

Cardiovascular Research Institute SPRING 2025 NEWSLETTER



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Highlights from the 12th Annual Cardiovascular Research Institute (CVRI) Symposium

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On April 9, 2025, the 12th Annual Cardiovascular Research Institute (CVRI) Symposium, chaired by Dr. Xander Wehrens, Director of the CVRI, Dr. Biykem Bozkurt, Associate Director of the CVRI and Dr. Lilei Zhang, Chair of the Symposium Program Committee took place at Baylor College of Medicine. Leading researchers, clinicians, and students convened for a full day of scientific exchange, immersing themselves in a dynamic program that featured groundbreaking research and innovative discoveries.

We were honored to host Patrick Ellinor, MD, PhD, as our distinguished keynote speaker. Dr. Ellinor is the Executive Director of the Heart and Vascular Institute at Mass General Brigham, as well as Professor of Medicine at Harvard Medical School, Director of the Demoulas Center for Cardiac Arrhythmias at Massachusetts General Hospital, Institute Member and Director of the Cardiovascular Research Initiative at the Broad Institute of MIT and Harvard, and Acting Chief of Cardiology and Co-Director of the MGH Corrigan-Minehan Heart Center.



Dr. Ellinor has a long-standing interest in human genetics, and his initial work focused on identifying the genetic basis of early-onset atrial fibrillation (AF). This research led to the establishment of the AFGen Consortium, an international collaboration that not only studies the genetics of AF, but also leads large-scale genetic analyses for atrial fibrillation and many other cardiovascular diseases. Now based primarily at the Broad Institute, Dr. Ellinor's lab has expanded its focus to a wide range of topics including cardiovascular disease genetics, disease mechanisms, single cell sequencing, the application of machine learning to cardiac imaging data, and the development of new therapies for cardiovascular diseases.

Keynote speaker: Dr. Patrick Ellinor
Moderator: Dr. Na Li

In his CVRI Symposium keynote lecture, titled "Morphological Profiling to Identify New Genes for Heart Failure," Dr. Ellinor discussed the development of high-throughput methods to identify causative genes for cardiovascular diseases. For example, engineered heart tissues have enabled modeling of cardiomyocytes to study conditions such as cardiomyopathies. However, these elegant models are challenging to scale. Given that cardiomyocyte structural alterations in hypertrophic cardiomyopathy and dilated cardiomyopathy have been well described, the Ellinor lab explored the use of imaging-based readouts as possible surrogate assays of cardiac cell function to increase throughput. The group optimized cell painting techniques to image cardiomyocytes in a way that allows for capture of different cell compartments. This technique generates vast datasets with around 100,000 images per 384-well plate (roughly 200 GB) and over 3000 morphological parameters. Such large amounts of data required lengthy processing times, but further optimizations, including the incorporation of additional steps to narrow down the parameters from 3000+ to around 500, significantly cut processing time from one month to one week, increasing scalability. As a proof of concept, this cell painting and profiling technique was used to differentiate wild-type and titin/DCM cardiomyocytes. The group then applied this approach to identify causal genes from a genome-wide association study (GWAS), using the rich phenotypic and genetic data from the UK Biobank. Induced pluripotent stem cells were differentiated into cardiomyocytes, and candidate genes for heart failure were deleted using CRISPR/Cas9 to generate a variety of mutant cardiomyocytes. Upon using the

optimized painting and profiling technique on these cells, results showed that genes of unknown function clustered with known familial cardiomyopathy causing genes. Furthermore, genes that clustered together morphologically had similar functions. The hope is to use this approach to identify causative genes from genetic loci and target genes for the treatment of cardiomyopathies.

Dr. Ellinor's lecture was a significant highlight of the symposium, offering valuable insights and innovative approaches to genetic discovery in cardiovascular research.



Additionally, the symposium featured ten invited speakers from the Texas Medical Center who covered a wide spectrum of topics addressing the CVRI's pivotal themes such as congenital developmental heart disease, cardiovascular genetics, arrhythmias and channelopathies, heart failure and cardiomyopathy, adult and pediatric heart transplant, and aging.



