Thomas Quertermous and Alan Yeung celebrated for time as Chiefs of Division of Cardiovascular Medicine

Thomas Quertermous, MD, and Alan Yeung, MD, have successfully led the Division of Cardiovascular Medicine, Department of Medicine, at Stanford for over 20 years. Their collaborative partnership provided leadership and mentorship to bring continued success and growth to the Division of Cardiovascular Medicine. Drs. Quertermous and Yeung leave an enduring clinical, training, and scientific legacy.

Stanford response to coronavirus

In the face of the coronavirus pandemic (COVID-19), Stanford University has taken important efforts to help decrease the spread while continuing to provide healthcare services, as well as maintaining educational pursuits. A few of these steps include:


- Virtual learning for the spring quarter put in place. While undergraduates are no longer on campus, instructors have worked to continue to provide an exceptional educational experience.

- Temporary telecommuting established for staff and faculty able to perform work from home.

For more information and updates on Stanford policies during this dynamic time can be found at Stanford Health Alerts: https://healthalerts.stanford.edu/

SDDS 2020 canceled and Frontiers in Cardiovascular Sciences canceled until further notice

LIFETIME ACHIEVEMENT Awardees:
John Schiller, PhD: Deputy Chief, Laboratory of Cellular Oncology, National Cancer Institute
Doug Lowy, MD: Acting Director National Cancer Institute
Visit tinyurl.com/SDDS2021 for more information.
Stanford-led teams receive clinical research awards

The Clinical Research Forum Foundation announced the 2020 Top 10 Clinical Research Awards to honor outstanding accomplishments in clinical research across the nation. Three research teams led by Stanford Medicine investigators were honored.


"Large-Scale Assessment of a Smartwatch to Identify Atrial Fibrillation", published in The New England Journal of Medicine. The author representing the team is Marco Perez, MD, associate professor of cardiovascular medicine.

"Sustained Outcomes in Oral Immuno therapy for Peanut Allergy (POISED study): A Large, Randomized, Placebo-controlled, Phase 2 Study", published in The Lancet. The author representing the team is Rebecca Sharon Chinthrajah, MD, clinical associate professor of medicine and of pediatrics.


Department of CT Surgery faculty recruitment

Rabin Gerrah, MD, has been appointed Clinical Assistant Professor in the Department of CT Surgery. Dr. Gerrah comes from Medical Associates of New York, where he practiced as a cardiac surgeon. Previously, he held posts as a consultant pediatric cardiothoracic surgeon at Heidelberg University in Germany, Associate Professor at University of North Texas Health Science Center in Fort Worth, and Assistant Professor at Oregon health and Science University. Dr. Gerrah will work at the Stanford program at Good Samaritan Regional Medical Center in Corvallis, Oregon, and is pleased to be part of the Stanford team.

BASE Program faculty recruitment

The Betty Irene Moore Children's Heart Center Basic Science and Engineering Initiative (BASE) "Discovery and Innovation to Improve the Outcome for Children with Heart Disease"

Mark Skylar-Scott, PhD, Assistant Professor. Mark Skylar-Scott is currently a research fellow in Jennifer Lewis' group in the John A. Paulson School of Engineering & Applied Sciences as well as the Wyss Institute for Biologically Inspired Engineering at Harvard University. He obtained his BA and MEng degrees from Cambridge University, and his PhD in Medical and Electrical Engineering from the Department of Health Science & Technology at the Massachusetts Institute of Technology, focusing on high-resolution multiphoton microfabrication of capillary networks.

Mark's research focuses on cardiovascular tissue biomanufacturing, seeking to push the complexity and scale at which tissue can be designed and manufactured on demand. By integrating high-throughput culture of designer organoids with new machines and methods for advanced 3D bioprinting, his laboratory seeks to enhance the maturation and function of vascularized cardiac tissues in vitro and in vivo.

Dr. Skylar-Scott will be onboarding at Stanford Bioengineering in Summer 2020.

Jesse Engreitz, PhD, Assistant Professor. Jesse Engreitz is currently a Junior Fellow at the Harvard Society of Fellows and leads a research group at the Broad Institute of MIT and Harvard.

During his postdoctoral fellowship at the Broad Institute, Jesse developed large-scale CRISPR tools to map enhancer-gene regulation with Eric Lander and Nir Hacohen, and launched the Variants-to-Function (V2F) Initiative to connect genetic disease variants to their molecular and cellular functions. Jesse previously attended Stanford University, where he developed computational algorithms for analyzing gene expression with Russ Altman, and completed his PhD in the Harvard-MIT Division of Health Sciences and Technology, where he studied genome regulation by long noncoding RNAs with Eric Lander and Mitch Guttman. His research has been supported by the National Human Genome Research Institute, Foundations for the National Institutes of Health, Harvard Society of Fellows, Fannie and John Hertz Foundation, and Department of Defense.

