sun is focusing on establishing cell models by altering mARC2 expression in COS7 endothelial and smooth muscle cells to study the functions and mechanisms of mARC2 as nitrite reductase. The potential of the sGC enzyme itself as a nitrite reductase is also under investigation. The potential role of sGC modulators Bay 41 and Bay 58 compounds in the treatment of sickle cells symptoms by increasing fetal hemoglobin gene expression has been discovered by Dr. Gladwin’s lab. Also being explored are the molecular mechanisms and pathways involved in sGC modulators induced fetal hemoglobin gene expression in human primary erythroid progenitor cells.

Prithu Sundd, PhD

The Sundd lab aspires to elucidate the molecular and biophysical mechanism of leukocyte-platelet-endothelium interaction during inflammation and how these events contribute to Vaso-Occlusive Crisis (VOC) and ACS in SCD. To achieve this, we are using a multi-scale integrative physiologic approach, which involves in vivo Multi-Photon Excitation (MPE) fluorescence microscopy in transgenic and knock-in mice, microfluidic assays with patient blood, total internal reflection fluorescence (TIRF) microscopy, structured illumination
microscopy (SIM), laser confocal microscopy, electron microscopy and various biochemical approaches. This multi-scale approach enables us to address the link between the pathophysiology of ACS affecting the lung (macro-level response) to the aberrant cellular events (micro-level response) driving the vaso-occlusion and the molecular interactions (nano-level response) enabling those cellular events. Identifying the molecular mechanism of vaso-occlusion in the lung will inspire therapeutics to prevent ACS in SCD patients.

**Study Sections**

- Reviewer, Immunology Basic Science Grants Committee, American Heart Association, 2014-present

**Advisory Committee Memberships and Leadership Positions**

- Panelist, Physiology, Organismal & Developmental Biology Panel, National Science Foundation Graduate Research Fellowship Program, 2017

**Professional Affiliations and Society Memberships**

- Member, Society for Leukocyte Biology, 2012-present
- Member, American Society for Hematology, 2014-present
- Member, University of Pittsburgh Institutional Biosafety Committee, 2015-present
- Member, American Thoracic Society, 2015-present

**Jesus Tejero, PhD**

Dr. Tejero's research is focused on the biology of heme proteins. His main research goals include: i) to understand and characterize the chemical and kinetic features of the reactions of nitrite with hemoglobin, myoglobin, cytoglobin and neuroglobin, ii) to elucidate the cytoprotective mechanisms of the six-coordinate globins neuroglobin and cytoglobin, and iii) the development of heme-based antidotes for carbon monoxide poisoning.

**Aisha L. Walker, PhD, MPH**

Dr. Walker's research interests include mechanisms of globin gene switching and pharmacologic reactivation of fetal hemoglobin, assessing perceptions of sickle cell therapies among stakeholders using social media, and differentiation and reparative mechanisms of bone marrow stem cells in sickle cell.

**Advisory Committee Memberships and Leadership Positions**

- Member, Abstract Review Committee, American Society of Hematology 59th Annual Meeting and Exposition, 2017

**Professional Affiliations and Society Memberships**

- Member, American Society of Hematology, 2012-present
- Member, Foundation for Sickle Cell Disease Research, 2016-present

**Ling Wang, MD, PhD**

Dr. Wang has two main areas of interest. The first focuses on the nitrite and NO signaling pathway in vascular and cardiopulmonary diseases, such as ALI, lung fibrosis, PAH and I/R injury. In particular, he is investigating the downstream signaling pathways regulated by nitrite and NO in cellular and animal models to identify new
therapeutic targets and develop nitrite-based therapy. The second research focus centers on mutant human Ngb as an antidote for carbon monoxide poisoning. This research aims to develop a specific antidote using mutationally engineered human Ngb as a "CO trap," which removes CO from blood, tissue, and cells.