Thomas Cooper, MD



Yun Nancy Huang, PhD



Hongjie Li, PhD



Nandan Mondal, PhD



Kriti Puri, MBBS



Md. Abul Hassan
Samee, PhD



Daryl Scott, MD, PhD



Joseph Spinner, MD



Xander Wehrens, MD,
PhD



Liang Xie, PhD

The symposium featured over 70 poster presentations by basic science and clinical trainees, as well as junior faculty, providing an important platform for emerging researchers to share their innovative work. The CVRI recognized excellence through the “Best Poster Awards,” honoring outstanding contributions in both basic science and clinical research. These awards were announced in categories by Dr. Lilei Zhang, Chair of the Symposium Program Committee.

Best Poster Awards



Student Category (Non-Graduate) Category

Winner: Joshua A. Keefe, PhD

Mentor: Xander Wehrens, MD, PhD

Poster title: “Atrial Fibroblast-Derived Macrophage Migration Inhibitory Factor Promotes Atrial Macrophage Accumulation in Postoperative Atrial Fibrillation”



Student Category (Graduate) Category Winner:

Dexter Robichaux

Mentor: Jason Karch, PhD

Poster title: “ATAD3 is an Essential Component of them Mitochondrial Permeability Transition Pore”



Postdoctoral Research Trainee Winner:

Jose Alberto Navarro-Garcia, PhD

Mentor: Xander Wehrens, MD, PhD

Poster title: “Oxidized LDL and LOX-1 Mediate Atrial Fibrillation Development in Chronic Kidney Disease”



Junior Faculty Category Winner:

Abhijnan Chattopadhyay, PhD

Poster title: “Pathogenic Variants in ACTA2 that Activate Heat Shock Factor 1 Signaling and Cholesterol Biosynthesis in Smooth Muscle Cells Predispose to Premature Atherosclerosis”



Clinical Outcomes/Research Category Winner:
Sai Prasada Rao Manikonda

Mentor: Nandan Kumar Mondal, PhD
Poster title: "Predicting Acute Ischemic Stroke in Heart Failure Patients with Left Ventricular Assist Devices: The Role of Elevated Plasma Homocysteine and High Mobility Group Box 1 Proteins"



Clinical Resident/Fellow Category Winner:
Co-first authors: Amrit Kannan MD, and Meredith Rae, MD

Mentor: Tam Doan, MD and Eyal Muscal, MD
Poster title: "The Added Value of Cardiac MRI in Pediatric Rheumatologic Disorders"

Furthermore, the annual Dr. Mark L. Entman Awards for Excellence in Cardiovascular Education were presented during the symposium. Established in 2021 by the CVRI to recognize faculty members for outstanding teaching and service in the graduate school curriculum in honor of Dr. Entman's extensive contributions to cardiovascular education. This year's winners are Dr. Christopher Walkey and Dr. Xinchun Pi.



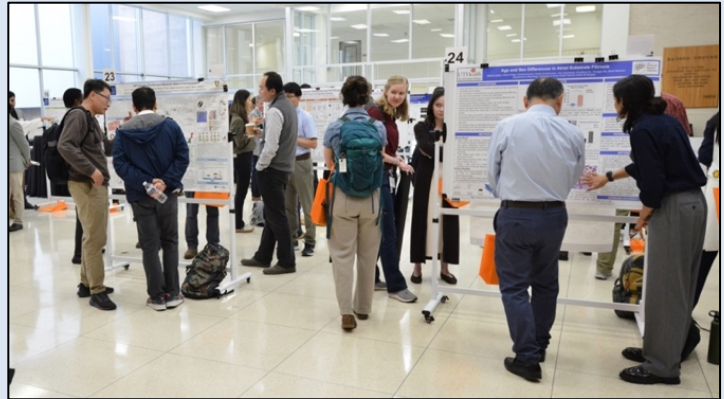
Christopher Walkey, PhD
Mark L. Entman **Teaching Award** for Excellence in Cardiovascular Education



Xinchun Pi, PhD
Mark L. Entman **Service Award** for Excellence in Cardiovascular Education

CONGRATULATIONS!

