CVI Hosts Stanford-Duke Cardiovascular Research Symposium

By Megan Mayerle, PhD
Photos by Thomas Wei, PhD, and David L.M. Preston

Attended by over 300 individuals, the Stanford-Duke Cardiovascular Research Symposium was held on November 29-30. The event featured 2 keynote addresses: American Heart Association President Ivor Benjamin, MD “Heart and Brain Sciences: Health Equity and the AHA”, and Stanford’s 2012 Nobel Laureate Brian Kobilka, MD “Structure-aided Drug Discovery for G Protein Coupled Receptors”. Over 25 Stanford and Duke cardiovascular researchers presented, including a discussion of Project Baseline, a joint study between Verily, Google, Stanford, and Duke to create a map of human health from data gathered from over 10,000 individuals, and 4 talks from abstract winners Laura Wingler, Catherine Tcheandjieu, Hasan Abbas, and Alison Schroer.

Recruitment for CVMed Chief

The Department of Medicine at Stanford University is recruiting a Chief for the Division Cardiovascular Medicine to lead the research, clinical, and educational activities of the Division. The Chief will be expected to lead the research, clinical, and educational activities of the Division and recruit additional faculty to support both laboratory and clinical research, and expand the clinical enterprise. The Chief will also be expected to strengthen the highly competitive fellowship program in Cardiovascular Medicine and increase its focus on the research opportunities prevalent at Stanford. For more information, please contact either Joseph C. Wu, MD, PhD or Y. Joseph Woo, MD (search committee chairs) or visit the website: https://tinyurl.com/yb83cu65
**Recruitment for Assistant, Associate, or Full Professor, Stanford BASE Initiative**

The Stanford Children’s Health Betty Irene Moore Children’s Heart Center is inaugurating a major initiative in Basic Science and Engineering (BASE). Scientists will be appointed to the Children’s Heart Center and as tenure track Assistant, Associate or Full Professors in the Basic Science or Engineering Departments of Stanford University. Our goal is to leverage cutting edge research to address the challenges we face in children with heart disease.

For information on the program and how to apply, please visit [http://www.med.stanford.edu/base](http://www.med.stanford.edu/base). Applications will be received starting September 15, 2018 and review will begin December 15, 2018. Inquiries to: Marlene Rabinovitch, MD c/o Michelle Fox, Research Administrator mfox1@stanford.edu.

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**Healing Broken Hearts One Cell at a Time**

*By Amanda Chase, PhD*

Cardiovascular disease is the primary cause of mortality worldwide, with a contributing factor being the challenge of heart tissue regeneration. After a typical heart attack, a significant number of cardiac muscle cells (cardiomyocytes) die. This cell death leads to a drastic decrease in heart function with no treatments to heal or repair the damage. But what if we lived in a world where damaged heart tissue could be replaced with a patient’s own cells? In the current era of rapid medical advancements and personalized medicine, researchers from Stanford University and the Stanford Cardiovascular Institute took the first step towards characterizing cells which could potentially be used to treat heart disease.

In a recent publication in *Nature Communication*, lead author Jared Churko, PhD, looked at RNA expression over time to determine which genes were turned off or on, either at the single-cell level or at a population level. The authors identified subpopulations of hiPSC-CMs with distinct profiles containing specific factors regulating them. Combining all the data, they derived a model in which distinct cell populations are associated with specific regulators of gene expression that mediate cardiac maturation.

This improved level of understanding allows future researchers to enrich for cardiomyocyte subtypes at different stages of maturity and functionality. These can then be used to better repair damaged heart tissue, provide a better model of patient-specific disease, and to test personalized drug responses. Disease models that closely mimic the patient are essential for understanding cardiovascular disease and developing new therapeutics. Findings like these will usher in an era where heart tissue growth can be stimulated, allowing damaged hearts to be repaired and reducing mortality from cardiovascular disease.


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**Height, A Risk Factor for Varicose Veins**

*By Tracie White*

The taller you are, the more likely you are to develop varicose veins, according to a study led by Stanford University School of Medicine researchers that examined the genes of more than 400,000 people in search of clues to what causes this common but little understood condition.

“Genes that predict a person’s height may be at the root of this link between height and varicose veins and may provide clues for treating the condition,” said Nicholas Leeper, MD.

The study also identified 30 genes linked to varicose vein disorder and to a strong genetic correlation with deep vein thrombosis. It was published September 24 in *Circulation*. Leeper and Erik Ingelsson, MD, PhD, professor of cardiovascular medicine, are the senior authors. Eri Fukaya, MD, PhD, clinical assistant professor of vascular surgery, and medical student Alyssa Flores share lead authorship.

