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The Vascular Medicine Institute’s (VMI) vision is to harness inter-disciplinary teams of researchers to expand our understanding of the control of blood flow to organ systems, hemostasis and thrombosis, and the development of novel therapies for diseases such as pulmonary hypertension, hemophilia, transfusion medicine, sickle cell vasculopathy, atherosclerosis, hypertension, and heart disease.

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.

As we look towards the future, the VMI intends on establishing a systems biology center to integrate our primary focus areas of hemostasis, transfusion medicine, cardiology and vascular biology.

FY20 saw a change in leadership for the VMI.

Founding Director and Department Chair Mark Gladwin, MD, stepped down from his role as VMI Director with Stephen Chan, MD, PhD, named as the new Director effective January 1, 2020.

Dr. Chan, graduated from the Massachusetts Institute of Technology and received his doctoral degrees from the University of California, San Francisco. He then completed an internship and residency in Internal Medicine at the Brigham and Women’s Hospital (BWH) and fellowship training in Cardiology at the Massachusetts General Hospital with his postdoctoral research performed in the laboratory of Joseph Loscalzo, MD, PhD. After serving as an Assistant Professor of Medicine at BWH and Harvard Medical School from 2010-2015, Dr. Chan came to the University of Pittsburgh to direct the Center for Pulmonary Vascular Biology and Medicine.

Dr. Chan has held research grants from the National Institutes of Health, the American Heart Association, the Pulmonary Hypertension Association, and Gilead Sciences. He has been the recipient of philanthropic awards at BWH, including the Lerner Scholarship, the Watkins Discovery Award, the Harris Family Research Prize, and the McArthur-Radovsky Research Scholarship, and he has received international research awards from the American College of Cardiology, the American Heart Association, and the American Society of Microbiology.
Stephen Y. Chan, MD, PhD
Director, Vascular Medicine Institute
Professor of Medicine, Division of Cardiology
Director, Center for Pulmonary Vascular Biology and Disease
Associate Program Director, Fellowship Research, Cardiovascular Fellowship Training Program

Imad Al Ghouleh, PhD
Assistant Professor of Medicine, Division of Cardiology
Director, Hypoxia Core

Jason Becker, MD
Associate 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

Mark T. Gladwin, MD
Chair, Department of Medicine
Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine

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 Hematology/Oncology

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 McTiernan, PhD
Research Associate Professor of Medicine, Division of Cardiology

Enrico M. Novelli, MD, MS
Associate Professor of Medicine, Division of Hematology/Oncology
Director, Benign Hematology Section, Division of Hematology/Oncology
Director, UPMC Adult Sickle Cell Disease Program
Solomon F. Ofori-Acquah, PhD
Associate Professor of Medicine,
Division of Hematology/Oncology, and
Human Genetics
Director, Center for Translational and
International Hematology

Amma T. Owusu-Ansah, PhD
Assistant Professor of Medicine,
Division of Hematology/Oncology

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

Tirthadipa Pradhan-Sundd, PhD
Research Assistant Professor of Medicine

Jason 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
Associate Professor of Medicine,
Division of Cardiology

Sruti Shiva, PhD
Associate Professor of Pharmacology
and Chemical Biology
Director of Academic Affairs for the
Vascular Medicine Institute

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
One of the major goals of this year was to move forward with newly funded Hemophilia Center of Western Pennsylvania (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. Future collaborative research networks with the Vitalant Research Institutes of San Francisco and Denver are currently being discussed with additional projects are in development. Moreover, 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 Dr. Mark Gladwin and other VMI investigators’ $19M UG3 clinical trial of erythrocytapheresis for adults with sickle cell disease (SCD) at the highest risk of cardiac death. With extensive collaborative effort for 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 fourth year of our alliance with Bayer, supporting a major clinical trial of riociguat for patients with SCD. 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. In FY20,

**RESEARCH ACTIVITIES**

It has been twelve 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.

In FY20, the Vascular Medicine Institute received a total of $18.2m in research funding from the Public Health Service, industry, and various societies and foundations. Research expenditures exceeded $12.9m, a slight increase from FY19.
Globin Solutions and VMI faculty received an NIH STTR grant to support their pursuits. Additionally, **Dr. Jason Rose**, CEO of Globin Solutions and a graduate of the VMI T32 program under the mentorship of Dr. Gladwin, has been appointed to lead a joint initiative between VMI and the Pulmonary Division to strengthen commercialization efforts among our faculty.