Dr. Engreitz will be onboarding at Stanford Genetics in May 2020.
Stanford Cardiovascular Institute Summer Undergraduate Research Program

Stanford CVI hosts a program for undergraduate students that provides the opportunity to gain research experience in laboratories of CVI-affiliated faculty members. The 2020 program will welcome 20 students from across the country for 10 weeks of research, career development, and the chance to establish long-lasting friendships. In 2019, the students performed individual research projects, had the opportunity to interact with Stanford faculty both formally and informally, took a field trip to tour a local biotech company, and ended the program by presenting their research projects in a special seminar. The 2020 program promises to be as exciting and enlightening. For more information visit tinyurl.com/cviundergradinfo.

CVI Weill Research Scholars Endowment

With an extraordinary gift of $4 million from Joan and Sanford I. Weill, the CVI Weill Research Scholars endowment has been established to provide faculty research support in perpetuity. Education and partnership are at the heart of the Weills’ passion for philanthropy and their dedication to making long term commitments to the organizations they support. The inaugural CVI Weill Scholars are Ronglih Liao, Mark Mercola, and Sean Wu.

Ronglih Liao, PhD, heads of one of the nation’s premier labs on amyloidosis. Her research program has centered on the investigation of cardiovascular physiology—from the cellular level to the organismal level—to understand the molecular underpinnings regulating the mechanisms for the diagnosis and treatment of amyloidosis, with a focus on the disease impact on cardiovascular health.

Mark Mercola, PhD, is on the forefront of using stem cells for disease modeling and drug development. His research is focused on developing and using quantitative assays of patient-specific cardiomyocyte function to discover druggable targets for preserving contractile function in heart failure and promoting regeneration following ischemic injury.

Sean Wu, MD, PhD, leads research in cardiac developmental biology, congenital heart disease, and stem cell biology. He is using pluripotent stem cell-derived heart muscle cells to develop new approaches to prevent and treat hypertrophic cardiomyopathy, which has no current existing medications to reverse or slow it.
Nanotherapy reduces plaque buildup in mouse arteries  By Mandy Erickson

A drug-coated nanoparticle reduces plaque buildup in mouse arteries without causing harmful side effects, Stanford School of Medicine researchers have found.

Atherosclerosis, the accumulation of plaque inside artery walls, can lead to heart attacks and strokes. It’s the world’s No. 1 killer. Available therapies treat risk factors such as high blood pressure and high cholesterol but fail to address the accumulation of diseased cells and inflammation within artery walls.

“This is precision medicine,” said Nicholas Leeper, MD, professor of vascular surgery and cardiovascular medicine. “We used the nanotubes to deliver a payload like a Trojan horse.”

Leeper, who sees patients at Stanford Health Care’s vascular and endovascular care clinic, is a senior author of a paper about the research that was published Jan. 27 in *Nature Nanotechnology*. The other senior author is Bryan Smith, PhD, a former visiting associate professor at the School of Medicine. He is now an associate professor of biomedical engineering at Michigan State University.

The researchers found that the nanotherapy reduced plaque by 40% in both female and male mice with less advanced plaque, and it reduced the plaque by 20% in male mice with more advanced plaque.

Because the white blood cells that took in the nanotubes went to artery plaque rather than to healthy tissue, Smith said, the nanotherapy avoided side effects such as anemia and organ damage.

“We were able to constrain the uptake into just the cells we want,” he said. “There’s a general rule of treatment: The more targeted you can get, the fewer side effects you have.”

Flores said their finding has additional treatment implications. “It’s an exciting development, not only for cardiovascular disease, but also for cancer,” she said.


Salamanders and stem cells: The key to unlocking patient-specific therapies  By Amanda Chase, PhD

Have you ever wondered why lizards can regenerate their tails after they drop them? How do salamanders have this amazing ability to regrow entire limbs and regenerate parts of major organs, including, for example, the heart? They stand out as the only vertebrates that can replace complex body parts that are lost or damaged at any age, meaning they have the ability to teach us an enormous amount about regeneration, which could eventually be used for tissue repair in humans. Recently, it was shown that specialized immune cells, called macrophages, are critical in the early stages of limb regeneration in salamanders. Interestingly, macrophages also play a vital role in organ and tissue development in mouse embryos, producing small signals to promote growth of new limbs and heal wounds.

Humans, for the most part, lack this fantastic ability to regrow or regenerate major organs. What if the right environment could be created to facilitate regrowth or regeneration. This would necessarily require a “super factor” to facilitate multiple changes and provide the energy needed for regeneration. There are clues as to what that factor could be, although it is not yet known.

Intriguing work from Stanford researchers, led by Nazish Sayed, MD, PhD, suggests that hypoxia-inducible factor one (HIF1a) is an unexpected but crucial regulator of innate immune-mediated nuclear reprogramming that has the potential to be this “super factor”. This work was published in *Stem Cell Reports*. It was found that HIF1a is a master regulator for the cellular response to low oxygen conditions, and its function is necessary for immune function and wound healing. Given the link between HIF1a and the immune response, which is known to be involved in repair and regeneration, the researchers investigated the role of HIF1a in innate immune-dependent nuclear reprogramming. They showed that HIF1a does this by initiating a switch in the way cells use energy to enable faster growth of induced pluripotent stem cells (iPSCs). This provides a key missing link in the knowledge that activation of the innate immune system is required for nuclear reprogramming. This knowledge can help us to better understand cell reprogramming and tissue regeneration, leading to safer, improved iPSC technology that can be used in clinical trials, ultimately leading to improved therapeutic strategies.

