

Stanford Cardiovascular Institute

Annual Report 2021-2022



The Stanford Cardiovascular Institute in 2021



A Letter from CVI Director Joseph C. Wu

Stanford Cardiovascular Institute (CVI) was established in 2004 to bring together students, scientists, engineers, and some of the brightest cardiologists and cardiac surgeons in the field. Together, the members of the Cardiovascular Institute embody a valuable collaborative spirit and an open-minded philosophy that have driven innovation and yielded incredible biomedical advances.

2021 was a challenging year in many ways, as the COVID-19 pandemic continued to create unprecedented challenges and we adjusted towards the “new normal”. It has forced us to learn and adapt in all facets of our life, and we have learned how to pursue science under new and changing circumstances. In the midst of the trials and adversity we have faced there is also great opportunity. Over the past year, CVI members have published over 2,000 articles in leading scientific journals. This report will highlight the innovation, accomplishments, and progress from our members from our almost 900 members that took place over 2021.

CVI facilitates an active exchange of ideas across disciplines and training levels. To achieve this we foster a diverse and inclusive environment. Our Frontiers of Cardiovascular Science seminar series features international leaders in the field, and we also host an annual Stanford Drug Discovery Symposium that attracts diverse leaders in academia, industry, and government. We have moved into the new Biomedical Innovations Building, designed to be a hub for cardiovascular scientists to work side-by-side and actively collaborate. We are continuing to lead important conversations within and outside the cardiovascular community at Stanford to promote fruitful collaborations across all facets of science.

The core strength of CVI comes from our talented students and postdoctoral and clinical fellows. Their training and career development are a top priority for the Institute, and we are fortunate to support numerous fellows on NIH training grants. In 2021, CVI trainees enthusiastically participated in a hybrid in-person and virtual Early Career Research Symposium.

As an academic institution, we are committed to ensure the professional growth and the development of scientific curiosity among all of our trainees. To that end, we appreciate greatly the generous endowment of the Dorothy Dee and Marjorie Helene Boring Trust, which supports Stanford medical students dedicated to cardiovascular research, and the Victor J. Dzau Distinguished Lecture in Cardiovascular Medicine dedicated to Dr. Dzau's pioneering work in cardiovascular medicine. In partnership with the Maternal and Child Health Research Institute and the Steven M. Gootter Foundation, the CVI awarded three seed grants to launch the most creative and impactful projects that are in line with the Cardiovascular Institute's innovative spirit. We were also extremely fortunate to receive a generous endowment from Joan and Stanford I. Weill to provide support for faculty selected as CVI Weill Scholars, based on the merits of their research and academic scholarship.

As the Cardiovascular Institute Director, I am tremendously proud of the transformative advances in knowledge and novel approaches to cardiovascular disease therapy that our members and collaborators have been able to achieve and look forward to continuing our success in 2022.

The Stanford Cardiovascular Institute in 2021



A Letter from Dean Lloyd B. Minor

The Stanford Cardiovascular Institute had another remarkable year. The institute—despite the continued challenges of the COVID-19 pandemic—exceeded its own high standards of excellence and innovation to fulfill its mission to improve cardiovascular health and develop the leaders of tomorrow.

I want to thank Joseph C. Wu, MD, PhD, the Simon H. Stertz, MD, Professor of Cardiovascular Medicine and of Radiology, for his visionary leadership. CVI's preeminence is fueled by Dr. Wu's focus on interdisciplinary collaboration that brings together a diverse, talented team of surgeons, scientists, clinicians, engineers, fellows, and students.

CVI's profound impact is demonstrated daily through world-class patient care, cutting-edge research, and rigorous education. Here are just a few highlights from this past year:

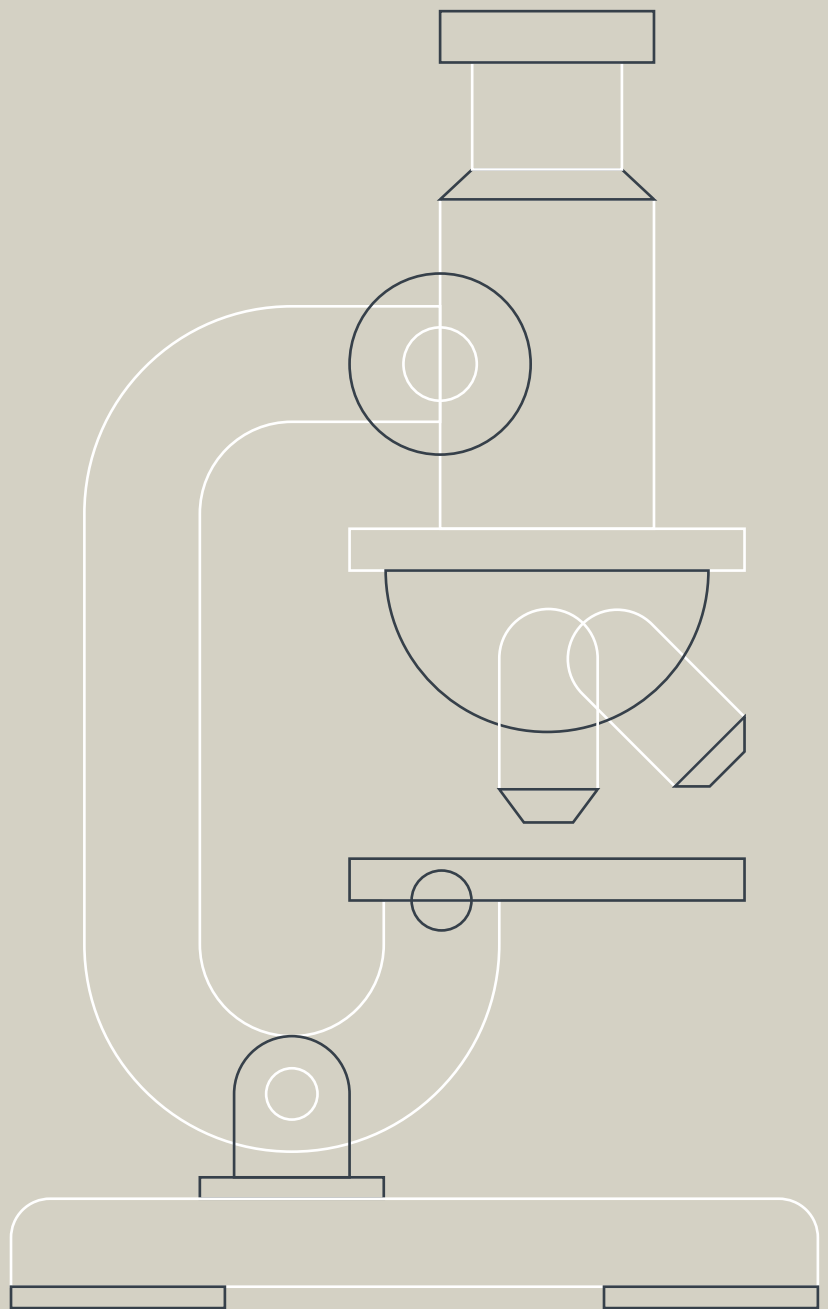
- Institute members addressed COVID-19's continued public health threat with research focused on pre-symptomatic detection using wearables, testing the safety of mRNA-based vaccines, and better understanding the disparities in COVID-19 outcomes in Black and Hispanic populations.
- CVI researchers, recognizing the inequities of cardiovascular treatment, studied how to improve health care for minority groups.
- CVI continues to advance precision medicine through cutting-edge collaborative genomics research, studies on genetic profiling, and innovations in drug development.
- CVI will launch a landmark first-in-human, regenerative medicine clinical trial to see if stem cells will improve function in people with damaged hearts.

CVI is an innovation engine and its continued focus on collaboration is a major factor. This mindset brought together more than 7,000 people from industry and academia for the Institute's virtual 5th Annual Drug Discovery Symposium to share insights, ideas, and recent discoveries. Another 100 early-career investigators participated in the Early Career Research Symposium to share findings and promote career development.

I am also very proud of CVI's undergraduate summer program, which this year expanded to host 28 students for an intense 10-week virtual program. More than 80% of the students are from groups underrepresented in medicine, a hopeful number as we push to diversify doctors' offices and research labs.

I am excited to see what the Stanford Cardiovascular Institute will accomplish in 2022 as it continues to lead the field of cardiovascular medicine.

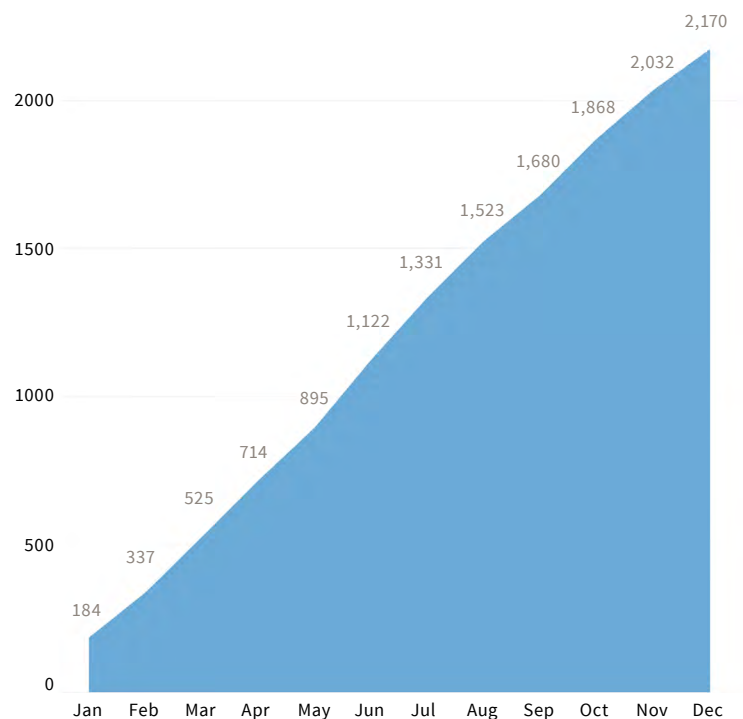
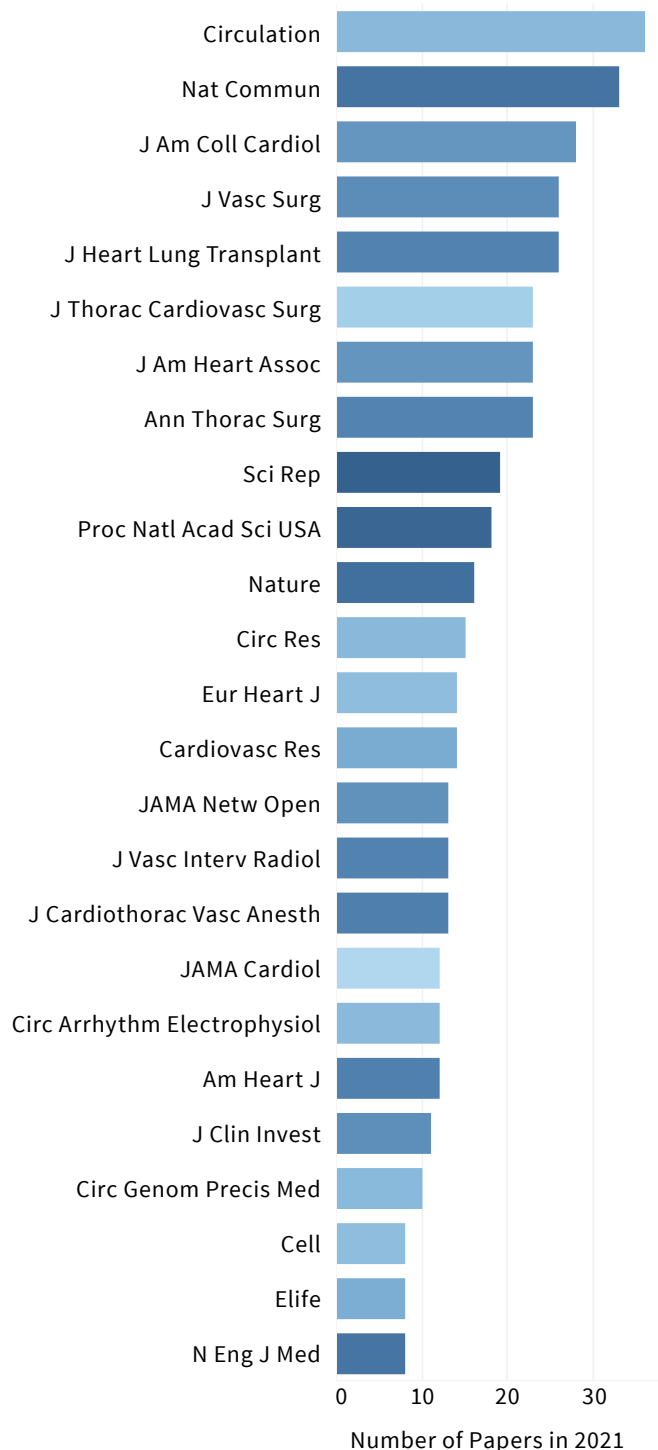
RESEARCH



CVI Scientists Share Cutting Edge Scientific and Medical Discoveries

Over the past year, CVI scientists have published over 2,000 articles in leading scientific journals. CVI science is wide-ranging, covering topics as disparate as *3D Printing of Microgel Scaffolds* to a *Worldwide Survey of COVID-19-Associated Arrhythmias*. CVI researcher output has remained continuous throughout the year. A subset of the high caliber publications CVI members work is shared in, including *Circulation*, *Nature Communications*, and the *Journal of the American College of Cardiology*, is listed below.

Some of the ground-breaking studies that were published by CVI scientists in 2021 include: studies on how to improve health care for minority groups, new treatments for heart failure, the mechanisms underlying pulmonary arterial hypertension, treatment innovations for abdominal aortic aneurysms, the problems with pharmacogenetics, better MRI methods, the relationship between COVID-19 and allergies, and ways to increase access to heart transplants.



Inaugural

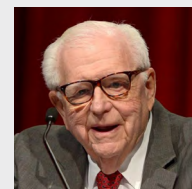
VICTOR J. DZAU

Watch a recording
of the seminar.

DISTINGUISHED LECTURE IN CARDIOVASCULAR MEDICINE

On December 8th, 2021, Eugene Braunwald, MD, presented the inaugural Victor J. Dzau Distinguished Lecture in Cardiovascular Medicine. The annual lecture series honors the extensive contributions of Dr. Victor Dzau to the field of cardiovascular medicine.

Dr. Braunwald is the Distinguished Hersey Professor of Medicine at Harvard Medical School, and Chair Emeritus of the Department of Medicine and Founding Chair of the TIMI Study Group at Brigham and Women's Hospital. To an audience of over 900, Dr. Braunwald presented on **"The War Against Heart Failure,"** in which he honored the legacy of Dr. Dzau, summarized the history of advances in the field, and highlighted four major paradigm shifts in heart failure treatment including the recent discovery of SGLT2 inhibitors. The presentation was followed by lively Q&A session featuring Dr. Braunwald, Dr. Victor Dzau, and Stanford Cardiovascular Institute Director, Dr. Joseph C. Wu.



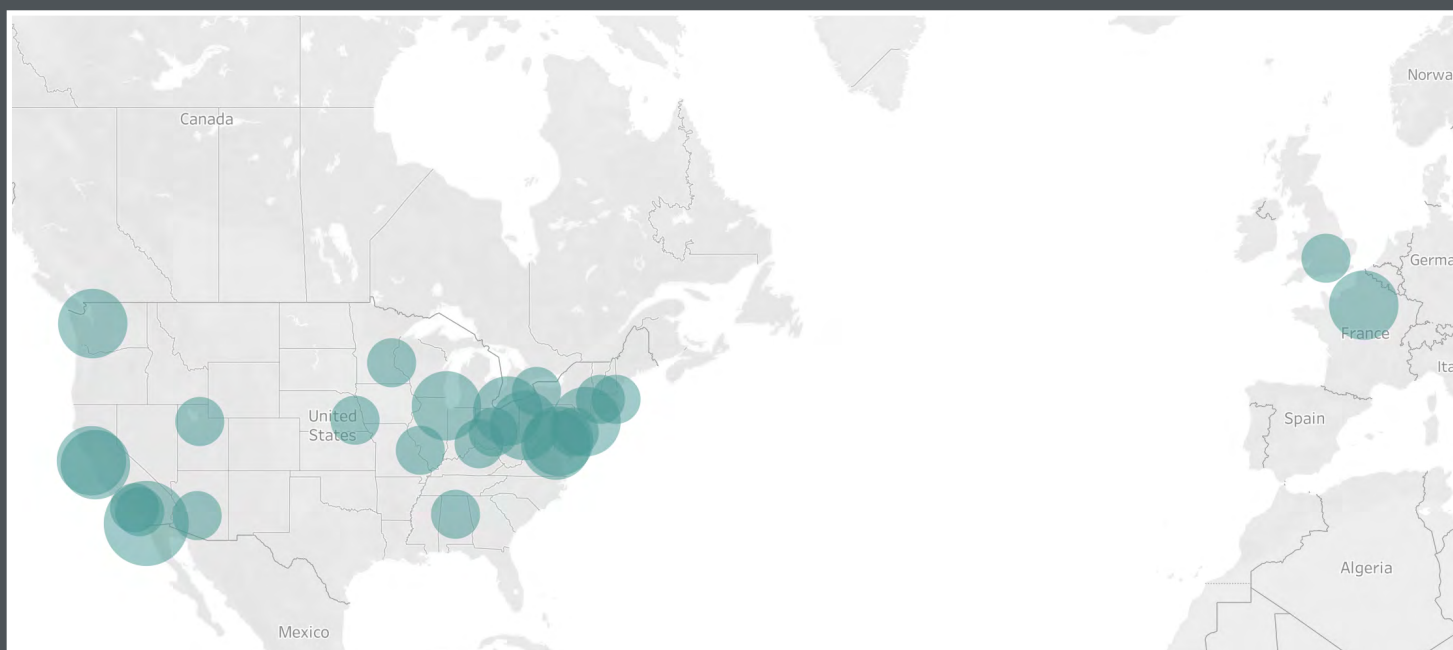
Victor J. Dzau, MD, is an internationally acclaimed leader and physician scientist who has performed seminal research in cardiovascular medicine and genetics. His work laid the foundation for the development of the class of lifesaving medications used globally to treat hypertension and heart failure. Dr. Dzau is President of the U.S. National Academy of Medicine (NAM), Vice Chair of the U.S. National Research Council, and Chancellor Emeritus and James B. Duke Distinguished Professor of Medicine at Duke University.

**Nominations Open for 2022
Distinguished Lecturer**

[Find Out More!](#)

Virtual Frontiers Seminar Series Shares Knowledge Across the World

In 2021, CVI's flagship seminar series [Frontiers in Cardiovascular Science](#) hosted 39 phenomenal national and international speakers, who shared their research with over 1,300 virtual attendees. All Frontiers seminars are open to the public and CVI maintains a [digital library](#) of all of their past seminars that is publicly available.