Other research awards and collaborations included:

- **Elena Goncharova, PhD**, was awarded an R01 as a multi-PI award from NHLBI titled “GATA6 in pulmonary arterial hypertension”.
- **Adam Straub, PhD**, received an R01 as a multi-PI award from NHLBI titled “Type II Alveolar Redox Control in Fibrogenesis and Resolution.”
- **Jesus Tejero Bravo, PhD**, and VMI-incubated start-up **Globin Solutions** were awarded an STTR grant from NIH, titled “CO Scavenging by Heme Containing Proteins - Studies of Kinetics, Stability, and Toxicity.” This award brings in funding to VMI in addition to venture capital contracted research dollars from Globin Solutions.

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, our echocardiography mouse core facility, utilizing a VEVO 3100 echocardiography machine for preclinical studies of heart disease, has recently hired an echo technician, **Brenda McMahon**, to run the core and the machine in support of VMI investigators. The core is also open to provide services to the entire University research community.

In September 2018, the VMI established an additional center 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 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.
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 governance in the VMI, we have established a leadership council of our senior faculty, who will provide advice and leadership support to the VMI director, Dr. Chan.
Faculty Research Interests and Activities

Stephen Y. Chan, MD, PhD Institute Director
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
• Professional Affiliations and Society Memberships
• Fellow, Pulmonary Vascular Research Institute, 2012-present
• Fellow, American Heart Association, 2012-present
• Member, Pulmonary Circulation, American Thoracic Society, 2019-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

Major Lectureships and Seminars
• Lecturer, Kellogg Seminar Series, Michigan State University, East Lansing, MI, 2020
• Speaker, 13th Annual Symposium on Neonatal and Childhood Pulmonary Vascular Disease, San Francisco, CA, 2020

Honors and Awards
• Fellow, American Society for Clinical Investigation, 2016-present
• Awardee, Medical Student/Resident Mentoring Merit Award, University of Pittsburgh School of Medicine, July 2019

Imad Al Ghouleh, PhD
Dr. Al Ghouleh's lab studies pulmonary hypertension, with a particular focus on defining the mechanisms that underlie right ventricular phenotypic changes in this disease. Current research is designed to test this pathway in the RV following pressure overload challenge and to delineate the upstream and downstream molecules involved. The long-term goal is to translate mechanistic insights into therapeutic strategies aimed at the RV.

Professional Affiliations and Society Memberships
• Member, Society for Free Radical Biology and Medicine, USA/International, 2010-present
• Member, American Heart Association, 2010-present
• Member, American Thoracic Society, 2018-present

Editorships
• Reviewer, Multiple journals (American Journal of Hypertension, Journal of Cardiovascular Medicine, Arteriosclerosis, Thrombosis, and Vascular Biology, American Journal of Physiology-Heart and Circulatory Physiology, International Journal of Molecular Sciences, Antioxidants and Redox Signaling) 2010-present

Jason R. 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
• Member, American Heart Association, 2003-present
• Member, American College of Cardiology, 2006-present

Editorships
• Ad hoc Reviewer, Multiple journals (American Journal of Physiology – Heart and Circulatory Physiology, Genetics in Medicine), 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. She 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

**Major Lectureships and Seminars**

- Invited Speaker, Sympathetic Neuronal Activation Triggers Myeloid Progenitor Proliferation and Differentiation, British Cardiovascular Society Annual Conference, Manchester, UK, June 2020

**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.

**Mark T. Gladwin, MD**

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 discov-
ery 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 vasodila-
tation. 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 epidemi-
ological 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 hemo-
lytic 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
- 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
- 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
- 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

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**

• Editorial Board, *Journal of Hematology*, 2007-present
• Editorial Board, *Society for Free Radical Biology and Medicine*, 2007-present
• Editorial Board, *Haematologica*, 2008-present
• Associate Editor, *American Journal of Respiratory and Critical Care Medicine*, 2015-2020