Mouse model developed to study right ventricular recovery in pulmonary arterial hypertension

There are about 500-1000 new cases of pulmonary arterial hypertension (PAH) in the US each year, primarily in women aged 30-60. PAH is characterized by a high blood pressure in the lungs, specifically the pulmonary arteries that carry blood from the right side of the heart (right ventricle, RV) to the lungs. While the RV pumps venous blood with low oxygen content to the lungs to pick up more oxygen, the left side of the heart receives blood from the lungs with high oxygen content to be pumped through the body. In PAH, due to a high pressure and resistance in the lung vessels, the ability to pump blood from the RV through the lungs is impaired, requiring the RV to pump against an increased afterload. Eventually this causes the RV to be overworked, leading to muscle weakening and right heart failure. From patients having received a lung transplantation for PAH, we have learned that the right ventricle has an amazing ability to recover after the excess pulmonary pressure is relieved, yet it is not known whether this is also true when its function is severely impaired. Some institutions prefer a heart-lung over a lung transplantation alone out of fear that the RV might not recover well enough in end-stage PAH and RV failure.

To study the capability of the RV to adapt to an increased afterload, animal models mimicking right ventricular afterload have been developed. One method is to place a band around the pulmonary artery to restrict the blood flow and increase the resistance. This method is called pulmonary artery banding (PAB). Yet, to study the recovery of the RV to a reduced afterload, particularly in small animal models such as mice and rats, no good model existed up until now. Surgical removal of the band weeks after placement is not possible due to the development of scar tissue and a high mortality rate in the animals.

A team of researchers, led by Edda Spiekerkoetter, MD, Associate Professor of Medicine at Stanford University Medical Center and member of the Cardiovascular Institute, as well as her postdoctoral research fellow, Mario Boehm, PhD, sought to address this lack of a mouse model to study RV recovery by establishing a novel mouse model of “de-banding”. Their findings were recently published in the European Society of Cardiology Journal. The team used the pre-clinical mouse model of surgical PAB and developed a reversal technique they termed “de-PAB”. Namely, they used absorbable sutures to allow studies on gradual right ventricular recovery from pressure overload. Using this novel mouse model, they were able to identify key molecular components responsible for the functional recovery of the right ventricle, allowing them to determine the order and timing of reverse remodeling, or recovery, events. Importantly, they were able to show that right ventricle dysfunction, RV fibrosis, and capillary rarefaction is completely reversible after the pressure overload is removed. Their mouse model provides the basis for future mechanistic studies on the recovery of the right ventricle, addressing the unknowns that could, eventually, lead to fewer heart-lung transplants in favor of lung transplants. Furthermore, their work shows that the right ventricle has self-healing properties, which opens the door to better understand beneficial pathways in the RV that might be therapeutically exploited to improve RV recovery in PAH.

Latha Palaniappan, MD, was awarded Faculty Leaves-in-Science, focusing on the exchange of learning and expertise around chronic disease prevention in India.

Seda Tierney, MD, received NIH/NHLBI funding for a clinical intervention study entitled "RE-ENERGIZE FONTAIN study".

Themistocles Assimes, MD, PhD, was elected as a member of American Society for Clinical Investigation.

Vinicio de Jesus Perez, MD, was elected as a member of American Society for Clinical Investigation and of Sigma Xi Professional Society.

Jordan Stern, MD, was approved for multiple investigations through the Society for Vascular Society Vascular Quality Initiative.

Francois Haddad, MD, was promoted to Clinical Professor, Cardiovascular Medicine.

Ronald Witteles, MD, was promoted to Professor, Cardiovascular Medicine.

Eri Fukaya, MD, PhD, received an AVF-JOBST research grant from American Venous Forum Foundation.

Yuanjia Zhu, received the 2020 TSDA Benson R. Wilcox Award at the 56th Society of Thoracic Surgeons Annual Meeting.

Ermelinda Porpiglia, PhD, was promoted to Instructor of Microbiology & Immunology in the Baxter Laboratory.

Mohsen Fathzadeh, PhD, was awarded a 1-year seed grant from Stanford Global Health and the Sean N. Parker Center for Allergy and Asthma Research.

A.J. Rogers, MD, MBA, was a finalist for Young Investigator Award at Heart Rhythm Society meeting for his manuscript "Machine learning of in vivo tissue electrophysiology in patients with heart failure".

William Goodyer, MD, PhD, received the Department of Pediatrics "Bridge to K Program" Grant.

STANFORD VASCULAR MEDICINE received the Anticoagulation Forum Ansell Fellowship, which provides funding for educational opportunities to the next generation of clinical investigators.