CVI Launches New Strategic Research Development Website

In April of 2021, CVI launched a new Strategic Research Development website designed to support CVI researchers at all career stages in their research efforts. This resource provides timelines, template documents, contact information, and links to help investigators prepare their proposals and have the strongest possibility of success. [S](#)

Are you applying for a Fellowship (e.g. F32)?	NO ➤	Are you applying for Career Development Award? (AHA, K Award)	NO ➤	Are you an instructor applying for an R level grant?	NO ➤	Are you an Assistant/ Associate/Full Professor applying for an R level grant?
YES ▼		YES ▼		YES ▼		YES ▼
<ul style="list-style-type: none"> Contact Jonathan Gagante Submit PDRF to RMG Complete a computer course (DOR-1218) (for F32) Find checklist for required documents 		<ul style="list-style-type: none"> Submit PIF to RMG via SeRA Complete a computer course (DOR-1219) Find K award and AHA CDA checklists for required documents Obtain PI waiver for Career Development 		<ul style="list-style-type: none"> Submit PIF to RMG via SeRA Find R award checklists for required documents Obtain Expanded Career Development Awards PI waiver 		<ul style="list-style-type: none"> Submit PIF to RMG via SeRA Find R award checklists for required documents PI waiver if needed (CE faculty)

CVI Strategic Research Development Support

Strategic research development means providing tailored scientific feedback on individual proposals, supporting navigation of Stanford and funding agency application processes, and helping identify new funding opportunities for researchers. Of the 34 proposals supported the CVI's Strategic Research Development Office in 2021, 12 (35%) have already been

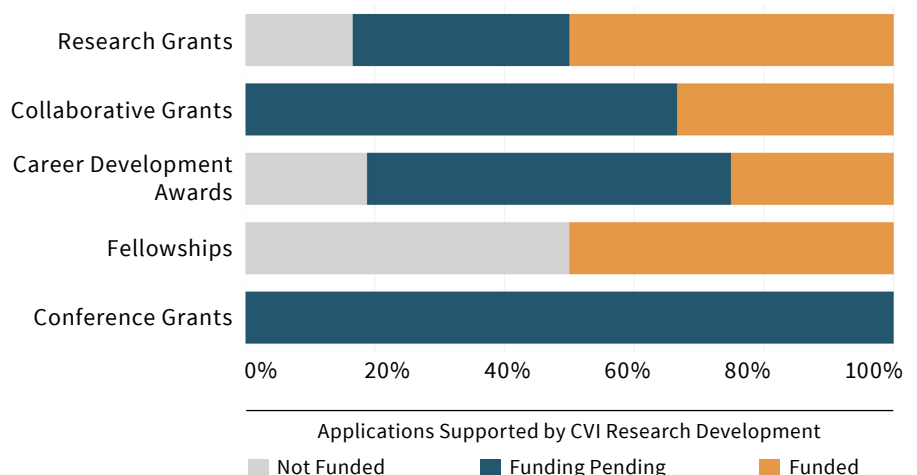
funded, with the majority of proposal outcomes still pending. Strategic research support is geared toward trainees with limited experience writing proposals, new faculty embarking on their first R-level research grants, and research groups seeking to collaborate on large proposals such as NIH program project grants (PPGs) or UM1 cooperative agreements.



Amanda Chase, PhD
Associate Director
Strategic Research
Development

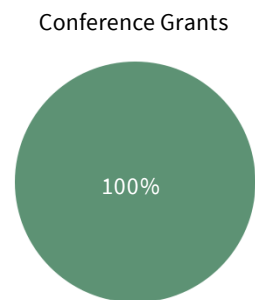
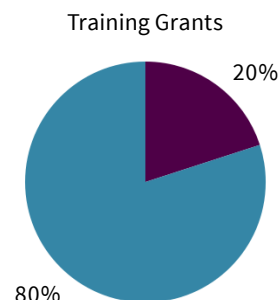
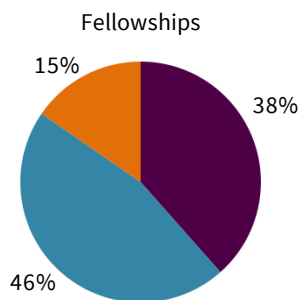
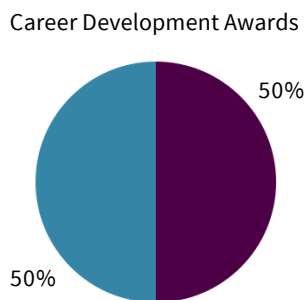
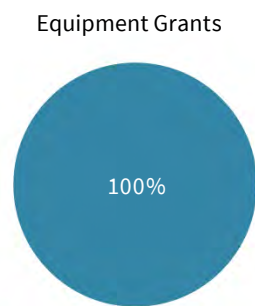
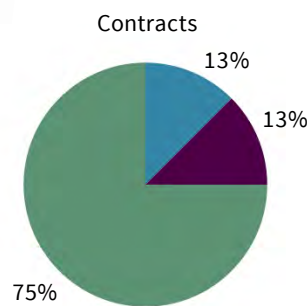
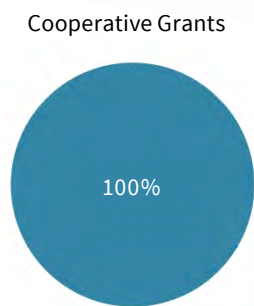
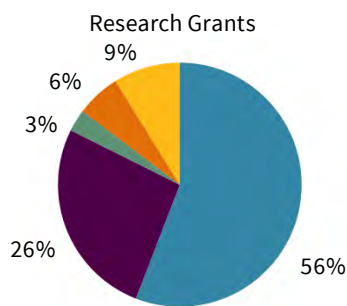
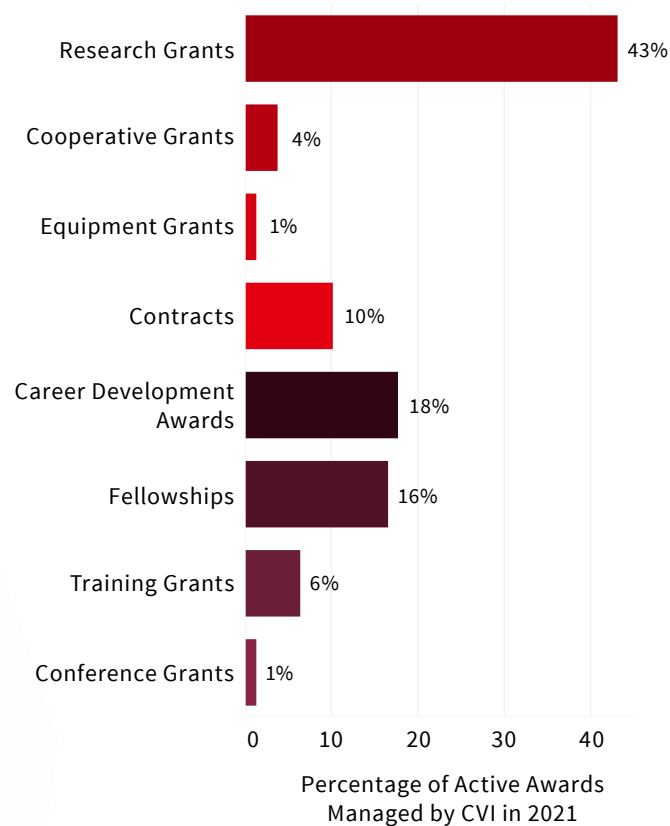
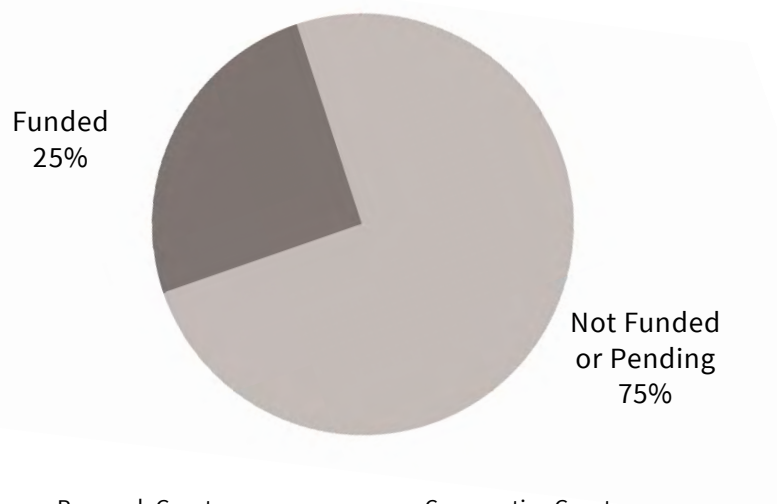


Yamini Dwarakanath
Research Administrator



Current Active Research Managed by CVI

Over the past 12 months, CVI investigators have been very successful in maintaining and securing funding for research projects, equipment grants, contracts, career development awards, fellowships and training grants. To date, 25% of grants, career development awards, and fellowships submitted and administered through CVI in 2021 have been awarded, with the outcomes of many proposals still pending. Notably, one of these awards was for the landmark first US clinical trial using stem cells to treat heart failure. CVI members also have several active multi-investigator grants, designed to foster new discoveries through structured collaborative work. In addition, our early career investigators—graduate students, postdocs, residents, and instructors—have been very successful in obtaining fellowship awards for specific research projects and career development awards to propel them into the next stages of their careers as independent investigators.



Funding Source

- Government
- Foundation
- Industry
- Non-Profit
- Stanford

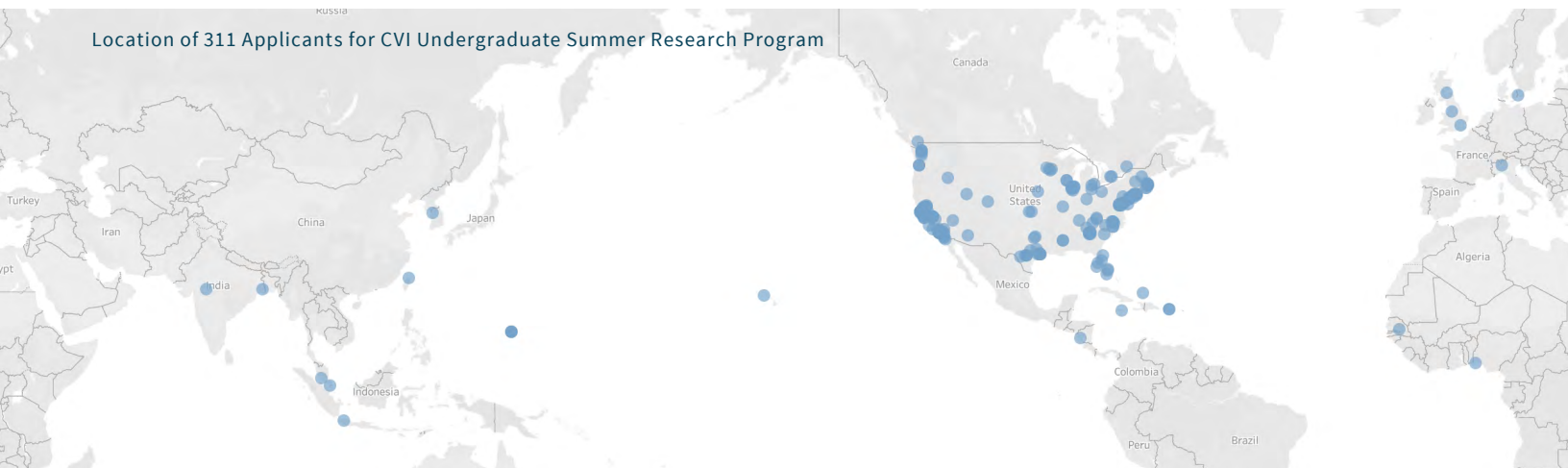
Education



CVI Recruited 28 Exceptional Students to its 2021 Undergraduate Summer Research Program

In 2021, over 300 students from around the world applied to participate in the CVI Undergraduate Summer Research Program. With funding from an NIH R25 award, an AHA institutional award, an AHA SURE pilot program, and additional support from CVI itself, 28 students were accepted into the program. From June 1st through August 10th they participated in 10 weeks of intense virtual cardiovascular and pulmonary research.

Location of 311 Applicants for CVI Undergraduate Summer Research Program



311

APPLICATIONS

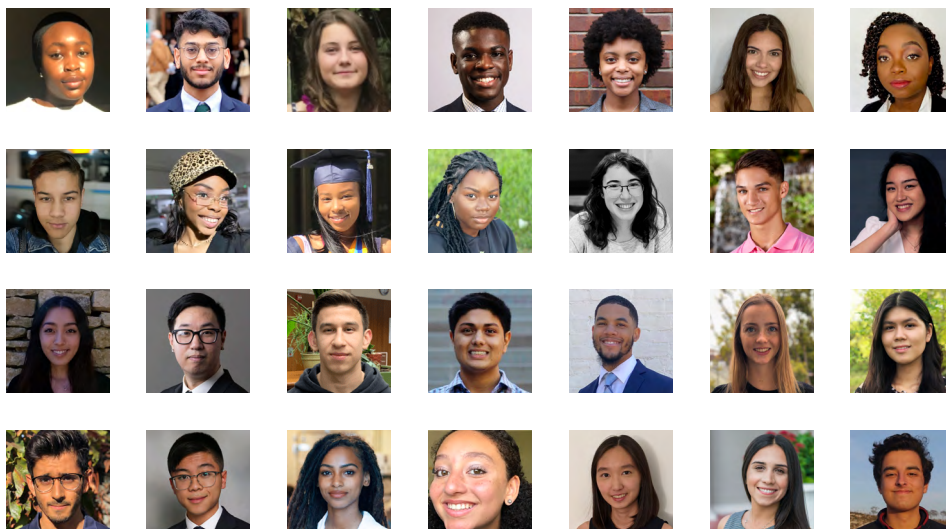
28

STUDENTS

90

EVENTS

The students not only pursued independent research projects from data analysis to experiments, but, through partnerships with Boston University, Northwestern University, and Vanderbilt University, they also had the opportunity to participate in 90 events—64 of which were hosted by Stanford. The students' summers culminated in a final symposium presentation during which they shared the new discoveries they made with their research projects.



[View Presentations](#)

CVI Undergraduate Summer Research Students Experience Significant Gains in Knowledge, Skills, and Confidence

87% of our students agreed that participation in the program increased their likelihood to pursue a career in STEM. In terms of gains: we compared self-evaluations of students' research skills and confidence before and after they participated in the program. Averaging responses across 46 unique traits for each student, we found a significant increase in students' self-reported assessment of their own skills, knowledge and confidence to pursue science after participation in our program.

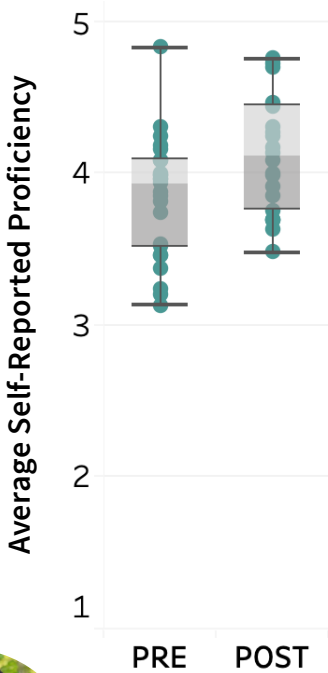


The CVI Undergraduate Summer Research Program has helped shape my curiosity and my decision to continue forward with obtaining a higher education. - Aaron Panduro



I got to form a close professional relationship with my mentor and getting this experience has helped me grow much more than I anticipated. I've never done research before but now I can confidently say that I have what it takes to do science. - Chisomaga Ekwueme

I valued the different exposure I had to the awesome, cutting-edge research being done at Stanford through the seminars because it made me even more excited about research and science. - Britney Joy Sison



Rigorous and Reproducible Research at CVI

By collaborating with the [Stanford Program on Research Rigor and Reproducibility](#), CVI was able to pilot a new initiative to instill training in rigorous and reproducible research methods in students enrolled in our undergraduate summer research program. Four research teams, led by CVI early career scientists and staff, worked with 16 students to perform meta-science studies on cardiovascular research publications using open and reproducible methods. In addition, all of the students participated in seminars and workshops on the importance of reproducibility, data sharing, pre-registration, pre-prints, and the peer review process.

Research Projects



Rigor in the study design of animal models for cardiothoracic surgery research - Led by Danielle Mullis



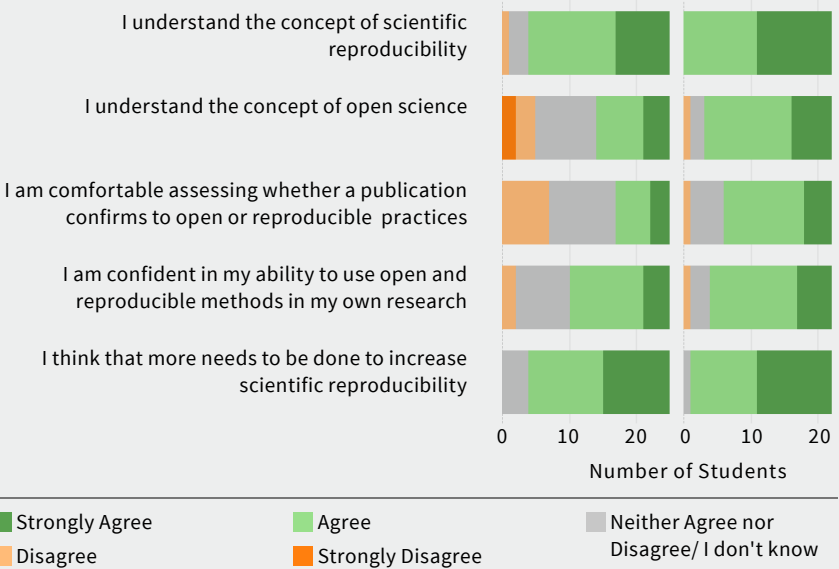
Analysis of sex as a biological variable in cardiovascular research - Led by Carlos Vera, PhD



Evaluation of primary outcome qualities in human randomized controlled trials - Led by Brian Wayda, MD



Accessibility and Reproducible Research Practices in Cardiovascular Literature - Led by Adrienne Mueller, PhD



CVI T32 Postdoctoral and R38 Resident Trainees in 2021

Below are 20 postdoctoral and resident fellows who participated in CVI's four NIH-funded T32 and R38 training programs in 2021.



