Baylor College of Medicine

Mouse atrial cardiomyocytes at 20X magnification Image courtesy of Mohit Hulsurkar, PhD from the Xander H. Wehrens, MD, PhD Lab

CARDIOVASCULAR RESEARCH INSTITUTE

FROM THE DIRECTOR

NEWSLETTER FALL 2021



Dear Colleagues,

As we enter the fall months, I would like to highlight a few key events and announcements that are featured in this newsletter. The CVRI will host Dr. Aarif Khakoo from Calico Life Sciences on November 17, 2021, as the featured speaker for the Dr. Mark L. Entman Distinguished Lecture in Cardiovascular Research. Dr. Khakoo's seminar will be hosted in person in the Kleberg Auditorium at 12:00 p.m. A live stream will be available on YouTube as well. I hope to see you all there! In addition, we will continue to host the fall seminar series virtually and we have a stimulating speaker line-up for the remainder of the year.

The CVRI is also kicking off Term 3 course, Cardiovascular Diseases (GS-DD-6210) January 3, 2022- March 4, 2022. This course provides a general overview of the most common types of cardiovascular disease and is taught by CVRI faculty. Please alert your new students, postdocs, and staff members to this course. Registration starts November 22, 2021.

In addition to ongoing and upcoming events, the CVRI recently released a call for applications for the 2021-2022 Pilot Awards. The competition was close, and we are happy to announce the four teams awarded this year! Each team had a unique proposal to further cardiovascular research in areas such as arrhythmias Chagas disease, aortic aneurysms, and rheumatic heart disease.

I am truly excited to see each project's progress in the coming months. Please join me in congratulating this year's winners! See page 8 of the newsletter for more information.

Xander Wehrens, MD, PhD **CVRI** Director

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CLINICAL FACULTY SPOTLIGHT

KENNETH K. LIAO, MD, PHD

By: Amber Eakin

Dr. Kenneth Liao is the Chief of the Division of Cardiothoracic Transplantation and Circulatory Support at Baylor College of Medicine and Texas Heart Institute (THI) at the Baylor St. Luke's Medical Center (BSLMC). Joining in 2019 from the University of Minnesota, Dr. Liao brings extensive expertise and innovation to the Cardiac Transplant Program at the BSLMC. He is board certified by the American Board of Surgery and American Board of Thoracic Surgery. He earned his medical degree from Beijing University Medical School with a doctoral degree in Clinical Surgery and continued his postdoctoral research in the Department of Cardiac Surgery at Albert Einstein College of Medicine. Liao completed his general surgery training at Brookdale University Hospital in Brooklyn, New York, and completed his cardiothoracic fellowship at the University of Minnesota. Dr. Liao's expertise includes robotic coronary bypass surgery, heart transplantation and VAD implantation, and minimally invasive mitral valve repair.

The CVRI recently had the pleasure of catching up with Dr. Liao and hearing more about his exciting work.



KENNETH K. LIAO, MD, PHD, FACS

Professor and Chief, Cardiothoracic Transplantation & Circulatory Support Lester and Sue Smith Endowed Chair in Surgery Baylor College of Medicine Chief, Cardiothoracic Transplantation and Mechanical Circulatory Support Baylor St. Luke's Medical Center

CLINICAL FACULTY SPOTLIGHT



Baylor St. Luke's has always been considered a leader in heart transplant surgery and Ventricular Assist Device (VAD) support and robotic minimally invasive surgery. When Dr. Liao was approached about his current position, he was excited for the opportunity to carry on and grow a legacy built by fellow surgeons and innovators in the cardiac surgery field.

A leader himself, Dr. Liao also has an outstanding track record for heart transplantation and robotic minimally invasive heart surgery. Since joining the team, he has quickly built a robust cardiac surgery program from the ground up at BSLMC and grown the surgery volume at a speed no other centers in the country have done. His team is among the top 10 in the US to perform robotic heart surgeries. Liao has also successfully led the Cardiac Transplant Program at Baylor St. Luke's to be among the best and busiest of its kind in the nation. When asked what is unique about the heart surgery, transplant, and VAD program at BSLMC compared to other hospitals in the Texas Medical Center and Texas, Dr. Liao acknowledged that the history, legacy, and infrastructure built around the program over the years have all largely contributed to its success. Liao says the program has grown to be better than ever and is a designated center for excellence for many major players including the United Network for Organ Sharing (UNOS) and Optum.

In addition to the program's growing success, THI is currently the only center in the Texas Medical Center that is participating in the EVAHEART clinical trial.

Dr. Liao's team is studying certain inflammatory markers in the blood and tissue of patients who have had robotic heart surgeries or new VAD devices implanted to see how new techniques impact patients differently.

CLINICAL FACULTY SPOTLIGHT

These markers can help predict stroke risk and assess the degree of tissue damage in patients. Liao's team hopes that their findings will lead to the development of certain interventions to improve surgical outcomes. In 2020, Dr. Liao was awarded a generous grant from The Brockman Foundation to study heart transplant using Donation after Circulatory Death (DCD) hearts. If demonstrated safe to use these kinds of donor hearts, heart transplantation volume could potentially increase by 20%. His team is evaluating DCD donor hearts by studying their functional, molecular, biochemical and histological changes, and trying to find ways to preserve the donor hearts. Liao's team aims to develop a protocol to preserve Donation after Circulatory Death (DCD) hearts and transplant them with successful results. Dr. Liao hopes to partner with basic scientists doing cardiovascular research to perform studies jointly to improve heart transplant safety, reduce pro-thrombogenic effects of ventricular assist devices, and to modify patients' response when going through major cardiac surgeries.

A true innovator at heart, Dr. Liao aims to expand robotic surgical techniques to treat more heart patients and train next-generation surgeons to carry on the legacy he is building. Dr. Liao says that his favorite thing about what he does is being able to help his patients and see them do well. According to Liao, robotic technology is here to stay and will continue to become more widely used, and Baylor College of Medicine is playing an important role in the way future heart patients are treated. He predicts that patients will become increasingly comfortable with the ever-changing surgical technology because they are already used to seeing other new technologies play out in everyday life. He is excited to have the opportunity to continue to push the envelope both in the operating room and lab.