**Manling Zhang, MD, MS**
Dr. Zhang's research focuses on the role of mitochondria protein acetylation in heart failure development.
TEACHING ACTIVITIES

The VMI now trains more than 20 postdoctoral fellows, so it is essential that we support their success as they transition to independent investigators in hemostasis, thrombosis, and vascular biology. Leading our postdoctoral mentoring programs, Sruti Shiva, PhD, and Iain Scott, PhD, have instituted new postdoctoral roundtable discussions and oversee semi-annual milestone meetings to ensure postdoctoral fellows are on the right trajectory for success. An NHLBI T32 training grant focused on pulmonary vascular biology provides several trainees with support, and several VMI postdoctoral fellows have been appointed to another NHLBI T32 focused on cardiac imaging that helps bridge the research interests of the Institute and the Division of Cardiology. Postdoctoral fellows interested in benign hematology may soon have another opportunity for training, as Dr. Gregory Kato’s recent T32 submission focused on benign hematology training received a favorable score and reviews. VMI fellows have also been successful in pursuing individual fellowships with four postdoctoral fellows awarded AHA postdoctoral fellowships in the past 2 years.

Beyond postdoctoral training, VMI core faculty are actively engaged in mentoring undergraduate and graduate students, with several faculty serving as primary mentors for students in Bioengineering, the Medical Scientist Training Program, and several other Departments within the School of Medicine. Moreover, there are numerous predoctoral educational programs within the VMI. For instance, as part of the AHA Summer Undergraduate Research Program, the VMI offers a stipend to support summer research experiences in cardiovascular sciences or brain ischemia research for undergraduates mentored by a University faculty member, thereby exposing students to cutting-edge basic and translational cardiovascular research. The VMI also provides summer undergraduate training for underrepresented minorities through support from an R25 training grant.

All trainees are encouraged to participate in weekly research in progress meetings, monthly journal club meetings, social activities, and other career development activities, as noted below.

Vascular Medicine Institute Research Conference Series
Held every week from noon to 1 p.m., the VMI Research Conference Series features presentations from Cardiology and Vascular Medicine Institute faculty—as well as visiting Professors and faculty candidates—who present state-of-the-art cardiology and vascular research findings to a large, multidisciplinary audience of fellows and faculty from across the institution. This year, the VMI Research Conference Series featured
talks from esteemed researchers such as Richard Youle, PhD (Chief, Biochemistry Section, Surgical Neurology Branch, NINDS, NIH); Paul Frenette, MD (Professor of Medicine and Cell Biology, Albert Einstein College of Medicine); and Kathryn J. Moore, PhD (Jean and David Blechman Professor of Medicine, Cardiology, Professor Department of Cell Biology, NYU School of Medicine).

**Postdoctoral Fellows Roundtable Discussion**
Postdoctoral fellows are invited to exclusive roundtable discussions with visiting Professors following their VMI Research Conference presentations. Fellows gain valuable insight from these renowned professionals outside of the Pitt community by discussing scientific topics and career development.

**VMI/HVI Research in Progress Conferences**
Meeting weekly, the VMI/HVI Research in Progress Conference features two presentations given by either a fellow or junior faculty member. Presentations are approximately 20-25 minutes long, allowing 5-10 minutes for questions and discussion. With the opportunity to present two to three times each academic year, fellows are provided a forum in which they may not only improve their public speaking skills, but also elicit helpful questions and comments from more senior researchers with whom they may not interact as frequently. The experience has the potential to open new avenues of research and opportunities for collaboration.

**VMI Journal Club**
Held once a month, trainees lead a discussion with faculty and fellows about two published peer-reviewed articles per meeting, focusing on methodology and quality of research, as well as clinical or scientific impact.

**VMI/HVI Fellows Research Retreat**
This past winter, the Division of Cardiology, in conjunction with the VMI, held its third annual fellows retreat at Seven Springs from February 20-22, 2019. Featuring a keynote presentation by Dr. Thomas Wang of Vanderbilt Heart and Vascular Institute and with focused presentations by research faculty, new fellows were exposed to potential areas of research while also afforded the opportunity to develop burgeoning mentor-mentee relationships outside of an academic setting. New cardiology trainees had the opportunity to formally present their work and interests, as well as informally socialize with other trainees and faculty during dinner, bowling, and skiing. Spanning two days, the retreat builds a congenial atmosphere between VMI and HVI fellows and faculty, highlighting the general collaborative spirit of the medical community at the University of Pittsburgh.