**Honors and Awards**

• Member, Alpha Omega Alpha, 1995-present
• Fellow, American Society of Clinical Investigations (ASCI), 2006-present
• Fellow, American College of Physicians, 2008-present

**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, Council on Arteriosclerosis, Thrombosis, and Vascular Biology, American Heart Association, 2009-present
• Member, Awards and Membership Committee, Histochemical Society, 2014-present
• Member, ATVB Council Women Leadership Committee, University of Pittsburgh, 2020

**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

**Honors and Awards**

• Award Finalist, Irvine Page Junior Faculty Award, American Heart Association, ATVB Council, 2020

**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.

Advisory Committee Memberships and Leadership Positions
- Member, ATS International Conference Committee, 2019-present
- Member, Women In Academic Leadership, 2019-present
- Professional Affiliations and Society Memberships
- Member, American Thoracic Society, 2007-present

Editorships
- Reviewer, Multiple journals (American Journal of Physiology: Lung Cellular and Molecular Physiology, PLOS One, Thorax, Circulation Research, Scientific Reports: Cancer Research, Cardiovascular Research, Circulation: Heart Failure), 2010-present
- Editorial Board, American Journal of Physiology: Lung Cellular and Molecular Physiology, 2018-present

Honors and Awards
- Eminent Reviewer Award, AJRCCM, 2019

Maria Kapetanaki, PhD
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.

Gregory J. Kato, MD
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.

Advisory Committee Memberships and Leadership Positions
- Member, Steering Committee, Evaluation of Purified Poloxamer 188 in Vaso-Oclusive 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

Professional Affiliations and Society Memberships
- Member, American Society of Hematology, 1993-present
- Member, American Society of Pediatric Hematology-Oncology, 2001-present
- Member, Society for Free Radical Biology and Medicine, 2006-present

Editorships
Brett A. Kaufman, PhD
Dr. Kaufman's long-standing research interest is to understand the contribution of mtDNA metabolism to disease progression. For 20 years, he has been investigating the fundamental processes that underlie mitochondrial respiratory deficiency, with a focus on mtDNA stability and copy number control-processes essential for respiratory function and viability. 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.

Study Sections
- Grant Reviewer, Pilot Project Program in Hemostasis and Vascular Biology, Vascular Medicine Institute, 2016-present
- Grant Review Committee, United Mitochondrial Disease Foundation, 2016-2020
- Grant reviewer, AAAS Nebraska EPSCoR grant/NSF, 2020

Advisory Committee Memberships and Leadership Positions
- Session co-chair, Translational Research on Mitochondria, Metabolism, Aging, and Disease Symposium (Trimad), University of Pennsylvania, Philadelphia, PA, 2019

Professional Affiliations and Society Memberships
- Member, American Society for Cell Biology, 2003-present
- Member, Mitochondria Research Society, 2009-present
- Member, United Mitochondria Disease Foundation, 2009-present
- Member, Genetics Society of America, 2017-present

Editorships
- Review Editor, Frontiers in Genetics of Aging, 2011-present
- Editorial Board Member, Mitochondrion Journal, 2019-present

Major Lectureships and Seminars
- Invited Speaker, 4th International Conference on Molecular Biology & Nucleic Acids, Chicago, IL, October 2019

Tatiana V. Kudryashova, PhD
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.

Janet R. Manning, PhD
Nutritive status may drive posttranslational non-nuclear protein acetylation in the heart, and can alter the recovery of the myocardium from ischemic injury. Dr. Manning's research is focused on the enzymatic acetylation of proteins localized to the mitochondria and endoplasmic reticulum, and the subsequent impact 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

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

**Advisory Committee Memberships and Leadership Positions**
- Director, Benign Hematology Conference, University of Pittsburgh, 2013-present
- Member, Scientific Committee on Thrombosis and Vascular Biology, American Society of Hematology, 2016-2020
- Member, Committee on Addressing Sickle Cell Disease, The National Academies of Science, Engineering, and Medicine, 2019-present

**Professional Affiliations and Society Memberships**
- Member, American Society of Tropical Medicine and Hygiene, 2008-present
- Member, American Society of Hematology, 2005-present
- Member, European Hematology Association, 2017-present
- Member, American Heart Association, 2017-present