Varicose veins are swollen, twisted veins that can be seen just under the surface of the skin, usually in the legs. More than thirty million people in the United States have varicose veins. Although the condition is often dismissed as nothing more than a cosmetic nuisance, it can cause moderate pain and has been linked to the more serious side effects of deep vein thrombosis, which occurs when a blood clot forms in one or more of the deep veins in the body.


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**Source: cvi.stanford.edu**
Skeletal Stem Cells Regress When Tasked With Extensive Regeneration

By Krista Conger

Adult mouse skeletal stem cells in the jaw revert to a more developmentally flexible state when called upon to regenerate large portions of bone and tissue, according to a study by researchers at the Stanford University School of Medicine.

The finding is the first to show that mammalian adult stem cells can march backward along the developmental timeline in a process called de-differentiation to become more primitive in response to environmental signals. In particular, the cells appeared to regress to a cell type that normally occurs within weeks of conception in humans and that give rise to the bones, cartilage and connective tissue of the head and face.

The results suggest the possibility of using naturally occurring adult stem cells, which are usually restricted to generate only a limited panel of closely related progeny, to carry out more extensive regeneration projects throughout the body — much in the way that salamanders or newts can replace entire limbs or tails.

A paper describing the research was published online Oct. 24 in Nature. Longaker, the Deane P. and Louise Mitchell Professor in the School of Medicine and co-director of the Stanford Institute for Stem Cell Biology and Regenerative Medicine, shares senior authorship with Howard Chang, MD, PhD, professor of dermatology and of genetics and director of Stanford’s Center for Personal Dynamic Regulomes. Graduate students Ava Carter and Ryan Ransom are the lead authors.

The finding has provocative clinical implications, the researchers believe.


About the Stanford Cardiovascular Institute

The Institute currently consists of over 241 faculty members representing physicians, surgeons, engineers, basic and clinical researchers. The mission of the Institute is integrating fundamental research across disciplines and applying technology to prevent and treat cardiovascular disease.

To support cardiovascular research and education at CVI, please contact: Cathy Hutton, Senior Associate Director, Medical Center Development at cathy.hutton@stanford.edu

For more information: http://med.stanford.edu/cvi/support-our-research.html and http://cvi.stanford.edu

Stanford Researchers Develop Tiny Nanostraws to Deliver Molecules to Human Cells Safely and Efficiently

By Nathan Collins

Researchers can design the perfect molecule to edit a gene, treat cancer or guide the development of a stem cell, but none of that will matter in the end if they can’t get their molecule into the human cells they want to manipulate.

The solution to that problem, described in a study published October 31 in Science Advances, could be minuscule nanostraws, tiny glass-like protrusions that poke equally tiny holes in cell walls to deliver their cargo.

A team led by Nicholas Melosh, an associate professor of materials science and engineering, first began testing nanostraws about five years ago using relatively tough cell lines derived from cancers, mouse cells and other sources. Now, Melosh and colleagues have shown the technique works in human cells as well, a result that could speed up medical and biological research and could one day improve gene therapy for diseases of the eyes, immune system or cancers.

Source: https://news.stanford.edu/2018/10/31/nanostraws-deliver-molecules-cells-safely-quickly/
Stanford, Apple Describe Heart Study With Over 400,000 Participants

Researchers at Stanford Medicine, in collaboration with Apple, launched the Apple Heart Study last November to determine whether a mobile app that uses the optical sensor on the Apple Watch to analyze pulse rate data can identify atrial fibrillation. The condition, which is characterized by an irregular heartbeat, often remains hidden because many people don’t experience symptoms. Atrial fibrillation can increase the risk of stroke and heart failure.

The study has entered the final phase of data collection and will be completed early next year, the researchers said. The Stanford team is led by principal investigators Mintu Turakhia, MD, associate professor of cardiovascular medicine, and Marco Perez, MD, assistant professor of cardiovascular medicine, and by study chair Kenneth Mahaffey, MD, professor of cardiovascular medicine.

“We hope this study will help us better understand how wearable technologies can inform precision health,” said Lloyd Minor, MD, dean of the School of Medicine.

The Food and Drug Administration announced Sept 11 that it had cleared two mobile medical apps designed by Apple to work on the Apple Watch. “The advantage of the app that uses the optical sensor is that it can check for an irregular pulse multiple times throughout the day in the background, without needing the user to actively engage the application,” Perez said.