In his spare time, Dr. Liao enjoys jogging and listening to music.



Dr. Kenneth Liao is pictured (center) with his surgical team after completing the 200th robotic cardiac surgery.

RESEARCH FACULTY SPOTLIGHT



JAMES F. MARTIN, MD, PHD

By: Rich Li, PhD

James F. Martin, MD, PhD is an internationally renowned leader in cardiac development and regeneration research. After obtaining his M.D. degree from the University of Texas Medical School, Houston, Dr. Martin continued with a residency in general surgery and then a fellowship in surgical research both at the University of Texas Medical School, Department of General Surgery.

It was during his fellowship that he became interested in academic research, joining a PhD program in Molecular Biology with Dr. Eric Olson at the University of Texas Health Science Center, Graduate School of Biomedical Sciences. Dr. Martin remains a current, active faculty member of the GSBS at UTHSC.

Martin then became an independent scientist and Assistant Professor at the Institute of Biosciences and Technology, Texas A&M University System Health Science Center. He quickly progressed to Professor in no time at the Institute of Biosciences and Technology, Texas A&M University System Health Science Center.

In 2011, he was recruited to Baylor College of Medicine where he is currently the Vivian L. Smith Professor and Vice Chair of the Department of Molecular Physiology and



Cardiomyocyte undergoing karyokinesis.

Biophysics. Martin is also Director of the Cardiomyocyte Renewal Lab at Texas Heart Institute.

He has authored more than 200 peer-reviewed papers in top journals such as Nature, Science, and Cell, and holds multiple patents, R01 grants, and funding from the American Heart Association.

Martin's research is focused on the regulation of development and tissue regeneration by signaling pathways, including: Hippo, Wnt, and Pitx2 signaling. His team reported that inhibition

"We are focused on translating our basic research studies to help treat patients with the most devastating types of heart disease such as heart failure and congenital heart disease."

James F. Martin, MD, PhD

RESEARCH FACULTY SPOTLIGHT

of Hippo signaling results in adult heart regeneration through a series of seminal studies. This work was recently translated to pigs to show that adeno-associated viral inhibition of Hippo signaling results in robust cardiac muscle renewal in adult pig hearts after myocardial infarction, a preclinical model for ischemic injury in the heart (Liu et al., Science Translational Medicine, 2021).

Martin is also currently working on understanding the genetic basis for hypoplastic left heart syndrome (HLHS), a congenital heart disease affecting about 1 in 4000 babies in the United States, by performing single-cell RNA sequencing on patient biopsies obtained during corrective surgical procedures. "We are focused on translating our basic research studies to help treat patients with the most devastating types of heart disease such as heart failure and congenital heart disease," says Martin.



Adult cardiomyocytes undergoing cytoskeletal reorganization.

Dr. Martin's passion for science and new technologies has maintained his position at the forefront of the cardiac research field. "My lab is committed to making new discoveries that will impact treatment of human heart disease. New technologies and innovations are helping us to accomplish our goals," said Martin, who was recently inducted to the National Academy of Inventors.

Outside of the lab, Dr. Martin enjoys working out by running and playing tennis. He also enjoys traveling and the occasional round of golf.



Differential regional expression of genes in the heart visualized by spatial transcriptomics.

FACULTY HIGHLIGHTS

First TAVI Procedure at Harris Health Ben Taub Hospital



Hani Jneid, MD

The first transcatheter aortic valve implantation (TAVI) was performed at the Harris Health System's Ben Taub Hospital on August 23, 2021 by **Dr. Hani Jneid and the Heart Team.**

Dr. Jneid was instrumental in spearheading this Structural Heart Disease program at Ben Taub Hospital.

He also serves as the Director of Interventional Cardiology Fellowship at Baylor College of Medicine as well as the Director of Interventional Cardiology at MEDVAMC.

Jneid said, "This milestone for Harris Health and Baylor College of Medicine was achieved through the collaborative effort of all Heart Team members, in partnership with cardiac surgery (Drs. Ravi Ghanta and Matthew Wall), and with the hard work and contributions of all team members, including stellar interventional cardiologists—Drs. Waleed Kayani and Faisal Rahman; non-invasive cardiologists—Drs. Juan Plana Gomez and Shaden Khalaf; radiologist—Dr. Veronica Lenge De Rosen— the support of the BTH cardiology faculty Drs. Hamzeh, Medrano, Tabaa and Shield, and many other healthcare providers. This achievement would not have come to fruition without the vision and support from Drs. Hashem El-Serag, Hemant Roy, and Christie Ballantyne, and importantly the hard work and dedication of the cardiac cath lab, cardiac surgery staff, and TAVI program coordinators (Ms. Gala Vela and Jana Bishop), as well as the excellent and strategic support from Ben Taub Hospital leadership (Drs. Gloria Medina and Sandeep Markan and Mr. George Gaston) and many others."



First EVAHEART LVAD Implant at CHI Baylor St. Luke's Medical Center



Alexis Shafii, MD, Leo Simpson, MD and Gabriel Loor, MD

Baylor-St.Luke's is one of a few centers in the nation (and only center in Houston) selected to participate with the COMPETENCE trial with the new EVAHEART2 LVAD. Unique to the design of this heart assist device is its ability to preserve the heart's intrinsic pulsatility. Access to this new technology allows the Baylor-St. Luke's heart failure program to continue to offer the latest advancements in advanced heart failure therapies to patients.

FACULTY HONORS AND AWARDS



Dr. Mark Entman, Professor, Cardiovascular Research, has been appointed as an Emeritus Fellow of the International Society for Heart Research for 2022. The International Society for Heart Research established a Fellowship status to recognize only the top 10% of members who have distinguished themselves for outstanding contributions to cardiovascular research.





Dr. Salim Virani is the recipient of the **2021 President's Service Award** from the **National Lipid Association**.

Dr. Salim Virani, Professor, Cardiology and Cardiovascular Research, has been appointed as a **technical advisor to the WHO** on the World Heart Organization's Technical Advisory Group on NCD-related research and innovation. The global advisory body is designed to promote international and national investments and strengthen national capacity for quality research and to support and facilitate NCD-related research and its translation.