**Editorships**
- Reviewer, Multiple journals, 2011-present
- Peer Reviewer, *UpToDate*, 2016-present

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

**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.

**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

**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.

**Major Lectureships and Seminars**
- Arthur C. Corcoran Memorial Lecture, American Heart Association, September 2019

**Tirthadipa Pradhan-Sundd, PhD**
Liver fibrosis, inflammation and loss of blood biliary barrier are the hallmark of chronic liver injury. Several experimental models have been used to mimic the end-stage pathophysiology of chronic liver injury. However, the underlying differences in the molecular mechanism driving liver injury in different models remains largely unknown due to our inability to visualize the progression of liver injury in vivo in mice. Dr. Pradhan-Sundd has introduced quantitative Liver Intravital Microscopy (qLIM) that enables real-time assessment of bile transport and blood-bile barrier (BBB) integrity in the intact liver of live mice (Pradhan-Sundd et al., Hepatology, 2017, Gastroenterology, 2018). Using qLIM, she seeks to understand the mechanisms of chronic liver injury initiation, progression, and recovery processes in experimental and disease models. Another of Dr. Pradhan-Sundd's longstanding interests is to understand the molecular mechanism of Sickle cell hepatic crisis. Sickle cell disease (SCD) is an autosomal recessive genetic disorder that affects ~100,000 Americans and millions of people worldwide. Sickle cell anemia can affect any part of the body and one of the main organs to be affected is the hepatobiliary system. Using qLIM in a transgenic, humanized mouse model of SCD that exclusively expresses sickle human hemoglobin, she has identified sinusoidal ischemia, impairment of canalicular bile secretion, and intrahepatic accumulation of bile acids in SCD mice. Understanding the molecular events that initiate and promulgate SCD induced hepatobiliary injury.

**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
- Member, Alpha Omega Alpha, 2010-present
- Member, American Thoracic Society, 2013-present
- Member, Undersea and Hyperbaric Medical Society, 2014-present
- Member, American Heart Association, 2016-present
- Member, American College of Medical Toxicology, 2017-present
- Member, Central Society for Clinical & Translational Research, 2018-present

**Editorships**

**Sanghamitra Sahoo, PhD**
Dr. 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 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**
- Reviewer, P3HVB Award Study Section, University of Pittsburgh, 2017-present
- Reviewer, VMI/HVI Innovator Award Study Section, University of Pittsburgh, 2017-present
- Abstract Reviewer, Scientific Sessions, American Heart Association, Dallas, TX, 2020

**Advisory Committee Memberships and Leadership Positions**
- Symposium Chair, Scientific Sessions, American Heart Association, Dallas, TX, 2020

**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, International Society for Heart Research, 2015-present
- Member, American Diabetes Association, 2016-present

**Editorships**

In 2020, Dr. Scott was promoted to the rank of Associate Professor with tenure.
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
• Member, Society for Redox Biology and Medicine Council, 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-Chair, 11th International Meeting on Nitric Oxide, 2020

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

Major Lectureships and Seminars
• Invited Speaker, Science 2019 Spotlight Session on Oxidative Stress, University of Pittsburgh, Pittsburgh, PA, 2019
• Invited Speaker, Pennsylvania State University, 2019

Courtney E. Sparacino-Watkins, PhD
Dr. Sparacino-Watkins's research seeks to elucidate the role of novel molybdenum-dependent oxidoreductase enzymes in human physiology 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, Federal Advisory Committee, Department of Veterans Affairs Scientific Review Group, Subcommittee for Cardiology, 2019

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

**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
- Chair, Endothelial and Vascular Biology Session, 2019

**Advisory Committee Memberships and Leadership Positions**
- Member, Arteriosclerosis, Thrombosis and Vascular Biology and Hypertension councils, American Heart Association, 2012-present
- 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, 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 ap-
proach, which involves in vivo Multi-Photon Excitation (MPE) fluorescence microscopy in transgen-
ic and knock-in mice, microfluidic assays with patient blood, total internal reflection fluorescence
(TIRF) microscopy, structured illumination microscopy (SIM), laser confocal microscopy, electron mi-
croscopy 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
vascular events (micro-level response) driving the vaso-occlusion and the molecular interactions (na-
no-level response) enabling those cellular events. Identifying the molecular mechanism of vaso-oc-
cclusion 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: 1) to understand and characterize the chemical and kinetic features of the reactions of nitrite with hemoglobin, myoglobin, cytoglobin and neuroglobin; 2) to elucidate the cytoprotective mechanisms of the six-coordinate globins neuro-
globin and cytoglobin; and 3) the development of heme-based anti-
dotes for carbon monoxide poisoning.