SPARK received the 2020 Janet Davison Rowley Patient Impact Award from Cures Within Reach

SPARK co-Directors Daria Mochly-Rosen, PhD, and Kevin Grimes, MD, MBA

SPARK is honored to receive the 2020 Janet Davison Rowley Patient Impact Research Award! Thanks to @CuresWReach for focusing on repurposing research.
Faculty Appointments of CVI-Affiliated Postdocs

Kevin Alexander, MD
Assistant Professor of Medicine, Cardiovascular Medicine, Stanford

Abbygail Foster, PhD
Technical Development Scientist at Genentech

Mingxia Gu, MD, PhD, FAHA
Assistant Professor, Center for Stem Cell & Organoid Medicine (CuSTOM), Divisions of Pulmonary Biology, Molecular Cardiovascular Biology, and Developmental Biology, Department of Pediatrics, Children’s Hospital Medical Center Center

Edward Lau, PhD
Assistant Professor of Medicine (Cardiology), University of Colorado Anschutz Medical Center

Karina Nakayama, PhD
Assistant Professor, Biomedical Engineering, Oregon Health and Science University School of Medicine

Vivek Nanda, PhD
Assistant Professor, Division of Molecular and Cellular Pathology, University of Alabama-Birmingham

Kevin Nead, MD, MPhil
Assistant Professor, Department of Epidemiology, Division of Cancer Prevention and Population Science, University of Texas, MD Anderson Center

Sheeva Rajaei, MD
Assistant Professor, University of Pennsylvania

Elsie Ross, MD
Assistant Professor of Surgery (Vascular Surgery) and of Medicine (Biomedical Informatics Research), Stanford

Karim Salim, MD
Assistant Professor of Medicine, Cardiovascular Medicine, Stanford

Gennifer Smith, PhD
Assistant Professor of Engineering, University of San Francisco

Ke Yuan, PhD
Assistant Professor, Department of Pediatrics, Boston Children’s Hospital

Mingtao Zhao, PhD
Assistant Professor at Ohio State University & Principal Investigator at Nationwide Children’s Hospital

Gootter Foundation Lecture
On June 26, Yoram Rudy, PhD, will present the annual Gootter Foundation Lecture. Dr. Rudy is the Fred Saigh Distinguished Professor of Engineering at the University of Washington, St. Louis. He is an expert in mathematical modeling for the study, diagnosis, and treatment of cardiac clinical arrhythmias. Heart rhythm disorders lead to over 400,000 cases of sudden death annually in the US, making this a critical area of research. Dr. Rudy is a member of the National Academy of Engineering, and has received numerous awards, including: NIH Merit Award, Biomedical Engineering Society Distinguished Lectureship Award, and the Heart Rhythm Society Distinguished Scientist Award.

Inaugural Victor Dzau Distinguished Cardiovascular Lecture
The Victor Dzau Distinguished Cardiovascular Lecture is to honor the legacy of Dr. Victor Dzau, who was Chief of Cardiovascular Medicine (1990-1996) and Chairman of the Medicine Department (1995-1996) at Stanford University.

In December 2020, Eugene Braunwald, MD, will present the inaugural Victor Dzau Cardiovascular Lecture. Dr. Braunwald is a cardiovascular medicine specialist at Brigham and Women’s Hospital and Distinguished Hershey Professor of Medicine at Harvard Medical School. He is also the founding chairman of the Thrombolysis in Myocardial Infarction (TIMI) Study Group.
Stanford patient avoids open heart surgery in aortic valve replacement

By Tracie White

Sharon Kramer, a 76-year-old businesswoman, has always thrived on hard work and keeping busy. At least until eight months ago, when all that energy disappeared, and she started taking catnaps in her car.

Eventually, disturbed by this unusual fatigue along with some shortness of breath and a fainting episode in a department store, she went to see her Stanford doctors. She discovered that she wasn’t just getting older: She needed heart surgery. Medical tests showed that she had severe aortic valve stenosis, a narrowing of the aortic valve, which is life threatening. She needed a new heart valve.

Fortunately for Kramer, her doctors were able to offer her a less-invasive option: transcatheter aortic valve replacement. TAVR reduces the patient’s hospital stay and recuperation period because it eliminates the need to cut open the chest. Instead, physicians insert an expandable biological heart valve via a catheter and thread it, usually through a needle puncture in the groin, into an artery in the leg up through the aorta and down into the heart to replace the diseased valve.

“It can be wonderful for patients,” said William Fearon, MD, Professor of Cardiovascular Medicine, who, along with other Stanford researchers, has been involved with several of the clinical trials used to study TAVR over the past decade. “TAVR is a less-invasive way for repairing defective heart valves, with a better quality of life.”

Previously, TAVR had been reserved for patients at high risk of not surviving open heart surgery. But positive results from two recent clinical trials resulted in its approval for use in a broader, healthier segment of the patient population who need new aortic valves.

The standard treatment has been to open the chest cavity and replace the aortic valve with a mechanical or bioprosthetic valve to improve blood flow. But TAVR started to change that in 2012, when it was approved for high-risk patients by the Food and Drug Administration. Last summer, after two randomized clinical trials revealed the procedure to be as good or even better for low-risk patients, the FDA approved use of the device for such patients.

“This new approval significantly expands the number of patients who can be treated with this less-invasive procedure for aortic valve replacement,” said Bram Zuckerman, MD, director of the Office of Cardiovascular Devices in the FDA’s Center for Devices and Radiological Health, in an Aug. 16 statement. It “follows a thorough review of data demonstrating these devices are safe and effective for this larger population.”

What the FDA approved was two artificial valves the two clinical trials found to be safe for use in the procedure. Stanford was a participant in one of the trials, and the Palo Alto Veterans Affairs Health Care System participated in the other.