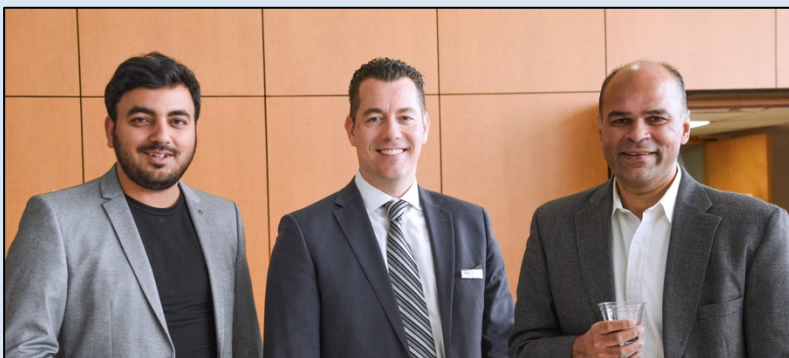
We would like to extend our sincere appreciation to all participants, presenters, and organizers whose contributions ensured the success of this year's symposium. Thank you for helping us continue to advance cardiovascular research and education at Baylor College of Medicine and across the Texas Medical Center.



Bud Frazier, MD



(Left to right): Drs. Huaizhu Wu and Chu-Huang Mendel Chen



(Left to right): Drs. Satadru Lahiri, Xander Wehrens, Ravi Birla



Dr. Xander H.T. Wehrens Receives the Distinguished Scientist Award from the Heart Rhythm Society



Legend Picture Top: Dr. Wehrens receiving the award from Dr. Kenneth Ellenbogen, President of the Heart Rhythm Society

On April 24th 2025, Dr. Xander Wehrens received the Distinguished Scientist Award from the Heart Rhythm Society. Dr. Xander Wehrens is the Director of the Cardiovascular Research Institute at Baylor College of Medicine, where he holds the Quigley Endowed Chair in Cardiology, and is a Professor in the Departments of Integrative Physiology, Medicine, Pediatrics, Neuroscience, and the Center for Space Medicine. Dr. Wehrens is internationally recognized for pioneering translational research on cardiac arrhythmias and heart failure mechanisms. Dr. Wehrens obtained his MD and PhD degrees from Maastricht University in the Netherlands. He completed his PhD thesis on the mechanisms underlying long QT syndrome type-3 under the supervision of renowned cardiac electrophysiologist Dr. Hein Wellens.

Subsequently, Dr. Wehrens was a postdoctoral fellow and instructor in the lab of Dr. Andrew Marks at Columbia University, where he performed seminal work on the role of ryanodine receptor/ calcium release channels in heart disease. His work at Columbia and subsequently at Baylor has led to the development of several small molecule inhibitors of these ryanodine receptor channels that are currently in preclinical development or clinical trials for catecholaminergic polymorphic ventricular tachycardia.

Dr. Wehrens directs a translational research lab that aims to elucidate the mechanism underlying inherited and acquired arrhythmia and cardiomyopathy phenotypes using a wide range of assays utilizing human tissue samples, isolated cardiac cells, and transgenic mouse models. His lab has been continuously funded by multiple NIH grants for two decades and he has published over 300 papers, many in high-impact journals.

Dr. Wehrens has served as Associate Director of the Medical Scientist Training Program at Baylor since 2009 and has mentored over 120 trainees in his lab, most of whom are still active in medical research. Over 20 former trainees are now tenure-track or tenured faculty in the US and around the world. Dr. Wehrens is also the co-director of a new T32 program for predoctoral students entitled 'Cardiovascular Research and Drug Development'. Finally, Dr. Wehrens is an elected member of the American Society of Clinical Investigation (ASCI) and Association of American Physicians (AAP), and a fellow of the American Heart Association, European Society of Cardiology, International Society for Heart Research, and the Heart Rhythm Society.



Legend 2nd Picture: Dr. Wehrens with some of his former trainees, whom he acknowledged in his acceptance

Exciting News!

Dr. Na Li to Receive the 2025 DeBakey Excellence in Research Award



Na Li, PhD, Professor in the Department of Medicine (Section of Cardiovascular Research) has been selected as a recipient of the 2025 Michael E. DeBakey, MD Excellence in Research Award. This honor recognizes BCM faculty whose published research has advanced impactful discoveries and demonstrated scientific merit in clinical or basic biomedical research over the past three years. Dr. Li's research in the field of cardiac arrhythmias illustrates the scientific excellence that the Department of Medicine strives for. Please join us in congratulating Dr. Li!