**Grant Writing Workshop**
We continue to offer a formalized, highly successful, and popular grant writing workshop for our postdoctoral fellows, preparing them for either NRSA or K award applications to the NIH. Fellows meet monthly with a group of senior T32 faculty to discuss all aspects of grant writing strategy and to have drafts of their Specific Aims pages and other components of their applications critiqued by the group. We have experienced T32
faculty, all R01-funded and serving on NIH study sections, to guide the workshop. Exposure of the fellows to each other's projects in a supportive and nurturing environment produces rapid acquisition of grant-writing skills and contributes to the high success rates of our fellows at the NIH level.

**K-to-R Workshops**
Organized to precede junior faculty's R01 submissions, the function of these workshops is to provide assistance with grant proposals, ultimately leading to a greater percentage of R01-funded faculty across the Division. Interested junior faculty are given the opportunity to present their ideas and concepts for R-level proposals to a small team of highly experienced faculty with significant NIH study section portfolios and in-depth scientific knowledge related to the proposal.

**Editorial Grant Review Core**
Under the direction of Dr. Christopher O'Donnell, Dr. Gladwin has initiated grant reviews for trainees during their career development phase. Reviewers must be experienced mid- to senior-level faculty from outside the mentorship training team who have previous study section experience so as to provide a highly detailed critique of the science, training plan, mentorship plan, RCR, and institutional support. Trainees submit their entire grant proposal three weeks prior to the NIH deadline, and reviewers spend a minimum of five hours critiquing the application and completing the required NIH review form (with a significant focus on weaknesses). The grant review process is mandatory for all trainees/junior faculty participating in the career development grant writing and K-to-R workshops and is a significant factor in the high funding success rates of our programs detailed above.

**Postdoctoral Fellows, FY2019**

**Gowtham Annarapu, PhD**  
**Mentor:** Sruti Shiva, PhD  
Dr. Annarapu investigates the mechanisms by which hemoglobin regulates platelet mitochondrial function and downstream signaling. As part of this research, he measures mitochondrial function, platelet function and endothelial cell signaling both in vitro and in animal models.

**Anu Bharara, PhD**  
**Mentor:** Sruti Shiva, PhD  
Dr. Bharara studies nitrite signaling through cAMP and cGMP pathways.

**Andrea C. Braganza Jardini, PhD**  
**Mentor:** Sruti Shiva, PhD  
Dr. Braganza Jardini's research focuses on elucidating the role played by the ubiquitin-proteasome system (UPS) and the mitochondria in age-dependent increases in platelet activation and thrombosis.

**Tomasz Brzóska, PhD**  
**Mentor:** Prithu Sundd, PhD  
Dr. Brzóska uses in vivo Multi-Photon Excitation enabled intravital fluorescence microscopy to identify the cellular and molecular cues that promote thrombosis and subsequent lung injury in transgenic SCD mice.
Daniel Simoes de Jesus, PhD
Mentor: Patrick J. Pagano, PhD
Dr. de Jesus is investigating whether redox signaling initiated by NADPH oxidase 1 (Nox1) could promote transcription factor CREB activation by redox factor 1 (Ref-1), transactivation of Gremlin1 transcription, EC migration, and proliferation.

Anthony W. DeMartino, PhD
Mentor: Mark T. Gladwin, MD
Dr. DeMartino is researching cytoglobin (Cygb) modification and small molecules for cyanide and carbon monoxide antidotes and understanding Cygb surface thiol importance.

Evan R. DeVallance, PhD
Mentor: Patrick J. Pagano, PhD
Dr. DeVallance’s research studies the role NADPH oxidase 1 plays in regulating endothelial cell gene expression and metabolism, and how these NADPH oxidase 1 pathways mediate the progression of vascular diseases such as pulmonary arterial hypertension.

Brittany G. Durgin, PhD
Mentor: Adam C. Straub, PhD
Dr. Durgin’s research involves studying the importance of vascular smooth muscle cell expression of cytochrome b5 reductase 3 and redox regulation of soluble guanylyl cyclase in blood pressure regulation.