Tom Alsaigh, MD

Precision Nanotherapies for Atherosclerotic Disease
Lab of Dr. Nicholas Leeper
Started Training



Leila Beach, MD

Novel Risk Factors for Right Ventricular Failure (RVF)
Following Left Ventricular Assist Device Implant
Lab of Dr. Matthew Wheeler
Completed Training



Colwyn Headley, PhD

Mitochondrial Phoenix: The Dysfunction, Transplantation, and Rejuvenation of Mitochondria in Cardiovascular Disease
Lab of Dr. Philip Tsao
Started Training



Marcella Martin, PhD

Defining the Role of Endothelial Cell Dysfunction in William's Syndrome Using iPSCs
Lab of Dr. Marlene Rabinovitch
Completed Training



Krishna Martinez-Singh, MD

The use of FlowMet-R Technology to Predict Wound Healing in Critical Limb Ischemia Patients in a Wound Care Center Setting
Lab of Dr. Venita Chandra
Started Training



Domenico Mastrodicasa, MD

High-Temporal and Spatial Resolution 4D-CT Angiography in Patients with Aortic Dissection
Lab of Dr. Dominik Fleischmann
Continued Training



McKay Mullen, PhD

Evaluating the Impact of Androgen Deprivation Therapy in Mediating Breast and Prostate Cancer Chemotherapy Cardiotoxicity
Lab of Dr. Joseph Wu
Started and Completed Training



Shaneice Mitchell, PhD

Targeting the Mechanisms of Age-related Clonal Hematopoiesis Impact on Cardiovascular Diseases
Lab of Dr. Siddhartha Jaiswal
Continued Training



Ebrahim Mostafavi, PhD

Development of *In Vitro* Clinical Trials in a Dish for Cardiovascular Disease modeling and Drug Screening
Lab of Dr. Joseph Wu
Continued Training



Oluwatomisin "Tomi" Obafemi, MD

High Resolution Mapping of Ventricular Tachycardia Using a Langendorff Model
Lab of Dr. Anson Lee
Started Training



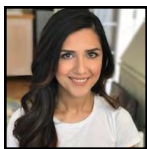
Fatemeh Ostadhossein, PhD

Smart Nanoprobes for the Detection of Hypoxic Regions in Ischemia, Teratoma Formation, and Stem Cell Apoptosis
Lab of Dr. Joseph Wu
Completed Training



Heyjun Park, PhD

Sleep Optimization May Improve Adverse Glucose Outcomes Among Individuals with Prediabetes or Type 2 Diabetes Who are at Risk for Cardiovascular Diseases / Lab of Dr. Michael Snyder
Continued Training



Sara Ranjbarvaziri, PhD

Investigating the Effect of Altered Cardiac Energetics in Hypertrophic Cardiomyopathy
Lab of Daniel Bernstein
Completed Training



Katharina Schimmel, PhD

Elucidating the Pathogenesis of Arteriovenous Malformations
Lab of Dr. Edda Spiekerkoetter
Started Training



David Staudt, MD, PhD

Using Human Induced Pluripotent Stem Cell Models of Genetic Cardiomyopathies to Elucidate Molecular Contributors to Diastolic Dysfunction
Lab of Dr. Mark Mercola
Completed Training



Jason Szafron, PhD

Understanding Disease Progression in Pediatric Pulmonary Hypertension through Patient-specific Simulations of Vascular Growth and Remodeling
Lab of Dr. Alison Marsden
Started Training



Ken Tran, MD

Patient Specific Computational Hemodynamic Performance Modelling in Complex EVAR
Lab of Dr. Jason Lee
Completed Training



Brian Wayda, MD, MPH

Narrowing the Gap Between Supply and Demand in Heart Transplantation
Lab of Dr. Kiran Khush
Completed Training



Rahel Woldeyes, PhD

Visualizing the Structures and Subcellular Organization of Macromolecules Inside Cardiomyocytes Using Cryo-Electron Tomography
Lab of Dr. Wah Chiu
Continued Training

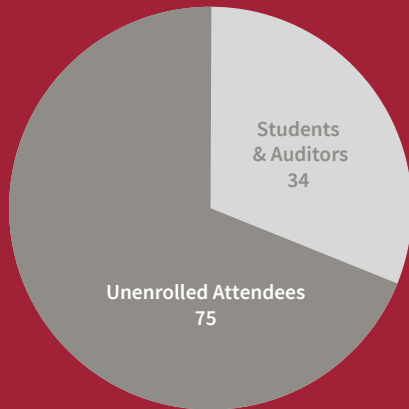


Qian Yu, PhD

Mechanisms Underlying CIP4-CaN α Signaling in Myocytes
Lab of Dr. Michael Kapiloff
Completed Training

CVI Launches Two New Courses on Drug Development

In 2021, four leaders of industry partnered with CVI to establish two courses on the Drug Development process, with an emphasis on cardiovascular applications. **MED225**, which runs in Spring Quarter, offers an overview of the drug development process: from first concept to the clinical application. **MED227**, which runs in Fall Quarter, covers key Issues in regulation and commercialization. Throughout both terms, the course directors have enlisted leaders from the FDA, industry, and academia to share their insights into the drug development process.



Course Directors from top left to bottom right: Peter DiBattiste, MD, Jonathan Fox, MD, PhD, Alexander Gold, MD, Jayakumar Rajadas, PhD, Philip Sager, MD.

MED225: Drug Development - From a Concept to the Clinic will be offered again in Spring 2022 as a one-credit course, starting March 29th. We hope to see many of you there!

CVI Early Career Scientists Establish Epigenetics Series

Starting in June of 2021, CVI postdocs Wilson Wen, PhD, and Lichao Liu, PhD, launched a new seminar series on cardiovascular epigenetics. The series recruits early career scientist speakers from across the nation to share their latest discoveries in the cutting-edge field of epigenetics. The CVI Epigenetics seminars run monthly via Zoom and hosted six events in 2021.

Cardiac Cell Type-Specific Gene Regulatory Programs and Disease Risk Association James Hocker, UCSD

A Transcriptional Switch Governs Fibroblast Activation in Heart Disease Michael Alexanian, PhD, Gladstone Institute, UCSF

Lysine Myristoylation in Cardiometabolic Disease

Emma Louise Robinson, PhD,
University of Colorado

Spatial Transcriptomics and Epigenome sequencing at Tissue Scale and Cellular Level

Yanxiang Deng, PhD, Yale University

Interpreting type 1 diabetes risk with genetics and single-cell epigenomics

Joshua Chiou, PhD, Pfizer

Chromatin topology dynamics in heart development and disease


Alessandro Bertero, PhD, Università di Torino

Higher education has the mission to advance human welfare in a rapidly changing world. Institutions that are truly inclusive and embrace and advance diversity everywhere—in every program, every school and every area of operation—will be the most successful. Stanford must become one of those institutions! • Recognizing this, we must clearly articulate why diversity and inclusion are important to us, how these values support the mission of the university, and

COMMUNITY

what goals we have set to advance our commitment to them. • Why is diversity important? Diversity is critical to our research and educational missions. • At its core, a university is devoted to the discovery and transmission of knowledge. The enterprise cannot be limited in its methods and ways of thinking, or confined to one individual's or a single community's experiences. To solve complex social problems, to discover the next breakthrough in science, or to reach new heights of artistic expression, we must bring a broad range of ideas and approaches. • At Stanford, we strive to ensure that a diversity of cultures, races and ethnicities, genders, political and religious beliefs, physical and learning differences, sexual orientations and identities is thriving on our campus. Such diversity will inspire new angles of inquiry, new modes of analysis, new discoveries and new solutions. • To advance education, it is essential to be exposed to views and cultures other than one's own and to have one's opinions and assumptions challenged. Such engagement expands our horizons, enables understanding across difference, prevents complacency and promotes intellectual breadth. • Our diversity ensures our strength as an intellectual community. In today's world, diversity represents the key to excellence and achievement. - *Provost Persis Drell*

Diversity, Equity, and Inclusion in 2021 and 2022

The Stanford Cardiovascular Institute is committed to enacting meaningful change and fostering a more just, equitable, and inclusive community. Our goal is to pursue meaningful practices that support diversity, equity, and inclusion in recruitment, mentorship, and work environments. Below is a brief update on these efforts in 2021 and our vision to expand them in 2022. 

2021




EVALUATE

- **Launched Annual CVI Recognition Award**
 - *In evaluating existing efforts, we recognized those who have already contributed significantly to support our community.*
- **Administered Diversity Engagement Survey**
 - *We collected information directly from our members about where they think our culture is thriving, and where it is faltering.*
- **Quantified Diversity at CVI**
 - *We reviewed the individuals who make up our committees and our members—identifying gaps in representation.*


EDUCATE

- **Raising Awareness among CVI Steering Committee**
 - *CVI's monthly steering committee meetings now include a dedicated segment about upcoming DEI opportunities.*
- **Training for Staff Members**
 - *CVI staff participated in workshops and digital courses about psychological safety and being an upstander.*
- **Mentorship Training for Summer Undergraduates**
 - *Undergraduate student Mentors received additional training in how to support individuals from disparate backgrounds.*

SUPPORT

- **Launched MAVENS** 
 - *MAVENS is a unique program of mentorship and sponsorship designed to bolster the pipeline of women in academic medicine.*
- **Expanded Undergraduate Summer Research Program** 
 - *By adjusting our funding and finding additional dollars, we increased the number of students we support by 25%.*
- **Established an Outreach Travel Award** 
 - *This dedicated award ensures individuals from underrepresented backgrounds have opportunities to present their work.*

ENGAGE

- **Leadership Meetings**
 - *CVI leadership now meets monthly to discuss progress on DEI objectives.*
- **Recruitment of Education and Outreach Support**
 - *To help ensure CVI's DEI objectives will be met, a new administrative support role was created and filled.*
- **Cross-Organization Collaboration** 
 - *CVI started collaborating with DEI representatives in other departments through the Staff JEDI Collective and individual meetings.*

2022

EVALUATE

- **Quantify CVI Speaker Diversity**
 - *Evaluate records of past speakers at CVI seminars and events—identifying gaps in representation.*
- **Re-survey Opinions of CVI Members**
 - *Collect additional information from CVI members will help us evaluate whether our actions of 2021 had any impact.*
- **Update Data on CVI Representation**
 - *Identify whether there have been in changes in representation among our committees or membership.*

EDUCATE

- **DEI-Focused Research Development Support**
 - *CVI's Research Development team will proactively inform the CVI community about research and career support opportunities available to individuals from underrepresented backgrounds.*
- **Training for Faculty Members**
 - *Introduce educational community-building activities into CVI steering committee meetings.*
- **Create an Onboarding Process for CVI Members**
 - *To ensure individuals who join the institute are quickly integrated into the CVI community and know where to seek support.*

SUPPORT

- **Expand MAVENS** 
 - *Provide additional support opportunities to women at CVI through cohort meetings and travel sponsorship.*
- **Training Opportunities for URM Undergraduate & MD Students**
 - *Work with minority-serving institutions to provide research training to more students from underrepresented backgrounds.*
- **Expand CVI Mentorship Program** 
 - *Encourage more CVI early career scientists to seek mentorship and ensure they have the support they need.*

ENGAGE

- **Update Steering and Advisory Committees**
 - *Invite individuals from backgrounds currently underrepresented among our leadership to participate in steering CVI.*
- **Emphasize DEI in CVI-Supported Research**
 - *Adjust the emphasis of our seed grant funding to encourage submissions that address diversity in their study plans.*
- **Understand CVI Member Needs through Focus Groups**
 - *Learn from CVI members directly about their concerns with CVI currently, and their aspirations for its future.*



2021 MAVENS ALUMNI

The mission of the Stanford Cardiovascular Institute's Mentoring to AdVance womEN in Science (MAVENS) program is to inspire, empower, and support women in academic medicine throughout their career progression in order to create an integrated community of scientists. In 2021, the first cohort of MAVENS completed the program and moved on to high impact new positions in academia and industry. The program provided support, resources and motivation to help them pursue their goals.



June Rhee, MD

Assistant Professor, Department of Medicine, City of Hope National Cancer Center

"MAVENS really helped me to prioritize my academic and personal goals and helped me strategize and execute these goals. MAVENS also helped me to increase my visibility as well as expand my network."



Seema Dangwal, PhD

Principal scientist, preclinical R&D at Elixir Medical Corp

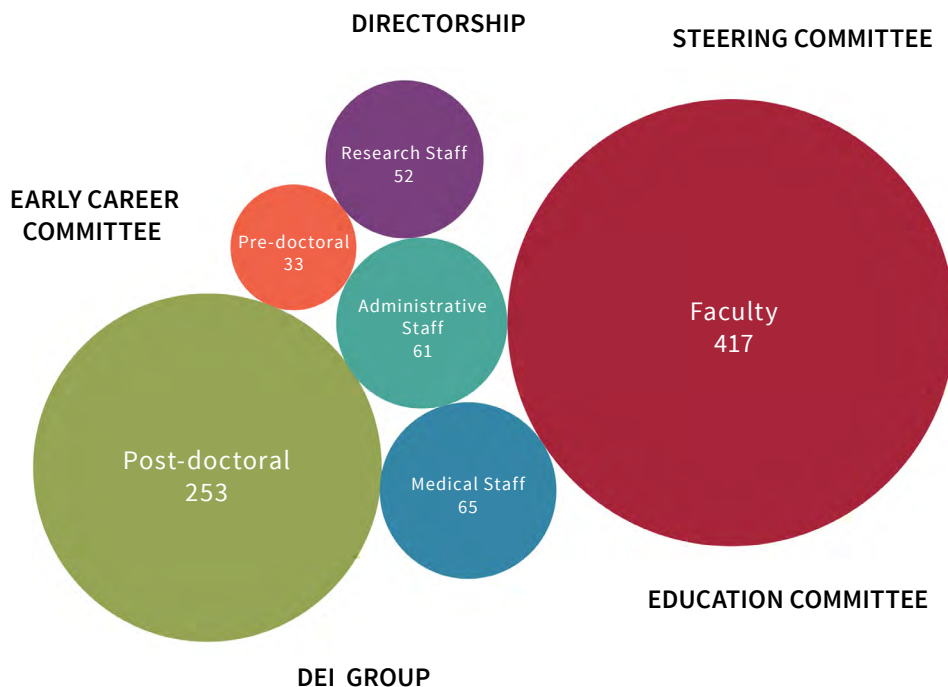
"Stanford MAVENS program provided me an exceptionally supportive platform to learn and discuss both research and career-oriented matters with two independent mentors at Stanford."

Overall, I feel fortunate and thankful to find mentors with friendship that goes long way and looking forward to welcome new fellows in next year. I strongly recommend all eligible postdocs, instructors and scientists to apply for this program."

CVI Leadership and Membership

The Stanford Cardiovascular Institute is comprised of almost 900 active members—from undergraduates, to senior research scientists, to professors' emeritus. Almost half of CVI members are faculty, and representatives from this pool make up CVI's steering committee and education committee. Ultimate oversight of CVI is provided by the institute's Director, Professor Joseph C. Wu, MD, PhD, and the institute's Director of Finance and Administration, Jason Irwin, MBA, and the institutes mission is strongly guided by its faculty, early career, and staff members.

Monthly steering committee meetings are a forum for CVI leadership to discuss ongoing and future initiatives, and opportunities for collaboration. The CVI Education Committee meets quarterly to evaluate CVI's educational initiatives, including its postdoctoral, resident, and undergraduate training programs, courses, and additional opportunities to support early career researchers. A subset of CVI administrative staff form a DEI group that meets monthly to identify and implement ways to increase diversity and improve CVI's culture. In addition, in 2021, CVI formed an Early Career Committee consisting of postdocs, medical students, instructors and residents, to steer CVI's programs for scientists in the early stages of their careers.



INAUGURAL CVI RECOGNITION AWARD

For Outstanding Service to the CVI Community

The annual Stanford Cardiovascular Institute (CVI) Recognition Award recognizes faculty members who continuously strive to improve the institute's culture and community. With this award, CVI recognizes CVI faculty members whose efforts increase or celebrate the diversity of CVI members, contribute to fair and just practices that ensure CVI members thrive, and/or promote an environment of mutual respect, belonging, and inclusion at CVI. Each year, CVI issues two awards of \$3,000 each to CVI-affiliated faculty who have made exceptional contributions to our community.



Vinicio de Jesus Perez, MD

Associate Professor of Medicine
(Pulmonary and Critical Care Medicine)

Recognized for his efforts in mentorship, participation and directorship of diversity training grant programs, and in planning new initiatives to strengthen the CVI community.



Ronglih Liao, PhD

Professor of Medicine
(Cardiovascular Medicine)

Recognized for her efforts towards promoting the career advancement of early career scientists, especially female and underrepresented minority trainees and junior faculty.

CVI IS GROWING

New CVI Staff to support Education, Outreach and Grant Finance

As CVI's programs and initiatives expand, we have recruited additional staff to help realize our goals. Already an integral member of the Vera Moulton Wall Center at Stanford, Victoria Rodrigues, Graphic Designer and Web Author, started sharing effort with CVI in the Fall of 2021. Victoria will help our programs reach a wider audience. To help support CVI faculty research, Helen Lei joined the Finances team and will help manage many of CVI's grants, awards, contracts, and accounts. CVI also created a new Education and Outreach Administrator position; filled by Micaela Harris in November of 2021. Micaela will help CVI grow our educational programs and support our current and forthcoming efforts to promote diversity, equity, and inclusion.



Victoria Rodrigues
Graphic Designer



Helen Zhuang Lei
Financial Analyst



Micaela Harris
Education and Outreach Administrator



Through the Cristo Rey Work Study Program, in 2021 CVI also had the opportunity to work with Lizeth Reyes - an amazing 12th grader, who supports our DEI initiatives.

Introducing the CVI Early Career Committee

Giving Voice to Scientists at Early Career Stages

In March 2021, CVI assembled a group of medical students, postdocs, residents, and instructors who possess a keen desire to shape the future of the institute. The committee organized the 2021 Early Career Research Symposium, has re-shaped the CVI Early Career Research Roundtable and will be guiding, inspiring, and creating new opportunities for the next generation of cardiovascular scientists.



A.J. Pedroza,
MD



Vedant
Pargaonkar,
MBBS



Katharina
Schimmel,
PhD



Alok Jha, PhD



Marina Codari,
PhD



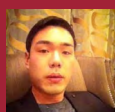
Mirwais
Wardak, PhD



Domenico
Mastrodicasa,
MD



Francesca
Briganti, PhD



James Jahng,
PhD



Soah Lee,
PhD



Danielle
Mullis



Carlos Vera,
PhD



Brian Wayda,
MD



Khadem Ali,
PhD

CVI Seed Grant Awardees Autumn 2021



Anson Lee, MD

Assistant Professor of Cardiothoracic Surgery

Co-Investigators: Paul Wang, MD; Daniel Ennis, PhD; Sanjiv Narayan, MD, PhD; Oscar Abilez, MD, PhD; Phillip Yang, MD; Udi Nussinovitch, MD, PhD; Meghedi Babakhanian, PhD; Oluwatomisin Obafemi, MD

Understanding Ventricular Tachycardia: A Wholistic Approach Using Porcine and Isolated Perfused Human Heart Models

Research Funded by the Steven M. Gootter Foundation



Virginia Winn, MD, PhD

Associate Professor, Obstetrics and Gynecology

Co-Investigators: Ruth Lathi, MD; Brice Gaudillière, MD, PhD; Nima Aghaeepour, PhD

Determining Early Maternal Immune Predictors of Preeclampsia

Research Funded by the Stanford Maternal & Child Health Research Institute



Joshua Spin, MD, PhD

Assistant Professor of Medicine

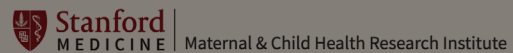
Co-Investigator: Philip Tsao, PhD

Maternal Vaping and Transgenerational Risk of Abdominal Aortic Aneurysm

Research Funded by the Stanford Maternal & Child Health Research Institute

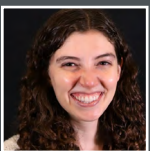


The Steven M. Gootter Foundation is dedicated to saving lives by defeating sudden cardiac death through increased awareness, education and scientific research. We dedicate ourselves to this mission in memory of Steven M. Gootter.



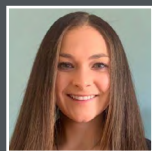
The Maternal and Child Health Research Institute (MCHRI) mobilizes Stanford discoveries and expertise to improve healthier lives for expectant mothers and children.

Boring Trust Award 2021



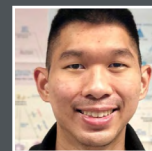
Jessica Herrmann

3rd Year Medical Student
Lab of Mark Skylar-Scott, PhD
Developing a Perfusion Bioreactor to Train a Vascularized Fontan Assist Biopump



Danielle Mullis

2nd Year Medical Student
Lab of Joseph Woo, MD
Intramyocardial Therapy to Induce Angiogenesis in a Transgenic Mouse Model of Coronary Heart Disease



Brian Yu

2nd Year Medical Student
Lab of Joseph C. Wu, MD, PhD
Mechanisms of Autophagy in Diabetic Cardiomyopathy with Human Stem Cells

The Dorothy Dee and Marjorie Helene Boring Trust Award supports Stanford medical students pursuing research solutions that impact how we treat and prevent cardiovascular diseases.



COLLABORATION



SDDS 2022

Stanford Drug Discovery Symposium

April 25-26, 2022

7400

ATTENDEES

45

SPEAKERS

April 19-20, 2021, was the first virtual Stanford Drug Discovery Symposium. As a virtual event, we were able to reach a far broader audience. There were over 5,400 registrants and over 7,400 attendees in to view the talks. Individuals were from the US, Europe, Asia, Australia, North and South America, and Africa, reflecting how our meeting has progressed and gained international recognition over the last five years.