The Michael E. DeBakey Award for Excellence in Research



Mary Dickinson, PhD and Zheng Sun, PhD

The **Michael E. DeBakey Excellence in Research Award** recognizes scientists whose recent research demonstrates the breadth and depth of basic science at Baylor College of Medicine. Selected recipients are Baylor faculty who have made the most significant published scientific contribution to clinical or basic biomedical research during the past three years. The awards were announced on October 5, 2021.

CVRI is honored to announce that **Dr. Zheng Sun** received the 2021 Michael E. DeBakey Excellence in Research Award. Dr. Sun is a basic scientist in neuroendocrinology and metabolism. His research involves epigenome and circadian rhythm in metabolic and neurological diseases.

He has made seminal findings regarding how the circadian clock regulates nutrient metabolism and how endocrine factors affect neurocognition. His is the primary investigator for 3 ongoing R01projects.

Among his many well-deserved awards, Dr. Sun was the recipient of the CVRI Pilot Award in 2019 for the proposal, "Cardiac Circadian Clock and Obesity Paradox". This initial pilot grant helped support and eventually lead to his R01 grant, "Cardiac Circadian Clock and Dialated Cardiomyopathy". Dr. Sun has been a faculty member of the CVRI, the Departments of Medicine and Molecular and Cellular Biology since 2014.

Please join CVRI in congratulating Dr. Sun on his outstanding achievement!

CVRI PILOT AWARDS

The **Cardiovascular Research Institute** promotes and supports research in cardiovascular sciences across all disciplines and levels of training at Baylor College of Medicine and affiliate hospitals. The CVRI Pilot Award program aims to facilitate cardiovascular research (clinical, translational or basic) and foster collaboration between investigators that are likely to lead to externally funded grants. Three proposals were selected for funding this year. A \$15,000 award in unrestricted BCM funds went towards supporting the winning research proposals.





"Lipid Nanoparticles for SMC Gene Silencing in Aortic Aneurysm and Dissection"

Co-Principal Investigators



Ketan B. Ghaghada, PhD Assistant Professor, Radiology Baylor College of Medicine Manager, Basic Science Research Program Edward B. Singleton Department of Radiology Texas Children's Hospital



Ying Shen, MD, PhD Professor Cardiothoracic Surgery Baylor College of Medicine



Co-Investigator: Scott LeMaire, MD, FACS, FAHA Professor and Vice-Chair Research, Surgery Cardiothoracic Surgery Baylor College of Medicine

Drs. Ketan Ghaghada, Ying Shen, Scott LeMaire and team aim to develop a lipid nanoparticle platform for CRISPR/Cas9based gene silencing of smooth muscle cells in aortic aneurysms and dissections.

For more information or if interested in collaborating with any of the 2021-2022 CVRI Pilot Award recipients, contact <u>cvri@bcm.edu</u>.

CVRI PILOT AWARDS

"Effect of Hookworm Derived Anti-inflammatory Proteins on Chagas Myocarditis"



Co-Principal Investigators:



Kathryn Jones, DVM, PhD Associate Professor Pediatrics-Tropical Medicine Baylor College of Medicine



Vanaja Konduri, PhD Assistant Professor Pathology & Immunology Baylor College of Medicine



Co-Investigator: Bin Zhan, MD, MS Associate Professor Pediatrics-Tropical Medicine Baylor College of Medicine

Drs. Kathryn Jones, Vanaja Konduri, and Bin Zhan propose to use mouse models to study chronic T. cruzi infections and the anti-inflammatory response induced by hookworm proteins to open avenues for developing therapeutics to treat Chagas disease.



"Training/Evaluation of imPulse™ Tor in AI Detection of Rheumatic Heart Disease"

Co-Principal Investigators:





Biykem Bozkurt, MD, PhD The Mary and Gordon Cain Chair and Professor of Medicine Baylor College of Medicine Medicine, Chief DeBakey VA Medical Center



Co-Investigator: NL Shasha Jumbe, PhD Co-Founder, CEO Level 42 AI, Inc. Palo Alto, CA

Dr. Amy Sanyahumbi, Dr. Biykem Bozkurt, and NL Shasha Jumbe aim to train and validate an impulse Tor system for machine learning/artificial intelligence for early detection of rheumatic heart disease.

CVRI PILOT AWARDS

"Studying TANGO2 Arrhythmia Crises In iPSC-CM"



Co-Principal Investigators:



Lilei Zhang, MD, PhD Assistant Professor Molecular & Human Genetics Baylor College of Medicine



Na Li, PhD Associate Professor Medicine-Cardiovascular Research Baylor College of Medicine



Co-Investigator: Christina Miyake, MD Associate Professor Pediatrics- Cardiology Texas Children's Hospital

Drs. Lilei Zhang, Christina Miyake, and Na Li will examine TANGO2 disease by generating iPSC lines from TANGO2 patients and investigating sodium channel trafficking and possible metabolic triggers for arrhythmia.

Progress of Past Pilot Award Recipients

Dr. Lavannya Pandit, Associate Professor, Pulmonary, Critical Care and Sleep Medicine, gave an invited presentation at Houston Methodist Hospital's Pulmonary Research Grand Rounds on Sept. 16, 2021. The presentation highlighted the joint research collaboration between Dr. Pandit and **Dr. Xinchun Pi, Assistant Professor of Cardiovascular Research.** Dr. Pandit's presentation was titled "The novel role of BMPER in pulmonary vasculopathy—the new kid on the block in pulmonary hypertension." Dr. Pi was a recipient of the CVRI Pilot Award in 2019 for her research entitled, "Evaluating the role of BMPER in pulmonary hypertension".

Drs. Christina Miyake and James Lupski were the recipients of the FY17 CVRI Pilot Award for their research on "The discovery of novel genes in arrhythmic sudden death syndromes". Dr. Miyake has since received the NIH K23HL136932 Award for her research entitled," Discovery of novel genes in inherited sudden arrhythmic death syndromes". Included is their most recent collaborative publication as a result of the funding support.