“This procedure has been well studied in patients,” Fearon said. “At Stanford, our approach has really evolved over the past decade. We’ve done more than 2,000 — about six a week.” With all the practice and advances in equipment over the years, the outcomes have continued to improve, he said. Fearon added that the trial results alleviated earlier concerns that TAVR showed a higher stroke risk than open heart procedures.


Showing support for women's cardiovascular health

Friday, February 7 was National Wear Red Day, an event organized by the American Heart Association and the National Heart, Lung and Blood Institute. Staff, faculty, and trainees joined the movement, sporting all things red to raise awareness of women’s cardiovascular health. Stanford Twitter highlights:
'Ageotypes' provide window into how individuals age, Stanford study report  
By Hanae Armitage

What's your type?
That question could gain new meaning, thanks to scientists who’ve categorized how humans age into different classes dubbed “ageotypes,” reports a new study from the Stanford University School of Medicine.

“We know already there are a handful of nice molecular and clinical markers, such as high cholesterol, that are more common in older populations,” said Michael Snyder, PhD, Professor and Chair of Genetics. “But we want to know more about aging than what can be learned from population averages. What happens to an individual as they age? No one has ever looked at the same person in detail over time.”

Now, Snyder and his team have done just that: They profiled a group of 43 healthy men and women between the ages of 34 and 68, taking extensive measurements of their molecular biology at least five times over two years.

The researchers determined that people generally age along certain biological pathways in the body: metabolic, immune, hepatic (liver) and nephrotic (kidney). People who are metabolic agers, for example, might be at a higher risk for diabetes or show signs of elevated hemoglobin A1c, a measure of blood-sugar levels, as they grow older. People with an immune ageotype, on the other hand, might generate higher levels of inflammatory markers or be more prone to immune-related diseases as they age. But the ageotypes are not mutually exclusive, and a metabolic ager could also be an immune ager, for example.

Using blood, stool and other biological samples, the study tracked levels of certain microbes and biological molecules, such as proteins, metabolites and lipids, in participants over two years, monitoring how the levels changed over time.

“Our study captures a much more comprehensive view of how we age by studying a broad range of molecules and taking multiple samples across years from each participant,” Snyder said. “We’re able to see clear patterns of how individuals experience aging on a molecular level, and there’s quite a bit of difference.” Differences not only in the ways one ages, but the rates at which one ages. Perhaps the most important thing, he said, is that the study’s measurements were taken during an actionable timeframe — two years — making it possible for someone to counteract increased markers of aging by changing their behavior.

“The ageotype is more than a label; it can help individuals zero in on health-risk factors and find the areas in which they’re most likely to encounter problems down the line,” Snyder said. “Most importantly, our study shows that it’s possible to change the way you age for the better. We’re starting to understand how that happens with behavior, but we’ll need more participants and more measurements over time to fully flesh it out.”

A paper describing the study was published Jan. 13 in Nature Medicine. Snyder is the senior author. Stanford postdoctoral scholar Sara Ahadi, PhD, and bioinformaticist Wenyu Zhou, PhD, share lead authorship.

https://med.stanford.edu/news/all-news/2020/01/_ageotypes_-provide-window-into-how-individuals-age--stanford-st.html

Robert Harrington on research, health equity and the gender gap in cardiology  
By Lindsey Baker

Last November, at the start of the American Heart Association 2019 Scientific Sessions in Philadelphia, cardiologist and current AHA president Robert Harrington, MD, sent out a tweet to his 14,200 followers: “No MANELS! There are no all-male panels at #AHA2019.”

Within an hour, the post had amassed hundreds of likes and retweets, as scientists and physicians from all over the country chimed in to express their support. “Outstanding! Let’s continue to support our young women in STEM and to increase the number of #WomeninMedicine,” replied a preventative cardiologist from USC. “The best part? This wasn’t hard for @AHAMeetings to accomplish. Because #WeAreEverywhere,” a cardiologist who specializes in myocardial infarction also tweeted in response.

Harrington, the Arthur L. Bloomfield Professor in Medicine and chair of the Department of Medicine at Stanford, has shown a commitment to amplifying diverse voices and leveraging innovative technologies and policies to improve health equity. And it’s these values that drive his work at Stanford and the AHA.

Ischemic heart disease affects over 150 million people worldwide, and accounts for 10 million deaths globally per year, making it one of the greatest threats to human health in most western countries. Ischemic heart disease is when the blood flow, and therefore oxygen, is restricted or reduced in the heart muscle. This is caused by the narrowing of heart arteries, usually as the result of plaque buildup, which can ultimately lead to a heart attack, or myocardial infarction (MI). The lack of blood flow, or significant decrease in blood flow, leads to damaged heart muscle. Current treatments include improving blood flow via medications or various procedures, including bypass surgery. Due to the enormity of people affected and the increasing cost associated with treating more patients, there are new pharmacologic therapies and strategies being developed. Despite these efforts, many patients are still progressing to heart failure despite optimal treatments for MI. Therefore, there is a significant and critical need for the development of novel therapeutic strategies to prevent and treat ischemic heart failure after MI.