Micol Falabella, PhD
Mentor: Brett A. Kaufman, PhD
Dr. Falabella investigates the mechanism associated with mitochondrial genome stability. She also works on unresolved secondary DNA structures, known as G-quadruplexes, and their pathological implication on mitochondrial function.

Jonathan Florentin, PhD
Mentors: Partha Dutta, DVM, PhD, and Stephen Y. Chan, MD, PhD
Dr. Florentin is researching how innate immune myeloid cells are involved in the development of cardiovascular diseases.

Oluwabukola T. Gbotosho, PhD
Mentor: Gregory J. Kato, MD
Dr. Gbotosho’s researches the role of macrophages in cardio-pulmonary complications of sickle cell disease.

Luca Giordano, PhD
Mentor: Brett A. Kaufman, PhD
Dr. Giordano studies mitochondrial genome stability.

Tomasz Kaminski, PhD
Mentor: Prithu Sundd, PhD
Dr. Kaminski’s research investigates the role of neutrophils and its interplay with inflammatory cytokines in
different pathophysiological states in lung tissue using intravital techniques.

Yao Li, PhD  
Mentor: Patrick J. Pagano, PhD  
Dr. Li is researching the role of TNFα-induced endothelial reactive oxygen species (ROS) in inflammation.

Maritza A. Montanez, PhD  
Mentor: Prithu Sundd, PhD  
The goal of Dr. Montanez’s research was to determine a role for microparticles, leukocytes and/or platelets in the progression of PH using intravital imaging and an in vitro microfluidic platform.

Maureen Mburu, MD  
Mentors: Solomon F. Ofori-Acquah, PhD, and Flordeliza Villanueva, MD  
Dr. Mburu’s research focuses on the role of chronic intravascular hemolysis in the progression of sickle cell cardiomyopathy.

Vinny Negi, PhD  
Mentor: Stephen Y. Chan, MD, PhD  
Dr. Negi researches the efficacy of re-purposing chemotherapeutics, such as such as I-BET and momelotinib, for Pulmonary Hypertension.

Lydia Perkins, PhD  
Mentors: Enrico M. Novelli, MD, MS, and Carolyn J. Anderson, PhD  
Dr. Perkins is investigating VLA-4 as a PET imaging biomarker of vaso-occlusive crisis in sickle cell disease.

Krithika Rao, PhD  
Mentor: Sruti Shiva, PhD  
Dr. Rao’s research focuses on the relationship between myoglobin mitochondrial Dynamics during negative cardiac remodeling.

Jairo Andrés Pulgarin Rocha, PhD  
Mentors: Dennis Bruemmer, MD, PhD, and Imad Al Ghouleh, PhD  
Dr. Pulgarin Rocha is studying L1 (long interspersed element-1 (L1) retrotransposons), an abundant class of DNA transposable elements, and their role in pulmonary artery hypertension (PAH).

Elizabeth R. Rochon, PhD  
Mentors: Mark T. Gladwin, MD, and Paola Corti, PhD  
Dr. Rochon’s research focuses on understanding the physiological function of Cytoglobin 1 and Cytoglobin 2 in the context of cardiac development and regeneration using zebrafish as a model.

Cody A Rutledge, MD  
Mentor: Brett A. Kaufman, PhD  
Dr. Rutledge’s research focuses on the regulation of mitochondrial DNA and its role in cardiovascular disease.
Taiju Satoh, PhD  
*Mentor: Mark T. Gladwin, MD*  
Dr. Satoh’s research focuses on the use of treprostinil in the treatment of pulmonary artery hypertension.

Yuanjun Shen, PhD  
*Mentor: Elena A. Goncharova, PhD*  
Dr. Shen is studying the role and mechanisms of regulation and function of TSC2 in PAH and its use as a molecular target to reduce hyper-proliferation of pulmonary vascular cells, and reverse or attenuate pulmonary vascular remodeling.

Dharendra Thapa, PhD  
*Mentor: Iain Scott, PhD*  
Dr. Thapa studies the role of mitochondrial acetyltransferase GCN5L1 in regulating fatty acid oxidation proteins via acetylation in diabetic cardiomyopathy and heart failure.

