

## Program Administration: Director and Associate Directors

**Sumanth D. Prabhu, MD** Dr. Prabhu is Professor of Medicine and Cell, Developmental, and Integrative



Biology, as well as Director of both the Division of Cardiovascular Disease and the CCVC. He will serve as the **Program Director (PD)** of the BTS HF training program, and Director of the Executive Committee. In this capacity, he will be responsible for the overall leadership, organization, and administration of the program. Prior to arriving at UAB in 2011, Dr. Prabhu was Cardiology faculty and Fellowship Director at the University of Texas Health Science Center at San Antonio (UTHSCSA, 1992-1999) and then Professor of Medicine, Distinguished University Scholar, Director of HF Research, and a key faculty of the HF/Transplant Program at the University of Louisville (U of L). Dr. Prabhu plays a very active role in all of the Division's missions, including teaching, clinical medicine, research, and administration. Clinically, he is a HF cardiologist who maintains a clinical practice and attends to patients with advanced HF who may require LVADs or heart transplantation. Throughout his career, he has been firmly committed to teaching and mentoring medical and graduate students, internal medicine residents, and fellows (clinical and PhD), and has been recognized with Outstanding Teaching Awards from the Department of Medicine and Division of Cardiology at UTHSCSA (1993) and at U of L (2002).

Dr. Prabhu's research program focuses on the pathophysiological, cellular, and molecular mechanisms of left ventricular (LV) remodeling, dysfunction, and repair in HF, especially those related to inflammation, immune cells, and stem cells. He is currently supported as PI by an NIH R01 grant (R01 HL125735-01) and a VA Merit grant (I01BX002706-01A1). In addition to laboratory-based research, Dr. Prabhu is actively engaged in clinical studies of HF exploring new device-based and stem cell therapies. His bibliography includes 117 peer-reviewed manuscripts and 11 book chapters, with papers appearing in high-impact journals such as *Circulation*, *JACC*, *Circulation Research*, *Hypertension*, *PNAS*, *Journal of Biological Chemistry*, and others. His research accomplishments have been recognized by election to membership in the American Society for Clinical Investigation, the Mary Gertrude Waters Endowed Chair of Cardiovascular Medicine at UAB, the Max Cooper Award for Research Excellence at UAB, the Distinguished University Scholar and President's Distinguished Faculty Award for Outstanding Scholarship, Research and Creative Activity at U of L, designation as an AHA Established Investigator, current appointment as a regular member of the NIH Mentored Patient-Oriented Research (MPOR) Study Section, and past appointment to the Cardiac Contractility, Hypertrophy and Failure (CCHF) Study Section and other (inter)national review panels.

Dr. Prabhu is regularly invited to present his work at national and international meetings, and is a member of the 2015 and 2016 AHA Committee on Scientific Sessions Program. He co-authored the first AHA basic science consensus statement on the use of animal models for HF (Circ Res 2012;111:131). He is Consulting Editor of *Circulation Research*, Editorial Consultant for *JACC Basic to Translational Research*, and serves on the Editorial Board of the *Journal of Molecular and Cellular Cardiology*. Dr. Prabhu has mentored 16 pre-doctoral and 21 post-doctoral trainees in laboratory-based and/or clinical research, along with junior faculty, many of whom have pursued academic careers of their own. In addition, he has served on several T32 and T35 NIH training grants as Faculty Mentor, and as PI on an NIEHS Multi-PI T35 training grant (ES014559). Dr. Prabhu's translational expertise as both a dedicated HF scientist and clinician, and his past experience in leadership, mentorship, administration, and scientific research ideally qualify him as the Director of this post-doctoral BTS HF Training Program.

**Martin E. Young, D.Phil** Dr. Young is Professor of Medicine, Vice-Director for Research in the Division of



Cardiovascular Disease, and Section Chief for Basic and Translational Research in the Division of Cardiovascular Disease. He will serve as an **Associate Director** of the BTS HF training program. His role will be to assist the PD in overall leadership, administration, and operations of the Training Program. He will also play a key role in the Executive Committee, helping to recruit outstanding trainee candidates, identify faculty mentors and research opportunities, and track trainee progress. Dr. Young has a long-standing dedication towards teaching and mentorship. During completion of his PhD, Dr. Young was appointed a Lectureship at Oxford University, for the tuition of Biochemistry to undergraduate and medical school students. At both UTHSC-Houston and UAB, Dr. Young has continued didactic teaching of intermediary metabolism to graduate and medical students. In the latter case, Dr. Young has been recipient of a Best Lecturer award for four straight years at UAB. Dr. Young also has an established track record of mentoring undergraduates, graduates and postdoctoral fellows, which is illustrated by both direct mentorship and his leadership roles. Dr. Young's research focuses on cardiometabolic diseases, assessing the mechanisms by which environmental factors (e.g., diet, time-of-day) and metabolic disease states (e.g., diabetes, obesity) influence cardiac contractility and contribute

to the pathogenesis of HF. Currently, his work is dedicated to understanding the interrelationship between cardiac metabolism, contractility, and failure and the mechanisms by which substrate imbalances impair cardiac structure and function. This expertise is illustrated by both his publication and funding histories. Dr. Young has published over 120 peer-reviewed manuscripts in top tier journals, such as *Circulation Research* and *Journal of Biological Chemistry*, and has been commissioned by numerous journals (including *Nature Reviews Endocrinology*) for the completion of invited reviews. More recently, he has co-chaired an AHA consensus statement focused on 'Assessing Cardiac Metabolism', which is in press in *Circulation Research*. Dr. Young's scientific interests and administrative skills are highly complementary to those of Dr. Prabhu. In addition to co-administering the Division of Cardiovascular Disease, Drs. Young and Prabhu have recently initiated pilot collaborative studies examining the role of the immune cell circadian clock in the pathogenesis of HF, and the combined effort on the BTSHF program is a logical extension to facilitate post-doctoral training.