Calame DG, Herman I, Fatih JM, Du H, Akay G, Jhangiani SN, Coban-Akdemir Z, Milewicz DM, Gibbs RA, Posey JE, Marafi D, Hunter JV, Fan Y, **Lupski JR, Miyake CY**. *Risk of sudden cardiac death in EXOSC5-related disease*. Am J Med Genet A. 2021 Aug;185(8):2532-2540.

Drs. Joshua Wythe and Benjamin Daneen's pilot study, "Targeting endothelial transcriptional networks in GBM" was funded in 2020. Dr. Wythe was subsequently awarded a CPRIT grant RP200402 and recently published findings from this study.

Carlson JC, Cantu Gutierrez M, Lozzi B, Huang-Hobbs E, Turner WD, Tepe B, Zhang Y, Herman AM, Rao G, Creighton CJ, **Wythe JD, Deneen B**. *Identification of diverse tumor endothelial cell populations in malignant glioma*. Neuro Oncol. 2021 Jun 1;23(6):932-944.

CARDIOVASCULAR RESEARCH INSTITUTE 9TH ANNUAL SYMPOSIUM SAVE THE DATE



The Nobel Prize in Physiology or Medicine 2019

Bio Link

Wednesday April 6, 2022

Cullen Auditorium

Gregg L. Semenza, MD, PhD

Director, Vascular Program Institute for Cell Engineering Professor of Genetic Medicine, Biological Chemistry Medicine, Oncology, Pediatrics, Radiation Oncology and Molecular Radiation Sciences

Johns Hopkins University



Follow CVRI for the latest updates.

CVRI EDUCATION

Graduate School of Biomedical Science Cardiovascular Courses

The Cardiovascular Research Institute offers 3 graduate school courses open to PhD students, postdocs, trainees, staff and all others interested in cardiovascular science. Lectures are in person.

Mid-term and Final Exams are provided via BlackBoard (for those taking the course for credit).

For those interested in these courses, there are 3 ways to sign up and participate.

- Enroll with the GSBS for full credit and grade (tests, surveys and attendance required).
- Audit the course through GSBS for credit (surveys and attendance required for credit; no tests or letter grade assigned).
- View the CVRI recorded lectures of interest within the course date (survey participation required). Email cvri@bcm.edu for further details.

CVRI is committed to supporting the growth and success of our next generation of innovative scientists.

ENROLL IN TERM 3

Cardiovascular Diseases

2 Credits

Registration: November 22, 2021- December 3, 2021

This course provides a general overview of the main, common cardiovascular diseases and their causes. Topics covered include atherosclerosis, hypertension, congenital heart disease, ischemic heart disease, cerebral stroke, cardiac arrhythmias, and the effects of aging on the cardiovascular system. **Course Director: Xander Wehrens, MD, PhD**

Tuesday, Thursday | Jan 3, 2022 – March 4, 2022 | 10 AM-11 AM

2021 Graduate School Bulletin

Term 4

Registration: February 14, 2022 - February 24, 2022

Advanced Topics in Cardiac Pathophysiology and Disease

GS-DD-6403

GS-DD-6210

This course covers the fundamentals of cardiac development, and cardiac function in both physiological and pathological conditions. The course will also discuss the cutting-edge research approaches used in cardiovascular Course Directors: Na Li, PhD & Xander Wehrens, MD, PhD research.

Monday, Tuesday, Wednesday, Thursday | March 14, 2022 - May13, 2022 | 9 AM- 10 AM

Term 5

Registration: April 25, 2022 - May 6, 2022

Advanced Topics in Vascular Pathophysiology and Disease **GS-DD-6404**

This course emphasizes cardiovascular disease pathology with a focus on vascular disorders and atherosclerosis. Lectures will cover all components of the normal system, inherited forms of disease, and the pathogenesis of acquired types of disease. Topics include vasculardiseases, lipid disorders, atherosclerosis, hemostasis and bleeding disorders, microcirculation disorders, stroke, hypertension, and peripheral artery disease. The course will also discuss the cuttingedge research approaches used in cardiovascular research.

Course Directors: William Lagor, PhD & Xander Wehrens, MD, PhD

<u>Monday, Tuesday, Wednesday, Thursday</u> | <u>May 23, 2022</u> – July 22, 2022 | <u>9</u> AM- 10 AM

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Room N317

4 Credits Room N302

4 Credits

Room N317

2021 FALL CVRI SEMINAR SERIES

Wednesdays

12-1 pm Virtual Zoom Seminar

The Cardiovascular Research Institute at Baylor College of Medicine conducts a bi-monthly seminar series during the spring and fall of each year. These seminars are open to faculty, students, staff and all who are interested in cardiovascular science. Our invited speakers are leading experts in the field of cardiovascular science. One of the key missions of the CVRI is to share and promote innovative research as well as facilitate new collaborations. If our guest speaker's research is of interest, please reach out to cvri@bcm.edu to connect. CVRI is happy to facilitate a meeting.



November 3, 2021 Patrick Osei-Owusu, PhD, FAHA Case Western Reserve University Novel Insights into the Regulation of Cardiac G Protein Signaling by Multiple RGS Proteins





December 8, 2021 <u>Yibin Wang, PhD</u> University of California Los Angeles *Cardiac Maturation: Novel Mechanisms and Therapeutic Implications in Heart Failure* Baylor College of Medicine alumnus



Thank you to our past 2021 CVRI Fall Seminar Speakers!

Annet Kirabo, DVM, MSc, PhD, FAHA

The Gut Microbiome & Immunity in Salt-sensitive Hypertension

<u>Bernhard Kühn, MD</u>

Harnessing Endogenous Regenerative Mechanisms for Treating Congenital Heart Disease

Sean M. Wu, MD, PhD, FACC

Dissecting the Complex Interplay Between Cell-Cell Contact and Proliferation During Cardiomyocyte Development

Kory J. Levine, MD, PhD

Cardiac Macrophages, Adaptive Remodeling, and Sensing of Mechanical Cues

Erin Michos, MD, MHS, FACC, FAHA

Female-specific Factors and Their Influence on Cardiovascular Health of Women Throughout the Lifespan



*Special thanks to Genetics & Genomics graduate student **Juwan Copeland** for hosting Dr. Sean Wu's student- led seminar.