Dr. Damian Young to be Named the Director of the Center for Drug Discovery at Baylor College of Medicine



Damian Young, PhD, Associate Professor in the Department of Biochemistry and Molecular Pharmacology and Co-Director of the T32 Grant: Cardiovascular Research and Drug Discovery will be promoted to Director of the Center for Drug Discovery at Baylor College of Medicine effective July 1st 2025. "I am honored to assume the position as Director and look forward to making new strides aimed at bringing medicines to patients. I am sincerely grateful to the Inaugural Director, Dr. Martin Matzuk, for his vision to build this amazing Center and his guidance to grow it into a leading academic institution devoted to generating therapeutics.

More Exciting News!

Breakthrough cardiac regeneration research offers hope for the treatment of ischemic heart failure

Researchers in the Michael E. DeBakey Department of Surgery at Baylor College of Medicine, the QIMR Berghofer Medical Research Institute in Brisbane, Australia, and collaborating institutions report a groundbreaking discovery in cardiac regeneration that offers new hope for the treatment of ischemic heart failure. Published in [npj Regenerative Medicine](#), the study reveals a novel approach to promoting cardiomyocyte proliferation.

"When the heart cannot replace injured cardiomyocytes with healthy ones, it becomes progressively weaker, a condition leading to heart failure. In this study, we investigated a new way to stimulate cardiomyocyte proliferation to help the heart heal," said co-corresponding author [Dr. Riham Abouleisa](#), Assistant Professor in the [Division of Cardiothoracic Surgery](#) at Baylor.



Previous studies showed that calcium plays an important role in cardiomyocyte proliferation.

In the current study, Abouleisa and her colleagues explored how modulating calcium influx in cardiomyocytes would affect their proliferation.

"We found that preventing calcium influx in cardiomyocytes enhances the expression of genes involved in cell proliferation," Abouleisa said. "We prevented calcium influx by inhibiting L-Type Calcium Channel (LTCC), a protein that regulates calcium in these cells. Our findings suggest that LTCC could be a target for developing new therapies to induce cardiomyocyte proliferation and regeneration."

The study demonstrates that both pharmacological and genetic inhibition of LTCC can induce cardiomyocyte replication and that this occurs by modulating the activity of calcineurin, a known regulator of cardiomyocyte proliferation. This innovative approach showed promising results both in human cardiac slices grown in the lab and in live animals

"Abouleisa's multi-continent collaborations led to a discovery that can revolutionize the use of current medicines that regulate calcium entry to the cells, such as Nifedipine, in heart failure patients," said [Dr. Tamer Mohamed](#), co-author and director of Baylor College of Medicine's [Laboratory for Cardiac Regeneration](#).





Co-author [Dr. Todd K. Rosengart](#), Chair and Professor of [the Michael E. DeBakey Department of Surgery](#), emphasized that, “The premise of regenerating heart tissue, which once seemed like an impossible dream, is getting closer almost daily. The work of Dr. Abouleisa and the Baylor cardiac regeneration team represents a major step toward human trials that I believe are in the not-too-distant future.”

Abouleisa and her colleagues’ research highlights the importance of targeting calcium signaling pathways to unlock the regenerative potential of the heart and opens new avenues for developing cardiac regenerative therapies, potentially transforming the treatment landscape for patients suffering

from heart failure.

Other contributors to this work include Lynn A C Devilee, Abou Bakr M Salama, Jessica M Miller, Janice D Reid, Qinghui Ou, Nourhan M Baraka, Kamal Abou Farraj, Madiha Jamal, Yibing Nong, Douglas Andres, Jonathan Satin and James E Hudson.

For a complete list of authors’ affiliations and support for this study, see the [publication](#).



T32 Training Program in Cardiovascular Research and Drug Discovery

The Baylor College of Medicine Research Training Program in Cardiovascular Research and Drug Development is designed to prepare PhD students for a research career in cardiovascular research in academia or the pharmaceutical industry. Our innovative program includes interactive didactic courses, individualized training plans, formal training of research mentors, mentor training of the trainees, and an exceptional research infrastructure within the largest medical center in the world. The program emphasizes the highest standards of rigor and reproducibility, equity, and ethics, while incorporating strong translational and clinical components to allow our trainees to bridge critically important gaps in basic and translational cardiovascular research to develop future therapeutic interventions.