**Professional Affiliations and Society Memberships**
- Member, Spanish Society for Biochemistry and Molecular Biology, 2000-present
- Member, Society for Free Radical Biology and Medicine, 2010-present
- Member, American Society for Pharmacology and Experimental Therapeutics, 2020-present

**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.

**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.

**Professional Affiliations and Society Memberships**
- Member, American Thoracic Society, 2007-present
- Member, Society for Free Radical Biology and Medicine, 2010-present
- Member, American Heart Association, 2016-present
- Member, Chinese-American Lung Association, 2016-present

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

**Professional Affiliations and Society Memberships**
- Member, American Heart Association, 2007-present
### GRANTS AND CONTRACTS

**AWARDED**

**July 1, 2019 to June 30, 2020**

#### PUBLIC HEALTH SERVICE

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**PUBLIC HEALTH SERVICE**

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**TOTAL PUBLIC HEALTH SERVICE** $7,790,569 $2,748,289

**SOCIETY AND FOUNDATIONS**

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<td>Novelli, Enrico</td>
<td>Characterization of Cerebral Oxidative Stress in Transgenic Sickle Mouse Models</td>
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<td>Pradhan, Tirthadipa</td>
<td>Molecular mechanism of Sickle Cell Hepatic Crisis</td>
<td>Community Liver Alliance</td>
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<td>Pradhan, Tirthadipa</td>
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<td>Sparacino-Watkins, Courtney</td>
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<td>Straub, Adam</td>
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<td>Sundd, Prithu</td>
<td>Mechanism of Platelet Extracellular Vesicle-Mediated Vaso-Occlusion in Sickle Cell Disease</td>
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<td>Sundd, Prithu</td>
<td>Defining the systems biology of the vascular matrix in pulmonary hypertension</td>
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<td>Yuan, Shuai</td>
<td>Regulation of Cytochrome b5 Reductase on Angiogenesis and Lipid Metabolism</td>
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**TOTAL SOCIETY AND FOUNDATIONS** | **$4,629,386** | **$458,104**

# INDUSTRY

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<th>INVESTIGATOR</th>
<th>TITLE</th>
<th>AGENCY</th>
<th>ANNUAL DIRECT COSTS</th>
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<td>Gladwin, Mark</td>
<td>Effect of Remodulin in Pulmonary Hypertension Associated with Heart Failure with Preserved Ejection Fraction (PH-HFpEF)</td>
<td>United Therapeutics Corp.</td>
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Vascular Medicine Institute
## INDUSTRY

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<td>Goncharova, Elena A.</td>
<td>Evaluation of the Role of Gremlin 1, Activin A and PDGFRB in Pulmonary Hypertension</td>
<td>Regeneron Pharmaceuticals, Inc.</td>
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<td>Hughan, Kara</td>
<td>Polycystic Ovarian Syndrome Real World Data Study</td>
<td>Bayer Corporation</td>
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<td>Kato, Gregory</td>
<td>Riociguat Study in SCD</td>
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<td>Ofori-Acquah, Solomon F.</td>
<td>Heme-Oxygenase-1 Infusion Therapy for Sickle Cell Disease</td>
<td>Shire</td>
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<td>Straub, Adam</td>
<td>Cyb5R3 and cGMP Signaling</td>
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<td>Tejero Bravo, Jesus</td>
<td>CO Scavenging by Heme Containing Proteins - Studies of Kinetics, Stability, and Toxicity</td>
<td>Globin Solutions, Inc.</td>
<td>$187,793</td>
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**TOTAL INDUSTRY** | $2,209,778 | $375,777 |

**PUBLIC HEALTH SERVICE** | $7,790,569 | $2,748,289 |

**SOCIETY AND FOUNDATIONS** | $4,629,386 | $458,104 |

**INDUSTRY** | $2,209,778 | $375,777 |

**TOTAL** | $14,629,733 | $3,582,170 |
TEACHING ACTIVITIES

With more than 20 postdoctoral fellows, 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 now have another opportunity for training, with a new T32 focused on benign hematology training. 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 including a summer undergraduate training for underrepresented minorities supported by an R25 training grant.