Recent efforts have been focused on heart regeneration. Following a heart attack, heart cells (cardiomyocytes) die, leading to heart muscle damage, and the non-viable cardiomyocytes are replaced with collagen scar. This ultimately leads to poor heart muscle contractility, and eventually leads to ischemic heart failure. Amphibians, such as newts, are able to undergo natural heart regeneration that results in minimal or no scar formation, in direct contrast to what is seen for humans. Recent work has suggested that this amazing ability of natural regeneration could be a neonatal phenotype, not just in amphibians. The implications of this have immense therapeutic potential for adult humans. However, current understanding of the mechanics of heart regeneration are severely limited by the scarcity of mammalian neonatal models of heart attack. Researchers at Stanford, led by Hanjay Wang, MD, and senior author Joseph Woo, MD, Professor of Cardiothoracic Surgery at Stanford, aimed to address this need by developing a neonatal rat myocardial infarction (MI) model. Their work, recently published in *Cells*, introduces a neonatal rat model of MI that is capable of natural heart regeneration, which results in minimal scar formation. This model is important for several reasons, namely that it further demonstrates neonatal heart regeneration and provides a more high-throughput model for developing a regeneration-based solution for treating ischemic heart disease following heart attack. A therapeutic for ischemic heart disease that allows heart muscle cell regeneration without scar formation would have the potential to save millions of lives every year.


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**CVI Travel Award Winners**

- **Aditi Kashikar, MBBS**
  Mentor: Shipra Arya, MD, SM, FACS
  15th Annual Academic Surgical Congress
  Orlando, FL

- **Kuninobu Kashiyma, MD**
  Mentor: Peter Fitzgerald, MD, PhD
  American Heart Association Scientific Sessions
  Philadelphia, PA

- **Zhanqiu Liu, PhD**
  Mentor: Daniel Ennis, PhD
  23rd Annual Scientific Sessions
  Orlando, FL

- **Masataka Nishiga, MD, PhD**
  Mentor: Joseph Wu, MD, PhD
  JCS 2020 and APSC 2020
  Kyoto, Japan

- **Areli Valencia, BA**
  Mentor: Fatima Rodriguez, MD
  American Heart Association Scientific Sessions
  Philadelphia, PA

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**Recruitment for R38 StARR Resident Fellowship**

**R38 Stanford Integrated Cardiovascular/Pulmonary Residency Research Training Program**

The R38 StARR (Stimulating Access to Research in Residency) program is a multi-disciplinary program funded by the NHLBI of the NIH. The program is designed to recruit and train resident-investigators in cardio-pulmonary research and to accelerate their development into independent clinician-investigators. This program is designed for individuals who have completed a significant portion of their clinical training and have developed a clinical and research focus. Stanford residents will be selected from Internal Medicine, Radiology, Pediatrics, and Cardiothoracic Surgery residency programs.

**Application deadline April 1, 2020, for a July 1, 2020, start date. 3 open positions. To apply, visit: tinyurl.com/R38CVI**

https://med.stanford.edu/cvi/education/resident-education/resident-fellowship.html
Recruitment for T32 Fellowships

Multi-Disciplinary Training Program in Cardiovascular Imaging T32 Training Grant
The Multi-Disciplinary Training Program in Cardiovascular Imaging at Stanford is funded by the National Institute of Biomedical Imaging and Bioengineering of the National Institutes of Health. With the impact of cardiovascular disease on U.S. and world health, and the rapid advances in imaging technologies and cardiovascular biology, it is critical that fellows be provided a broad, multi-disciplinary, and collaborative training program to foster their ability to translate CV imaging research into clinical applications. The program is designed to train the next generation of CV imaging investigators by exposing them to three complementary areas—clinical, engineering, and molecular imaging. Recruiting for 2 positions. http://med.stanford.edu/cvi/education/cardiovascular-imaging-t32.html

Mechanisms and Innovations in Cardiovascular Disease T32 Training Grant
This program provides training in the following areas of vascular medicine and research: Vascular Reactivity and Thrombosis, Vascular Regeneration and Development, Metabolic or Lifestyle Influences on Vascular Outcomes, Proteomic Markers & Genetic Determinants of Vascular Disease, Gender and Ethnicity Differences in Vascular Disease, and Vascular Bioengineering. Twenty-nine faculty mentors from eighteen different departments within the School of Medicine and the University provide a variety of angles from which to address fundamental questions about vascular disease. Recruiting for 2 positions. http://med.stanford.edu/cvi/education/mechanisms-and-innovations-t32.html

Research Training in Myocardial Biology T32 Training Grant
The multi-disciplinary Research Training Program in Myocardial Biology is funded by the National Institutes of Health to bring together post-doctoral fellows and faculty from six complementary areas – genetics and genomics, cellular signaling, molecular imaging, physiology and phenotyping, cardiac development and regeneration, and outcomes research and population science. Although many possible divisions exist in the spectrum of cardiovascular investigators, one of the most discrete is the division between those researchers interested in blood vessels and those primarily interested in the biology of the heart muscle itself. Myocardial biologists at Stanford are found in diverse departments and divisions within the wider Stanford community and this provides a natural vehicle for multi-disciplinary training. Recruiting for 2 positions.http://med.stanford.edu/cvmedicine/education/timbs.html

CTS 225: Stem Cells in Cardiovascular Regenerative Medicine
This course, taught by Dr. Ngan Huang, will consist of didactic lectures and journal club presentations on the basic principles and translational applications of stem cells for treatment of cardiovascular diseases. The course is for graduate and medical students, and is held in the spring quarter on Tuesdays and Thursdays.