#### **Steven G. Lloyd, MD, PhD**



Dr. Lloyd is Professor of Medicine and Radiology, the H. Cecil Coghlan, M.D., Endowed Scholar in Cardiovascular Medicine, and Vice-Director for Education in the Division of Cardiovascular Disease. In addition, he serves as the Section Head for CV MRI, Director of the Cardiovascular Disease Fellowship Program, and is Immediate Past-President of the Alabama Chapter of the ACC (ALACC). He will serve as an **Associate Director** of the BTSHF training program and on the Executive Committee. Dr. Lloyd's role will be to help the PD in recruiting top-tier clinical (MD and MD/PhD) post-doctoral candidates (especially general cardiology fellows and ABIM research pathway trainees interested in clinical and translational science), matching of trainees with appropriate faculty research mentors, and in the evaluation of trainee progress. As the Fellowship Program Director, Dr. Lloyd administratively oversees the training of all clinical cardiovascular fellows, including those enrolled in the ABIM Research Pathway. Moreover, and particularly relevant to this T32 application, as a member of the ACC Board of Governors, Dr. Lloyd is in a unique position to understand (and help implement) emerging trends in national policy that impact the research training of clinical fellows; hence, his input will be critical for the administration and success of the BTSHF Training Program. Dr. Lloyd will also mentor postdoctoral trainees in cardiovascular imaging research, and coordinate and implement any MRI and spectroscopy projects associated with the HF research program. As the CV MRI Section Head, Dr. Lloyd has served as principal mentor for numerous trainees who have used CMR imaging to complete collaborative clinical research projects in HF, and to obtain research and clinical training. He has received Outstanding Teaching Awards from the UAB Department of Medicine in 2013 and 2015. Dr. Lloyd also has an active basic research program investigating the effects of weight loss diets on the response to myocardial infarction. He also has a particular interest in use of MRI and spectroscopy to study the heart and vascular system in HF models. Dr. Lloyd's distinct perspectives on, and experiences in, training and mentoring post-doctoral cardiovascular fellows and his research interests in HF imaging and cardiac metabolism ideally complement those of the other members of the Executive Committee, and will provide substantial depth and quality to the training experience.

#### **George Howard, DrPH**



Dr. Howard is Professor of Biostatistics and will serve as an **Associate Director** of the BTSHF training program. In this role, Dr. Howard will serve on the Executive Committee and assist the PD in recruiting top-tier post-doctoral candidates, especially those interested in translational and population science research, and help assure effective thematic alignment between mentors and trainees and the implementation of the proposed educational and research training programs. Dr. Howard has been faculty on NIH-funded training programs in both the Schools of Medicine and Public Health, playing roles as primary mentor and secondary/support mentor in the domains of biostatistics and epidemiology, an academic advisor of physicians in the Masters of Science of Clinical Research (MSPH) program, as part of T32 and T15 programs, and as academic advisor of students pursuing Masters and PhDs in Biostatistics (including physicians pursuing this degree during their post-doctoral [post-MD] training programs). His past mentees have faculty positions at research-oriented universities; a prominent mentee has had more than 70 publications since 2010, and has been promoted to associate professor and assistant dean at the UAB School of Public Health. A major focus of Dr. Howard's research has been the application of statistical methods in randomized trials and observational studies, including research in hypertension, atherosclerosis, and HF. He is PI of the REGARDS Study, a longitudinal cohort of 30,239 African American and White participants from across the US. He has more than 340 publications, and has been PI of Statistical and Data Coordinating Centers (SDCC) for large multi-center randomized clinical trials. Currently, he is the PI of the SDCC for the Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial (CREST-2), and has previously been the PI of the SDCC for the Carotid Revascularization Endarterectomy Stenting Trial, and the

Secondary Prevention of Small Subcortical Stroke Study. *Dr. Howard has successfully developed and applied novel statistical methods in epidemiological studies and clinical trials; hence, his scientific and mentoring skills add considerable depth for the training program in population and translational science related to HF.*

### Primary Faculty (in addition to Director and Associate Directors)

**Pankaj Arora, MD:** Dr. Arora is an Assistant Professor of Medicine in the Division of Cardiovascular Disease. His clinical and research background is in molecular biology, genomics, and clinical research. His research revolves around a central hypothesis that a deficiency in natriuretic peptide signaling promotes cardiometabolic disease, and represents an important therapeutic target. Cardiometabolic disorders such as hypertension, central obesity, and glucose intolerance constitute major sources of morbidity and mortality in the U.S. and worldwide. The management of cardiometabolic abnormalities represents an important public health challenge, given the rising prevalence of obesity and poor adherence to lifestyle interventions. The heart serves a major endocrine function by producing a family of hormones known as the natriuretic peptides (NPs). In the past decade, a large body of experimental evidence has suggested that the NP axis could play a key role in modulating susceptibility to cardiometabolic risk. Nonetheless, data translating these biologic insights to humans are very limited. Our laboratory is focused primarily on translating genetic, molecular and animal discoveries around the NP system into an improved understanding of human physiology through clinically-focused research.

**Marcas M. Bamman, PhD:** Dr. Bamman is a Professor of Cell, Developmental, & Integrative Biology, and Director of the UAB Center for Exercise Medicine (UCEM). He has been devoted to clinical and translational research and training on human muscle biology and exercise medicine throughout his career. As Director of the UCEM, steering committee member for the CCVC, and director of 1T32HD071866, he is ideally suited to serve as a mentor on this proposed T32 training program. Dr. Bamman's research focuses on mechanisms of human skeletal muscle atrophy and dysfunction in various disease states including heart failure, and restoration of muscle mass and function using exercise as regenerative medicine. The research takes advantage of expertise in the Core Muscle Research Laboratory (molecular, biochemical, histological, and in vitro approaches) and the Clinical Exercise Facility (exercise training, Neuromuscular Function Laboratory, Cardiorespiratory Function Laboratory).