The 45 Speakers, moderators, and panelists represented pharmaceutical and biotech companies, government policy makers, Nobel laureates and academic leaders, scientists, editors from major journals, venture capitalists, and angel investors. They presented their groundbreaking work and perspectives in the field of drug development and provided insights into how the COVID-19 pandemic adjusted how they worked.

The Symposium also honored Drs. Doug Lowy and John Schiller from the National Cancer Institute with the 2021 Lifetime Achievement Award for their work in HPV-associated cancers and the HPV vaccine.

Improving COVID-19 Treatment

Machine Learning and Artificial Intelligence

Omics in Drug Discovery

Interdisciplinary Exchange

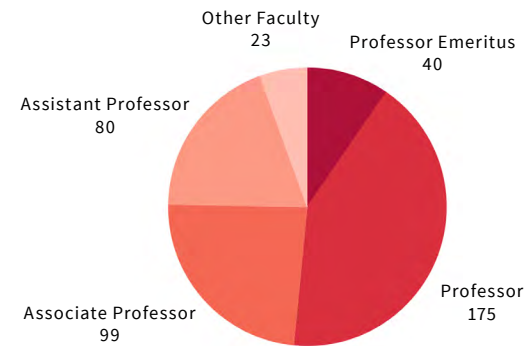
[View Recordings of SDDS 2021](#)

[Register for SDDS 2022](#)

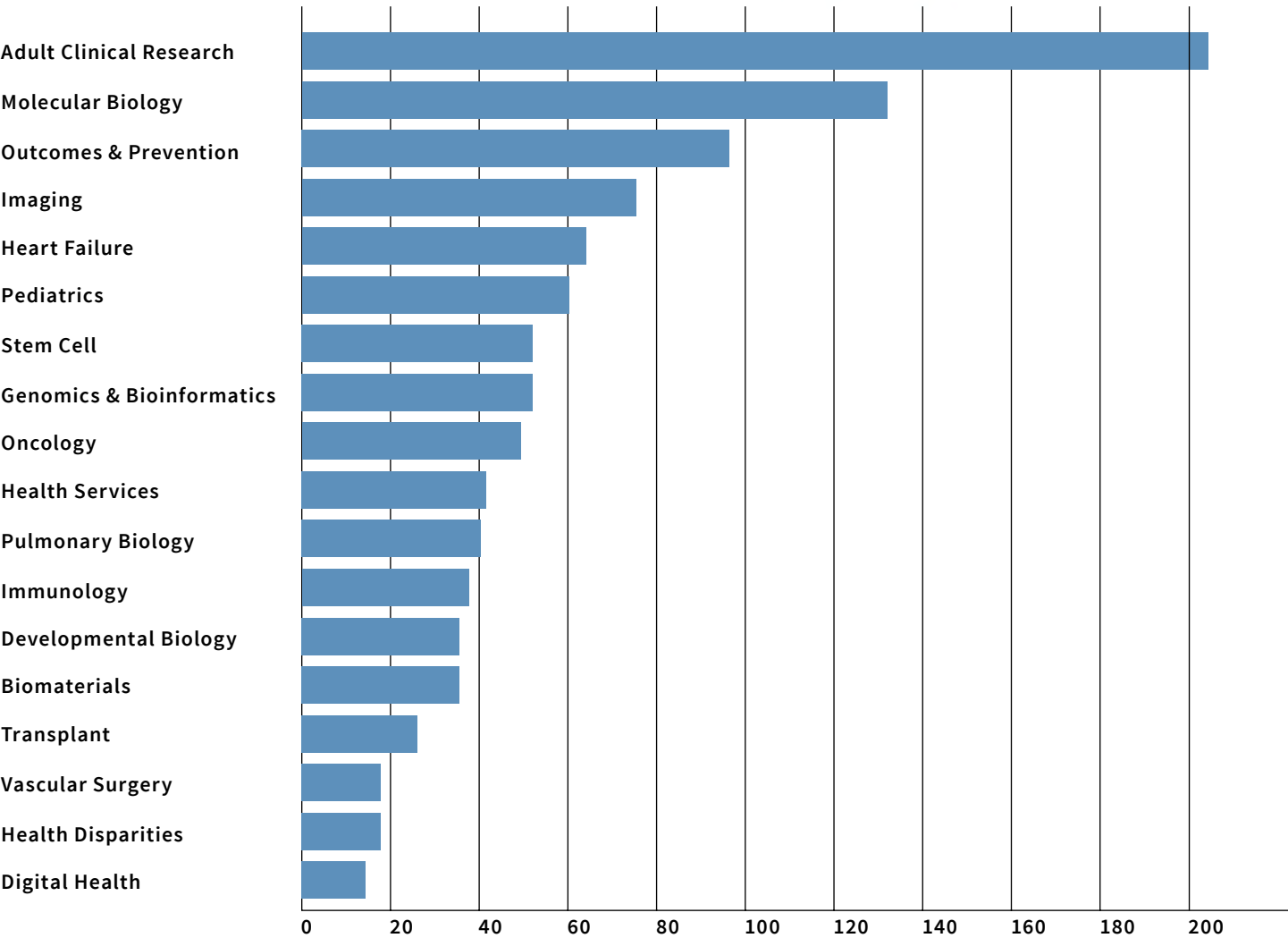
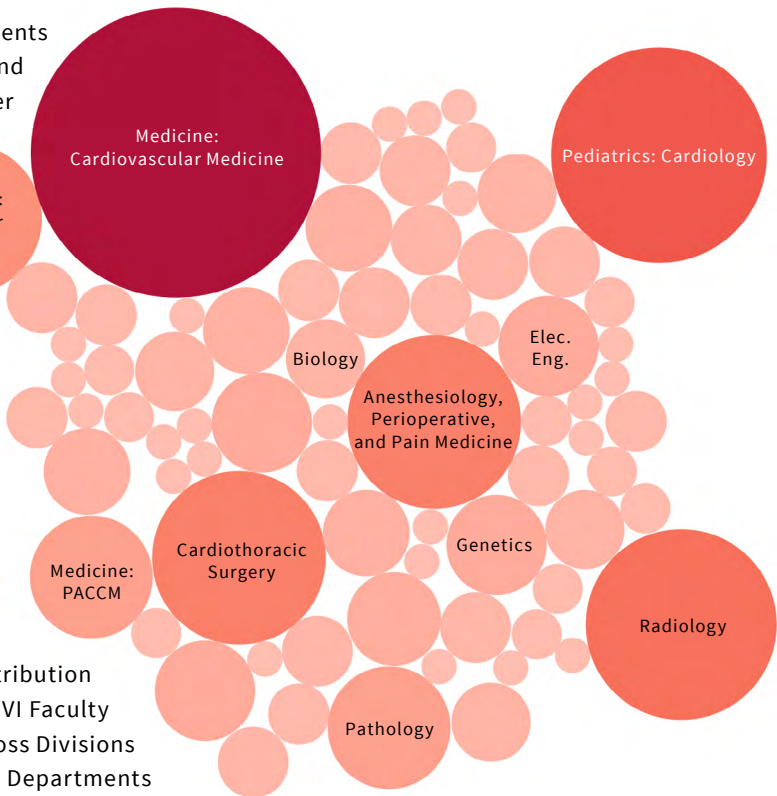
CVI Faculty and Research Topics in 2021

CVI has over 400 faculty members across 76 departments and divisions as well as over 400 early career scientists and research staff. With a broad faculty pool at multiple career stages, in 2021 CVI helped recruit two new faculty, Nazish Sayed, MD, PhD, and Juyong Brian Kim, MD, and launched national searches for three more positions.

CVI research covers an incredible breadth of disciplines from stem cells to adult clinical research; from genomics to health services research.



Distribution of CVI Faculty across Divisions and Departments



2021 CVI Early Career Research Symposium: A Hybrid Success

On November 3rd 2021, CVI hosted the 4th Annual Early Career Symposium as a hybrid event! With over 100 attendees from across the world, the symposium was a huge success.

22 speakers participated in total — both in person and virtually — covering topics ranging from population research, to clinical and translational research, to *in vitro* and *ex vivo* research, to “how to get published,” and future careers. Six fantastic early career trainees presented lightning talks including: Kenzo Ichimura, MD, PhD; Neil Manohar Kalwani, MD; Xuan Yu, MD, PhD; Heyjun Park, PhD; Hye Sook Shin; and Narelli Paiva. Hye Sook Shin and

Narelli Paiva won awards for Best CVI Early Career Symposium Lightning Talks.

The event was organized by CVI’s Early Career Committee, and spearheaded by A.J. Pedroza, MD; Carlos Vera, PhD; Danielle Mullis; Domenico Mastrodicasa, MD; James Jahng, PhD; Katharina Schimmel, PhD; and Mirwais Wardak, PhD.



117 TOTAL ATTENDANCE
28 IN-PERSON
89 VIRTUAL

22 TOTAL SPEAKERS
7 IN-PERSON
15 VIRTUAL

CVI Early Career Symposium Lightning Talk Awardees 2021



Narelli de Paiva Narciso

Graduate PhD Student
Lab of Sarah Heilshorn

Injectable Hydrogels for Mechanically Active Tissues



Hye Sook Shin

Life Science Research Professional
Labs of Yasuhiro Shudo & Y. Joseph Woo

Naturally Aligned Cell Delivery Platform to Limit Post-infarction Ventricular Remodeling and Improve ventricular Function by Augmenting Mature Neovascularization via CXCL12 Activation

The 2021 CVI Early Career Symposium featured six fantastic lightning talks from early career researchers who shared their science with the community. Hye Sook Shin and Narelli de Paiva Narciso were both awarded prizes for their exceptional presentations on hydrogels and cell delivery platforms.

CVI Travel Award Winners Autumn 2021



Kevin Cyr

Medical Student
Lab of Paul Wang
Heart Rhythm Society 2021

Evaluation of the 3-Dimensional Substrate of Ventricular Tachycardia in a Langendorff Perfused Human Heart



Francisco Galdos

MD-PhD Student
Winner of CVI Outreach Travel Award
Lab of Sean Wu
AHA Scientific Session 2021

TBX5-Based Lineage Tracing Identifies a Propensity for Left Ventricular Cardiomyocyte Differentiation of Human Induced Pluripotent Stem Cells Using Biphasic Modulation of WNT Signaling



Kenzo Ichimura, MD, PhD

Postdoctoral Researcher
Lab of Edda Spiekerkoetter
AHA Scientific Session 2021

Three-Dimensional Deep-Tissue Imaging of the Right Ventricle Reveals Decreased Capillary-Cardiomyocyte Contact Surface in Decompensated Right Heart Failure



Chun Liu, PhD

Instructor
Lab of Joseph Wu
AHA Scientific Session 2021

Statins Improve Endothelial Function via Suppression of Epigenetics Driven-EndMT



Yae Hyun Rhee, PhD

Postdoctoral Researcher
Lab of Philip Tsao
AHA Scientific Session 2021

E-cigarette Nicotine Vapor Increases Aortic Stiffness in Mice

Due to COVID-19 related travel restrictions, CVI travel awards were on hiatus until the Fall of 2021. We are excited to once again offer these opportunities for early career researchers to share their work with the broader scientific community.

RESEARCHER PROFILES





Kevin Alexander, MD

Assistant Professor of Medicine - Cardiovascular Medicine

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EDUCATION/TRAINING

MD University of Pennsylvania

RESIDENCY

Johns Hopkins Hospital

FELLOWSHIPS

Brigham and Women's Hospital/Harvard Medical School (Cardiology)

Stanford Hospital (Advanced Heart Failure and Transplant Cardiology)

CLINICAL FOCUS

Cardiac amyloidosis
Cardiac sarcoidosis
Heart failure
Heart transplant
Mechanical circulatory support

HONORS & AWARDS

Fellow of the Heart Failure Society of America (FHFA) (2021)

Stanford KL2 Career Development Award (2020)

Thomas W. Smith Fellowship in Heart Failure, Brigham and Women's Hospital (2017)

Fellow of the American College of Cardiology (FACC) (2018)

Harold Amos Medical Faculty Development Award, American Heart Association (2019-2023)

MEMBERSHIPS

AHA Scientific Advisory and Coordinating Committee (2021-2022)

Assistant Editor, JACC: Cardio-Oncology (2021-2022)

CURRENT RESEARCH

My research focuses on understanding the molecular mechanisms involved in cardiac amyloidosis, particularly transthyretin amyloidosis. The main goals are to (i) elucidate key determinants of protein misfolding and amyloid formation, (ii) develop biomarkers for early disease detection and monitoring, and (iii) identify novel targets for specific amyloid therapies. To pursue these goals, we use cell- and animal-based models combined with detailed phenotypic profiling of large cardiac amyloid patient cohorts.

Some people want it to happen, some wish it would happen, others make it happen. — Michael Jordan

SELECTED PUBLICATIONS

Future Perspectives of Cardiovascular Biomarker Utilization in Cancer Survivors: A Scientific Statement From the American Heart Association. Zaha VG, Hayek SS, Alexander KM, Beckie TM, Hundley WG, Kondapalli L, Ky B, Leger KJ, Meijers WC, Moslehi JJ, Shah SH. *Circulation*. 2021 Dec 21;144(25)

Racial and Ethnic Disparities in Transthyretin Cardiac Amyloidosis. Chandrashekar P, Alhuneafat L, Mannello M, Al-Rashdan L, Kim MM, Dungu J, Alexander K, Masri A. *Circ Genom Precis Med*. 2021 Oct;14(5).

Racial and Ethnic Disparities in Transthyretin Cardiac Amyloidosis. Spencer-Bonilla, G, Njoroge, JN, Pearson, K, Witteles RM, Aras MA, Alexander KM. *Curr Cardiovasc Risk Rep* 15, 8 (2021).

Outcomes in Patients With Cardiac Amyloidosis Undergoing Heart Transplantation. Barrett CD, Alexander KM, Zhao H, Haddad F, Cheng P, Liao R, Wheeler MT, Liedtke M, Schrier S, Arai S, Weisshaar D, Witteles RM. *JACC Heart Fail*. 2020 Jun;8(6):461-468.

Randomized Evaluation of Heart Failure with Preserved Ejection Patients with Acute Heart Failure and Dopamine (ROPA-DOP) Trial. Sharma K, Vaishnav J, Kalathiya R, Hu J, Miller J, Shah N, Hill T, Sharp M, Tsao A, Alexander K, et al. *JACC Heart Fail*, 2018;6(10):859-70.

Geographic Disparities in Reported US Amyloidosis Mortality During 1979-2015: Potential Underdetection of Cardiac Amyloidosis. Alexander KM, Orav J, Singh A, Jacob S, Menon A, Padera RF, et al. *JAMA Cardiol*, 2018;3(9):865-70.

Association Between Ruptured Distal Biceps Tendon and Wild-Type Transthyretin Cardiac Amyloidosis. Geller HI, Singh A, Alexander KM, Mirto TM, Falk RH. *JAMA*, 2017;318(10):962-3.

Phosphorylation of Src by Phosphoinositide 3-kinase Regulates Beta-adrenergic Receptor Mediated EGFR Transactivation. Watson LJ, Alexander KM, Mohan ML, Bowman AL, Mangmool S, Xiao K, et al. *Cell Signal*, 2016;28(10):1580-92.



Christopher Almond, MD

Professor of Pediatrics (Cardiology)
at the Lucile Salter Packard Children's Hospital
Director, Cardiac Anticoagulation Services, Stanford Children's Health

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PROFILE med.stanford.edu/profiles/Christopher-Almond

EDUCATION/TRAINING

MD University of Connecticut

INTERNSHIP

Boston Children's Hospital (2000)

RESIDENCY

Boston Children's Hospital (Combined
Residency in Pediatrics) (2002)

FELLOWSHIPS

Boston Children's Hospital (2005)
Boston Children's Hospital (2006)

BOARD CERTIFICATION

Pediatrics, American Board of Pediatrics
(2002)
Pediatric Cardiology, American Board of
Pediatrics (2014)

CURRENT RESEARCH

Dr. Almond's clinical research efforts focus on improving outcomes for children with end-stage heart failure, specifically in the areas of pediatric ventricular assist devices, cardiac transplantation, medical management of decompensated heart failure, and anticoagulation. He has a special interest in the design of multi-center clinical trials to evaluate promising drugs and devices seeking FDA approval for rare diseases. Dr. Almond served as the national PI for the Berlin Heart EXCOR Pediatric VAD multi-center clinical trial. He currently serves as PI for the TEAMMATE Trial, a randomized clinical trial evaluating Everolimus to prevent long-term complications after pediatric heart transplantation, and the PumpKIN trial, evaluating the Jarvik 2015, a miniaturized continuous flow durable VAD for bridge to heart transplant in children.

We have had a longstanding interest in how to use ventricular assist devices (VAD) in children, and we want to carry that into the future, as well.

SELECTED PUBLICATIONS

Impact of the 18th Birthday on Waitlist Outcomes Among Young Adults Listed for Heart Transplant: A Regression Discontinuity Analysis. Peng DM, Qu Q, McDonald N, Hollander SA, Bernstein D, Maeda K, Kaufman BD, Rosenthal DN, McElhinney DB, Almond CS. *J Heart Lung Transplant.* 2017 May 19.

Temporary Circulatory Support in U.S. Children Awaiting Heart Transplantation. Yarlagadda VV, Maeda K, Zhang Y, Chen S, Dykes JC, Gowen MA, Shuttleworth P, Murray JM, Shin AY, Reinhartz O, Rosenthal DN, McElhinney DB, Almond CS. *J Am Coll Cardiol.* 2017 Oct 31;70(18):2250-2260.

Hemodynamic Profiles of Children with End-Stage Heart Failure. Chen S, Dykes CJ, McElhinney DB, Gajarski RJ, Shin AY, Hollander SA, Everitt ME, Price JF, Thiagarajan RR, Kindel SJ, Rossano JW, Kaufman BD, May LJ, Pruitt E, Rosenthal DN, Almond CS. *European Heart Journal* 2017 Oct 7;38(38):2900-2909.

Development and Validation of a Major Adverse Transplant Event (MATE) Score to Predict Late Graft Loss in Pediatric Heart Transplantation. Almond CS, Hoen H, Rossano JW, Castleberry C, Auerbach SR, Yang L, Lal AK, Everitt MD, Fenton M, Hollander SA, Pahl E, Pruitt E, Rosenthal DN, McElhinney DB, Daly KP, Desai M; Pediatric Heart Transplant Study (PHTS) Group Registry. *J Heart Lung Transplant.* 2017 Mar 24.

Impact of a Modified Anti-thrombotic Guideline on Stroke in Children Supported With a Pediatric Ventricular Assist Device. Rosenthal DN, Lancaster CA, McElhinney DB, Chen S, Stein M, Lin A, Doan L, Murray JM, Gowen MA, Maeda K, Reinhartz O, Almond CS. *J Heart Lung Transplant.* 2017 May 20.



Russ B. Altman, MD, PhD

Kenneth Fong Professor and Professor of Bioengineering, of Genetics, of Medicine (General Medical Discipline) and, by Courtesy, of Computer Science

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PROFILE <https://rbaltman.people.stanford.edu>

HELIX GROUP <http://helix.stanford.edu/>

EDUCATION/TRAINING

MD Stanford University

PHD Stanford University

BOARD CERTIFICATION Diplomate, ABIM

RESEARCH FOCUS

Biomedical informatics,
pharmacogenomics,
structural informatics,
bioengineering, genetics,
artificial intelligence,
data science,
pharmacology

HONORS & AWARDS

Editor-in-Chief, Annual Reviews of
Biomedical Data Science (2016 -
Present)

Advisor, NIH Advisory Committee to the
Director (ACD) (2013 - 2018)

Member, FDA Commissioner Science
Board (2011 - 2014)

Co-Organizer, Pacific Symposium on
Biocomputing (psb.stanford.edu) (1995-
Present)

Co-PI UCSF-Stanford FDA Center of
Excellence for Regulatory Science &
innovation (2015 - present)

CURRENT RESEARCH

Russ Altman's primary research interests are in the application of computing and informatics technologies to problems relevant to medicine. He is particularly interested in methods for understanding drug action at molecular, cellular, organism, and population levels. His lab studies how human genetic variation impacts drug response (e.g., <http://www.pharmgkb.org/>). Other work focuses on the analysis of biological molecules to understand the actions, interactions and adverse events of drugs (e.g., <http://feature.stanford.edu/>). He helps lead an FDA-supported Center of Excellence in Regulatory Science & Innovation.