Sathish B. Vasamsetti, PhD  
*Mentor: Partha Dutta, DVM, PhD*  
Dr. Vasamsetti is researching the role of sympathetic activation in triggering myelopoiesis in diseased conditions such as diabetes. He also studies the role of visceral adipose tissue resident macrophages in heart failure-induced insulin resistance.

Chen-Shan Woodcock, PhD  
*Mentor: Stephen Y. Chan, MD, PhD*  
Dr. Woodcock seeks to determine the role of adenosine-to-inosine RNA editing in PH to provide insight into a significant new aspect of post-transcriptional modifications in the pathogenesis of PH.

Bingxian Xie, PhD  
*Mentor: Iain Scott, PhD*  
Dr. Xie’s research focuses on SGLT2 inhibitors and myocardial metabolism.

Jimin Yang, PhD  
*Mentor: Stephen Y. Chan, MD, PhD*  
Dr. Yang is researching the regulatory mechanism involving m6A RNA methylation in PAH.

Shuai Yuan, PhD  
*Mentor: Adam C. Straub, PhD*  
Dr. Yuan's current research demonstrates that endothelial NADH-cytochrome b5 reductase 3 protects cells from inflammatory activation and damage, in part through suppression of NADPH oxidase 2 and nuclear factor kappa B signaling.
THREE-YEAR BIBLIOGRAPHY

Enabled by our extensive funding from a variety of sources, the VMI persistently publishes innovative research in high-impact journals on blood transfusion, hemophilia, hemostasis, thrombosis and vascular biology. This past fiscal year, institute members published over 100 original research articles, continuing our upward trend over the past 5 years.

Mark T. Gladwin, MD


Lanteri MC, Kancias T, Keating S, Stone M, Guo Y, Page GP, Brambilla DJ, Endres-Dighe SM, Mast AE, Bialkowski W, D’Andrea P, Cable RG, Spencer BR, Triulzi DJ, Murphy EL, Kleinman S, Gladwin MT, Busch MP; NHLBI Recipient Epidemiology Donor Evaluation Study (REDS)-III Program. Intradonor reproducibility and


Vanderpool RR, Saul M, Nouraie M, Gladwin MT, Simon MA. Association Between Hemodynamic Markers of Pulmonary Hypertension and Outcomes in Heart Failure With Preserved Ejection Fraction. JAMA Cardiol. 2018 Apr 1;3(4):298-306.


Krias T, Lanteri MC, Page GP, Guo Y, Endres SM, Stone M, Keating S, Mast AE, Cable RG, Triulzi DJ, Kiss JE, Murphy EL, Kleinman S, Busch MP, Gladwin MT. Ethnicity, Sex, and Age are Determinants of Red Blood Cell


Imad Al Ghouleh, PhD


Jason Becker, MD


Dennis Bruemmer, MD, PhD


Stephen Y. Chan, MD, PhD


Bertero T, Handen AL, Chan SY. Factors associated with heritable pulmonary arterial hypertension exert convergent actions on the miR-130/301-vascular matrix feedback loop. Int J Mol Sci. 2018 Aug 4;19(8).


Eugenia Cifuentes-Pagano, PhD


Paola Corti, PhD


Partha Dutta, DVM, PhD


Ning Feng, MD, PhD

Samit Ghosh, PhD

Ghosh S, Hazra R, Ihunnah CA, Weidert F, Flage B, Ofori-Acouah SF. Augmented NRF2 activation protects...


Delphine A. H. Gomez, PhD


Baylis RA, Gomez D, Owens GK. Shifting the Focus of Preclinical, Murine Atherosclerosis Studies from Prevention to Late-Stage Intervention. Circ Res. 2017 Mar 3;120(5):775-777.