The goals of the study are threefold: to determine how many among those who receive irregular pulse notifications are found to have atrial fibrillation on ECG patch monitoring; to determine how many among those who received an irregular pulse notification go on to get medical attention; and to determine the accuracy of irregular-pulse detection by the watch by comparing it with the simultaneous ECG patch recordings.

The Apple Heart Study is funded by Apple Inc.


New Med School Curriculum Expands Opportunities for Research, Learning

By Julie Greicius

A new curriculum at the School of Medicine is transforming the way medical students learn and prepare for careers in clinical care and scientific investigation. The School of Medicine’s new curriculum is designed to introduce research to medical students earlier in their training to support their goals for learning and discovery without requiring them to spend the seven to eight years needed to complete an MD-PhD program. The redesign committees also sought to make the curriculum more flexible, re-engage basic scientists in teaching, continuously improve the quality of teaching across the board, and foster scientific investigation while maintaining students’ clinical training and preparation for residency.

We Are Bombarded by Thousands of Diverse Species and Chemicals

By Hanae Armitage

We are all exposed to a vast and dynamic cloud of microbes, chemicals and particulates that, if visible, might make us look something like Pig-Pen from Peanuts. Using a re-engineered air-monitoring device, scientists from the Stanford University School of Medicine have peered into that plume and discovered a smorgasbord of biological and chemical minutia that swirl in, on and around us. Their findings show, in unprecedented detail, the variety of bacteria, viruses, chemicals, plant particulates, fungi, and even tiny microscopic animals that enter our personal space — a bombardment known as the human “exposome.”

The study was published online Sept. 20 in Cell. Snyder is the senior author. Postdoctoral scholar Chao Jiang, PhD; research scientist Xin Wang, PhD; research associate Xiyan Li, PhD; and postdoctoral scholars Jingga Inlora, PhD, and Ting Wang, PhD, are co-lead authors.

Between participants, Snyder and Jiang found that exposomes could be vastly different, even in a reasonably tight geographic region — in this case, the San Francisco Bay Area. Snyder cited an especially well-controlled portion of the study, in which four participants, including Snyder, were closely monitored over one month.

Specific and unique signatures were captured for every individual. For example, the resident from San Francisco showed high rates of “sludge bacteria,” or bacteria typically found in wastewater and sewage treatments. Snyder had consistently high fungal exposures at home due to what he suspects is the use of “green” paint. “The guy who painted my house was a really environmentally friendly, green person. And he avoided using paints with a substance called pyridine in it,” Snyder said. Pyridine, which used to be a popular additive to house paints, has an inverse relationship with fungus, meaning the less pyridine, the more fungus.

“The bottom line is that we all have our own microbiome cloud that we’re schlepping around and spewing out,” Snyder said.

The work is an example of Stanford Medicine’s focus on precision health, the goal of which is to anticipate and prevent disease in the healthy and precisely diagnose and treat disease in the ill.


Genes Behind Rapid Deer Antler Growth, Hardening Identified

By Hanae Armitage

Stanford scientists and their collaborators have identified two key genes responsible for the rapid growth of deer antlers. They hope their insights will open the door to new approaches for treating bone diseases and fractures.

“Knowing the genetics behind antler regeneration, fast bone growth and mineralization is fundamental to our ultimate therapeutic goal and is critical to understanding rapid bone regeneration in other species, like humans,” Yang said.

“There’s a lot of work to be done, but this could be a unique model of bone regeneration, and our initial work here has started to lay a foundation for future studies,” Yang said.


cvi.stanford.edu
Chan Zuckerberg Biohub Funds New Research Efforts, Microbiome Initiative  By Amy Adams

Thirteen Stanford faculty are among the leaders of six research teams that received funding from the Chan Zuckerberg Biohub. Combined with the new microbiome initiative, which includes four Stanford faculty, the CZ Biohub is committing $13.7 million over three years to new collaborative research to enhance human health. The intercampus research awards were given to teams of investigators that include faculty from Stanford, UCSF and Berkeley with the goal of fostering scientific research collaboration across the Bay Area. The six awards and team leaders are:

- **Beyond model systems: Insights into genome evolution and cellular innovations** — Christopher Lowe, Stephen Palumbi & Irving Weissman, Stanford; Daniel Rokhsar, Berkeley; Wallace Marshall, UCSF.

- **Social network analysis of neuroimmune interactions in the developing human brain** — James Zou and Alice Ting, Stanford; Tomasz Nowakowski, Jimmie Ye and Alex Pollen, UCSF; David Schaffer, Berkeley.