SELECTED PUBLICATIONS

RedMed: Extending Drug Lexicons for Social Media Applications. Lavertu A, Altman RB. *J Biomed Inform.*, 2019 Nov;99:103307.

Graph Convolutional Neural Networks for Predicting Drug-Target Interactions. Torng W, Altman RB. *J Chem Inf Model.*, 2019 Oct 28;59(10):4131-4149.

Predicting Venous Thromboembolism Risk From Exomes in the Critical Assessment of Genome Interpretation (CAGI) Challenges. McInnes G, Daneshjou R, Katsonis P, Lichtarge O, Srinivasan R, Rana S, Radivojac P, Mooney SD, Pagel KA, Stambouliau M, Jiang Y, Capriotti E, Wang Y, Bromberg Y, Bovo S, Savojardo C, Martelli PL, Casadio R, Pal LR, Moulton J, Brenner SE, Altman R. *Hum Mutat.*, 2019 Sep;40(9):1314-1320.

Pharmacogenomic Polygenic Response Score Predicts Ischemic Events and Cardiovascular Mortality in Clopidogrel-Treated Patients. Lewis JP, Backman JD, Reny JL, Bergmeijer TO, Mitchell BD, Ritchie MD, Déry JP, Pakyz RE, Gong L, Ryan K, Kim EY, Aradi D, Fernandez-Cadenas I, Lee MTM, Whaley RM, Montaner J, Gensini GF, Cleator JH, Chang K, Holmvang L, Hochholzer W, Roden DM, Winter S, Altman R, Alexopoulos D, Kim HS, Gawaz M, Bliden K, Valgimigli M, Marcucci R, Campo G, Schaeffeler E, Dridi NP, Wen MS, Shin JG, Fontana P, Giusti B, Geisler T, Kubo M, Trenk D, Siller-Matula JM, Ten Berg JM, Gurbel PA, Schwab M, Klein TE, Shuldiner AR. *Eur Heart J Cardiovasc Pharmacother.*, 2019 Sep 3.

Atrial Fibrillation Burden Signature and Near-Term Prediction of Stroke: A Machine Learning Analysis. Han L, Askari M, Altman RB, Schmitt SK, Fan J, Bentley JP, Narayan SM, Turakhia MP. *Circ Cardiovasc Qual Outcomes.*, 2019 Oct;12(10):e005595.



Shipra Arya, MD

Associate Professor of Surgery (Vascular Surgery)

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PROFILE profiles.stanford.edu/shipra-arya

EDUCATION/TRAINING

MD All India Institute of Medical Sciences, India

RESIDENCY

Creighton University General Surgery Residency

FELLOWSHIP

University of Michigan

BOARD CERTIFICATION

General Surgery, Vascular Surgery (ABS)

CLINICAL FOCUS

Abdominal and thoracic aortic aneurysms/dissections

Peripheral artery disease

Intestinal circulation disorders

Carotid angioplasty/stenting

Vascular trauma

Dialysis access

Thoracic outlet syndrome

Venous disease

Pediatric vascular disease

HONORS & AWARDS

Chair, Diversity and Inclusion Committee, Association for VA Surgeons (2020)

Chair, VA surgeons committee, SVS (2021)

SVS EJ Wylie Traveling Fellowship (2021)

President, Surgical Outcomes Club (2021)

Society of Asian Academic Surgeons – Association of Women Surgeons Visiting Professor (2022)

CURRENT RESEARCH

Shipra Arya, MD SM FACS is an Associate Professor of Surgery at the Stanford University School of Medicine and section chief of vascular surgery at VA Palo Alto Healthcare System. She has a Master's degree in epidemiology from the Harvard School of Public Health with focus on research methodology and cardiovascular epidemiology. She completed her General Surgery Residency at Creighton University Medical Center followed by a Vascular Surgery Fellowship at University of Michigan. She has been funded by American Heart Association (AHA), NIH/NIA GEMSSTAR grant, VA Palo Alto Center for Innovation and Implementation (Ci2i) and is currently funded by VA HSR&D. The accumulated evidence from her research all points to the fact that frailty is a versatile tool that can be utilized to guide surgical decision making, inform patient consent and design quality improvement initiatives at the patient and hospital level. Her current grant focuses on streamlining frailty evaluation and implementation of patient and system level interventions to improve surgical outcomes and enhance patient centered care.

Measure what matters.

SELECTED PUBLICATIONS

Home-Time and Health-Related Quality of Life: A Mixed Methods Study of Veterans after Surgery. Arya S, Langston A, Chen R, Sasnal M, George EL, Kashikar A, Barreto N, Trickey A, Morris AM. *JAMA Netw Open.* 2022 Jan 4;5(1):e2140196. doi: 10.1001/jamanetworkopen.2021.40196. PMID: 35015066

Comparing Veterans Affairs and Private-sector Perioperative Outcomes After Noncardiac Surgery. George E, Massarweh NN, Youk A, Reitz KM, Shinall MC, Chen R, Trickey AW, Varley PR, Johanning JM, Shireman P, Arya S, Hall DE. *JAMA Surg.* 2021 Dec 29:e216488. doi: 10.1001/jamasurg.2021.6488. Online ahead of print. PMID: 34964818

Reducing Nontraumatic Lower-Extremity Amputations by 20% by 2030: Time to Get to Our Feet: A Policy Statement From the American Heart Association. Creager MA, Matsushita K, Arya S, Beckman JA, Duval S, Goodney PP, Gutierrez JAT, Kaufman JA, Joynt Maddox KE, Pollak AW, Pradhan AD, Whitsel LP. *Circulation.* 2021 Apr 27;143(17):e875-e891. doi: 10.1161/CIR.0000000000000967. Epub 2021 Mar 25. PMID:33761757

Association Between Patient Frailty and Postoperative Mortality Across Multiple Noncardiac Surgical Specialties. George EL, Hall DE, Youk A, Chen R, Kashikar A, Trickey AW, Varley PR, Shireman PK, Shinall MC Jr, Massarweh NN, Johanning J, Arya S. *JAMA Surg.* 2021 Jan 1;156(1):e205152. doi: 10.1001/jamasurg.2020.5152. Epub 2021 Jan 13. PMID:33206156



Euan A. Ashley, BSc, MB ChB, FRCP, DPhil

Roger and Joelle Burnell Chair in Genomics and Precision Health
Associate Dean, School of Medicine
Professor, Medicine - Cardiovascular Medicine; Professor, Genetics;
Professor, Biomedical Data Science; Professor (by courtesy), Pathology;
Co-Director, Stanford Data Science Initiative; Director, Stanford Clinical
Genomics Program; Co-Director, Center for Digital Health
Director, Stanford Cardiopulmonary Exercise Testing Laboratory

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CENTER familyheart.stanford.edu

EDUCATION/TRAINING

MD University of Glasgow

DPhil University of Oxford

MEDICINE INTERNSHIP

University of Glasgow

MEDICINE RESIDENCY

University of Oxford

CARDIOLOGY FELLOWSHIP

Stanford University

BOARD CERTIFICATION MRCP (UK)

CLINICAL FOCUS

Cardiology

Heart Failure

Genomic Medicine

Inherited Cardiovascular Disease

HONORS & AWARDS

White House Honoree

One Brave Idea

NIH Director's New Innovator Award

Innovative Research Award, American
Heart Association (AHA)

Faculty Scholar, Donald E. and Delia B.
Baxter Foundation

CURRENT RESEARCH

My lab is focused on the application of genomics to medicine. We develop methods for the interpretation of whole genome sequencing data to improve diagnosis of genetic disease and to personalize the practice of medicine. We love big data questions and are obsessed with systems approaches to biology especially analysis of network graphs. The wet bench is where we test causality of key genes and investigate the biology of network modules. It is also the focus of our translational efforts. Therapeutic development is a near term goal, and several of our discoveries are the focus of patents or are being actively pursued by pharmaceutical and biotechnology partners.

If your dreams do not scare you, they are not big enough. — Ellen Johnson Sirleaf

SELECTED PUBLICATIONS

Ultrarapid Nanopore Genome Sequencing in a Critical Care Setting. Gorzynski JE, Goenka SD, Shafin K, Jensen TD, Fisk DG, Grove ME, Spiteri E, Pesout T, Monlong J, Baid G, Bernstein JA, Ceresnak S, Chang PC, Christle JW, Chubb H, Dalton KP, Dunn K, Garalde DR, Guillory J, Knowles JW, Kolesnikov A, Ma M, Moscarello T, Nattestad M, Perez M, Ruzhnikov MRZ, Samadi M, Setia A, Wright C, Wusthoff CJ, Xiong K, Zhu T, Jain M, Sedlazeck FJ, Carroll A, Paten B, Ashley EA. *N Engl J Med.* 2022 Jan 12. doi: 10.1056/NEJMc2112090. Online ahead of print. PMID:35020984 No abstract available.

The genetics of human performance. Kim DS, Wheeler MT, Ashley EA. *Nat Rev Genet.* 2022 Jan;23(1):40-54. doi: 10.1038/s41576-021-00400-5. Epub 2021 Sep 14. PMID:34522035 Review

Towards precision medicine in heart failure. Weldy CS, Ashley EA. *Nat Rev Cardiol.* 2021 Nov;18(11):745-762. doi: 10.1038/s41569-021-00566-9. Epub 2021 Jun 9. PMID:34108678 Review.

Pathologic Gene Network Rewiring Implicates PPP1R3A as a Central Regulator in Pressure Overload Heart Failure. Cordero P, Parikh VN, Chin ET, Erbilgin A, Gloude-mans MJ, Shang C, Huang Y, Chang AC, Smith KS, Dewey F, Zaleta K, Morley M, Brandimarto J, Glazer N, Waggott D, Pavlovic A, Zhao M, Moravec CS, Tang WHW, Skreen J, Malloy C, Hannenhalli S, Li H, Ritter S, Li M, Bernstein D, Connolly A, Hakonarson H, Lusis AJ, Margulies KB, Depaoli-Roach AA, Montgomery SB, Wheeler MT, Cappola T, Ashley EA. *Nat Commun.* 2019 Jun 24;10(1):2760.



Themistocles (Tim) Assimes, MD, PhD, FAHA

Associate Professor, Medicine - Cardiovascular Medicine
 Attending Cardiologist, Palo Alto VA Health Care System
 Director, Medical & Population Genomics for Precision Medicine, VA Palo Alto Health Care System
 Associate Director, Epidemiology Research and Information Center for Genomics, VA Palo Alto Hospital

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EDUCATION/TRAINING

MD/PHD McGill University

MEDICINE RESIDENCY
 McGill University

CARDIOLOGY FELLOWSHIP
 Stanford University

BOARD CERTIFICATION
 Cardiovascular Medicine, ABIM

CLINICAL FOCUS

General Cardiology
 Primary and Secondary Prevention of Coronary Artery Disease
 Echocardiography

HONORS AND AWARDS

50 faces of Vanier College (2018)
 AHA Genomic & Precision Medicine & Epidemiology Mid-Career Research Award (2019)
 Elected Member, American Society of Clinical Investigation (2020)
 Steering Committee, Project Baseline (2017 - Present)
 AHA Leadership Committee, Council of Genomics and Precision Medicine (2016 - Present)
 Member, Ancillary Studies Committee, Women's Health Initiative (2010 - Present)

CURRENT RESEARCH

My investigative focus is the design, conduct, analysis, and interpretation of human molecular epidemiology studies of complex cardiovascular disease (CVD) related traits including coronary atherosclerosis and risk factors for coronary atherosclerosis. In addition to performing discovery and validation population genomic studies, we use contemporary genetic studies to gain important insight on the causal and mechanistic nature of associations between purported risk factors and adverse cardiovascular related health outcomes through instrumental variable analyses and genetic risk score association studies of intermediate phenotypes. I am also actively involved in studies assessing the clinical utility of novel genetic markers in isolation or in combination with other biomarkers.

To crack the code of complex cardiovascular traits, we need collaborative networks almost as complicated as the biological networks we are trying to understand. The CVI allows such networks to seed and flourish.

SELECTED PUBLICATIONS

Blood Leukocyte DNA Methylation Predicts Risk of Future Myocardial Infarction and Coronary Heart Disease. Agha G, Mendelson MM, Ward-Caviness CK, Joeannes R, Huan T, Gondalia R, Salfati E, [40 authors], Ferrucci L, Sotoodehnia N, Matullo G, Peters A, Fornage M, Assimes TL, Whitsel EA, Levy D, Baccarelli AA. *Circulation*, 2019 Aug 20;140(8):645-657.

Genetics of Blood Lipids Among ~300,000 Multi-ethnic Participants of the Million Veteran Program. Klarin D, Damrauer SM, Cho K, Sun YV, Teslovich TM, Honerlaw J, Gagnon DR, DuVall SL, [30 authors]; Global Lipids Genetics Consortium; Myocardial Infarction Genetics (MIGen) Consortium; Geisinger-Regeneron DiscovEHR Collaboration; VA Million Veteran Program, Concato J, Gaziano JM, O'Donnell CJ, Tsao PS, Kathiresan S, Rader DJ, Wilson PWF, Assimes TL. *Nat Genet*. 2018 Nov;50(11):1514-1523.

Leveraging Multi-ethnic Evidence for Risk Assessment of Quantitative Traits in Minority Populations. Coram MA, Fang H, Candille SI, Assimes TL, Tang H. *Am J Hum Genet*. 2017 Aug 3;101(2):218-226.

Fifteen New Risk Loci for Coronary Artery Disease Highlight Arterial-wall-specific Mechanisms. Howson JMM, Zhao W, Barnes DR, Ho WK, Young R, Paul DS, Waite LL, Freitag DF, Fauman EB, [60 authors], Chen YI, Nordestgaard BG, Assimes TL, Danesh J, Butterworth AS, Saleheen D. *Nat Genet*. 2017 Jul;49(7):1113-1119.



Leah Backhus, MD, MPH, FACS

Associate Professor of Cardiothoracic Surgery (Thoracic Surgery) at the Palo Alto Veterans Affairs Health Care System
Thoracic Track Residency Associate Program Director
Co-Director, Thoracic Surgery Health Services Research

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EDUCATION/TRAINING

MD University of Southern California
Keck School of Medicine

MPH University of Washington

RESIDENCY UCLA David Geffen School of
Medicine and USC Medical Center

INTERNSHIP USC Medical Center

AB Stanford University, Human Biology

BOARD CERTIFICATION

Thoracic Surgery, ABTS
General Surgery, ABS

HONORS & AWARDS

MEMBER

American Medical Association
Society of Thoracic Surgeons
International Association for the Study
of Lung Cancer
Fellow, American College of Surgeons
Western Thoracic Surgical Association
Women in Thoracic Surgery
Professional member of the Patient
Centered Outcomes Research Institute
(PCORI) Advisory Panel on Improving
Healthcare Systems

CURRENT RESEARCH

Leah Backhus trained in general surgery at the University of Southern California and cardiothoracic surgery at the University of California Los Angeles. She practices at Stanford Hospital and is Chief of Thoracic Surgery at the VA Palo Alto. Her surgical practice consists of general thoracic surgery with special emphasis on thoracic oncology and minimally invasive surgical techniques. She is Co-Director of the Thoracic Surgery Clinical Research Program and has independent grant funding with a VA Merit Award through the Veterans Affairs Administration Health Services Research & Development. She also has grant funding as a co-PI on an RO1 clinical trial titled, "A Mechanistic Clinical Trial of JAK Inhibition to Prevent Ventilator-induced Diaphragm Dysfunction.". Her current research interests are in imaging surveillance following treatment for lung cancer and cancer survivorship. Outside of Stanford, she is also a member of the National Lung Cancer Roundtable in conjunction with the American Cancer Society; serves as the Chair of the Women and Lung Cancer Task Group; and serves as Chair of the Thoracic Surgery Review Committee for the ACGME.

SELECTED PUBLICATIONS

Thirty-day Unplanned Postoperative Inpatient and Emergency Department Visits Following Thoracotomy. Shaffer R, Backhus L, Finnegan MA, Remington AC, Kwong JZ, Curtin C, Hernandez-Boussard T. *J Surg Res.* 2018 Oct;230:117-124.

Unhealthy Alcohol Use is Associated With Postoperative Complications in Veterans Undergoing Lung Resection. Graf SA, Zeliadt SB, Rise PJ, Backhus LM, Zhou XH, Williams EC. *J Thorac Dis.* 2018 Mar;10(3):1648-1656.

Intraoperative Costs of Video-assisted Thoracoscopic Lobectomy can be Dramatically Reduced Without Compromising Outcomes. Richardson MT, Backhus LM, Berry MF, Vail DG, Ayers KC, Benson JA, Bhandari P, Teymourtash M, Shrager JB. *J Thorac Cardiovasc Surg.* 2018 Mar;155(3):1267-1277.e1.

Patients Reported Outcomes in Thoracic Surgery. Pompili C, Absalom K, Velikova G, Backhus L. *J Thorac Dis.* 2018 Feb;10(2):703-706.

Imaging Surveillance and Survival for Surgically Resected Non-small-cell Lung Cancer. Backhus LM, Farjah F, Liang CK, He H, Varghese TK Jr, Au DH, Flum DR, Zeliadt SB. *J Surg Res.*; 2016 Jan; 200(1): 171-6.

Failure to Rescue and Pulmonary Resection for Lung Cancer. Farjah F, Backhus L, Cheng A, Englum B, Kim S, Saha-Chaudhuri P, Wood DE, Mulligan MS, Varghese TK. *J Thorac Cardiovasc Surg.* 2015 May; 149 (5): 1365-71.

Predictors of Imaging Surveillance for Surgically Treated Early-stage Lung Cancer. Backhus LM, Farjah F, Zeliadt SB, Varghese TK, Cheng A, Kessler L, Au DH, Flum DR. *Ann Thorac Surg.*; 2014 Dec; 98 (6): 1944-51; discussion 1951-2.



Hans-Christoph Becker, MD

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EDUCATION/TRAINING

MD Ludwig-Maximilians-University, Germany

INTERNSHIP Ludwig-Maximilians-University, Germany

RESIDENCY Ludwig-Maximilians-University, Germany

HONORS & AWARDS

MEMBER

Radiological Society of North America

North American Society of Cardiovascular Imaging

Society of Computed Tomography & Magnetic Resonance

Society of Cardiac Computed Tomography

European Society of Radiology

CURRENT RESEARCH

My current research focus is applying radiomics and deep learning algorithms to tumor response assessment with computed tomography, positron emission tomography and magnetic resonance imaging. Together with the 3D lab, I am establishing standardized response assessment for different tumor entities and new targeted and immunotherapies with cross sectional imaging for patients in clinical trials. From my former work, my area of expertise includes contrast induced nephropathy, new image reconstruction methods and radiation protection strategies, meta-analysis for the predictive value of cardiac CT, as well as large clinical surveys in the field of radiation exposure habits. My recent publications dealt with the comparison of intravascular ultrasound with computed tomography for the assessment of myocardial coronary artery bridges. My primary clinical focus is cardiovascular and body imaging.