Elena A. Goncharova, PhD


Falabella M, Sun L, Barr J, Pena AZ, Kershaw EE, Gingras S, Goncharova EA, Kaufman BA. Single-Step qPCR


Maria Kapetanaki, PhD


Gregory J. Kato, MD


Brett A. Kaufman, PhD


**Tatiana V. Kudryashova, PhD**


Janet R. Manning, PhD


Charles F. McTiernan, PhD


Davis EM, Ewald G, Givertz MM, Rajagopalan N, Cooper LT Jr, Briller J, Felker GM, Bozkurt B, Drazner MH,


Quyen L. Nguyen, MD

Nguyen QL, Corey C, White P, Watson A, Gladwin MT, Simon MA, Shiva S. Platelets from pulmonary
hypertension patients show increased mitochondrial reserve capacity. JCI Insight. 2017 Mar 9;2(5):e91415.

**Enrico M. Novelli, MD, MS**


Solomon F. Ofori-Acquah, PhD


Buland JR, Wasserloos KJ, Tyurin VA, Tyurina YY, Amoscato AA, Mallampalli RK, Chen BB, Zhao J, Zhao Y,

**Amma T. Owusu-Ansah, PhD**


**Patrick J. Pagano, PhD**


Li Y, Cifuentes-Pagano E, DeVallance ER, de Jesus DS, Sahoo S, Meijles DN, Ross M, Koes D, Camacho C, St Croix C, Pagano PJ. NADPH Oxidase 2 Inhibitors CPP11G and CPP11H Attenuate Endothelial Cell


Jason J. Rose, MD, MBA


Rose JJ, Nolley E, Gladwin MT. A 53-Year-Old Woman with Severe Carbon Monoxide Poisoning. Ann Am


Sanghamitra Sahoo, PhD


Iain Scott, PhD


Sruti Shiva, PhD
Feriduni B, Barzegar M, Sadeghvand S, Shiva S, Khoubnasabjafari M, Jouyban A. Determination of valproic acid and 3-heptanone in plasma using air-assisted liquid-liquid microextraction with the assistance of vortex:


Volonte D, Liu Z, Shiva S, Galbiati F. Caveolin-1 Controls Mitochondrial Function Through Regulation of m-


Courtney E. Sparacino-Watkins, PhD


Cynthia L. St. Hilaire, PhD


Adam C. Straub, PhD

Galley JC, Durgin BG, Miller MP, Hahn SA, Yuan S, Wood KC, Straub AC. Antagonism of Forkhead box


Lohman AW, Straub AC, Johnstone SR. Identification of Connexin43 Phosphorylation and S-Nitrosylation in


Bin Sun, MD


Prithu Sundd, PhD


Jesus Tejero, PhD


Aisha L. Walker, PhD, MPH


Ling Wang, MD, PhD


Manling Zhang, MD, MS


ACKNOWLEDGMENTS

This report was produced by the Office of Academic Affairs in the Department of Medicine.

EXECUTIVE EDITOR
Nichole Radulovich, MEd, CRA
Executive Administrator

SENIOR EDITOR, FACT-CHECKER, AND GRAPHIC DESIGN
Katie Nauman
Academic Affairs Administrator

PROJECT COORDINATORS
Kristen Bagwell
Web Producer

Jane-Ellen Robinet
Communications Coordinator

VMI CONTENT MANAGERS
Jodi Masse
Administrative Assistant

Andy Stephany
Associate Administrator, Vascular Medicine Institute

DATABASE DEVELOPMENT AND SUPPORT
Nemanja Tomic
Database Developer

Photo credits:
All photos courtesy of the VMI/Department of Medicine.
Department of Medicine
2019 Annual Report
Vascular Medicine Institute

ACKNOWLEDGMENTS

This report was produced by the Office of Academic Affairs in the Department of Medicine.

EXECUTIVE EDITOR
Nichole Radulovich, MEd, CRA

Executive Administrator

SENIOR EDITOR, FACT-CHECKER, AND GRAPHIC DESIGN
Katie Nauman

Academic Affairs Administrator

PROJECT COORDINATORS
Kristen Bagwell
Web Producer
Jane-Ellen Robinet
Communications Coordinator

VMI CONTENT MANAGERS
Jodi Masse
Administrative Assistant
Andy Stephany
Associate Administrator, Vascular Medicine Institute

DATABASE DEVELOPMENT AND SUPPORT
Nemanja Tomic
Database Developer

Photo credits:
All photos courtesy of the VMI/Department of Medicine.