The Mark L. Entman, MD Distinguished Lecture in Cardiovascular Research



Understanding the Causes of Human Aging: Medicine's Next Frontier Distinguished Lecturer:

Aarif Khakoo, MD, PhD

Head of Research and Development Calico Life Sciences Wednesday November 17 12 PM Kleberg Auditorium

Dr. Aarif Khakoo is a cardiologist and physician scientist with a broad interest in understanding the causes of complex human diseases and using these insights to develop therapeutics for diseases with unmet medical need. He is the Head of Research and Development at Calico Life Sciences, an Alphabet funded company focused on understanding the biology controlling aging and lifespan to develop interventions that help people live longer and healthier lives. Calico's "big idea" is that through cutting edge approaches in technology and biology, we will

understand why age is the most important risk factor for many human diseases and translate this knowledge to develop transformative therapeutics for age-related diseases. Dr. Khakoo's scientific career started in the Texas Medical Center as a faculty member at UT MD Anderson Cancer Center, where he ran a lab studying mechanisms of cardiotoxicity of anti-cancer drugs for six years, with a specific focus on receptor tyrosine kinases in the cardiovascular system.

The Annual Mark L. Entman, MD, Distinguished Lecture in Cardiovascular Research was inaugurated in 2019. **Cardiovascular Research Institute** hosts this annual lectureship to bring in leading experts from across the globe in honor of Dr. Mark L. Entman's extensive



ABOUT DR. ENTMAN:

Dr. Entman is Professor of Medicine, Biochemistry and Pathology and William J. Osher Professor of Cardiovascular Research, and is Scientific Director of the DeBakey Heart Center. Dr. Entman was recruited to Baylor as an assistant professor in 1970. He was a Howard Hughes Medical Investigator from 1971 to 1979. In 1977, Dr. Entman became Chief of the Section of Cardiovascular Sciences and Director of the Division of Research of NHLBI National Research and Demonstration Center (now the DeBakey Heart Center) at Baylor College of

Medicine and The Methodist Hospital.

Dr. Entman has been continuously funded as a principal investigator by the National Institutes of Health since 1967, and was principal investigator of two Program Project Grants (21 years) and Research Director of the NHLBI Research and Demonstration Center at Baylor from 1976-1985. Dr. Entman has been an inspirational leader whose research has spanned a range of topics including the role of myocardial calcium and sarcoplasmic reticulum function, acute inflammation and myocardial injury, and the chronic inflammatory response in cardiac repair and remodeling. Dr. Entman has received numerous awards for his research, including the Outstanding Research Award from the International Society of Heart Research (1986), an NIH Merit Award (1989-1999), the Distinguished Alumnus Award from Duke University Medical Center, and the Bowman Award for Outstanding Research from the Institute of Cardiovascular Sciences.

AMERICAN HEART ASSOCIATION

The American Heart Association **Houston Heart Walk** takes place **Nov. 13** at the University of Houston (or choose your own path). Join the Baylor College of Medicine Heart Walk team! **Contact** <u>Melissa Croft</u> for information.



community in better health! This fall, the American Heart Association is bringing you Heart Walk Here, a new Heart Walk experience offering different ways to participate for maximum flexibility. You can Heart Walk Here, there or anywhere. Choose our path or yours!

> Join the Baylor College of Medicine Heart Walk team by scanning here:



WEBINARS: AMERICAN HEART ASSOCIATION RESEARCH AWARD OFFERINGS

AHA will host webinars consisting of a 20-minute overview of AHA Research awardofferings and a 10-minute Q & A session. These calls are a great opportunity for scientists, researchers, institutions, and grant officers to get application questions answered.

- Tuesday, October 26, 2021, at 10:00 am CT Click to join
- Thursday, January 27, 2022, at 10:00 am CT Click to join
- Tuesday, March 29, 2022, at 10:00 am CT <u>Click to join</u>

recipients of NIH support.

2020-21 Application Deadlines	Application Deadline	Award Start Date
Career Development Award Supports highly promising healthcare and academic professionals in the early years of first professional appointment, to explore innovative questions or pilot studies that will provide preliminary data and training to assure the applicant's future success as a research scientist in the field of cardiovascular and/or cerebrovascular disease research.	Monday, Dec 6, 2021	April 1, 2022
AHA Institutional Research Enhancement Award : To support small-scale research projects related to cardiovascular and cerebrovascular diseases at educational institutions that provide baccalaureate or advanced degrees but that have not been major	Wednesday, Jan. 12, 2022	April 1, 2022

CONGRATULATIONS TO THE 2021 AHA GRANT RECIPIENTS!

James Martin, Iki Adachi, Div	vakar Turaga	2021-2024
AHA/EH Research Awards in Pe	diatric Heart Transplantation	
Early Detection of Cardiac Allo	graft Vasculopathy in post-transplant Pediatric Hearts	
via Single-Cell Genomics		
Yuriana Aguilar-Torres		2021-2023
Postdoctoral Fellowship	(Wehrens Lab)	
Role of striated muscle prefere	ntially expressed gene (SPEG) kinase domain 2 in	
heart failure progression and c	alcium ha	
Ting Chang		2021-2023
Predoctoral Fellowship	(Hamilton Lab)	
The Role of Junctin (JNC) in Ca	rdiac Function	
Longlong (Lucas) Tu		2021-2023
Postdoctoral Fellowship	(Yong Xu Lab)	
Ano4 in the NTS mediates hype	oglycemic hunger	
Venkatasubramaniam Sunda	ramurthy	2021-2023
Predoctoral Fellowship	(Goodell Lab)	
DNMT3A in heart development	and clonal hematopoiesis-mediated atherosclerosis	
		/

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Baylor College of Medicine

MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

Request for Applications Michael E. DeBakey Department of Surgery Cardiovascular Surgery T32 Research Training Program Baylor College of Medicine, Houston, TX July 1, 2022 – June 30, 2024

The Baylor College of Medicine Research Training Program in Cardiovascular Surgery is designed to prepare MD surgical residents and PhD post-doctoral fellows for an academic career in cardiovascular surgical research. Funded by a T32 grant from the National Heart, Lung and Blood Institute of the National Institutes of Health, our program is led by principal investigator/program director Todd K. Rosengart, MD, chair of the Department of Surgery, and program co-directors, Scott A. LeMaire, MD, vice chair for research, and Barbara W. Trautner, MD, PhD, director of clinical research.