SELECTED PUBLICATIONS

Contrast Administration in CT: A Patient-Centric Approach. Kalra MK, Becker HC, Enterline DS, Lowry CR, Molvin LZ, Singh R, Rybicki FJ. *J Am Coll Radiol*, 2019 Mar;16(3):295-301.

Myocardial Bridges on Coronary Computed Tomography Angiography Correlation with Intravascular Ultrasound and Fractional Flow Reserve. Forsdahl SH, Rogers IS, Schnittger I, Tanaka S, Kimura T, Pargaonkar VS, Chan FP, Fleischmann D, Tremmel JA, Becker HC. *Circ. J.* 2017 Nov 24.



Daniel Bernstein, MD

Associate Dean for Curriculum and Scholarship

Stanford University School of Medicine

Alfred Woodley Salter and Mabel G. Salter Endowed Professor of Pediatrics
(Cardiology) Stanford University

Former Division Chief, Pediatric Cardiology

Former Director, Children's Heart Center, Lucile Packard Children's Hospital at Stanford

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LAB murinecvcore.stanford.edu

CURRENT RESEARCH

Our recent work has focused on the mechanism by which mutations in sarcomeric proteins such as myosin lead to the clinical phenotypes of hypertrophic cardiomyopathy (HCM). Utilizing human induced pluripotent stem cell-derived cardiomyocytes, with mutations induced by CRISPR/Cas9 gene editing, we are undertaking a multi-scale approach ranging from structural and function studies on the single myosin molecule, to the individual myofibril, to whole cells and to microengineered tissues. To better understand cardiomyocyte mechano-transduction, we are applying FRET sensors in critical sarcomeric and junctional proteins. We are also studying a large biobank of myocardial samples from patients with HCM, combining transcriptomics and metabolomics with measurements of mitochondrial function to determine the degree to which HCM is a disease of altered cardiac energetics. These studies will allow us to correlate findings from hiPSC-CMs with actual patient samples. Another focus of our lab has been on the molecular mechanisms of RV hypertrophy and its transition to RV failure, and how this differs from LV failure. I am also involved in several clinical/translational projects: a multi-center clinical study to evaluate novel biomarkers for post-transplant lymphoproliferative disorder in pediatric solid organ transplant patients; the Pediatric Cardiac Genomics Consortium, an NIH initiative to sequence 10,000 trios for genes associated with congenital heart disease; and a study to use immune profiling to predict adverse outcomes after pediatric left ventricular assist device (LVAD) implantation.

SELECTED PUBLICATIONS

Hypertrophic cardiomyopathy: A disease of altered mitochondrial function and metabolism? Ranjbarvaziri S, Fajardo G, Zhao M, Vaziri S, Ruppel K, Spudich J, Contrepolis K, Woo J, Snyder M, Bernstein D. *Circulation* 144:1714–1731, 2021. PMID: 34672721

Hypertrophic cardiomyopathy β -cardiac myosin mutation (P710R) leads to hypercontractility by disrupting super-relaxed state. Vander Roest AS, Liu C, Morck MM, Kooiker KB, Jung G, Song D, Dawood A, Jhingran A, Pardon G, Ranjbarvaziri S, Fajardo G, Zhao M, Campbell KS, Pruitt BL, Spudich J, Ruppel K, Bernstein D. *PNAS* 118(24):e2025030118, 2021. PMID: 34117120

Dach1 extends artery networks and protects against cardiac injury. Raftrey B, Williams I, Rios Coronado, PE, Chang AH, Zhao M, Roth R, Racelis R, D'Amato G, Phansalkar R, Gonzalez KM, Zhang Y, Bernstein D, Red-Horse K. *Circ. Res.*, 2021 Sep 17;129(7):702–716

β 2-adrenergic signaling modulates mitochondrial function and morphology in skeletal muscle in response to aerobic exercise. Voltarelli VA, Coronado M, Fernandez LG, Campos JC, Jannig PR, Ferreira JCB, Fajardo G, Brum PC, Bernstein D. *Cells* 10:146, 2021. PMID: 33450889

Transcriptomic and Functional Analyses of Mitochondrial Dysfunction in Pressure Overload-induced Right Ventricular Failure. HV Hwang, N Sandeep, RV Nair, DQ Hu, M Zhao, IS Lan, G Fajardo, SJ Matkovich, D Bernstein, S Reddy. *JAMA*, 10:e017835, 2021. PMID 3352225e91625, 2017.

EDUCATION/TRAINING

MD New York University

PEDIATRICS RESIDENCY

Montefiore Medical Center

MEDICAL EDUCATION FELLOWSHIP

Albert Einstein College of Medicine

PEDIATRIC CARDIOLOGY FELLOWSHIP

UCSF

BOARD CERTIFICATION

Pediatrics, ABP

Pediatric Cardiology, ABP

CLINICAL FOCUS

Pediatric Cardiology

Pediatric Heart Failure and Transplantation

HONORS & AWARDS

CHAIR

Committee on Curriculum and Academic Policy

CVI Education & Training Committee

Best Lecture Award, Stanford University Medical School (2013)

Leo M. Davidoff Society Award for excellence in teaching, Albert Einstein College of Medicine (1982)

HUME FACULTY SCHOLAR Stanford University (1987-88, 1989-90)

MELLON FOUNDATION FELLOW Stanford University (1986-87)

FORMER PRESIDENT

Society for Pediatric Research

ELECTED MEMBER

American Pediatric Society



Helen M. Blau, PhD

Donald E. and Delia B. Baxter Foundation Professor & Director,
Baxter Laboratory for Stem Cell Biology

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LAB stanford.edu/group/blau

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EDUCATION/TRAINING

MA Harvard University

PHD Harvard University

Postdoctoral UCSF

ELECTED MEMBER

National Academy of Sciences

National Academy of Medicine

National Academy of Inventors

Pontifical Academy of Sciences

American Institute for Medical & Biological Engineering

American Academy of Arts & Sciences

American Association for the Advancement of Science

American Heart Association

Harvard Board of Overseers

HONORS & AWARDS

Ellison Medical Foundation, Senior Scholar Award

AACR-Irving Weinstein Award

NIH MERIT Award

NIH Challenge Grant

NIH EUREKA Grant

NIH Director's Transformative Research Award

FASEB Excellence in Science Award

HONORARY DOCTORATE

University of Nijmegen, Holland

University of York, England

PRESIDENT

International Society of Differentiation

Society for Developmental Biology

COUNCIL MEMBER

National Academy of Medicine

NIH National Institute on Aging

American Academy of Arts and Sciences

CURRENT RESEARCH

Dr. Blau studies fundamental regulatory mechanisms and therapeutic interventions to enhance stem cell function in muscle regeneration. Our primary focus is on understanding what goes awry in the dedicated stem cells that exist in our muscle tissues with aging and in genetic muscle wasting disorders. For example, we have discovered novel small molecules, niche proteins, and biophysical cues that rejuvenate, expand, and enhance the function of muscle stem cells, crucial for muscle regeneration. We have also determined a new role for telomeres in Duchenne muscular dystrophy, which provides novel insights into the development of heart failure and potential treatments. Capitalizing on cardiomyocytes differentiated from patient-derived induced pluripotent stem cells to model DMD cardiomyopathy, we are elucidating how microenvironmental cues lead to telomere dysfunction in disease and strategies to protect telomeres. To accomplish our research goals, we integrate diverse powerful single cell technologies –CODEX, RNAseq, ATACseq– for studying changes at the protein, genome, and epigenetic levels; advanced imaging techniques and algorithms for tracking cell fate in vitro and in vivo; and engineered biomaterials platforms to model changes in the cellular microenvironment. Our overarching goal is to make a difference in human health.

We dance for laughter, we dance for tears, we dance for madness, we dance for fears, we dance for hopes, we dance for screams, we are the dancers, we create the dreams. — Albert Einstein

SELECTED PUBLICATIONS

Inhibition of Prostaglandin Degrading Enzyme 15-PGDH Rejuvenates Aged Muscle Mass and Strength. Palla AR, Ravichandran M, Wang YX, Alexandrova L, Yang AV, Kraft P, Holbrook CA, Schürch CM and Blau HM. *Science*. 2021 Jan 29;371(6528):eabc8059.

Tissue Stem Cells: Architects of Their Niches. Fuchs E, Blau HM. *Cell Stem Cell*. 2020 October Volume 27, Issue 4, Pages 532-556.

Glucose Metabolism Drives Histone Acetylation Landscape Transitions that Dictate Muscle Stem Cell Function. Yucel N, Wang YX, Mai T, Porpiglia E, Lund PJ, Markov G, Garcia BA, Bendall SC, Angelo M, Blau HM. *Cell Rep*. 2019 Jun 25;27(13):3939-3955.e6.

Stem Cells in the Treatment of Disease. Blau HM, Daley GQ. *N Engl J Med*. 2019 May 2;380(18):1748-1760.

Telomere Shortening is a Hallmark of Genetic Cardiomyopathies. Chang ACY, Chang ACH, Kirillova A, Sasagawa K, Su W, Weber G, Lin J, Termglinchan V, Karakikes I, Seeger T, Dainis AM, Hinson JT, Seidman J, Seidman CE, Day JW, Ashley E, Wu JC, Blau HM. *Proc Natl Acad Sci USA*. 2018 Sep 11;115(37):9276-9281.



Carlos Bustamante, PhD

Professor of Biomedical Data Science, Genetics, and (by courtesy) Biology

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PROFILE med.stanford.edu/profiles/Carlos-Bustamante

EDUCATION/TRAINING

PHD Harvard University

HONORS & AWARDS

Marshall Sherfield Fellow, Marshall Aid Commemoration Commission (2001-2002)

Sloan Research Fellow in Molecular Biology, Sloan Foundation (2007-2009)

Provost Award for Distinguished Research, Cornell University (2008)

MacArthur Fellow, John D. and Catherine T. MacArthur Foundation (2010)

CURRENT RESEARCH

My research focuses on analyzing genome wide patterns of variation within and between species to address fundamental questions in biology, anthropology, and medicine. My group works on a variety of organisms and model systems ranging from humans and other primates to domesticated plant and animals. Much of our research is at the interface of computational biology, mathematical genetics, and evolutionary genomics.

SELECTED PUBLICATIONS

An Unexpectedly Complex Architecture for Skin Pigmentation in Africans. Martin AR, Lin M, Granka JM, Myrick JW, Liu X, Sockell A, Atkinson EG, Werely CJ, Möller M, Sandhu MS, Kingsley DM, Hoal EG, Liu X, Daly MJ, Feldman MW, Gignoux CR, Bustamante CD, Henn BM. *Cell*. 2017 Nov 30;171(6):1340-1353.e14.

Genetic Mapping and Biochemical Basis of Yellow Feather Pigmentation in Budgerigars. Cooke TF, Fischer CR, Wu P, Jiang TX, Xie KT, Kuo J, Doctorov E, Zehnder A, Khosla C, Chuong CM, Bustamante CD. *Cell*. 2017 Oct 5;171(2):427-439.e21.

FIRE: Functional Inference of Genetic Variants That Regulate Gene Expression. Ioannidis NM, Davis JR, DeGorter MK, Larson NB, McDonnell SK, French AJ, Battle AJ, Hastie TJ, Thibodeau SN, Montgomery SB, Bustamante CD, Sieh W, Whittemore AS. *Bioinformatics*. 2017 Dec 15;33(24):3895-3901.

Human Demographic History Impacts Genetic Risk Prediction Across Diverse Populations. Martin AR, Gignoux CR, Walters RK, Wojcik GL, Neale BM, Gravel S, Daly MJ, Bustamante CD, Kenny EE. *Am J Hum Genet*. 2017 Apr 6;100(4):635-649.

Population Genetic Analysis of the DARC Locus (Duffy) Reveals Adaptation From Standing Variation Associated With Malaria Resistance in Humans. McManus KF, Taravella AM, Henn BM, Bustamante CD, Sikora M, Cornejo OE. *PLoS Genet*. 2017 Mar 10;13(3):e1006560.



Scott Ceresnak, MD

Associate Professor of Pediatric Cardiology
Program Director, Pediatric Cardiology Fellowship
Director, Interim, Pediatric Electrophysiology

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PROFILE med.stanford.edu/profiles/scott-ceresnak

EDUCATION/TRAINING

BA/MD Rutgers University combined
7-year program / Robert Wood Johnson
Med School (2002)

INTERNSHIP Weill Cornell School of
Medicine (2003)

RESIDENCY Weill Cornell School of
Medicine (2005)

FELLOWSHIP
New York Presbyterian Hospital
Columbia (2008)
Lucile Packard Children's Hospital at
Stanford (2009)

BOARD CERTIFICATION
Pediatric Cardiology, American Board of
Pediatric Cardiology (2008)
Adult Congenital Heart Disease,
American Board of Internal Medicine
(2015)

HONORS & AWARDS

Fellow, American Academy of Pediatrics
Member, American Heart Association

Member, American College of Cardiology
Member, Heart Rhythm Society

Member, Pediatric and Congenital
Electrophysiology Society

Member, Pediatric Society of Greater
New York

Member, New York Pediatric
Electrophysiology Society

CURRENT RESEARCH

My research involves clinical and translational work in heart rhythm disorders in children and adults with congenital heart disease. My primary area of interest is in novel methods of signal analysis and approaches to ablation in children with SVT. I am also involved in efforts to evaluate arrhythmias in adults with congenital heart disease, multi-center collaborations involving the evaluation of children with WPW, and collaborations on device therapies in children and adults with heart disease and cardiomyopathies.

I truly love what I do. It is a privilege to care for my patients and to work with a tremendously bright and motivated group of caregivers and scholars here at Stanford.

SELECTED PUBLICATIONS

Pectoral Nerve Blocks Decrease Postoperative Pain and Opioid Use After Pacemaker or Implantable Cardioverter-Defibrillator Placement in Children. Yang JK, Char DS, Motonaga KS, Navaratnam M, Dubin AM, Trela A, Hanisch DG, McFadyen G, Chubb H, Goodyer W, Ceresnak SR. *Heart Rhythm*. 2020 Mar 19.

Loss of Ventricular Preexcitation During Noninvasive Testing Does not Exclude High-risk Accessory Pathways: A Multi-center Study of WPW in Children. Escudero CA, Ceresnak SR, Collins KK, Pass RH, Aziz PF, Blaufox AD, Ortega MC, Cannon BC, Cohen M, Dechert BE, Dubin AM, Motonaga KS, Epstein MR, Erickson CC, Fishberger SB, Gates GJ, Capone CA, Nappo L, Kertesz NJ, Kim JJ, Valdes SO, Kubuř P, Law IH, Maldonado J, Moore JP, Perry JC, Sanatani S, Seslar SP, Shetty I, Zimmerman FJ, Skinner JR, Marcondes L, Stephenson EA, Asakai H, Tanel RE, Uzun O, Etheridge SP, Janson C. *Heart Rhythm*. 2020 Jun 1:S1547-5271(20)30533-6.

Validation of a Novel Automated Signal Analysis Tool for the Ablation of Wolff-Parkinson-White Syndrome. Ceresnak SR, Pass RH, Dubin AM, Yang L, Motonaga KS, Hedlin H, Avasarala K, Trela A, McElhinney DB, Janson C, Nappo L, Ling XB, Gates GJ. *Plos One*. 2019 Jun 26;14(6):e0217282.

QTc Prolongation and Risk of Torsades de Pointes in Hospitalized Pediatric Oncology Patients. Lim TR, Rangaswami AA, Dubin AM, Kapphahn KI, Sakarovitch C, Long J, Motonaga KS, Trela T, Ceresnak SR. *J Pediatr*. 2020 Feb;217:33-38.

Extended Cardiac Ambulatory Rhythm Monitoring in Adults with Congenital Heart Disease: Arrhythmia Detection and Impact of Extended Monitoring. Schultz KE, Lui GK, McElhinney DB, Long J, Balasubramanian V, Sakarovitch C, Fernandes SM, Dubin AM, Rogers IS, Romfh AW, Motonaga KS, Viswanathan MN, Ceresnak SR. *Congenit Heart Dis*. 2019 Jan 3.

Advances in Pediatric Cardiology Boot Camp: Boot Camp Training Promotes Fellowship Readiness and Enables Retention of Knowledge. Ceresnak SR, Axelrod DM, Motonaga KS, Sacks LD, Johnson ER, Krawczeski CD. *Pediatric Cardiology*, 2017 Mar;38(3):631-640.



Christopher Cheng, PhD

Adjunct Professor of Surgery (Vascular Surgery)

Director, Vascular Intervention Biomechanics & Engineering (VIBE) Lab

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PROFILE med.stanford.edu/profiles/Christopher-cheng

LINKEDIN www.linkedin.com/in/chris-cheng-225482/

LAB vibelab.stanford.edu

EDUCATION/TRAINING

PhD Stanford University

HONORS & AWARDS

Handbook of Vascular Motion nominated by Elsevier for PROSE book award (2019)

Best Paper Award at American Association of Wine Economists Conference (2019)

Medical Research Council, Expert-In-Residence, University of Oxford (2018)

Fannie Mitchell Expert-In-Residence, Duke University (2015)

Board Membership

MedRes (2021)

Pinnacle Partners OZ Fund VIII (2021)

Global Science & Technology (2020)

The Power Rank (2011)

Kōli (2012)

480 Biomedical (2012)

Tendyne Medical (2011)

Duke University, Pratt School of Engineering (2018)

American Leader Forum – Silicon Valley (2021)

Cardiovascular Implant Durability (2019)

CURRENT RESEARCH

Our research laboratory focuses on understanding the mechanics of the cardiovascular system, especially with respect to interactions between medical devices and the dynamic cardiovascular environment. We use medical imaging, 3D geometric modeling, and custom deformation quantification techniques to investigate disease processes and medical device performance. We are interested in the dynamics of the heart, aorta, and peripheral vasculature, and are always seeking ways to apply our research to current and emerging therapies. While our research pursuits seek to add to the fundamental understanding of cardiovascular biomechanics, all of our projects are directly related to improving medical device design, evaluation, regulation, and their use in clinical practice.

We study how the heart and blood vessels move.

SELECTED PUBLICATIONS

Thoracic Aortic Parallel Stent-Graft Behaviour When Subjected to Radial Loading. Kwiecinski J, Cheng CP, Uberoi R, Mohammed H, Hempel P, Degel C, You. *Journal of the Mechanical Behavior of Biomedical Materials*, (2021) 118: 104407

Quantification of True Lumen Helical Morphology and Chirality in Type B Aortic Dissections. Bondesson J, Suh G, Lundh T, Dake MD, Lee JT, Cheng CP. *American Journal of Physiology – Heart and Circulatory Physiology*, (2021) 320: H901-H911

The Biomechanical Impact of Hip Movement on Iliofemoral Venous Anatomy and Stenting for Deep Venous Thrombosis. Cheng CP, Dua A, Suh G, Shah RP, Black SA (2020) *Journal of Vascular Surgery: Venous and Lymphatic Disorders*, 8(6): 953-960 (editor highlighted as outstanding paper)

Aortic Geometry Correlates with Endograft Bird-Beaking Severity. Frohlich M, Suh G, Bondesson J, Lee JT, Dake MD, Leineweber M, Cheng CP. *Journal of Vascular Surgery*, (2020) 72(4): 1196-1205

Effects of Heat Treatment on the Magnetic Properties of Nitinol Devices. Combs JW, Levin E, Cheng CP, Daly S, Yeralan S, Duerig T. *Shape Memory & Superelasticity*, (2019) 5(4): 429-435

Cardiac- and Respiratory-Induced Deformations of the Renal Arteries and Stents and Relative Compliance Damping After Snorkel Endovascular Aneurysm Sealing. Cheng CP, Suh G, Kim JJ, Holden A *Journal of Endovascular Therapy*, (2019) 26(4): 556-564.