Ngan Huang, PhD
Funding Opportunities

APRIL 2020


Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship (Parent F32). Due Date: April 8, 2020. PA-19-188.

Department of Defense Peer Reviewed Medical Research Program Discovery Award. The intent of the PRMRP Discovery Award is to support innovative, non-incremental, high-risk/potentially high-reward research that will provide new insights, paradigms, technologies, or applications. Studies supported by this award are expected to lay the groundwork for future avenues of scientific investigation. Pre-application deadline: April 16, 2020. Full application deadline: April 30, 2020. Opportunity number W81XWH-20-PRMRP-DA.

Department of Defense Peer Reviewed Medical Research Program Focused Program Award. The PRMRP Focused Program Award mechanism is intended to optimize research and accelerate solutions to a critical question related to at least one of the Congressionally directed FY20 PRMRP Topic Areas through a synergistic, multidisciplinary research program. Pre-application deadline: April 23, 2020. Full application deadline: August 6, 2020. Opportunity number W81XWH-20-PRMRP-FPA.

Department of Defense Peer Reviewed Medical Research Program Investigator-Initiated Research Award. The PRMRP Investigator-Initiated Research Award is intended to support studies that will make an important contribution toward research and/or patient care for a disease or condition related to at least one of the FY20 PRMRP Topic Areas. Pre-application deadline: April 23, 2020. Full application deadline: August 20, 2020. Opportunity number W81XWH-20-PRMRP-IIRA.

JUNE 2020

American Heart Association and Enduring Hearts Research Award in Pediatric Heart Transplantation. This award provides support for investigators who are actively conducting research directly related to improving the life expectancy and quality of life of Pediatric Heart Transplant Recipients. Letter of Intent deadline June 1, 2020.

Children’s Heart Foundation – Medical Research Grant. Up to $100k/yr for 2 years. Supports clinical and basic science research in congenital heart disease, including but not limited to, these areas: Molecular genetics, biochemistry, pharmacology devices, and procedural research (cardiac catheterization and surgery), and long-term care of adults with congenital birth defects. Eligibility: faculty with PI eligibility and CE faculty (with approved CE faculty PI waiver). Deadline: June 5, 2020. https://www.childrensheartfoundation.org/for-researchers.

NIH R01 Research Project Grant Improving Patient Adherence to Treatment and Prevention Regimens to Promote Health (R01 Clinical Trial Optional). Deadline: June 5, 2020. PA-18-722.

NIH R01 Research Project Grant Implementation of shared decision making for HLBS diseases and conditions (R01 Clinical Trial Optional). Deadline: June 5, 2020. PA-19-166.


NIH Research Project Grant (Parent R01 Clinical Trial Required). Note that NHLBI only accepts mechanistic studies. Eligibility: faculty with PI eligibility and CE faculty with an approved CE faculty PI waiver. Deadline: June 5, 2020. (Standard R01 deadlines). PA-19-055.


JULY 2020


ROLLING DEADLINE

Mackay California-Pacific Rim Tobacco Policy Scholar Award. $250K/yr x 3 yrs. Build leadership among mid-career researchers to foster evidence-based tobacco control policy with relevance to California and the Pacific Rim (Asia, Pacific Islands and Latin America). Eligibility: mid-career faculty with PI eligibility and mid-career CE faculty (with an approved CE faculty PI waiver). Applicants must be 5 years post-completion of his/her terminal degree or 5 years post-completion of his/her medical residency at the start of the award. Note: Stanford visiting scholars are not eligible to be PIs. Awardees are required to commit at least 35% of their effort each year. No citizenship requirement.
National and Global Cardiovascular Conferences

Please note: some events may be canceled or postponed due to COVID-19. Please check directly with event organizers.

APRIL 2020


MAY 2020


JUNE 2020


AUGUST 2020


Stanford Cardiovascular Institute
Stanford CVI Postdoc Retreat
June 26, 2020
Paul Berg Hall, Li Ka Shing Center, Stanford
CVI Resources

Stanford CVI Human iPSC Biobank Service

Normal and patient-derived reprogrammed cardiomyocytes are a tremendous resource for researchers and physicians here at Stanford and around the country. Understanding the disease process directly at the population level and observing these cells as surrogates under a myriad of conditions has the potential to be a game-changer for cardiovascular medical research.

To facilitate research in a dish that allows screening of new compounds or characterization of human disease phenotypes using cardiomyocytes, CVI created a service by which de-identified peripheral blood mononuclear cell (PBMC) samples from selected patients can be sent to Stanford CVI for reprogramming free of cost.

SCVI biobank is supported in part by the National Heart, Lung and Blood Institute (NHLBI) and the Stanford Cardiovascular Institute (CVI).