The program provides salary and educational support to two (MD or PhD) trainees per year, for two years each. Postdoctoral MD and PhD trainees accepted into the program will engage in a mentored research project which will be complemented by a set of core program activities, team science training, and responsible conduct of research training. All T32 faculty mentors have active research programs, have been successful in securing extramural funding, and have a strong commitment to training the next generation of cardiovascular surgeonscientists and PhD investigators.

Eligibility

• Postdoctoral candidates who are MDs in their second or third year of surgical residency and PhD postdoctoral fellows, all with a strong interest in cardiovascular research. Surgery resident applicants must be willing to delay the completion of their clinical training for two years.

• Citizens or non-citizen nationals of the United States, or those lawfully admitted to the United States for permanent residence.

How to Apply

Please email coordinator Alicia Wang <u>yiqunw@bcm.edu</u> for detailed instructions.

Applications are due Friday January 7, 2022 by 5pm CST. Selections will be made in early March 2022.

Details regarding training curriculum, training tracks, faculty mentors list, stipend, and eligibility criteria can be found on_ <u>https://www.bcm.edu/departments/surgery/education/training-programs/t32-research-training-program</u> (scan QR code for link).

For questions, please contact Barbara W. Trautner, MD, PhD, at trautner@bcm.edu.



FUNDING OPPORTUNITIES

November 2021

<u>Heart to Heart Grant- Alpha Phi Foundation</u>/ Women's heart health initiative. Deadline: November 6, 2021.

RFA-OD-21-007: **NIH** Investigation of Co-occurring conditions across the Lifespan to Understand Down syndrome (INCLUDE) Exploratory/ Developmental Research Grant Award (R21 Clinical Trial Not Allowed) Renewal, resubmission, revision. Deadline: November 3, 2021.

PA-20-185: **NIH** Research Project Grant (Parent R01 Clinical Trial Not Allowed). Renewal, resubmission, revision. Deadline: November 5, 2021.

PA-20-183: **NIH** Research Project Grant (Parent R01 Clinical Trial Required). Renewal, submission, revision. Deadline: November 5, 2021.

PA-18-398: **NIH** Pathway to Independence Award (Parent K99/R00 Independent Clinical Trial Not Allowed). Renewal, submission, revision. Deadline: November 12, 2021.

PA-18-397: **NIH** Pathway to Independence Award (Parent K99/R00 Independent Clinical Trial Required). Renewal, submission, revision. Deadline: November 12, 2021.

PAR-20-310: **NIH** Health Services Research on Minority Health and Health Disparities (R01- Clinical Trial Optional). Deadline: November 17, 2021.

NSF: Reproducible Cells and Organoids via Directed-Differentiation Encoding (RECODE) Prelim proposal due November 22, 2021.

RFA-OD-19-029: **NIH** The Intersection of Sex and Gender Influences on Health and Disease (R01 Clinical Trial Optional) Deadline: November 26, 2021

<u>Shaw Prize in Life Science and Medicine -</u> **The Shaw Prize Foundation**. Candidate nomination deadline: November 30, 2021.

December 2021

<u>Myocarditis, Heart Failure and Sudden Death Research</u> <u>Grant- **Myocarditis Foundation**</u>. Deadline: December 1, 2021.

<u>Fellowships Research Grants - American Society of</u> <u>Transplantation.</u> Deadline: December 1, 2021.

Faculty Development Research Grants- American Society of Transplantation. Deadline December 1, 2021.

Research Publication Grant in Engineering, Medicine, and Science- American Association of University Women. Deadline: December 1, 2021.

<u>Vallee Scholar Awards- Vallee Foundation.</u> Sponsor nomination due: December 1, 2021.

PA-21-051: **NIH** Ruth L. Kirschtein National Research Service Award (NRSA) Individual Predoctoral Fellowship (Parent F31). Deadline: December 8, 2021.

PA-21-048: **NIH** Ruth L. Kirschtein National Research Service Award (NRSA) Individual Postdoctoral Fellowship (Parent F32). Deadline: December 8, 2021.

PA-21-049: **NIH** Ruth L. Kirschstein National Research Service Award (NRSA) Individual Fellowship for Students at Institutions with NIH-Funded Institutional Predoctoral Dual-Degree Training Programs (Parent F30). Deadline: December 8, 2021.

PAR-21-143: **NHGRI** Predoctoral to Postdoctoral Transition Award for a Diverse Genomics Workforce (K99/K00). Deadline: December 8, 2021.

January 2022

<u>Innovators Award</u> -**The Marfan Foundation**. Deadline: January 10, 2022

PAR-19-367 **NIH** Maximizing Investigators' Research Award (R35) Deadline: January 18, 2022.

CVRI SELECT PUBLICATIONS

<u>July 2021</u>

Yeghiazarians Y, **Jneid H,** Tietjens JR, Redline S, Brown DL, El-Sherif N, Mehra R, **Bozkurt B,** Ndumele CE, Somers VK. Obstructive Sleep Apnea and Cardiovascular Disease: A Scientific Statement From the American Heart Association. Circulation. 2021 Jul 20;144(3): e56-e67.

Yin L, Zahradnikova A Jr, Rizzetto R, Boncompagni S, Rabesahala de Meritens C, Zhang Y, Joanne P, Marqués-Sulé E, **Aguilar-Sánchez Y**, Fernández-Tenorio M, Villejoubert O, Li L, Wang YY, Mateo P, Nicolas V, Gerbaud P, Lai FA, Perrier R, Álvarez JL, Niggli E, Valdivia HH, Valdivia CR, Ramos-Franco J, Zorio E, Zissimopoulos S, Protasi F, Benitah JP, Gómez AM. Impaired Binding to Junctophilin-2 and Nanostructural Alteration in CPVT Mutation. Circ Res. 2021 Jul 23;129(3):e35-e52.