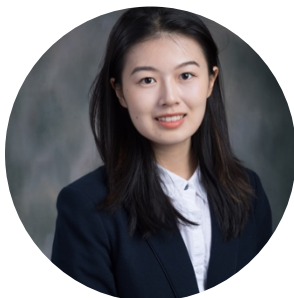
Funded by a T32 grant from the National Heart, Lung and Blood Institute (NHLBI), our program is [led](#) by program directors Xander Wehrens, MD, PhD Director of the Cardiovascular Research Institute, and Damian Young, PhD, Director of the Center for Drug Development.



Zaniqua Bullock, Graduate Student
Mentor: William Decker, PhD
Graduate Program: Chemical, Physical & Structural Biology



Jorie Fleischmann, Graduate Student
Mentor: Christine Beeton, PhD
Graduate Program: Development, Disease Models & Therapeutics



Zian Liao, Graduate Student
Mentor: Martin Matzuk, MD, PhD
Graduate Program: Genetics and Genomics



Dexter Robichaux, Graduate Student
Mentor: Jason Karch, PhD
Graduate Program: Molecular and Cellular Biology



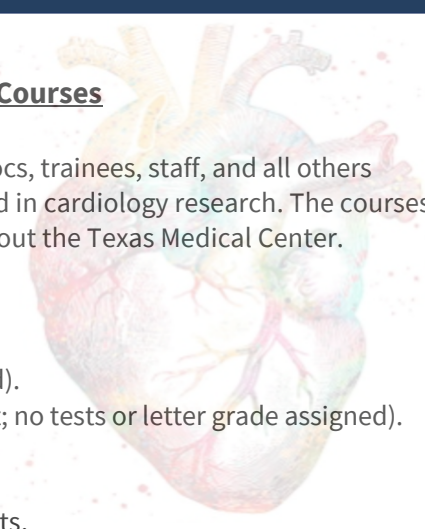
Jessica Wang, Graduate Student (in the MSTP)
Mentor: Jane Grande-Allen, PhD
Graduate Program: Rice Bioengineering



Inioluwa Ojediran, Graduate Student
Mentor: Jane Grande-Allen, PhD
Graduate Program: Rice Bioengineering

Cardiovascular Graduate 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. The courses will discuss cutting-edge research approaches used in cardiology research. The courses will be taught by a combination of clinicians, basic scientists, and physician-scientists from throughout the Texas Medical Center. Lectures are in person.

For those interested in these courses, here are 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).
- Email cvri@bcm.edu for further details.

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

Term 2: GS-DD-6210 - Cardiovascular Diseases GS-DD-6210

2 Credits

Registration: September 8 – 19, 2025

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. Tuesday, Thursday | October 6 – December 5, 2025

Course Director: Xander Wehrens, MD, PhD

Term 3: GS-DD-6304 - Advanced Topics in Cardiac Pathophysiology and Disease

3 Credits

Registration: November 17 – 28, 2025

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 research. Tuesday, Wednesday, Thursday | January 5 – March 6, 2026

Course Directors: Na Li, PhD & Xander Wehrens, MD, PhD

Term 4: GS-DD-6305 - Advanced Topics in Vascular Pathophysiology and Disease

3 Credits

Registration: February 16 – 27, 2026

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 vascular diseases, lipid disorders, atherosclerosis, hemostasis and bleeding disorders, microcirculation disorders, stroke, hypertension, and peripheral artery disease. The course will also discuss the cutting-edge research approaches used in cardiovascular research. Tuesday, Wednesday, Thursday | March 16 – May 15, 2026