- **Multi-scale deep learning and single-cell models of cardiovascular health** — Euan Ashley and James Priest, Stanford; Rima Arnaout and Atul Butte, UCSF; Ben Brown and Bin Yu, Berkeley.

- **Machine learning for interpreting rare genetic variation in comprehensive newborn screening and pharmacogenetics** — Russ Altman and Carlos Bustamante, Stanford; Steven Brenner & Michael Jordan, Berkeley; Renata Gallagher & Kathleen Giacomini, UCSF.

- **Defining host responses of virus-infected and uninfected neighbor cells** — Karla Kirkegaard & Peter Sarnow, Stanford; Laurent Coscoy, UC-Berkeley; Melanie Ott, UCSF, Gladstone Institutes.

- **Imaging complex biological machines in action** — Wah Chiu & John Boothroyd, Stanford; Carolyn Larabell, UCSF; J. Sethian, Berkeley.


Patients with Undiagnosed Diseases Find Answers  By Hanae Armitage

More than 100 patients afflicted by mysterious illnesses have been diagnosed through a network of detective-doctors who investigate unidentified diseases, reports a study conducted by scientists at the Stanford School of Medicine and multiple collaborating institutes. The long-awaited diagnoses are the fruits of the Undiagnosed Diseases Network, a program created by the National Institutes of Health in 2014.

The group has so far sleuthed out 132 of 382 previously unknown ailments — roughly 35%. “Some of these patients had been waiting decades to put a name to their illness. They tell us how much of a relief it is simply to know what they were up against,” Ashley said. But what’s most exciting, he said, was that for 80 percent of the network’s diagnoses, they distilled actionable information, such as changes to patient therapy, adjustments to future diagnostic testing and recommendations for family screening.

“Our findings underscore the impact that establishing a clear diagnosis can have on clinical decision-making for previously undiagnosed patients,” said Kimberly Splinter, associate director of research operations for the network’s coordinating center and a genetic counselor at Harvard Medical School. “We hope that the results of this analysis will provide a compelling case for adopting some of the network’s diagnostic approaches more broadly in an attempt to clarify diagnoses and refine treatment for patients with rare conditions.”

From Heart Disease to Cancer: New Study Tracks Shift of County Death Rates

The leading cause of death in the United States is shifting from heart disease to cancer, but the transition is happening at varying paces across the country and affecting racial and ethnic groups differently, according to new Stanford research.

In the new study, which appears in the Annals of Internal Medicine, senior author Latha Palaniappan, MD, and her colleagues track the shift across the country through more than a decade of county-level mortality data covering all fifty states.

Heart disease death rates decreased by thirty percent in high-income counties compared to twenty-two percent in low-income counties; while cancer mortality fell by eighteen percent in the wealthiest areas compared to eleven percent in less affluent counties.

In 2015, heart disease continued to be the top killer in the lowest-income counties among all racial/ethnic groups; however, in the highest-income counties, cancer had become the leading cause of death among Asian-Americans, Hispanics and non-Hispanic whites, according to the study.

Additionally, the researchers found that blacks had the highest overall mortality rate, though they also showed the greatest improvements during the period studied. American Indians/Alaska Natives were the only group with an increased all-cause mortality rate between 2003 and 2015.

Palaniappan said she hoped the study would be helpful to identify geographic areas that could benefit most from enhanced public health efforts. “Prevention and treatment efforts aren’t reaching all corners of the U.S. at the same time” she said, adding:

Some of the differences documented in the study could be explained by varying levels of health care access and by diverging trends in risk behaviors, such as smoking, Palaniappan said.

Regular recommended cancer screenings and other preventive tests (such as blood pressure, cholesterol and glucose screening) are essential to lowering cancer and heart disease risk, she said.

There are many ways for people on tight budgets to reduce their health risks, Palaniappan added: “The most cost-effective way to prevent both cancer and heart disease is to stop smoking, exercise and eat nine servings of vegetables and fruit daily.”


Researchers Identify Protein Essential for Making Stem Cells

Researchers at the School of Medicine have identified a new protein critical to the production of induced pluripotent stem cells, or iPS cells. The protein, NKX3-1, has previously been shown to play a role in prostate development and tumor suppression. It can substitute for one of the four proteins first identified in 2007 by stem cell researcher Shinya Yamanaka, MD, PhD, as sufficient to prod mature cells like those in the skin or blood to become iPS cells — a transformation known in the stem cell world as reprogramming.