Contact: Joseph Wu, MD, PhD / joewu@stanford.edu
or Biobank manager, Yan Zhuge, PhD / yanzhuge@stanford.edu with any questions.

Clinical Biomarker & Phenotyping Core Lab (BPCL)

BPCL provides quantitative assessment of clinical cardiovascular phenotypes for translational research and clinical trials. These cardiovascular phenotypes include evaluating cardiac structure and function, measuring carotid intimal thickness and arterial stiffness, testing endothelial function, and cardiopulmonary exercise testing.

In collaboration with the Human Immune Monitoring Center at Stanford and members of the Cardiovascular Institute, we also offer central blood processing and banking capabilities. In addition, we develop new biomarker platforms and imaging modalities.

Contact: Francois Haddad, MD / fhaddad@stanford.edu

CVI Clinical Trials Core

The CVI Clinical Trials Core provides a full spectrum of support to CVI members and their clinical trials. The coordinator has extensive clinical research experience in both industry and academia. The team provides services and support to principal investigators and sponsors, including:

- Consultation
- Study start-up management, including IRB applications, budget development
- Subject recruitment, site visits, and follow-ups (AE reporting and queries)
- Data management
- Regulatory compliance and documentation
- Closeout

Contact: Ed Finn, Clinical Trials Manager, efin@stanford.edu

Cardiovascular Pharmacology (BioADD)

The Cardiovascular Pharmacology/Biometalics and Advanced Drug Delivery (BioADD) Laboratory is a cutting edge research facility that specializes in the creation of biomaterials and drug delivery agents. The lab lends its expertise toward designing and analyzing biomaterials, developing drug delivery devices and formulations, pharmacokinetic and pharmacodynamic studies, and developing smart materials for biomedical applications. The CVI Cardiovascular Pharmacology also offers trainings and lectures.

Contact: Jayakumar Rajadas, PhD
jayra@stanford.edu

3DQ Imaging Laboratory

Stanford’s 3DQ Imaging Laboratory develops new approaches to exploration, analysis and quantitative assessments of diagnostic images that result in new and/or more cost-effective diagnostic approaches, and new techniques for the design and monitoring of therapy. The lab processes over 1,200 clinical cases to deliver relevant visualization and analysis of medical imaging data at Stanford. The lab is co-directed by Dominik Fleischmann, MD, Roland Bammer, PhD and Sandy Napel, PhD. Contact: Dominik Fleischmann, MD / d.fleischmann@stanford.edu
Communication is at the heart of scientific advancement and innovation. This quarter, the Stanford Cardiovascular Institute members published over 350 original manuscripts and reviews, further contributing to our understanding of cardiovascular biology and disease. Here, we highlight selected manuscripts by our members.

**December**


A Literature-Based Knowledge Graph Embedding Method for Identifying Drug Repurposing Opportunities in Rare Diseases. Sosa DN, Derry A, Guo M, Wei E, Brinton C, Altman RB. *Pac Symp Biocomput.* 2020;25:463-474. PMID: 31797619


**January**


Patient and Disease-Specific Induced Pluripotent Stem Cells for Discovery of Personalized Cardiovascular Drugs and Therapeutics. Paik DT, Chandy M, Wu JC. *Pharmacol Rev.* 2020 Jan;72(1):320-342. PMID: 31871214


The Effects of ROCK Inhibition on Mesenchymal Stem Cell Chondrogenesis Are Culture Model Dependent. Gegg C, Yang F. Tissue Eng Part A. 2020 Feb;26(3-4):130-139. PMID: 31411113


February


Leadership

Joseph C. Wu, MD, PhD
Director, Stanford Cardiovascular Institute
Simon H. Stertzer, MD, Professor of Medicine and Radiology

Robert A. Harrington, MD
Arthur L. Bloomfield Professor of Medicine
Chair, Dept. of Medicine

Ronald L. Dalman, MD
Walter C. and Elsa R. Chidester Professor of Surgery
Chief, Division of Vascular Surgery

Stephen J. Roth, MD, MPH
Professor and Chief, Pediatric Cardiology
Director, Children’s Heart Center

Dominik Fleischmann, MD
Professor, Dept. of Radiology
Chief, Cardiovascular Imaging

Michael Snyder, PhD
Stanford W. Ascherman, MD, FACS, Professor in Genetics
Chair, Department of Genetics
Director, Stanford Center for Genomics and Personalized Medicine

Eldrin Lewis, MD, MPH
Professor of Medicine and Division Chief, Cardiovascular Medicine

Y. Joseph Woo, MD
Norman E. Shumway Professor in Cardiothoracic Surgery
Chair, Dept. of Cardiothoracic Surgery

Kenneth Mahaffey, MD
Professor, Dept. of Medicine
Vice Chair of Medicine for Clinical Research

Paul Yock, MD
Martha Meier Weiland Professor, Bioengineering and Medicine; and Professor, by courtesy, of Mechanical Engineering, Director, Byers Center for Biodesign

Mark Nicolls, MD
Professor of Pulmonary and Critical Care Medicine, Dept. of Medicine, Chief, Pulmonary and Critical Care Medicine

Marlene Rabinovitch, MD
Dwight and Vera Dunlevie Professor in Pediatric Cardiology, Director of BASE Program