**Dan E. Berkowitz, MD:** Dr. Berkowitz is Professor and Chair of Anesthesiology & Perioperative Medicine. Dr. Berkowitz's laboratory has been studying the mechanisms contributing to the pathobiology of vascular dysfunction in diseases such as age-related systolic hypertension, atherosclerosis, radiation induced vascular injury and pulmonary hypertension. His integrated vascular biology laboratory has been continuously funded for 15 years by the NIH, as well as the American Heart Association, and NASA through the National Space Biomedical Research Institute. During his tenure, he has had the good fortune of mentoring many undergraduates, graduate students, post-doctoral basic scientist and clinician scientists as well as young faculty. A number of his post-doctoral fellows have been funded by foundations including the American Heart Association (AHA). More over the young faculty have been funded by the AHA through the original Grant-In Aid program as well as through anesthesia foundations such as the Foundation for Anesthesia Education and Research and the International Anesthesia Research Society (IARS). One of his long-standing mentees is currently a K08 awardee at Johns Hopkins, and two of his mentees received independent R01 funding for their work this year. He has demonstrated through his career a deep commitment to mentorship and trainee development. As a faculty member on the T32 training grant, he will continue to maintain this commitment and promote a successful transition of our fellows and faculty to a career in academic medicine.

**Smita Bhatia, MD, MPH:** Dr. Bhatia is Professor and Vice Chair of Pediatrics, as well as Director of the Institute of Cancer Outcomes and Survivorship at UAB. Dr. Bhatia has successfully trained 6 post-doctoral fellows over the past 8 years, all of which have successfully transitioned to independent career paths in translational science. Dr. Bhatia has a broad background in epidemiology and outcomes research. Her research includes describing the burden of morbidity borne by cancer survivors, identifying those at highest risk, exploring the molecular pathogenesis of long-term complications, and developing interventions to mitigate this burden of morbidity. One long-term complication of interest is the development of heart failure in survivors. As Director of the Institute for Cancer Outcomes and Survivorship at UAB, Dr. Bhatia's role is to initiate, facilitate, and coordinate cancer outcomes and survivorship research activities, to encourage members to pursue extramurally funded research, and to publish results from currently active research endeavors.

**Surya Bhatt, MD:** Dr. Bhatt is Assistant Professor of Pulmonary, Allergy, and Critical Care Medicine, as well as Medical Director of the Pulmonary Function and Exercise Physiology Laboratory. Dr. Bhatt has a keen dedication to teaching, as illustrated by receipt of the Best Senior Resident Teaching Award from Temple University/St Luke's Hospital in 2008, as well as the Department of Medicine 'Top Ten Teachers Award' in 2013, 2014, and 2015. Dr. Bhatt's research focuses on the pathophysiology of acute exacerbations of chronic obstructive pulmonary disease (COPD), including phenotyping and risk stratification, with a specific emphasis on cardiovascular comorbidity and co-existence of cardiac dysfunction in such patients. These studies have already identified serum magnesium as a risk factor for frequent exacerbations, and revealed that arrhythmias are not just a consequence of exacerbations but also potentially causative of these events.



**Vera Bittner, MD:** Dr. Bittner is currently a Professor of Medicine and Section Head of General Cardiology, Prevention and Imaging in the Division of Cardiovascular Disease. She has >30 years of experience as a clinical investigator conducting clinical trials and epidemiologic investigations, predominantly in secondary prevention of atherosclerosis, cardiac rehabilitation, heart failure, and women's health. Dr. Bittner has served as Director of the Cardiology Fellowship Program at UAB for 13 years and has mentored medical students, graduate students, residents, fellows and junior faculty throughout her career.

**Todd M. Brown, MD, MSPH:** Dr. Brown is Associate Professor of Medicine in the Division of Cardiovascular Disease, Associate Director of the Cardiovascular Disease Fellowship Program, and Medical Director of the UAB Cardiology Outpatient Clinic. In this role, he has actively mentored multiple medical residents and cardiology fellows. As both a practicing clinical cardiologist with formal training in epidemiology, Dr. Brown has worked extensively in the fields of clinical and population science primarily as an investigator in the NIH-funded REGARDS-Myocardial Infarction study.

**David A. Calhoun, MD:** Dr. Calhoun is Professor of Medicine in the Division of Cardiovascular Disease, and the Director of the Hemodynamic and Vascular Research Laboratory. Dr. Calhoun has been faculty mentor on 5 NIH-funded training programs for pre- or post-doctoral students at UAB. In the last 10 years, Dr. Calhoun has mentored 11 postdoctoral fellows; of these, 5 currently hold faculty positions at various Universities world-wide and one is medical director for a large pharmaceutical company. Dr. Calhoun's translational research has focused on identifying the mechanisms of resistant hypertension and sleep apnea (major HF co-morbidities), and development of treatment strategies. Important discoveries from his NIH- and industry- sponsored research have included: 1) identification of hyperaldosteronism as a common cause of resistant hypertension, and demonstration of the therapeutic benefit of mineralocorticoid receptor antagonism; 2) establishing that high salt sensitivity contributes importantly to antihypertensive drug resistance; 3) linkage of aldosterone excess to the severity of obstructive sleep apnea in patients with resistant hypertension; and 4) demonstration that aldosterone antagonism reduces the severity of obstructive sleep apnea in these patients.

**John C. Chatham, D.Phil:** Dr. Chatham is Professor and Director of Molecular and Cellular Pathology. He has successfully mentored 11 post-doctoral fellows during his academic career, the majority of whom have continued to pursue successful academic careers, and is currently mentoring two additional post-doctoral fellows. Dr. Chatham has been involved in cardiovascular research for more than 20 years and has been continuously funded by NIH for approximately 15 years. He has published more than 80 peer-reviewed manuscripts. His recent studies have focused on understanding the impact of the role of O-GlcNAc in regulating cellular stress responses, particularly in the context of age related diseases, such as myocardial ischemia, diabetes, and heart failure. In addition, he has also demonstrated that aging is associated with a chronic upregulation of O-GlcNAc levels, which may contribute to the decreased tolerance to injury associated with aging, and subsequent development of heart failure.