The discovery creates a peephole into the black box of cellular reprogramming and may lead to new ways to generate iPS cells in the laboratory. It was made possible by the use of a unique laboratory model for reprogramming that tightly synchronizes the earliest steps of the process. “This is a crucial regulator that would not have been discovered any other way,” said Helen Blau, PhD, professor of microbiology and immunology. “It appears within two hours of the initiation of reprogramming, and then it’s gone. But it’s absolutely critical. If we eliminate it, reprogramming doesn’t happen.”

Matching Kids to Right-Sized Hearts: New Method Shortens Transplant Waits  
By Erin Digitale

Children who need heart transplants can spend months or years waiting for a suitable donor heart. Fortunately, the pediatric cardiology team at Lucile Packard Children’s Hospital Stanford has a new strategy for shortening the wait. The technique enables children to accept larger donor hearts than doctors would have considered for them in the past. Traditionally, heart transplant teams made size-matching decisions on the basis of total body weight and height. However, many children who need transplants can safely receive a larger heart than height- and weight-based matching suggests. “If they file a CT scan to our 3D lab, we can put it in [the software], do a quick estimate of the donor’s heart size, and in 15 minutes we have a total cardiac volume that we can compare with the recipient,” Dykes said.


Genetics of Cholesterol Point to Possible Drug Targets for Heart Disease, Diabetes  
By Hanae Armitage

From the DNA of nearly 300,000 veterans, scientists have singled out a handful of genetic mutations that not only govern levels of cholesterol, but may also inform the development and use of drugs for cardiovascular disease and diabetes, according to researchers at the Stanford University School of Medicine and the Veterans Affairs Palo Alto Health Care System.

Scientists zeroed in on three mutations that disrupt the function of their respective genes. That might sound bad, but in this case, it’s actually beneficial, as veterans who carried one of these mutations showed improved cholesterol profiles in their blood and a decreased risk of either heart disease, abdominal aortic aneurysms or diabetes, depending on the gene mutation.

“The idea is to use genetic data linked to electronic health records from a very large number of individuals to find genetic variants that simultaneously improve lipid profiles and protect against cardiovascular disease,” said Tim Assimes, MD, PhD, associate professor of cardiovascular medicine. “From there, you can figure out what the best potential drug targets are.”


Eight Scientists Awarded NIH Grants for High-Risk, High-Reward Research  
By Hanae Armitage, Krista Conger, Erin Digitale, and Bruce Goldman

Eight School of Medicine researchers have been awarded High-Risk, High-Reward Research grants from the National Institutes of Health. In all, the Stanford researchers will receive $32 million over the next 5 years. The grants support high-risk research efforts with the potential to make a big impact in the biomedical sciences.

Two of the Stanford scientists received Pioneer Awards, two received New Innovator Awards and four received Transformative Research Awards. The grant program is part of the NIH Common Fund.

Transformative Research Award

The award supports individuals or teams proposing projects that are inherently risky and untested, but that have the potential to create new paradigms and may require large budgets.

Brunet’s work concerns the molecular mechanisms of aging and longevity, with a particular emphasis on the nervous system. “We’re looking to identify ways to observe changes in the brain during aging,” she said. “We’ve pioneered genetic and genome-editing tools to transform a short-lived vertebrate, the African killifish, into a premier model organism for studying aging and age-related diseases such as Alzheimer’s disease. We feel that this system is ideally suited to discover new neuronal networks that respond to aging and can regulate its pace.”

How Colds and Chronic Disease Affect DNA Expression

By Hanae Armitage

We’re all born with a DNA sequence that encodes the very traits that make us. We think of those genes as unchanging, but in reality, the way they are expressed is regularly in flux.

Many of those fluctuations remain little understood, including how a disease like a cold affects gene expression.

But Michael Snyder, PhD, professor and chair of genetics at Stanford, has been working to change that. He has been tracking how his body is changing on a molecular level in response to diseases, including diabetes, which Snyder has. After consistently sampling his own DNA and RNA, Snyder has spotted some interesting patterns that track with illness.

Over the course of three years, Snyder came down with a cold or flu six times, and had two notable increases in blood sugar that rose to diabetic levels. During every bout of viral illness, Snyder saw dramatic changes in his "transcriptome," a catalog of RNA molecules that indicates levels of gene activity.

During each illness, a core set of genes known to contribute to the immune response were revved up, which makes sense, but each viral infection also triggered activation of its own separate group of genes too. That could reflect the fact that the infections were caused by different virus strains.

After Snyder recovered his transcriptome settled back into its normal groove, with immune-response genes tamping down activity. All of this was expected.