Conferences

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.

Held every Wednesday at noon, 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. Immediately following presentations by visiting faculty, postdoctoral fellows are invited to exclusive roundtable discussions, thereby gaining valuable insight from these renowned professionals outside of the Pitt community by discussing scientific topics and career development.

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.

Held once a month, the VMI Journal Club sees 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.
This past winter, the Division of Cardiology, in conjunction with the VMI, held its annual VMI/HVI Fellows Research Retreat at Seven Springs from February 20-22, 2019. Featuring a keynote presentation Dr. Iris Jaffe of the Tufts Medical Center Molecular Cardiology Research 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.

Career Development Opportunities

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.

The VMI also organizes K-to-R workshops designed to provide assistance to junior faculty preceding their R01 submissions, ultimately leading to a greater percentage of R01-funded faculty across the Institute. 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.

Additionally, Dr. Christopher O'Donnell oversees an editorial grant review core to assist trainees and junior faculty 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 approximately five hours critiquing the application and completing the required NIH review form focusing 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 and Activities

Matthew B. Amdahl, PhD  
Mentor: Mark Gladwin, MD  
Dr. Amdahl is focused on studies on cytoglobin structure and function, and vascular remodeling.

Publications

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.

Publications

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 is focused on the changes in platelet mitochondrial function in healthy aging.

Publications

Tomasz Brzóska, PhD  
Mentor: Prithu Sundd, PhD  
Dr. Brzoska 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.

Publications

Rolando Cuevas, PhD
Mentor: Cynthia St. Hilaire, PhD
Dr. Cuevas is focused on dysregulation of Foxo1 and its effects on calcification in arterial calcification.

Publications

Anthony W. DeMartino, PhD T32 Scholar
Mentor: Mark T. Gladwin, MD
Dr. DeMartino’s research focuses on the exploration of allosteric regulation of cytoglobin using chemical kinetics and cellular models and development of a small molecule CO and CN-antidotes.

Publications

Presentations and Abstracts
- Allosteric redox sensor properties of cytoglobin interrogated via ligand binding at the distal heme pocket, 15th Annual Metals in Biological and Chemical Systems symposium, Duquesne University, Pittsburgh, PA, September 2019.
Matthew Dent, PhD *T32 Scholar*
*Mentor: Mark Gladwin, MD*
Dr. Dent is focused on rcom protein based carbon monoxide scavengers as a treatment for carbon monoxide poisoning.

**Publications**

Evan R. DeVallance, PhD *T32 Scholar*
*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.

Maria Cristina Espinosa Diez, PhD
*Mentor: Delphine Gomez, PhD*
Dr. Espinosa Diez 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.

**Publications**

Brittany Durgin, PhD *T32 Scholar*
*Mentor: Adam Straub, PhD*
Dr. Durgin’s research focuses on CYB5R3 function in vascular smooth muscle cells in the context of systemic hypertension.

**Publications**

**Presentations and Abstracts**

**Honors and Awards**
• Shark Tank Research Pitch Presentation Award, Vascular Medicine Institute Fellows Research Retreat, University of Pittsburgh, Pittsburgh, PA, February 2020.
• F32 Award, Physiological mechanisms governing soluble guanylyl cyclase redox regulation in resistance arteries, May 2020.
• Oral Presentation and Travel Award, Joint Meeting of European and International Societies of Hypertension (ESH-ISH), Glasgow, Scotland, May 2020.

Jonathan Florentin, PhD  
**T32 Scholar**  
*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.

**Publications**


Oluwabukola T. Gbotosho, PhD  
*Mentor: Gregory J. Kato, MD*

Dr. Gbotosho researches the role of macrophages in cardio-pulmonary complications of sickle cell disease.

**Publications**


Luca Giordano, PhD  
*Mentor: Brett A. Kaufman, PhD*

Dr. Giordano’s research focuses on mtDNA analysis and mitochondrial bioenergetics in the context of the oxidative stress induced by cigarette smoke exposure in cells and tissue.