**Yabing Chen, PhD:** Dr. Chen is the Jay M. McDonald Endowed Professor in Laboratory Medicine, the Vice Chair of Faculty Development and Education for the Department of Pathology, the Director of the PBMM Graduate Program in Graduate Biomedical Sciences and a Professor of Pathology. She has over 15 years' experience in teaching and mentoring, particularly at the graduate and postgraduate levels. In addition to mentoring graduate students and serving on many graduate student thesis committees, she has been chairing graduate student admissions committees for the UAB graduate school Pathobiology and Molecular Medicine (PBMM) theme since 2011, and served as the Director for the PBMM theme since 2015. Dr. Chen's research has been focused on studying the molecular and cellular mechanisms underlying phenotypic modulation of vascular smooth muscle cells (VSMC) and their contributions to the pathogenesis of vascular diseases, including restenosis, atherosclerosis and hypertension. She has 15-years' experience in vascular biology and have expertise in using genetically modified mouse models to study cardiovascular diseases. Over the years, her laboratory has generated novel mouse models with SMC-specific gene ablations and accumulated experience using cutting-edge technologies to evaluate vascular cells and their function during development and in disease. We have established in vitro and in vivo systems to determine molecular mechanisms that control VSMC gene expression and phenotypic modulation in response to oxidative stress and hyperglycemia in vascular disease, such as atherosclerosis, diabetic vascular complications, and vascular aging. Our research in vascular biology and disease has been well recognized, as manifested by citations, highlights and editorials of our publications, invited talks in other national and international institutes and invited moderator and speaker at AHA scientific sessions. She has received the Research Career Scientist Award in 2016 from the US Department of Veterans Affairs. In 2018, she received the prestigious Vascular Biology Special Recognition Award from the AHA ATVB council. Dr. Chen has continuously contributed to the research and education missions by serving on editorial board and/or guest editor of the AHA journals, Circulation Research and Arteriosclerosis Thrombosis and Vascular Biology, as well as the Journal of Biological Chemistry and Frontier in Cardiovascular Medicine. She is currently serving as the chair of the Scientific Sessions Program Committee of the AHA/ATVB council, as well as review committees on cardiovascular research for AHA, VA and NIH study sections, including AICS and VCMB.

**Louis J. Dell'Italia, MD:** Dr. Dell'Italia is Professor of Medicine in the Division of Cardiovascular Disease, and Co-Director of the CCVC. Dr. Dell'Italia has a robust translational research program in HF; he has served as faculty on several training grants and mentored many basic and clinical students and doctors over the past 30 years, resulting in the Dean's mentorship award in 2009. The overarching theme of his research is to understand the biochemical and molecular mechanisms that regulate LV remodeling in various forms of HF. His laboratory implements a multi-disciplinary approach

incorporating *in vitro* and *in vivo* systems and more recently clinical translational studies. As to the latter, Dr. Dell'Italia was PI of the only NIH SCCOR awarded to study HF (P50 HL077100-05, 2005-2010), which had the stipulation that each research project must include "hands on" interaction with patients. His laboratory has three specific areas of interest: 1) understanding the LV remodeling that occurs in patients with mitral regurgitation; 2) defining the roles played by inflammation and oxidative stress in cardiac failure; and 3) understanding how the relationship between cardiomyocyte mitochondria and oxidative stress in the volume-overloaded heart. Dr. Dell'Italia's background in clinical research and ventricular mechanics is ideally suited for this training grant.

**Raegan Durant, MD, MPH:** Dr. Durant is Assistant Professor of Medicine in the Division of Preventive Medicine, and has mentored multiple students with a focus on relationships between social support, HF self-management, and hospital use for HF. He previously established a prospective local cohort of over 700 African Americans and Whites with HF to determine if racial disparities in hospital readmission rates were attributable to differences in social support or HF self-care. He has worked with African American HF patients and their caregivers to learn more in-depth information about the respective roles each group plays in disease self-management, and studied clinical research methodology and strategies to increase the enrollment of racial and ethnic minority groups in clinical trials. He currently has a funded randomized control trial to explore the efficacy and cost-effectiveness of an adapted patient navigation model to reduce readmission rates among African American men with HF.

**James F. George, PhD:** Dr. George is Professor of Surgery, Director of the Cardiovascular Research Laboratory, Division of Cardiothoracic Surgery, and Director of the UAB Microsurgical Core Facility. Dr. George is a current faculty mentor on 3 NIH-funded training grants and has mentored 8 post-doctoral fellows over the last 10 years (one current), several of whom are now faculty members at their current universities. His research focuses on vascular disease, immune regulation, and the role of heme oxygenase-1 (HO-1) in end stage organ disease and solid organ transplantation. A major theme is the role of innate immunity after acute injury or during chronic disease through analysis of intra-organ macrophages and dendritic cells. Another major theme is the development of animal models of end-stage heart and renal disease. Current investigations include: 1) the role of HO-1 in arterial thrombosis and post-transplant vascular disease, a key limitation to long-term allograft survival; and 2) the development of unique rodent models of transplantation. Dr. George also has a substantial interest in translational research as it relates to transplantation and end stage organ failure.

**Orlando Gutierrez, MD, MMSc:** Dr. Gutierrez is Associate Professor of Medicine and Section Head of Outcomes and Epidemiology Research for the Division of Nephrology. Dr. Gutierrez has an established record for both translational research and teaching excellence. This is exemplified by his publication and extramural funding history, as well as by various honors, including an Education Supplemental Award in 2014. He actively mentors young clinical investigators, including medical students, residents, fellows and pre- and post-doctoral investigators. Dr. Gutiérrez's research focuses on the mechanisms by which bone and mineral metabolism disorders impact the pathophysiology of cardiovascular disease (including HF), kidney disease progression, and death in patients with chronic kidney disease. Dr. Gutiérrez has extensive experience in designing and completing both patient-oriented and large epidemiological studies, including nested case-control and case-cohort studies in established cohorts such as the Accelerated Mortality on Renal Replacement (ArMORR) Study and the Reasons for Geographic and Racial Differences in Stroke (REGARDS) Study.