The surprise came when Snyder studied epigenetic changes across his genome, specifically, chemical modifications called methylation. His methylation patterns generally only changed twice during the three years — both times just before Snyder had an upswing in blood sugar. In other words, his DNA was modified during the onset of his glucose dysregulation and diabetes spikes. Many of these changes were near genes known to function in metabolic control.

What is intriguing is that the methylome starts changing prior to the glucose level spikes. "So because it's occurring a little bit before, it's a sign that the methyl changes might actually be somewhat responsible for, or contribute to the dysregulation of glucose." Once his glucose levels dropped, the methylation did too.

The next step is to see how these findings hold up when compared to other individuals.


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 US 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.

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.

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 multidisciplinary training.

http://med.stanford.edu/cvmedicine/education/timbs.html
Awards

Awards at 2018 AHA Scientific Sessions

Congratulations to CVI members Drs. Joseph C. Wu, Euan Ashley, Sean Wu, Sarasa Isobe, Ji-Hye Jung and David Paik. Euan Ashley was presented with the Genomics and Precision Medicine Medal of Honor, while Joseph Wu was made an AHA Distinguished Scientist. Sean Wu delivered the 2018 Kenneth D. Bloch Memorial Lecture. Sarasa Isobe was a finalist for the Courand and Comroe Young Investigator Award Competition. Ji-Hye Jung won the 2018 Melvin L. Marcus Young Investigator Award, and David Paik won the 2018 Circulation Research Best Manuscript Award.

Congrats to 2018 CVI Trainees Starting Professorships

Faculty Grant Awards

Sean Wu, MD, PhD: MHCRI Pilot grant "Validation of Ctnn2-800: an imaging contrast to detect the cardiac conduction system".

Patricia Kim Phuong Nguyen, MD: AHA grant "Toward the Identification of Patient-Specific Antigens Causing Atherosclerosis"; NIH grant "The Contribution of T cells to the Pathogenesis of Atherosclerosis in Older Adults"

Nicholas Leeper, MD: 2018 recipient of a Falk Medical Research Trust Catalyst Award for his grant “Precision Nanotherapies for Cardiovascular Disease”.

2019 CVI Travel Awards

Open to Stanford Cardiovascular Institute affiliated postdocs, instructors, and nurses

The Stanford Cardiovascular Institute is now accepting applications for the March 2019 CVI Travel Awards.

To apply go to http://med.stanford.edu/cvi/research/travel_grant.awards.html.
Each year the CVI awards seed grants to fund innovative cardiovascular research projects. This year, winners were selected from over 60 applications, and the awardees proposed projects that initiate new areas of pediatric and obstetric research, the development of new technologies for heart and vascular biology, and the mechanisms of sudden cardiac death.

**PI:** Helen Blau, PhD, Yu Xin Wang, PhD  
**Co-Investigators:** Mingxia Gu, MD, PhD, Marlene Rabinovich, MD  
**Funded by MCHRI**  
**Multiparametric imaging to study cellular dynamics in Duchenne muscular dystrophy-associated dilated cardiomyopathy.**

**PI:** Michael Snyder, PhD, Mads Melbye, MD  
**Co-Investigator:** Liang Liang, PhD  
**Identification of metabolic markers during early pregnancy associated with the risk of congenital heart defects in the offspring.**

**PI:** Philip Tsao, PhD  
**Co-Is:** Joshua M. Spin MD, PhD; Ronglih Liao, PhD; Nicholas J. Leeper, MD; Juyong Brian Kim, MD  
**Influence of e-cigarette vapor on experimental aortic aneurysm**

**PI:** Erik Ingelsson MD, PhD, FAHA  
**Co-Pi:** Mark Mercola, PhD  
**Harnessing Big Data to Reduce Peripheral Evaluation of orphan G-protein-coupled receptor GPR151 as a novel obesity drug target**

**PI:** Detlef Obal, MD, PhD  
**Co-Investigator:** Ian Ying-Li Chen, MD, PhD  
**Anesthetics induced myocardial depression through TRPA1 signaling pathway**

**PI:** Kristy Red-Horse, PhD  
**Co-Pi:** Daniel Bernstein, MD  
**Does enhancing coronary artery development promote recovery from cardiac injury?**

**PIs:** June-Wha Rhee, MD; Stanley Qi, MD, PhD  
**Co-I:** Masataka Nishiga, MD, PhD  
**Genome-scale CRISPR Interference Approach to Investigate Statin-induced Myotoxicity**