Glenn Chertow, MD

Professor of Medicine (Nephrology) and, by courtesy, of Health Research and Policy (Epidemiology)

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EDUCATION/TRAINING

MD Harvard Medical School

MPH Harvard School of Public Health

RESIDENCY Brigham and Women's Hospital

FELLOWSHIP Brigham and Women's Hospital

BOARD CERTIFICATION
Internal Medicine (ABIM); Nephrology (ABIM)

CLINICAL FOCUS

Nephrology, Dialysis, Hypertension, Mineral metabolism

HONORS & AWARDS

Elected Member, American Society of Clinical Investigation (2004)

National Torchbearer Award, American Kidney Fund (2007)

Senior Mentor, Network of Minority Research Investigators, NIDDK (2008-)

Denise O'Leary Award for Clinical Excellence, Stanford Health Care (2014)

Elected Member, Association of American Physicians (2015)

Belding H. Scribner Award, American Society of Nephrology (2015)

Elected Member, National Academy of Medicine (2015)

David M. Hume Memorial Award, National Kidney Foundation (2018)

CURRENT RESEARCH

Dr. Chertow's research interests are focused on clinical epidemiology, health services research, and clinical trials in acute and chronic kidney disease. In addition to his own research program, he devotes considerable effort in collaborative research and in mentoring junior faculty, fellows, residents and other trainees.

You miss 100% of the shots you don't take.

— Wayne Gretzky

SELECTED PUBLICATIONS

Chronic Kidney Disease and Risk of Death, Cardiovascular Events and Hospitalization. Go AS, Chertow GM, Fan D, McCulloch CE, Hsu CY. *N Engl J Med* 2004; 351:1296-1305.

Intensity of Renal Support for Acute Kidney Injury in the Critically Ill. Palevsky PM, Zhang JH, O'Connor TZ, Chertow GM, Crowley ST, Choudury D, Finkel K, Kellum JA, Paganini E, Schein RMH, Smith MW, Swanson KM, Vijayan A, Watnick S, Star RA, Peduzzi P. *N Engl J Med* 2008; 359:7-20.

In Center Hemodialysis Six Times per Week Versus Three Times per Week. Chertow GM, Levin NW, Beck GJ, et al.; Frequent Hemodialysis Network Trial Group. *N Engl J Med* 2010; 363:2287-2300.

The Effect of Cinacalcet on Cardiovascular Disease in Hemodialysis. Chertow GM, Block GA, Correa-Rotter R, Drüeke TB, Floege J, Goodman WG, Herzog CA, Kubo Y, London GM, Mahaffey KW, Mix TCH, Moe SM, Trotman ML, Wheeler DC, Parfrey PS. *N Engl J Med* 2012; 367:2482-2494.

Bardoxolone Methyl in Type 2 Diabetes and Stage 4 Chronic Kidney Disease. De Zeeuw D, Akizawa T, Audhya P, Bakris GL, Chin M, Christ-Schmidt H, Goldsberry A, Houser M, Krauth M, Lambers-Heerspink HJ, McMurray JJ, Meyer CJ, Parving HH, Remuzzi G, Toto RD, Vaziri ND, Wanner C, Wittes J, Wrolstad D, Chertow GM. *N Engl J Med* 2013; 369:2492-2503.

Effect of Etelcalcetide Versus Placebo on Serum Parathyroid Hormone in Patients Receiving Hemodialysis With Secondary Hyperparathyroidism: Two Randomized Clinical Trials. Block GA, Bushinsky DA, Cunningham J, Drueke TB, Ketteler M, Kewalramani R, Martin KJ, Mix TC, Moe SM, Patel UD, Silver J, Spiegel DM, Sterling L, Walsh L, Chertow GM. *JAMA* 2017; 317:146-155.



Gerald Crabtree, MD

Department of Pathology Professor in Experimental Pathology
and Professor of Developmental Biology

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EDUCATION/TRAINING

MD Temple University

HONORS & AWARDS

Investigator, Howard Hughes Medical
Institute

CURRENT RESEARCH

We are interested in the role of chromatin regulation in development and human cancer. Recent studies have shown that over 20% of all human cancers have mutations in the subunits of an ATP-dependent chromatin regulatory complex we discovered several years ago. The genes behave as tumor suppressors and sometimes as oncogenes. We hope to understand the fundamental mechanisms used by these complex to prevent cancer.

These same chromatin remodeling complexes are frequently mutated in a variety of human neurologic diseases, reflecting their roles in the development of the nervous system. It appears that these specialized roles in the nervous system are due to the use of unique neural specific assemblies in the developing human and mouse brain. We hope to understand their fundamental mechanism of action through biochemical and genetic approaches in combination with genome-wide analysis and genome sequencing studies.

Finally, we are developing new ways of making conditional alleles of mammalian genes using synthetic ligands that we hope will bring about a new fusion of biochemical and genetic approaches to understanding and controlling fundamental biologic processes. Recently we have developed an effective way of both assaying and modifying chromatin regulation in living cells.

SELECTED PUBLICATIONS

Rapid Chromatin Repression by Aire Provides Precise Control of Immune Tolerance. Koh AS, Miller EL, Buenrostro JD, Moskowitz DM, Wang J, Greenleaf WJ, Chang HY, Crabtree GR. *Nat Immunol.* 2018 Feb;19(2):162-172.

Dominant-negative SMARCA4 Mutants Alter the Accessibility Landscape of Tissue-unrestricted Enhancers. Hodges HC, Stanton BZ, Cermakova K, Chang CY, Miller EL, Kirkland JG, Ku WL, Veverka V, Zhao K, Crabtree GR. *Nat Struct Mol Biol.* 2018 Jan;25(1):61-72.

Rapid and Reversible Epigenome Editing by Endogenous Chromatin Regulators. Braun SMG, Kirkland JG, Chory EJ, Husmann D, Calarco JP, Crabtree GR. *Nat Commun.* 2017 Sep 15;8(1):560.

TOP2 Synergizes With BAF Chromatin Remodeling for Both Resolution and Formation of Facultative Heterochromatin. Miller EL, Hargreaves DC, Kadoch C, Chang CY, Calarco JP, Hodges C, Buenrostro JD, Cui K, Greenleaf WJ, Zhao K, Crabtree GR. *Nat Struct Mol Biol.* 2017 Apr;24(4):344-352.



Bianxiao Cui, PhD

Associate Professor of Chemistry

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EDUCATION/TRAINING

PHD University of Chicago

HONORS & AWARDS

Michael and Kate Barany Award,
Biophysical Society, (2018)

NSF INSPIRE award, National Science
Foundation (2013)

NIH New Innovator Award, National
Institutes of Health (2012)

Hellman Scholar, Hellman Foundation
(2011)

NSF CAREER award, National Science
Foundation (2011)

Packard Fellowships for Science and
Engineering, David and Lucile Packard
Foundation (2009)

CURRENT RESEARCH

Our research focuses on developing biophysical and chemical tools to probe fundamental questions in biology. We bring together state-of-the-art nanotechnology, physical science, engineering, and molecular and cell biology, to advance current understandings of biological processes in neurons and cardiomyocytes. Currently, there are two major research directions: (1) Developing nanoscale tools to probe electric activities and cellular processes at the cell-material interface. In this area, we have developed nanoscale electric probes for measuring intracellular action potentials in electrogenic cells, as well as structural probes and optical probes with high sensitivity and subcellular localization. (2) Employing optical, magnetic, and optogenetic tools to understand nerve growth factor (NGF) signaling in neurons. By adapting a variety of microscopy, optogenetic, nanotechnology and biochemical tools, we aim for a deeper understanding of NGF signaling in normal neurons and neurodegenerative diseases.

Life is like riding a bicycle. To keep your balance,
you must keep moving. – Albert Einstein

SELECTED PUBLICATIONS

Understanding CRY2 Interactions for Optical Control of Intracellular Signaling. Duan L, Hope J, Ong Q, Lou HY, Kim N, McCarthy C, Acero V, Lin MZ, Cui B. *Nature Communications*, 8, 547 (2017).

Nanoscale Manipulation of Membrane Curvature for Probing Endocytosis in Live Cells. Zhao W, Hanson L, Lou HY, Akamatsu M, Chowdary PD, Santoro F, Marks JR, Grassart A, Drubin DG, Cui Y, Cui B. *Nature Nanotechnology*, 12, 750, (2017).

Accurate Nanoelectrode Recording of Human Pluripotent Stem Cell-derived Cardiomyocytes for Assaying Drugs and Modeling Disease. Lin ZC, McGuire A, Burridge PW, Matsa E, Lou HY, Wu JC, Cui B. *Microsystems & Nanoengineering*, 3, 16080 (2017).

Vertical Nanopillars for In Situ Probing of Nuclear Mechanics in Adherent Cells. Hanson L, Zhao W, Lou HY, Lin ZL, Lee SW, Chowdary PD, Cui Y, Cui B. *Nature Nanotechnology*, 10, 554-562 (2015).

Iridium Oxide Nanotube Electrodes for Intracellular Measurement of Action Potentials. Lin ZL, Xie C, Osakada Y, Cui Y, Cui B. *Nature Communications*, 5, 3206 (2014).

Intracellular Recording of Action Potentials by Nanopillar Electroporation. Xie C, Lin ZL, Hanson L, Cui Y, Cui B. *Nature Nanotechnology*, 7, 185-190 (2012).



Ronald L. Dalman, MD

Walter C. and Elsa R. Chidester Professor
Stanford Medicine Associate Dean for Market Development

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DIVISION vascular.stanford.edu

EDUCATION/TRAINING

MD University of Michigan

GENERAL SURGERY RESIDENCY
University of Washington

VASCULAR SURGERY FELLOWSHIP
Oregon Health Sciences University

BOARD CERTIFICATION
General Vascular Surgery, American
Board of Surgery
Surgery, American Board of Surgery

CLINICAL FOCUS

Abdominal Aortic Aneurysm Disease

HONORS & AWARDS

FELLOW

American College of Surgeons, American
Heart Association

MEMBER

American Heart Association, Fellow

American Surgical Association; Society
of University Surgeons;

Vascular Surgery Board, American Board
of Surgery (2016 to 2022).

Board of Governors, American College of
Surgeons

Society for Vascular Surgery: Vice-
President 2018-2019; President 2020-
2021 (75th Anniversary)

GRANTS

PRINCIPAL INVESTIGATOR

"LIMItting AAAs with meTformin (LIMIT)
trial" 1 R61 HL146835, 09/01/2020 -
09/01/2021. Co-PIs Kenneth Mahaffey,
Ying Lu.

CURRENT RESEARCH

Stanford Vascular Surgery is recognized worldwide for expertise in aortic aneurysm disease. My laboratory continues to focus on understanding aneurysm pathophysiology, as well as developing innovative treatment, screening and access to care strategies in abdominal aortic aneurysm (AAA) disease management.

We are on the threshold of understanding,
and thus eliminating, the threat of premature death
from aortic aneurysm disease worldwide.

SELECTED PUBLICATIONS

Angiotensin-converting Enzyme 2, Coronavirus Disease 2019 and Abdominal Aortic Aneurysms. Xu B, Li G, Guo J, Ikezoe T, Kasirajan K, Shao S, Dalman RL. *J Vasc Surg* 2021 Feb Online.

The Society for Vascular Surgery Executive Board response to the Diversity, Equity and Inclusion Taskforce Report. Dalman RL, Murphy SA, AbuRahma AF, Calligaro KD, Dalsing MD, Eagleton MC, Hodgson KJ, McDevitt DT, Reed AB, Schanzer A, Shutze WP, Slaw KM. *J Vasc Surg*, 2020.

Efficacy of Telmisartan to Slow Growth of Small Abdominal Aortic Aneurysms: A Randomized Clinical Trial. Golledge J, Pinchbeck J, Tomee SM, Rowbotham SE, Singh TP, Moxon JV, Jenkins JS, Lindeman JH, Dalman RL, McDonnell L, Fitridge R, Morris DR, TEDY Investigators. *JAMA Cardiol*, 2020.

Top 10 Candidate Aortic Disease Trials. Dalman RL, Wanhainen A, Mani K, Modarai B. *J Intern Med*, 2020.

Inhibition of VEGF (Vascular Endothelial Growth Factor)-A or its Receptor Activity Suppresses Experimental Aneurysm Progression in the Aortic Elastase Infusion Model. Xu B, Lida Y, Glover KJ, Ge Y, Wang Y, Xuan H, Hu X, Tanaka H, Wang W, Fujimura N, Miyata M, Shoji T, Guo J, Zheng X, Gerritsen M, Kuo C, Michie SA, Dalman RL. *Arterioscler Thromb Vasc Biol*, 2019.

The 2019 Update of the European Abdominal Aortic Aneurysm Guidelines. Dalman RL. *J Vasc Surg*. 2019 Mar;69(3):633-634.



Rajesh Dash, MD, PhD

Assistant Professor, Medicine – Cardiovascular Medicine
Medical and Scientific Director, Stanford South Asian Translational Heart Initiative (SSATHI)
Co-Director, Falk Cardiovascular MRI Facility

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EDUCATION/TRAINING

MD University of Cincinnati

PHD University of Cincinnati

MEDICINE RESIDENCY

University of Washington Medical Center

CARDIOLOGY FELLOWSHIP UCSF

BOARD CERTIFICATION

Cardiovascular Medicine, ABIM

Echocardiography, NBE

Nuclear Cardiology, CBNC

CLINICAL FOCUS

Non-Invasive Cardiac Imaging

Preventive Cardiology

HONORS & AWARDS

Best Poster Award, American College of Cardiology (ACC) Scientific Sessions (2013)

CVI Seed Grant (2012)

Finalist, Jeremiah Stamler Distinguished Young Investigator Award, Northwestern University (2012)

Melvin Judkins Young Investigator Award, American Heart Association (AHA) Scientific Sessions (2009)

AHA Cardiovascular Radiology and Intervention Travel Award (2009)

Finalist, Society of Cardiovascular Magnetic Resonance (SCMR) Young Investigator Award (2008)

CURRENT RESEARCH

My research focuses on the prediction of coronary and cardiovascular disease in high risk patient populations, using population health and molecular imaging, as well as digital health technologies to achieve better preventive outcomes. I am Medical and Scientific Director of the Stanford South Asian Translational Heart Initiative (SSATHI). Our mission is to detect, treat, and prevent the onset of coronary and cardiometabolic diseases in young South Asians. We study this problem at the cellular and physiological levels, and validate our discoveries with partners in India. Within SSATHI, I launched CardioClick, a team-based video visit platform for patient visits that include physician visits, lifestyle intervention, and clinical research study conduction. CardioClick has attracted industry clinical sponsorship to test technologies designed for patient engagement and outcome improvement. This telemedicine platform is now being scaled across cardiovascular medicine and SHC. In addition, I study cell signaling in the heart and have developed molecular imaging probes that track to injured heart tissue or transplanted stem cells, such that we can visualize these injury or survival signals in real-time, non-invasively. In this capacity I am Co-Director of the Falk Cardiovascular MRI Facility. I am applying these imaging strategies in select high-risk patients.

Everyone has a plan until they get hit in the face.
— Mike Tyson

SELECTED PUBLICATIONS

Dose-dependent Cardioprotection of Moderate (32°C) Versus Mild (35°C) Therapeutic Hypothermia in a Porcine Acute Ischemia-reperfusion Injury Model. Dash R, Mitsutsake Y, Pyun W, Dawoud F, Lyons J, Tachibana A, Matsuura Y, Kolodgie FD, Virmani R, McConnell MV, Illindala U, Ikeno F, Yeung AC. *JACC Cardiovasc Interv.* 2018 Jan 22;11(2):195-205.

Tada Y. and Dash R. T1 Mapping for Infarct Characterization. T1-Mapping in Myocardial Disease. July 2018. Edited by Philip Yang. Copyright 2018. Chapter 6, pp 77-86.

Mn-Enhanced Magnetic Resonance Imaging Enables In Vivo Confirmation of Peri-Infarct Restoration Following Stem Cell Therapy in a Porcine Ischemia-Reperfusion Model. Dash, R., Kim, P. J., Matsuura, Y., Ikeno, F., Metzler, S., Huang, N. F., Lyons, J. K., Nguyen, P. K., Ge, X., Foo, C. W., McConnell, M. V., Wu, J. C., Yeung, A. C., Harnish, P., Yang, P. C. *Journal of the American Heart Association*; 2015; 4 (7).

Magnetic Resonance Imaging & Positron Emission Tomography Approaches to Imaging Vascular and Cardiac Inflammation. Amsellem M, Saito T, Tada Y, Dash R, McConnell MV. *Circ J.* 2016 May 25;80(6):1269-77.



Mark M. Davis, PhD

Burt and Marion Avery Family Professor
 Professor, Microbiology and Immunology
 Investigator, Howard Hughes Medical Institute
 Director, Stanford Institute for Immunity, Transplantation and Infection (ITI)

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INSTITUTE iti.stanford.edu

EDUCATION/TRAINING

BA Johns Hopkins

PHD Caltech

HONORS & AWARDS

Paul Ehrlich and Ludwig Darmstaedter Prize, Paul Ehrlich Institute, Germany

King Faisal Prize

Behring-Heidelberger Prize, American Association of Immunologists

Novartis Prize for Basic Immunology

ELECTED MEMBER

National Academy of Sciences, USA

Institute of Medicine, National Academy of Sciences

Royal Society of London, UK

SCIENTIFIC ADVISORY BOARDS

Amgen, Chugai Pharmabody, 3T, Janux, Pact Bio, TCR Cure

CURRENT RESEARCH

My laboratory is interested in the molecular basis of T and B lymphocyte recognition, as well understanding the human immune system and its relationship to health and disease. These later efforts have employed systems biology approaches to understand vaccine responses, twin studies to understand the relative influence of environment versus genetics, and T cell repertoire studies to understand self vs non-self capabilities and the origin of memory T cell responses. By identifying markers that could tell us how a particular person's immune system is functioning, we could both understand immune system-related and infectious diseases better and formulate new and more efficacious interventions.

By identifying markers that could tell us how a particular person's immune system is functioning, we could both understand immune system-related and infectious diseases better and formulate new and more efficacious interventions.

SELECTED PUBLICATIONS

Identifying Specificity Groups in the T Cell Receptor Repertoire. Glanville, J., Huang, H., Nau, A., Hatton, O., Wagar, L.E., Rubelt, F., Ji, X., Han, A., Krams, S.M., Pettus, C., Haas, N., Lindestam-Arlehamn, C.S., Stte, A., Boyd, S.D., Scriba, T.J., Martinez, O.M., and Davis, M.M. *Nature*, 547(7661): 94-98, 2017.

Variation in the Human Immune System is Largely Driven by Non-heritable Influences. Brodin P, Jojic V, Gao T, Bhattacharya S, Angel CJ, Furman D, Shen-Orr S, Dekker CL, Swan GE, Butte AJ, Maecker HT, Davis MM. *Cell*; 2015 Jan 15; 160 (1-2): 37-47.

Transcript-indexed ATAC-seq Reveals Paired Single-cell T Cell Receptor Identity and Chromatin Accessibility for Precision Immune Profiling. Satpathy, A.T., Saligrama, N., Buenrostro, J.D., Wei, Y., Wu, B., Rubin, A.J., Granja, J.M., Lareau, C.A., Li, R., Qi, Y., Parker, K.R., Mumbach, M.R., Serratelli, W.S., Gennet, D.G., Schep, A.N., Corces, M.R., Kim, Y.H., Khavari, P.A., Greenleaf, W.J., Davis, M.M., and Chang, H.Y. *Nature Med* 24(5): 580-590, 2018.

Rebooting Human Immunology. Davis, M.M. and Brodin, P. *Ann Rev Immunology*. 36: 843-864 2018.