**Fadi G. Hage, MD:** Dr. Hage is Associate Professor of Medicine in the Division of Cardiovascular Disease. He plays an active role in education and mentorship. He is a member of the Division's Education Committee, and since 2009 has directly mentored 9 fellows. Dr. Hage also teaches medical students as a discussion leader in the cardiovascular module. Dr. Hage's research interests include understanding the relationship between inflammation and vascular injury, and how this may be mediated by C-reactive protein (CRP), a biomarker of cardiovascular risk. Using a CRP transgenic mouse, Dr. Hage has shown that CRP facilitates adverse remodeling observed following acute arterial injury, and that this depends on expression of the activating immunoglobulin receptor FcγRI, and a functioning complement system. Estrogen (E2: 17β-estradiol) prevents this adverse effect of CRP, but this protective effect may be lost and/or reversed with aging. These novel findings may help explain why E2 is vasculoprotective in young peri-menopausal women but carries increased risk of cardiovascular disease in older post-menopausal women.

**Ganesh V. Halade, PhD:** Dr. Halade is Assistant Professor of Medicine in the Division of Cardiovascular Disease. He has significant experience in translational research training of pre- and post- doctoral fellows. Currently, he is a faculty mentor for the Graduate School, and has mentored 2 pre-medical students, 3 graduate students, and 1 post-doctoral fellow. Following completion of their projects (and publication of resulting manuscripts), two trainees have successfully been accepted into medical school. Dr. Halade's research focuses on the resolution of inflammation following myocardial infarction (MI), and how this contributes to HF. His group has focused on strategies to promote the resolution of inflammation, and is particularly interested in understanding the coordinated roles of cyclo-oxygenase and lipoxygenase during post-MI remodeling, and the effects of obesity and aging.

**Virginia Howard, PhD:** Dr. Howard is a Professor of Epidemiology for the School of Public Health. Dr. Howard is a stroke epidemiologist with over 30 years' experience in multicenter, multidisciplinary clinical trials and longitudinal cohort studies with a focus on stroke, stroke risk factors, health disparities, and cardiovascular disease in general. Her role in this project will be as a mentor and collaborator. In her career, she has worked with multidisciplinary scientists and clinicians through collaborations in many projects including multicenter, primary and secondary stroke prevention clinical trials as well as the REasons for Geographic and Racial Differences in Stroke (REGARDS) of which she is the lead

epidemiologist. She has initiated and facilitated the development of several REGARDS Working Groups that engage with junior investigators and trainees from across the country and the world in supporting use of data for manuscripts and ancillary studies. This includes training/mentoring in epidemiologic methods including clinical trials and observational studies. She has been a co-investigator and member of the Executive Committees, lead or co-leader of the Statistical and Data Coordinator Center for several NINDS-funded clinical trials of primary and/or secondary stroke prevention: Asymptomatic Carotid Atherosclerosis Study (ACAS), Vitamin Intervention for Stroke Prevention (VISP), Carotid Revascularization Endarterectomy vs. Stent Trial (CREST), and the ongoing Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial (CREST-2). Dr. Howard has been part of training and mentorship opportunities within multicenter clinical trials and other projects through the School of Public Health, the broader UAB community, as well as outside UAB. She is currently a co-investigator and mentor on UAB's Deep South Resource Center for Minority Aging Research (RCMAR) funded by NIA. In her own funded research, she has supported opportunities to engage graduate students and early career investigators in the day-to-day conduct of the research as well as in manuscript development. She is serving or has served on master's thesis committees, dissertation committees and mentoring committees for K-awardees and T32 awardees, and is an active mentor in many existing training programs at UAB. In 2017, she received the UAB Graduate School Dean's Award for Excellence in Mentorship. In summary, her years of training and mentoring of graduate students and early stage clinical investigators with diverse backgrounds and her collaborative experience in the design and conduct of complex, epidemiologic studies and clinical trials have prepared her well to participate in this training and mentored career development program.

**Marguerite Ryan Irvin, PhD, MS:** Dr. Irvin is an Associate Professor of Epidemiology. She is a genetic epidemiologist focused on finding new 'omic' markers of CVD in order to better characterize disease pathways and ultimately prevent disease. She has substantial training in biology, biostatistics, and genetic epidemiology, and has completed a fellowship in statistical genetics; this combination has provided her with a unique interdisciplinary perspective enabling cross-discipline collaborations. Much of her previous work has been dedicated to understanding risk factors for severe hypertension and treatment-resistant hypertension in African-American participants from the Genetics of Hypertension Associated Treatment Study (GenHAT) and the Reasons for Geographic and Racial Differences in Stroke (REGARDS) Study. Dr. Irvin is a co-investigator for several large epidemiologic cohort studies coordinated at the University of Alabama at Birmingham (UAB). Along with her collaborators, she has been actively engaged in genome wide association studies (GWAS), whole exome sequencing, exome chip analysis, genome wide methylation studies (epigenetics), and lipidomics. Two cohorts for which she is a co-investigator (HyperGEN and GOLDN) have joined NHLBI's Whole Genome Sequencing Project (TOPMed). She currently leads the TOPMed epigenetics working group. In addition to her research activities, she teaches the Department of Epidemiology's core doctoral level course, analysis of case-control studies (EPI710), sits on multiple dissertation committees related to statistical genetics and genetic epidemiology and is committed to mentoring students and postdocs in the field of heart failure genomics and other omics.

**Elizabeth Jackson, MD, PhD:** Dr. Jackson is currently a Professor of Medicine and a cardiologist. She has completed a Masters of Public Health from Harvard University with an emphasis on clinical effectiveness, and clinical epidemiology. Her particular expertise relates to implementation and clinical trial design for digital health interventions; cardiovascular prevention; and social determinants of health. She has an ongoing clinical trial funded by NIH to examine a tailored walking program for patients with vascular disease. Dr. Jackson has ample clinical experience and research expertise related to the care of complex medical patients. Her clinical expertise together with her research training and prior grants provide her with the skills required for the successful completion of the proposed project. She has put together a multidisciplinary team to complement her research experience and who will assist her to complete the study aims proposed.