**PIs:** Michael Fowler, MB, FRCP; Petra Mamic, MD  
**Co-Is:** Michael Snyder, PhD; Thomas Quertermous, MD  
**Characterization of the Gut Microbiome-Host Metabolome Interactions in Heart Failure-Related Insulin Resistance**

**PIs:** Alison Marsden, PhD; Jack Boyd, MD  
**Co-Is:** Hanjay Wang, MD; Muhammad Owais Khan, PhD; Alexa Wnorowski, MS  
**A bioabsorbable external mesh to prevent vein graft failure after coronary artery bypass graft surgery**

**PIs:** Jeremy Dahl, PhD; Matthew Lungren, MD, MPH  
**Co-Is:** Arsenii Telichko, PhD; Carl Herickhoff, PhD  
**Novel Intravascular Ultrasound Array Catheter for Quantitative Imaging of Vulnerable Plaque**

**PIs:** Charles KF Chan, MD, Irving Weissman, MD, Patricia K. Nguyen, MD  
**Co-I:** Andrew Lee  
**Functional Characterization of Distinct Bone Marrow Sub-Fractions for Treatment of Myocardial Infarction**
Funding Opportunities

Trainees

JANUARY 2019

Sarnoff Cardiovascular Research Foundation Fellowship
Deadline: Jan 10, 2019

FEbruARy 2019

Heart Rhythm Society (HRS) Research Fellowship Opportunities in Cardiac Electrophysiology
Deadline:  Feb 3, 2019

Marfan Foundation Victor A. McKusick Fellowship Program
Deadline:  Feb 1, 2019

Stanford Maternal Child Health Research Institute (MCHRI) Clinical Trainee Support
Deadline:  Feb 1, 2019

Tobacco-related Disease Research Program (TRDRP) of California Postdoctoral Fellowship Award
Letters of intent (required) deadline:  Feb 7, 2019
Full application (by invitation only):  Mar 14, 2019

NIH Pathway to Independence Award PA-18-397 (Parent K99/R00 - Independent Clinical Trial Required)
Deadline:  Feb 12, 2019

NIH Pathway to Independence Award PA-18-398 (Parent K99/R00 - Independent Clinical Trial Not Allowed)
Deadline:  Feb 12, 2019

NIH K08 Mentored Clinical Research Career Development Award PA-18-372 (Parent K08 - Independent Clinical Trial Required)
Deadline:  Feb 12, 2019

NIH K08 Mentored Clinical Research Career Development Award PA-18-373 (Parent K08 - Independent Clinical Trial Not Allowed)
Deadline:  Feb 12, 2019

NIH NHLBI K01 Mentored Career Development Award to Promote Faculty Diversity RFA-HL-19-026
Deadline:  Feb 11, 2019

Faculty

JANUARY 2019

International Society for Heart and Lung Transplantation (ISHLT)
Norman E. Shumway Career Development Award (1 award)
Joel D. Cooper Career Development Award (1 award)
Deadline:  Jan 14, 2019

AHA Transformational Project Award
Deadline:  Jan 23, 2019

FEBRUARY 2019

The Marfan Foundation Early Investigator Grant Program
Deadline:  Feb 1, 2019

Stanford-Coulter Translational Research Grants
Deadline:  Feb 16, 2019

Clinical Excellence Research Center (CERC) Design Fellowship
For information, contact cercinquiry@stanford.edu.
Deadline: Rolling Admission

NIH Research Project Grant (Parent R01-Clinical Trial Not Allowed) PA-18-484
Deadline:  Feb 5, 2019

NIH Improving Outcomes in Cancer Treatment-Related Cardiotoxicity (R01 Clinical Trial Optional) PA-18-003 R01 Research Project Grant
Deadline:  Feb 5, 2019

NIH Research Project Grant (Parent R01 Clinical Trial Required) PA-19-055
Deadline:  Feb 5, 2019

Tobacco-related Disease Research Program (TRDRP) of California High Impact Research Project Award
Letters of intent (required) deadline:  Feb 7, 2019
Full application (by invitation only):  Mar 14, 2019

Tobacco-related Disease Research Program (TRDRP) of California High Impact Pilot Research Award
Preliminary data or proof-of-principle with high impact potential
Letters of intent (required) deadline:  Feb 7, 2019
Full application (by invitation only):  Mar 14, 2019

Tobacco-related Disease Research Program (TRDRP) of California New Investigator Award
Letters of intent (required) deadline:  Feb 7, 2019
Full application (by invitation only):  Mar 14, 2019

Tobacco-related Disease Research Program (TRDRP) of California Mackay California-Pacific Rim Tobacco Policy Scholar Award
Applications accepted on a rolling basis.