Course Directors: David Durgan, PhD & Xander Wehrens, MD, PhD

American Heart Association Funding Opportunities

Opportunity	Proposal Deadline	Award Start Date
<u>AHA Predoctoral Fellowship</u> The purpose of this funding opportunity is to enhance the integrated research and clinical training of promising students who are matriculated in pre-doctoral or clinical health professional degree training programs and who intend careers as scientists, physician-scientists or other clinician-scientists, or related careers aimed at improving global cardiovascular, cerebrovascular and brain health.	9/3/25	1/1/26
<u>AHA Postdoctoral Fellowship</u> The purpose of this funding opportunity is to enhance the training of postdoctoral applicants who are not yet independent. The applicant must be embedded in an appropriate investigative group with the mentorship, support, and relevant scientific guidance of a research mentor. Recognizing the unique challenges that clinicians, in particular, experience in balancing research and clinical activity, this award mechanism aims to be as flexible as possible to enable applicants to develop academic careers in research alongside fulfilling clinical service commitments.	9/4/25	1/1/26
<u>Merit Award</u> Funds investigators with stellar track records of accomplishment, demonstrated by federal or equivalent funding from multiple sources and excellent publication records with substantial impact, who have the potential to move a field of science forward with creative approaches that are aligned with the AHA's mission.	7/25	TBD
<u>AHA Institutional Research Enhancement Award (AIREA)</u> Stimulates research at educational institutions that provide baccalaureate or advanced degrees related to scientific research training. Eligible institutions may not have been major recipients of NIH support. Awards provide funding for small-scale research projects related to cardiovascular diseases and brain health, enhancing the research environment at eligible institutions, and exposing students to research opportunities.	9/11/25	1/1/26
<u>Career Development Award</u> Supports highly promising healthcare and academic professionals in the early years of first professional appointment to assure the applicant's future success as a research scientist in the field of cardiovascular and/or cerebrovascular disease research.	12/2/25	4/1/26

See more funding opportunities through the American Heart Association, [HERE](#).



Additional Funding Opportunities

Opportunity - Thoracic Surgery Foundation	Application open date	Deadline
Nina Starr Braunwald Research Fellowship Award Nina Starr Braunwald, MD was the first woman to be certified by the American Board of Thoracic Surgery and the first woman to conduct open heart surgery. This research award in her name supports up to \$55,000 per year for up to two years for a woman resident working in a cardiac surgical clinic or laboratory research program who has not yet completed cardiothoracic surgical training. Since the award's inception, Braunwald Fellows have gone on to become established leaders within the field. The Braunwald Award is widely recognized as one of the specialty's most prestigious research fellowships.	7/1/2025	9/15/25
Catalyst Award for Data Access A new offering for the 2025 TSF Award cycle, the Catalyst Grant for Data Access provides support for STS Database Participant User File (PUF) research expenses, or other standalone research projects of a similar nature. Support of up to \$10,000 will be awarded to cover data access costs and other direct costs.	7/1/25	9/15/25
STS Research Award This award provides operational support of original research efforts by cardiothoracic surgeons who have completed their formal training, and who are seeking initial support and recognition for the research program. Awards of up to \$90,000 per year for up to two years are granted to support the work of an early-career cardiothoracic surgeon (within seven years of first faculty appointment at time of application deadline). The STS Research Award designation is given to the highest-ranking TSF Research Award application.	7/1/25	9/15/25
TSF Research Award This award provides operational support of original research efforts by cardiothoracic surgeons who have completed their formal training, and who are seeking initial support and recognition for the research program. Awards of up to \$85,000 per year for up to two years are granted to support the work of an early-career cardiothoracic surgeon (within seven years of first faculty appointment at time of application deadline).	7/1/25	9/15/25
STS Database Clinical Research Fellowship Award The STS Research and Analytic Center (RAC) is the home for database harvest analytics and clinical research efforts leveraging the family of cardiothoracic surgery registries within the STS National Database. The transition of database and research analytics in-house to the STS RAC presents an opportunity for clinical fellows to deeply engage in STS clinical outcomes research activities working closely with the in-house database and analytics staff, gaining fundamental knowledge in statistical modeling and research based on the STS Database. In collaboration with the Thoracic Surgery Foundation, the STS Research and Analytic Center will support one research fellow for a one-year period with a grant of \$80,000. This award is open to those in active residency training in an approved ACGME or equivalent training program, or within the first two years of practice.	7/1/25	9/15/25



Request for Applications

**Clinical Translational Science
Pilot Awards Program**

Submission Portal Opens: Tuesday, April 15, 2025
Applications Due: Friday, May 23, 2025, 5 p.m. CT

Click the link below to read more information | Forward to all
interested research investigators

[Request for Applications: 2025 CTPH Pilot Awards](#)

Select Publications

Share your work! Increase your impact!

Email cvi@bcm.edu with your latest publications and we will share it with our CV community on social media.



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