**James K. Kirklin, MD:** Dr. Kirklin is Professor and Director of the Division of Cardiothoracic Surgery. A major focus of Dr. Kirklin's professional career has been cardiac transplantation and mechanical circulatory support (MCS) for the treatment of advanced HF in pediatric and adult patients. He serves as PI of the Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS), a NHLBI-funded multi-disciplinary, multi-institutional database on all durable mechanical circulatory support devices placed in the US that represents a collaborative effort between the NHLBI, FDA, CMS, expert clinicians in advanced HF and MCS, and industry. This database has been the platform for many clinical studies and has been integral to the training of several pre- and post-doctoral fellows over the years. Dr. Kirklin is also interested in quality of life and outcomes following durable MCS. He is first author of the premier Textbook on Heart Transplantation, co-author of the 4th Edition of the Cardiac Surgery textbook, and editor of a monograph on MCS from the International Society of Heart and Lung Transplantation (ISHLT).

**Emily Levitan, PhD:** Dr. Levitan is Associate Professor of Epidemiology. Throughout her career, Dr. Levitan has had a firm commitment towards teaching/mentoring of trainees. In the latter case, Dr. Levitan has formally and informally mentored masters students, PhD students, post-doctoral fellows, and other junior faculty at UAB, Harvard, and the Karolinska Institute, and has served as a lecturer in a doctoral level course on epidemiologic and statistical methods for cohort studies. Her dedication to teaching was recently recognized through receipt of the President's Award for Excellence in Teaching in 2012. Dr. Levitan's research focuses on heart failure prevention/treatment, involving the development of novel methodologies for the statistical analysis of large epidemiologic data sets, including the UAB Deep South Arthritis and Musculoskeletal Center for Education and Research in Therapeutics (CERTS).



**Nita A. Limdi, PharmD, PhD:** Dr. Limdi is Professor of Neurology and Medicine. She has been a faculty member of several training grants (T32, T35, K12), enabling her to train residents, post-doctoral clinical and research trainees and junior faculty, as well as high school students. Dr. Limdi's accomplishments in training were recently recognized through receipt of the Dean's Excellence in Mentorship Award (2013). Her primary research focus is the pharmacogenetic predictors of drug efficacy and safety. As a pharmacist and epidemiologist, her expertise in clinical pharmacology, clinical research methods, epidemiology and biostatistics benefit cardiovascular and HF research. Her NIH-sponsored projects aim to define the influence of candidate genes and environmental factors on warfarin dose and anticoagulation control, and to develop and validate dosing algorithms. Dr. Limdi aims to inform critical knowledge gaps in the linkages between atrial fibrillation and stroke, atrial fibrillation and HF, the effects of antiplatelet, anticoagulant, and statin therapy, and genetic susceptibility to adverse medications reactions.

**Sadis Matalon, PhD:** Dr. Matalon is a Professor of Anesthesiology and Professor of Cell Developmental & Integrative Biology as well as the Director of the Division of Molecular and Translational Biomedicine for the Department of Anesthesiology and Perioperative Medicine. Throughout Dr. Matalon's career, he has been investigating cellular and biochemical mechanisms by which oxidant gases damage the cardiorespiratory systems. His earlier studies concentrated on identifying the mechanisms by which hyperoxia damaged the pulmonary surfactant, increased alveolar permeability and decreased the reabsorption of edema fluid through active transport. After moving to the University of Alabama at Birmingham, he expanded the scope of his work to cellular systems to complement in vivo studies. During the last ten years, he has been concentrating on understanding the basic mechanisms by which exposure to halogens damages the respiratory system and developing appropriate countermeasures. His collaborators and he were first to demonstrate that post exposure administration of antioxidants and nitrite in chlorine exposed rodents decreases mortality and lung injury. In more recent studies, they have shown that low molecular weight hyaluronan plays an integral role in the pathogenesis of chlorine induced lung injury and that release of free heme from damaged erythrocytes is a key mediator of bromine toxicity to the pulmonary system and leads to death from respiratory failure. In collaboration with Dr. Patel, an expert investigator in the field of redox biology and Dr. Saurabh Agarwal, they also demonstrated that post exposure administration of the heme scavenging protein hemopexin, intraperitoneally, reverses Br<sub>2</sub> induced acute and chronic lung injury. In collaborations with Dr. Ambalavanan and Dr. Jilling, they demonstrated that exposure of newborn mice to bromine causes epigenetic changes that may be responsible for delayed lung development. Dr. Matalon has been funded continuously by the NIH since 1978 and by CounterACT since its inception. He has served as a Principal Investigator of a U54 sponsored by CounterACT and is currently the Principal Investigator of two U01 grants. He has organized two national and two international symposia on mechanisms of halogen induced injury, the most recent in the 2016 ATS meeting.

**Salpy Pamboukian, MD, MSPH:** Dr. Pamboukian is Professor of Medicine in the Division of Cardiovascular Disease, Co-Section Head for Advanced HF, MCS, and Cardiac Transplantation, and Director of the Advanced HF and Transplant Cardiology Fellowship. Dr. Pamboukian is actively involved in the training, mentoring, and evaluation of cardiology fellows, and also serves as a lecturer for medical students. At a national level, Dr. Pamboukian is a member of the ACC In-Training Examination (ITE) Material Development Committee, which works with the National Board of Medical Examiners to author, edit and vet questions for the annual ITE examination. Hence, she brings a unique HF mentoring perspective to the BTS HF program. A very active HF/transplant and MCS clinician and clinical investigator, she is the UAB PI for several large scale industry- and NIH/NHLBI-supported HF and MCS trials. These unique patient cohorts will be an invaluable resource for clinical research trainees enrolled in the BTS HF program.