NIH Exploratory/Developmental Research Grant Program (Parent R21 Clinical Trial Required) PA-19-054
Deadline:  Feb 16, 2019
National and Global Cardiovascular Conferences

JANUARY 2019

Cardiology Update at Puerto Vallarta: A Focus on Prevention
January 7 - 11, 2019
Marriott Casa Magna, Puerto Vallarta, Mexico

Cardiovascular Conference at Snowmass
January 19 - 23, 2019
The Westin Snowmass Resort, Snowmass, CO

Arrhythmias and the Heart: A Cardiovascular Update
January 28 - February 1, 2019
Fairmont Kea Lani, Maui, HI

Vascular and Endovascular Surgery Society
January 31 - February 3, 2019
Snowbird Resort, Snowbird, UT

FEBRUARY 2019

Hawaii Heart: Echocardiography and Multimodality Imaging Case-Based Clinical Decision Making
February 3 - 8, 2019
The Westin Hapuna Beach Resort, Kohala Coast, Big Island, HI

Cardiovascular Conference at Snowbird
February 6 - 9, 2019
Cliff Lodge, Snowbird, UT

Cardio-Oncology: Putting Principles into Action in Your Practice 2019
February 7 - 9, 2019
Scottsdale, AZ

Big Sky Cardiovascular Update: Practical Applications in Clinical Cardiology
February 18 - 22, 2019
The Huntley Lodge, Big Sky, MT

Cardiology at Cancun: Topics in Clinical Cardiology
February 25 - March 1, 2019
Marriott Cancun Resort, Cancun, Mexico

MARCH 2019

Echocardiographic Workshop on 2-D and Doppler Echocardiography at Vail
March 3 - 7, 2019
Vail Marriott, Vail, CO

EPI|LIFESTYLE 2019 Scientific Sessions
Epidemiology and Prevention | Lifestyle and Cardiometabolic Health
March 5 - 8, 2019
The Westin Galleria, Houston, TX

MAY 2019

Vascular Discovery: From Genes to Medicine Scientific Sessions 2019
May 14 - 16, 2019
Marriott Copley Square Hotel, Boston, MA

Mythbusters: Exposing the Truths of Cardiac Sarcoidosis
March 15, 2019
JW Marriott New Orleans, Ile de France Ballroom, New Orleans, LA

ACC.19 68th Annual Scientific Session and Expo
March 16 - March 18, 2019
New Orleans, LA

Society for Clinical Vascular Surgery
March 6-20, 2019
Boca Raton, FL

Heart Failure Management for Nurse Practitioners, Physician Assistants, and Primary Care Providers
March 21-23, 2019
Disney’s Boardwalk Inn, Lake Buena Vista, FL

Echo/Imaging New York: State-of-the-Art 2019
March 22-24, 2019
Crowne Plaza Times Square, New York, NY

Mayo Clinic Vascular Symposium
March 28 - 30, 2019
Omni Amelia Island Plantation Resort, Amelia Island, FL

APRIL 2019

QCOR 2019 Scientific Sessions
Quality of Care and Outcomes Research
April 5 - 6, 2019
The Ritz-Carlton Pentagon City, Arlington, VA

Echo Fiesta: An In-Depth Review of Adult Echo for Sonographers and Physicians
April 11 - 14, 2019
Hyatt Regency Hill Country, San Antonio, TX

Mayo Clinic Echocardiography Review Course for Boards and Recertification
April 27 - 30, 2019
Rochester Hilton, Rochester, MN

MAY 2019

Vascular Discovery: From Genes to Medicine Scientific Sessions 2019
May 14 - 16, 2019
Marriott Copley Square Hotel, Boston, MA
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, and 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

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
Member Publications

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.

SEPTEMBER


Frequency of Statin Use in Patients With Low-Density Lipoprotein Cholesterol ≥190 mg/dl from the Veterans Affairs Health System. Rodriguez F, Knowles JW, Maron DJ, Virani SS, Heidenreich PA. Am J Cardiol. 2018 Sep 1;122(5):756-761.


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
Professor and Chair, Dept. of Genetics
Director, Stanford Center for Genomics and Personalized Medicine

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

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

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

Alan Yeung, MD
Li Ka Shing Professor of Medicine
Co-Chief (Clinical), Division of Cardiovascular Medicine

Tom Quertermous, MD
William G. Irwin Professor of Medicine
Co-Chief (Research), Division of Cardiovascular Medicine

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

Marlene Rabinovitch, MD
Dwight and Vera Dunlevie Professor in Pediatric Cardiology