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.

**Publications**


Soumojit Pal, PhD
Mentor: Jason Becker, MD
Dr. Pal is focused on genetic and acquired cardiomyopathies in an effort to identify novel methods to prevent and treat hypertrophic cardiomyopathy and heart failure.

Publications

Lydia Perkins, PhD T32 Scholar
Mentors: Carolyn J. Anderson, PhD, and Enrico M. Novelli, MD, MS
Dr. Perkins investigated VLA-4 as a PET imaging biomarker of vaso-occlusive crisis in sickle cell disease.

Publications

Jairo Andrés Pulgarin Rocha, PhD
Mentors: 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).

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

Elizabeth R. Rochon, PhD
Mentors: Mark T. Gladwin, MD, and Paola Corti, PhD
Dr. Rochon’s research uses zebrafish as a model to perform a reverse genetic screen to determine the physiological functions of globin proteins with a focus on developmental and cardiac phenotypes.

Publications


Cody A. Rutledge, MD, PhD T32 Scholar
Mentor: Brett A. Kaufman, PhD
Dr. Rutledge’s research focuses on the regulation of mitochondrial DNA and its role in cardiovascular disease.

Publications


Presentations and Abstracts

- Mitochondrial DNA Preservation Protects Cardiac Function Following Sudden Cardiac Arrest, AHA Basic Cardiovascular Sciences Scientific Sessions, July 2019.
- Mitochondrial DNA Preservation as a Target for Cardioprotection after Sudden Cardiac Arrest, Vascular Medicine Institute, University of Pittsburgh, Pittsburgh, PA, February 2020.

Taiju Satoh, PhD
Mentor: Mark T. Gladwin, MD
Dr. Satoh’s research focuses on exercise-induced pulmonary hypertension in HF-pEF.

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.

Daniel Simoes de Jesus, PhD
Mentor: Patrick J. Pagano, PhD
Dr. Simoes de Jesus is studying the hypothesis that hypoxia via Nox1 induces a role for bone
morphogenetic protein antagonist Gremlin1 in lung endothelial cell proliferation.

**Wei Sun, MD, PhD T32 Scholar**  
**Mentors: Stephen Y. Chan, MD, PhD, and Gang Li, PhD**  
Dr. Sun is investigating the role of SCUBE1 in endothelial angiogenesis.

**Publications**

**Presentations and Abstracts**
- Downregulation of SCUBE1 Controls BMPR2-Dependent Pulmonary Endothelial Function: Implications for Diagnostic Marker Development in Pulmonary Arterial Hypertension, Northwestern Cardiovascular Young Investigator Forum, 2019.

**Honors and Awards**
- 1st place, Cardiovascular Medicine Update Conference Poster Award, AHN, ACC PA Chapter, 2019.
- 3rd place, Award for Excellence in Basic Science (Fellows), Northwestern Cardiovascular Young Investigator Forum, 2019.

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**Dharendra Thapa, PhD K99 Scholar**  
**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.

**Publications**

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**Sathish B. Vasamsetti, PhD**  
**Mentor: Partha Dutta, DVM, PhD**  
Dr. Vasamsetti is investigating the role of adipocytokines on the loss of visceral adipose tissue resident macrophages during heart failure-induced insulin resistance.

**Publications**

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**Katherine C. Wood, PhD**  
**Mentor: Adam Straub, PhD**  
Dr. Wood's research focuses on cytochrome b5 reductase 3 (Cyb5R3) involvement in impaired sig-
naling in sickle cell disease associated with pulmonary hypertension and stroke. Mechanisms of pathological crosstalk between brain and lung are being studied.

Chen-Shan “Julia” Woodcock, PhD T32 Scholar
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.

Publications


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

Publications


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.
ONE-YEAR

BIBLIOGRAPHY

July 1, 2019 to June 30, 2020

Non-original research publications are in italics. VMI faculty are in bold.


DeLallo LJ, Hahn S, Katayama PL,
Department of Medicine 2020 Annual Report


Kim EJ, Fox S, Moretti ME, Turner M, Girard TD, Chan SY. Motivations and Barriers Associated With Physician Volunteering for an International Tele


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