**Greg Payne, MD, PhD:** Dr. Payne is an Assistant Professor of Medicine within the Division of Cardiovascular Disease. His determination to understand the pathophysiology of vascular disease has defined his early career as a physician-scientist. As a trainee of both Medical Scientist and Physician Scientist Training Programs, he has gained unique basic/translational scientific skills to investigate vascular and extracellular matrix biology. These skills, coupled with his clinical practice in general cardiology, uniquely position him to be a future leader in translational cardiovascular research. His doctoral research provided his most formative experience with science. As a graduate student, he worked in the laboratory of Dr. Johnathan Tune. With Dr. Tune, he had the opportunity to learn an integrative approach to investigating vascular physiology while studying mechanisms of obesity-induced cardiovascular disease. Dr. Payne gained expertise working with large animal models of coronary blood flow, ex vivo preparations of vascular samples and basic cellular/molecular techniques for in vitro experimentation. Importantly, results from this work generated tremendous success, including multiple publications and an extramural individual predoctoral award from the NIH (F31 HL 095362). As an extension of his professional and graduate training, he joined the University of Alabama at Birmingham Physician-Scientist Research Pathway Program. As a post-doctoral trainee of the Vascular Biology and Hypertension Training Program (T32 HL007457), he gained expertise in novel mechanisms of endothelial inflammation including extracellular matrix-derived chemokines (termed matrikines) in the laboratories of Drs. Amit Gaggar and J.E. Blalock. Results from this work have led to recent publications in Science Advances and Scientific Reports as well as extramural funding as an inaugural American Heart Association – Amos Medical Faculty Development Program scholar (2018 AHA-AMFDP Scholar). Together, his expertise and previous achievements have left him well prepared to conduct integrative, translational cardiovascular science.

**Gangjian Qin, MD:** Dr. Qin's research program is dedicated to defining the molecular mechanisms that underlie cardiovascular biology and contribute to the recovery from cardiovascular disease, and to translating the results from these basic science investigations to clinical applications. His laboratory revealed the role of E2F oncogenes in angiogenesis and blood pressure regulations. His serial work on bone marrow and cardiac stem cells contributed to the advancement of the field of ischemic tissue repair. Ongoing research in the Qin lab focuses on the pathophysiology of cardiovascular microvesicles and exosomes, epigenetic mechanisms of cardiac differentiation of embryonic and induced-pluripotent stem cells, peptide-based nanoparticles for enhancing the therapeutic benefit of human progenitor cells in pre-clinical models, and novel signaling pathways in gluconeogenesis and adipose thermogenesis linked to obesity and diabetes. Dr. Qin has published over 100 original research articles in mainstream journals, including *Circulation*, *Circ Res*, *J Clin Invest*, *J Exp Med*, *PNAS*, and *Nat Comm*. His research has been supported by the National Institute of Health (NIH), American Heart Association (AHA), and American Diabetes Association (ADA). In addition, Dr. Qin serves on the editorial board of multiple journals in stem cell biology and cardiovascular sciences including *Circ Res*, and on the review committees of national and international funding organizations including NIH, VA, and AHA. Dr. Qin also serves on the Council on Basic Cardiovascular Science (BCVS) and Council on Cardiovascular Radiology and Intervention (CVRI) of AHA. Over the last 15 years, Dr. Qin has trained or is training 45 research trainees at multiple academic levels, and several fellows from his lab have attained independent faculty positions in the US and abroad.

**Glenn C. Rowe, PhD:** Dr. Rowe is Assistant Professor of Medicine in the Division of Cardiovascular Disease. Dr. Rowe has directly supervised and mentored undergraduates, graduates and medical students in research investigation, resulting in first author publications for many of the mentees. Dr. Rowe also served as a teaching fellow for two years for an introductory course in developmental biology and has lectured on cardiac metabolism as part of a cardiovascular educational series. In addition, he organized a scientific article reading series geared toward senior undergraduates and 1st year graduate students to teach how to effectively read a scientific paper. Dr. Rowe's research focuses on the mechanisms by which exercise influences mitochondria, and ultimately improves both cardiac and skeletal muscle function. As a junior faculty in the BTSHF program, Dr. Rowe will extend his work in molecular cardiology and cardiometabolic diseases to HF research. Dr. Rowe is also committed to the recruitment and mentoring of underrepresented minorities for the BTSHF program, a theme exemplified by his participation in analogous efforts with national organizations including ABRCMS, the Endocrine Society, and the Keystone Symposia.

**Palaniappan Sethu, PhD:** Dr. Sethu is Associate Professor of Medicine in the Division of Cardiovascular Disease. A bioengineer, Dr. Sethu has a strong history of mentoring trainees at the high school, undergraduate, graduate, and post-doctoral level, including specific programs providing opportunities to underrepresented groups. He developed a comprehensive outreach program, funded by an NSF CAREER award, to increase enrollment of minority students in the STEM fields; his laboratory provides paid research opportunities and mentorship for up to 6 minority students per year. Dr. Sethu's research focuses on the use of novel technologies in cardiovascular and HF research. His laboratory, which functions in a truly multidisciplinary training environment, pioneered the Cardiac and Endothelial Cell Culture Models (CCCM and ECCM) that represent the current state-of-the art for culture of cardiac and vascular cells *in vitro*. These systems establish physiological relevance of the culture environment by ensuring that pathological mechanical stresses and hemodynamic loading are accurately replicated and sensed by cardiac and/or endothelial cells. Currently, he is using both models for tissue regeneration and for the establishment of *in vitro* models of disease.