Jui E, Singampalli KL, Shani K, Ning Y, Connell JP, **Birla RK**, Bollyky PL, **Caldarone CA**, Keswani SG, **Grande-Allen KJ.** The Immune and Inflammatory Basis of Acquired Pediatric Cardiac Disease. Front Cardiovasc Med. 2021 Jul 27;8:701224.

<u>August 2021</u>

Zhang L, Jain MK. Circadian regulation of cardiac metabolism. J Clin Invest. 2021 Aug 2;131(15):e148276.

Elbadawi A, Elgendy IY, Omer M, Abdelazeem M, **Nambi V**, **Krittanawong C**, Hira RS, Tamis-Holland J, **Ballantyne C, Jneid H.** Outcomes of Acute Myocardial Infarction in Patients with Familial Hypercholesteremia. Am J Med. 2021 Aug;134(8):992-1001.e4.

Zhang Z, Liu S, Qi Y, Aluo Z, Zhang L, Yu L, Li Q, Luo Z, **Sun Z**, Zhou L, Li Y. Calcium supplementation relieves highfat diet-induced liver steatosis by reducing energy metabolism and promoting lipolysis. J Nutr Biochem. 2021 Aug;94:108645.

Bozkurt B, Kamat I, **Hotez PJ**. Myocarditis With COVID-19 mRNA Vaccines. Circulation. 2021 Aug 10;144(6):471-484.



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Murdock DR, Venner E, Muzny DM, Metcalf GA, Murugan M, Hadley TD, Chander V, de Vries PS, Jia X, Hussain A, Agha AM, Sabo A, Li S, Meng Q, Hu J, Tian X, Cohen M, Yi V, Kovar CL, Gingras MC, Korchina V, Howard C, Riconda DL, **Pereira S**, Smith HS, Huda ZA, Buentello A, Marino PR, Leiber L, **Balasubramanyam A,** Amos CI, **Civitello AB, Chelu MG,** Maag R, McGuire AL, Boerwinkle E, Wehrens XHT, **Ballantyne CM, Gibbs RA.** Genetic testing in ambulatory cardiology clinics reveals high rate of findings with clinical management implications. Genet Med. 2021 Aug 6.

Singampalli KL, Jui E, Shani K, Ning Y, Connell JP, Birla RK, Bollyky PL, **Caldarone CA, Keswani SG, Grande-Allen KJ.** Congenital Heart Disease: An Immunological Perspective. Front Cardiovasc Med. 2021 Aug 9;8:701375.

Campbell H, Aguilar-Sanchez Y, Quick AP, Dobrev D, **Wehrens XHT.** SPEG: a key regulator of cardiac calcium homeostasis. Cardiovasc Res. 2021 Aug 29;117(10):2175-2185.

September 2021

Debus ES, Nehler MR, Govsyeyev N, Bauersachs RM, Anand SS, Patel MR, Fanelli F, Capell WH, Brackin T, Hinterreiter F, Krievins D, Nault P, Piffaretti G, Svetlikov A, Jaeger N, Hess CN, Sillesen HH, Conte M, **Mills J,** Muehlhofer E, Haskell LP, Berkowitz SD, Hiatt WR, Bonaca MP. Effect of Rivaroxaban and Aspirin in Patients with Peripheral Artery Disease Undergoing SurgicalRevascularization: Insights from the VOYAGER PAD Trial. Circulation. 2021 Aug 12.

CVRI SELECT PUBLICATIONS

September 2021

Daher M, **Al Rifai M,** Kherallah RY, Rodriguez F, **Mahtta D**, Michos ED, Khan SU, Petersen LA, **Virani SS.** Gender disparities in difficulty accessing healthcare and costrelated medication non-adherence: The CDC behavioral risk factor surveillance system (BRFSS) survey. Prev Med. 2021 Sep 3;153:106779.

Raber I, **Al Rifai M,** McCarthy CP, Vaduganathan M, Michos ED, Wood MJ, Smyth YM, Ibrahim NE, Asnani A, Mehran R, McEvoy JW. Gender Differences in Medicare Payments Among Cardiologists. JAMA Cardiol. 2021 Sep 8:e213385.

Elbadawi A, Elgendy IY, Rai D, Mahtta D, Megaly M, Pershad A, Denktas A, Brilakis ES, Drachman DE, Banerjee S, Shishehbor MH, **Jneid H.** Impact of Hospital Procedural Volume on Outcomes After Endovascular Revascularization for Critical Limb Ischemia. JACC Cardiovasc Interv. 2021 Sep 13;14(17):1926-1936.

Li L, Xu W, **Zhang L**. KLF15 Regulates Oxidative Stress Response in Cardiomyocytes through NAD. Metabolites. 2021 Sep 13;11(9):620.

Hulsurkar MM, Lahiri SK, Moore O, Moreira LM, Abu-Taha I, Kamler M, Dobrev D, Nattel S, Reilly S, Wehrens XHT. Atrial-Specific LKB1 Knockdown Represents a Novel Mouse Model of Atrial Cardiomyopathy With Spontaneous Atrial Fibrillation. Circulation. 2021 Sep 14;144(11):909-912.

Blumenthal DM, Maddox TM, Aragam K, Sacks CA, **Virani SS,** Wasfy JH. Predictors of PCSK9 (Proprotein Convertase Subtilisin/Kexin Type 9) Inhibitor Prescriptions for Secondary Prevention of Clinical Atherosclerotic Cardiovascular Disease. Circ Cardiovasc Qual Outcomes. 2021 Sep;14(9):e007237.

Linz D, Gawałko M, Sanders P, Penders J, **Li N**, Nattel S, Dobrev D. Does gut microbiota affect atrial rhythm? Causalities and speculations. Eur Heart J. 2021 Sep 14;42(35):3521-3525.