**José A. Tallaj, MD:** Dr. Tallaj is Professor in the Division of Cardiovascular Disease, as well as Co-Section Head for Advanced HF, MCS, and Cardiac Transplantation. Dr. Tallaj has been actively involved in the clinical and research training and mentoring of general cardiology and advanced HF fellows for over 10 years. The evaluations and feedback provided by the fellows have uniformly been outstanding, and he has received a number of teaching awards, including the H. Cecil Coghlan Award for Excellence in Teaching in Cardiovascular Disease (2010). Dr. Tallaj is the immediate Past Chair of the Heart Failure and Transplant Medicine Working Group of the ISHLT. His research focuses on the management of patients with advanced HF and cardiomyopathy, ranging from novel drugs and devices to MCS and heart transplantation. He is currently site PI on several large-scale HF trials supported by both industry and the NHLBI, which include difficult-to-access patient cohorts (e.g., patients with cardiac amyloidosis). In addition, he has collaborated on numerous research projects with national leaders in HF and transplantation, resulting in many peer-reviewed publications.

**Adam Wende, PhD:** Dr. Wende is Assistant Professor of Molecular and Cellular Pathology. Dr. Wende is a current mentor to an MSTP graduate student and a postdoctoral fellow. He is also on three PhD thesis committees and on the mentoring committee of two NIH T32 postdoctoral scholars. In addition to direct mentoring, Dr. Wende is actively involved in the postdoctoral association, as a judge for poster/oral presentations, and speaker at events. He is also a member of the admissions board for the graduate school and is a lecturer in multiple GBS courses. Dr. Wende's research focuses on understanding molecular pathways in control of mitochondrial oxidation in both cardiac and skeletal muscle. By combining his training in transcriptional biology and cellular signaling he has begun an independent career that aims to decipher the cardiometabolic control of cellular function in normal physiology and disease (including HF). NIH funded studies are focused on changes in DNA methylation that may impact gene expression and mitochondrial function in the diabetic heart.

**C. Roger White, PhD:** Dr. White is Professor of Medicine in the Division of Cardiovascular Disease. Dr. White has been actively involved in didactic graduate/medical education at UAB over the past 20 years as a lecturer in cardiovascular



pharmacology and pathophysiology. He is currently a faculty mentor on the NIH-funded Pathobiology and Molecular Medicine training program, and over his career has mentored 12 undergraduate students, 2 graduate trainees, and 12 postdoctoral/clinical fellows. His trainees now hold faculty positions at various Universities and Medical Schools. At UAB, he served as a mentor for Dr. Himanshu Gupta, who went on to successfully acquire a K-award. Another of Dr. White's trainees, Dr. Chunxiang Zhang, is currently Professor and Chair of the Department of Pharmacology at Rush University Medical Center. Dr. White has a broad background in the study of inflammatory injury and cardiovascular disease. These include studies identifying pro-oxidant mechanisms that contribute to the development of endothelial dysfunction. More recently, he has been investigating how oxidation influences HDL function and has applied apolipoprotein mimetic peptides to study how improved HDL function prevents inflammation-induced injury in animal models of ischemic injury and HF, sepsis and atherosclerosis. Currently, Dr. White is applying these skills to assess protective mechanisms of apoE and apoE mimetic peptides in a murine model of sepsis and in primary human cell cultures.

**Min Xie, MD, PhD:** Dr. Xie is Assistant Professor of Medicine in the Division of Cardiovascular Disease. Newly recruited to UAB, Dr. Xie is a physician-scientist with a distinct translational research focus on the pathogenesis of ischemic heart disease and HF. Consistent with his new faculty status, Dr. Xie does not possess an established track record in teaching/mentorship. However, as a junior faculty member of the BTSHF training program, Dr. Xie affirms a strong commitment towards the mentoring of future translational scientists. Dr. Xie's research focuses on the cardioprotective effects of histone deacetylase inhibitors, involving the use of rodent models (e.g., genetically modified mice), pre-clinical models (e.g., rabbits) and human subjects.

**Jianhua Zhang, PhD:** Dr. Zhang is a Professor of Pathology within the Division of Molecular & Cellular Pathology. Her long-term research interests are to understand the integration of cellular and molecular mechanisms responsible for autophagy, cellular bioenergetics, oxidative stress and cell death, in the context of human diseases. Her lab uses transgenic and conditional knockout mouse models, and cultured cells to dissect mechanisms and pathways. In particular, her lab is interested in circadian regulation of mitophagy in heart diseases, aiming to identify novel regulatory pathways, and helping design novel therapeutic approaches.

**Jianyi Zhang, MD, PhD:** Dr. Zhang is Professor and Chair of Department of Biomedical Engineering, as well as the T. Michael and Gillian Goodrich Endowed Chair of Engineering Leadership. Dr. Zhang's broad research interests include biomaterials and tissue engineering, stem cell therapy for HF using mesenchymal stem cells and induced pluripotent stem cells (iPSCs), iPSCs as models of human disease, myocardial bioenergetics of *in vivo* normal and failing hearts using MR imaging and spectroscopy, and clinically relevant large animal models. Throughout his career, Dr. Zhang has exhibited a profound dedication to teaching and mentoring, acting as an advisor to 59 students and post-doctoral fellows during the past 22 years, in addition to serving as a primary faculty member on two cardiovascular-related T32 training programs. His broad experience in cardiac regenerative medicine will be invaluable for the BTSHF Training Program.

**Lufang Zhou, PhD:** Dr. Zhou is Assistant Professor of Medicine in the Division of Cardiovascular Disease. In the past three years, Dr. Zhou has mentored 3 postdoctoral fellows and one PhD student; one of his fellows has obtained a research scientist position in industry and another has been appointed as Associate Professor in China. He has also mentored 7 students from the BME honor and NSF REU programs, and one medical student. Dr. Zhou has also participated in GSB teaching (GBS 751) and has received excellent feedback from his students. Dr. Zhou's research focus is to develop and validate multi-scale cardiac models at the cellular and tissue level to predict and analyze how loss of mitochondrial function contributes to arrhythmias and contractile dysfunction in the failing heart. The long-term goal is to translate this information into new antiarrhythmic therapies. Dr. Zhou has a broad background in cardiac energetics and electrophysiology, with specific training in live cell imaging, patch clamping, and mathematical modeling.