September 2021

Nissen SE, Hutchinson HG, Wang TY, **Ballantyne CM,** Travis S, Morris M, Miller W, Hynson J, Wolski K, Ridker PM. Technology-Assisted Self-Selection of Candidates for Nonprescription Statin Therapy. J Am Coll Cardiol. 2021 Sep 14;78(11):1114-1123.

Pandey A, Shah SJ, Butler J, Kellogg DL Jr, Lewis GD, Forman DE, Mentz RJ, Borlaug BA, Simon MA, Chirinos JA, Fielding RA, Volpi E, Molina AJA, Haykowsky MJ, Sam F, Goodpaster BH, Bertoni AG, Justice JN, White JP, Ding J, Hummel SL, LeBrasseur NK, **Taffet GE,** Pipinos II, Kitzman D. Exercise Intolerance in Older Adults With Heart Failure With Preserved Ejection Fraction: JACC State-of-the-Art Review. J Am Coll Cardiol. 2021 Sep 14;78(11):1166-1187.

Berry JD, **Nambi V**, Ambrosius WT, Chen H, Killeen AA, Taylor A, Toto RD, Soliman EZ, McEvoy JW, Pandey A, Joshi PH, Blankenberg S, Kitzman DW, **Ballantyne CM**, de Lemos JA. Associations of High-Sensitivity Troponin and Natriuretic Peptide Levels With Outcomes After Intensive Blood Pressure Lowering.: Findings From the SPRINT Randomized Clinical Trial. JAMA Cardiol. 2021 Sep 1:e213187.

Kotla S, Zhang A, Imanishi M, Ko KA, Lin SH, Gi YJ, Moczygemba M, Isgandarova S, Schadler KL, Chung C, Milgrom SA, Banchs J, Yusuf SW, Amaya DN, Guo H, Thomas TN, Shen YH, Deswal A, Herrmann J, Kleinerman ES, **Entman ML,** Cooke JP, Schifitto G, Maggirwar SB, McBeath E, Gupte AA, Krishnan S, Patel ZS, Yoon Y, Burks JK, Fujiwara K, Brookes PS, Le NT, Hamilton DJ, Abe JI. Nucleus-mitochondria positive feedback loop formed by ERK5 S496 phosphorylationmediated poly (ADP-ribose) polymerase activation provokes persistent pro-inflammatory senescent phenotype and accelerates coronary atherosclerosis after chemo-radiation. Redox Biol. 2021 Sep 20;47:102132.

September 2021

Meng F, Xie B, **Martin JF.** Targeting the Hippo pathway in heart repair. Cardiovasc Res. 2021 Sep 16:cvab291

Koczo A, Marino A, Rocco J, Ewald G, Givertz MM, Rajagopalan N, **Bozkurt B,** Elkayam U, Cooper LT, Fett J, McTiernan CF, Morel PA, Hanley-Yanez K, McNamara DM; IPAC Investigators. Proinflammatory TH17 cytokine activation, disease severity and outcomes in peripartum cardiomyopathy. Int J Cardiol. 2021 Sep 15;339:93-98.

LeMaire SA, Zhang L, Zhang NS, Luo W, Barrish JP, Zhang Q, **Coselli JS, Shen YH.** Ciprofloxacin accelerates aortic enlargement and promotes dissection and rupture in Marfan mice. J Thorac Cardiovasc Surg. 2020 Sep 22:S0022-5223(20)32667-2.

<u>October 2021</u>

Lahiri SK, Hulsurkar MM, Wehrens XH. Cellular regeneration as a potential strategy to treat cardiac conduction disorders. J Clin Invest. 2021 Oct 1;131(19):e152185.

Kahr PC, Tao G, Kadow ZA, Hill MC, Zhang M, Li S, **Martin JF.** A novel transgenic Cre allele to label mouse cardiac conduction system. Dev Biol. 2021 Oct;478:163-172.

Liu S, Tang L, Zhao X, Nguyen B, Heallen TR, Li M, Wang J, Wang J, **Martin JF.** Yap Promotes Noncanonical Wnt Signals From Cardiomyocytes for Heart Regeneration. Circ Res. 2021 Oct;129(8):782-797.

Angelini A, Saha PK, Jain A, Jung SY, Mynatt RL, Pi X, **Xie L.** PHDs/CPT1B/VDAC1 axis regulates long-chain fatty acid oxidation in cardiomyocytes. Cell Rep. 2021 Oct 5;37(1):109767.

October 2021

Li Y, **LeMaire SA, Shen YH.** Molecular and Cellular Dynamics of Aortic Aneurysms Revealed by Single-Cell Transcriptomics. Arterioscler Thromb Vasc Biol. 2021 Oct 7:ATVBAHA121315852.

Li R, Wang H, Ma F, Cui GL, Peng LY, Li CZ, Zeng HS, **Marian AJ,** Wang DW. Widespread myocardial dysfunction in COVID-19 patients detected by myocardial strain imaging using 2-D speckle-tracking echocardiography. Acta Pharmacol Sin. 2021 Oct;42(10):1567-1574.

Liu S, Tang L, Zhao X, Nguyen B, **Heallen TR,** Li M, Wang J, **Wang J**, **Martin JF.** Yap Promotes Noncanonical Wnt Signals From Cardiomyocytes for Heart Regeneration. Circ Res. 2021 Oct;129(8):782-797.

Gaba P, Bhatt DL, Giugliano RP, Steg PG, Miller M, Brinton EA, Jacobson TA, Ketchum SB, Juliano RA, Jiao L, Doyle RT Jr, Granowitz C, Tardif JC, **Ballantyne CM,** Pinto DS, Budoff MJ, Gibson CM. Comparative Reductions in Investigator-Reported and Adjudicated Ischemic Events in REDUCE-IT. J Am Coll Cardiol. 2021 Oct 12;78(15):1525-1537.

Bonilla-Ramirez C, Molossi S, Sachdeva S, Reaves-O'Neal D, Masand P, Mery CM, **Caldarone CA,** McKenzie ED, Binsalamah ZM. Outcomes in anomalous aortic origin of a coronary artery after surgical reimplantation. J Thorac Cardiovasc Surg. 2021 Oct;162(4):1191-1199.

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