Anne Dubin, MD

Professor of Pediatrics (Pediatric Cardiology) at the Lucile Salter Packard Children's Hospital
Interim Division Chief for Pediatric Cardiology

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EDUCATION/TRAINING

MD University of Rochester School of Medicine and Dentistry (1988)

INTERNSHIP Columbia Presbyterian Medical Center NY (1989)

RESIDENCY Columbia Presbyterian Medical Center NY (1991)

FELLOWSHIP
Children's Hospital of Philadelphia PA (1992)
Yale - New Haven Hospital CT (1995)

BOARD CERTIFICATION:

Pediatric Cardiology, American Board of Pediatric Cardiology (1998)

International Board of Heart Rhythm Examiners Pediatric Electrophysiology (2015)

American Board of Internal Medicine Adult Congenital Heart Disease (2015)

CLINICAL FOCUS

Pediatric Electrophysiology

CURRENT RESEARCH

I am most interested in the diagnosis and treatment of arrhythmia in pediatric heart failure, especially the use of resynchronization therapy in the pediatric and congenital heart population.

It's more than just the technology; it is our caring staff, colleagues, and modern facilities that make the difference for every patient.

SELECTED PUBLICATIONS

Mind the Gap: Sex Disparity in Salaries Amongst Pediatric and Congenital Cardiac Electrophysiologists. Shah MJ, Dubin AM, Etheridge SP, Saare IEV, Stephenson EA, Escudero CA. *JACC:EP* 2021 in press.

Impact of Cardiac Resynchronization Therapy on Transplant-Free Survival in Pediatric and Congenital Heart Disease Patients. Chubb H, Rosenthal DN, Almond CS, Ceresnak SR, Motonaga KS, Arunamata AA, Long J, Trela AV, Hanisch D, McElhinney DB, Dubin AM. *Circ: Electrophys and Arrhythmia* 2020; 13:e0079253

An Exploratory Assessment of Pediatric Patient and Parent Needs After Implantable Cardioverter Defibrillator Implant. Schneider LM, Wong JJ, Trela A, Hanisch D, Shaw RJ, Sears SF, Motonaga KS, Ceresnak SR, Hood KH, Dubin AM. *PACE*: 2020; 43:289-296

A proposed method for the calculation of age-dependent QRS duration z-scores. Chubb H, Ceresnak SR, Motonaga KS, Dubin AM. *J Electrocardiol* 2020;58:132-4

Identifying an Appropriate Endpoint for Cryoablation in Children with Atrioventricular Nodal Reentry Tachycardia: is Residual Slow Pathway Conduction associated with Recurrence? Zook NB, DeBruler KE, Ceresnak SR, Motonaga KS, Goodyer W, Trela AV, Dubin AM, Chubb H. *Heart Rhythm* 2021: in press.



Alexander Dunn, PhD

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EDUCATION/TRAINING

PHD Caltech (2003)

HONORS & AWARDS

NIH Director's New Innovator Award

Burroughs Wellcome Career Award at the Scientific Interface

CVI Seed Grant (2013)

Terman Fellowship, Stanford University

James H. Clark Faculty Fellowship

American Heart Association
Postdoctoral Fellowship

Jane Coffin Childs Fellowship

Herbert Newby McCoy Award (Caltech,
outstanding chemistry PhD thesis)

Barry Goldwater Scholarship

GRADUATE ADMISSIONS COMMITTEE
Stanford Biophysics Program

SCIENTIFIC DIRECTOR
Cell Science Imaging Facility Cost
Center for Building 4

FELLOW
Stanford Chemical Biology Institute

MEMBER
Department of Chemical Engineering
undergraduate teaching committee

FACULTY ADVISOR
Stanford AICHE student chapter

STEERING COMMITTEE MEMBER
Stanford Cardiovascular Institute

CURRENT RESEARCH

The goal of our laboratory is to determine how molecular-scale information encodes the shape and physical properties of cells, tissues, and whole organisms. To do so, we use a combination of sophisticated microscopy, single-molecule biophysics, and theoretical modeling to explore how information propagates upwards across biological length scales. Specific questions we are currently investigating include: 1) How do molecular-scale asymmetries encoded in individual proteins give rise to the emergent physical properties of the cell; and 2) How do cells coordinate their actions to shape organs and tissues? In helping to answer these general questions we hope to understand the physical principles that underlie the construction of complex, multicellular life. We anticipate that this knowledge will be highly relevant to the development of stem-cell-based therapies and to engineering complex, three-dimensional tissues in the laboratory

SELECTED PUBLICATIONS

Physical basis for the determination of lumen shape in a simple epithelium. Vasquez CG, Vachharajani VT, Garzon-Coral C, Dunn AR. *Nat Commun.* 2021 Sep 23;12(1):5608. doi: 10.1038/s41467-021-25050-3.

Regulation and dynamics of force transmission at individual cell-matrix adhesion bonds. Tan SJ, Chang AC, Anderson SM, Miller CM, Prahls LS, Odde DJ, Dunn AR. *Sci Adv.* 2020 May 15;6(20):eaax0317. doi: 10.1126/sciadv.aax0317.

Vinculin forms a directionally asymmetric catch bond with F-actin. Huang DL, Bax NA, Buckley CD, Weis WI, Dunn AR. *Science.* 2017 Aug 18;357(6352):703-706. doi: 10.1126/science.aan2556.

Single Molecule Force Measurements in Living Cells Reveal a Minimally Tensioned Integrin State. Chang AC, Mekhdjian AH, Morimatsu M, Denisin AK, Pruitt BL, Dunn AR. *ACS Nano.* 2016 Dec 27;10(12):10745-10752. doi: 10.1021/acsnano.6b03314. Epub 2016 Nov 28.

Cell adhesion. The minimal cadherin-catenin complex binds to actin filaments under force. Buckley CD, Tan J, Anderson KL, Hanein D, Volkmann N, Weis WI, Nelson WJ, Dunn AR. *Science.* 2014 Oct 31;346(6209):1254211. doi: 10.1126/science.1254211.



Vinicio A. de Jesus Perez, MD, FAHA, FCCP, ATSF

Associate Professor of Medicine with Tenure - Division of Pulmonary, Allergy and Critical Care Medicine

Co-Director, Stanford Translational Investigator Program

Co-Chair, DOM Diversity and Inclusion Committee

Chair of 3CPR Scientific & Clinical Education Lifelong Learning Committee

Chair, AHA COC Diversity Committee

Chair, International Pulmonary Vascular Diseases Consortium (iPVD)

Vice-chair, 3CPR Scientific & Clinical Education Lifelong Learning Committee

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LAB <http://med.stanford.edu/dejesusperezlab/home.html>

EDUCATION/TRAINING

MD University of Puerto Rico

MEDICINE RESIDENCY

Massachusetts General Hospital

PULMONARY DISEASES FELLOWSHIP

University of Colorado
Stanford University

PULMONARY VASCULAR FELLOWSHIP

Stanford University

BOARD CERTIFICATION

Internal Medicine, ABIM
Pulmonary Diseases, ABIM
Critical Care Medicine, ABIM

CLINICAL FOCUS

Pulmonary Hypertension
Scleroderma Related Lung Diseases
Drug Induced Pulmonary Hypertension
Pulmonary Fibrosis

HONORS & AWARDS

American Society of Clinical Investigation (ASCI) membership
Pulmonary Hypertension Association Award for Outstanding K08
Be Heard Rare Challenge Disease International Award
FELLOW, American College of Chest Physicians
FELLOW, American Heart Association
FELLOW, American Thoracic Society
Keystone Symposia Fellowship
American Society of Clinical Invest. Young Physician Scientist Award
ATS Pulmonary Circulation Assembly Early Career award

EDITORIAL BOARD

American Journal of Respiratory and Critical Care Medicine, Pulmonary Circulation, Circulation Research, AJP Lung Cell Molecular Biology, PLoS One

CURRENT RESEARCH

My lab focuses on understanding the genetic, cellular and molecular mechanisms involved in the pathogenesis of pulmonary arterial hypertension (PAH). We are interested in understanding how pulmonary arteries respond to injury and identify novel genetic modifiers whose dysfunction can trigger small vessel loss and vascular remodeling in PAH patients. In particular, we are currently focused on exploring how the Wnt signaling pathways regulate the behavior of pulmonary artery endothelial cells (PAECs), smooth muscle cells (PASMCs) and pericytes in response to injury and whether mutations related to these pathways can affect signaling via other pathways relevant to PAH resulting in development of clinical disease. The overarching goal of our work is to identify potential biomarkers and drug targets that can be used in the development of novel diagnostic and treatment approaches to offer patients afflicted with this devastating disease.

SELECTED PUBLICATIONS

Loss of Endothelial Derived WNT5a is Associated With Reduced Pericyte Recruitment and Small Vessel Loss in Pulmonary Arterial Hypertension. Ke Yuan, Elya Shamskhov, Mark Orcholski, Abinaya Nathan, Sushma Reddy, Hiroaki Honda, Vigneshwaran Mani, Yitian Zeng, Mehmet Ozen, Lingli Wang, Utkan Demirci, Wen Tian, Mark Nicolls and Vinicio A. de Jesus Perez. *Circulation*. 139(14):1710-1724 (2019).

Targeted proteomics of right heart adaptation to pulmonary arterial hypertension. Myriam Amsallem, Andrew Sweatt, Jennifer Arthur, Julien Guihare, Maria Ghigna, Marlene Rabinovitch, Ramon Ramirez, VINICIO A. DE JESUS PEREZ, Edda Spiekerkoetter, Olaf Mercier, Francois Hadda and Roham T. Zamanian. *ERJ* (2020)

Mural Cell SDF-1 Signaling is Associated with the Pathogenesis of Pulmonary Arterial Hypertension. *American Journal of Respiratory and Molecular.* Ke Yuan, Yun Liu, Abinaya Nathan, Wu Tian, Joyce Yu, Andrew Sweatt, Elya Shamskhov, David Condon, Ananya Chakraborty, Stuti Agarwal, Natasha Auer, Shuan Zhang, Roham T. Zamanian, Mark R. Nicolls and VINICIO A. DE JESUS PEREZ. *Biology*. 62(6): 747-759 (2020) (PMID: 32084325).

Novel Molecular Mechanisms Targeted by Drug Trials in PAH. David Condon, Ananya Chakraborty, Stuti Agarwal, Rocio Taire, Hiral Patel, Roham Zamanian, and VINICIO DE JESUS PEREZ *Chest* 2022



Daniel B. Ennis, PhD

Professor, Department of Radiology, Stanford University
Director, Radiology Research, VA Palo Alto Health Care System

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EDUCATION/TRAINING

BS UCSD, Bioengineering

PHD Johns Hopkins, Biomedical Engineering

POST-DOC Stanford, Radiology and Cardiothoracic Surgery

HONORS & AWARDS

Society for Cardiovascular Magnetic Resonance, Fellow

American Heart Association, Fellow

International Society for Magnetic Resonance in Medicine, Senior Fellow

NIH Imaging Technology Development Study Section, Chair

Academy for Radiology and Biomedical Imaging Research, Distinguished Investigator

CURRENT RESEARCH

The Cardiac Magnetic Resonance (CMR) Group develops translational cardiac and cardiovascular MRI techniques to study cardiovascular physiology and improve clinical care for pediatric and adult patients. Current NIH R01 research projects focus on: 1) characterizing several cardiac MRI biomarkers to detect the cardiomyopathy associated with Duchenne Muscular Dystrophy; 2) developing MRI methods and a computational modeling framework to estimate changes in passive ventricular stiffness in patients with Heart Failure with Preserved Ejection Fraction (HFpEF); and identifying MRI-based biomarkers of atrial fibrosis. Our group is also very interested in further developing MRI methods to explore cardiac structure, function, flow, and remodeling with particular emphasis on MRI pulse sequence and gradient waveform design. One central aim of this effort is to increase the quantitative accuracy and reduce the image acquisition times for CMR exams.

The good life is one inspired by love and guided by knowledge. — Bertrand Russell

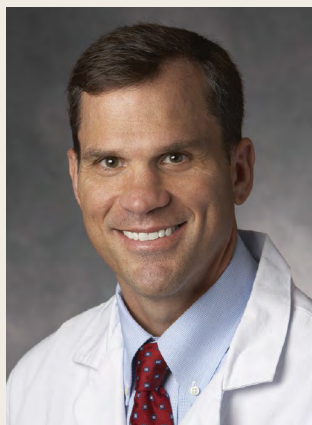
SELECTED PUBLICATIONS

Right Ventricular Function and T1ρ Mapping in Boys With Duchenne Muscular Dystrophy. SA Dual, NG Maforo, DB McElhinney, A Prosper, HH Wu, S Maskatia. *Journal of Magnetic Resonance Imaging* 54 (5), 1503-1513

Myofiber strain in healthy humans using DENSE and cDTI. K Moulin, P Croisille, M Viallon, IA Verzhbinsky, LE Perotti, DB Ennis. *Magnetic Resonance in Medicine* 86 (1), 277-292

On the impact of vessel wall stiffness on quantitative flow dynamics in a synthetic model of the thoracic aorta. J Zimmermann, M Loecher, FO Kolawole, K Bäuml, K Gifford, SA Dual. *Scientific reports* 11 (1), 1-14

Using synthetic data generation to train a cardiac motion tag tracking neural network. M Loecher, LE Perotti, DB Ennis. *Medical Image Analysis* 74, 102223.



William Fearon, MD

Professor of Medicine - Cardiovascular Medicine
Director, Interventional Cardiology

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EDUCATION/TRAINING

MD Columbia University, College of Physicians and Surgeons

MEDICINE RESIDENCY & INTERNSHIP
Stanford University

CARDIOLOGY FELLOWSHIP
Stanford University

INTERVENTIONAL CARDIOLOGY FELLOWSHIP
Stanford University

BOARD CERTIFICATION
Cardiovascular Medicine, ABIM
Interventional Cardiology, ABIM

CLINICAL FOCUS

Interventional Cardiology:
Percutaneous Coronary
Intervention and Transcatheter
Aortic Valve Replacement

HONORS & AWARDS

E. William Hancock, MD,
Cardiovascular Medicine Teaching
Award (2004, 2009, 2020)
Division of Cardiovascular Medicine
Mentoring Award (2008)
Division of Cardiovascular Medicine
Teaching Award (2004, 2013, 2017,
2018)
American Society for Clinical
Investigation (2015)
Association for University
Cardiologists (2020)
FELLOW
American College of Cardiology
Society of Cardiac Angiography and
Interventions
American Heart Association

CURRENT RESEARCH

My research group focuses on the invasive assessment of coronary physiology. In particular, we use coronary wire-based methods to evaluate which coronary artery narrowings are responsible for myocardial ischemia and warrant stenting. We have helped to perform multicenter, international clinical trials examining the role of fractional flow reserve in guiding percutaneous coronary intervention in various patient populations. Through NIH sponsored research, we have also applied these wire-based methods to understand better coronary microvascular function and its role in patient outcomes. For example, in collaboration with other members of the Cardiovascular Institute, we are investigating the effect of PCSK9 inhibition early after cardiac transplantation on coronary physiology and endothelial function.

The saying 'Don't judge a book by its cover' applies to coronary angiography. By invasively assessing coronary physiology, we have learned how misleading the angiogram can be.

SELECTED PUBLICATIONS

Accuracy of Fractional Flow Reserve Derived From Coronary Angiography. Fearon WF, Achenbach S, Engström T, Assali A, Shlofmitz R, Jeremias A, Fournier S, J Kirtane A, Kornowski R, Greenberg G, Jubeh R, Kolansky DM, McAndrew T, Dressler O, Maehara A, Matsumura M, Leon MB, De Bruyne B. *Circulation*, 2019; 139:477-484.

Prognostic value of comprehensive intracoronary physiology assessment early after heart transplantation. Ahn JM, Zimmermann FM, Arora S, Solberg OG, Angerås O, Rolid K, Rafique M, Aaberge L, Karason K, Okada K, Luikart H, Khush KK, Honda Y, Pijls NHJ, Lee SE, Kim JJ, Park SJ, Gullestad L, Fearon WF. *Eur Heart J* 2021;42:4918-4929.

Microcirculatory Resistance Predicts Allograft Rejection and Cardiac Events After Heart Transplantation. Ahn JM, Zimmermann FM, Gullestad L, Angerås O, Karason K, Russell K, Lunde K, Okada K, Luikart H, Khush KK, Honda Y, Pijls NHJ, Lee SE, Kim JJ, Park SJ, Solberg OG, Fearon WF. *J Am Coll Cardiol* 2021;78:2425-2435.

FAME 3 Investigators. Fractional Flow Reserve-Guided PCI as Compared with Coronary Bypass Surgery. Fearon WF, Zimmermann FM, De Bruyne B, Piroth Z, van Straten AHM, Szekely L, Davidavičius G, Kalinauskas G, Mansour S, Kharbada R, Östlund-Papadogeorgos N, Aminian A, Oldroyd KG, Al-Attar N, Jagic N, Dambrink JE, Kala P, Angerås O, McCarthy P, Wendler O, Casselman F, Witt N, Mavromatis K, Miner SES, Sarma J, Engström T, Christiansen EH, Tonino PAL, Reardon MJ, Lu D, Ding VY, Kobayashi Y, Hlatky MA, Mahaffey KW, Desai M, Woo YJ, Yeung AC, Pijls NHJ. *N Engl J Med* 2022;386:128-137.



Jeffrey A. Feinstein, MD, MPH

Dunlevie Family Professor of Pulmonary Vascular Disease,
and Professor, by courtesy, of Bioengineering
Director, Vera Moulton Wall Center

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PROFILE profiles.stanford.edu/jeffrey-feinstein

EDUCATION/TRAINING

MD New York Medical College (1991)

MPH George Washington University,
Health Administration (1994)

MS Duke University, Biomedical
Engineering (1987)

INTERNSHIP & RESIDENCY

Children's Hospital National Medical
Center (1992, 1994)

FELLOWSHIP

Children's Hospital Boston (1998)
Children's Hospital National Medical
Center (1997)

BOARD CERTIFICATION

Pediatric Cardiology, ABP (1998)

CLINICAL FOCUS

Pulmonary Hypertension; Pulmonary
Vascular Disease; Pulmonary Vascular
Abnormalities; Congenital Heart
Defects; Biomechanical Engineering/
Bioengineering; Pediatric Cardiology

HONORS & AWARDS

The Dunlevie Family Professorship in
Pulmonary Vascular Disease

Medical Advisory Board, Alagille
Syndrome Alliance (2016–Present)

Medical Director, Pediatric Pulmonary
Hypertension Program, LPCH (1998–
Present)

Director, Vera Moulton Wall Center for
Pulmonary Vascular Disease, Stanford
University (2000–Present)

Director, Pediatric Cardiology Training
Program, Stanford University (2009–
2015)

Associate Chair, Education; Department
of Pediatrics (Fellowships), Stanford
University (2012–2016)

CURRENT RESEARCH

Research interests include (1) computer simulation and modeling of cardiovascular physiology with specific attention paid to congenital heart disease and its treatment, (2) the evaluation and treatment of pulmonary hypertension/pulmonary vascular diseases, and (3) development and testing of medical devices/therapies for the treatment of congenital heart disease and pulmonary vascular diseases.

SELECTED PUBLICATIONS

Pulmonary Lung Doppler Signals: Normative Data in a Pediatric Population Compared With Adults. Journal of Clinical Monitoring and Computing. Burstein, D. S., Hopper, R. K., McCarthy, E. K., Hall, K., Schatzberger, R., Palti, Y., Feinstein, J. A. *J Clin Monit Comput* (2019).

Evolution of Hemodynamic Forces in the Pulmonary Tree With Progressively Worsening Pulmonary Arterial Hypertension in Pediatric Patients. Yang, W., Dong, M., Rabinovitch, M., Chan, F. P., Marsden, A. L., Feinstein, J. A. *Biomech Model Mechanobiol*. 2019

Death or Resolution: The “Natural History” of Pulmonary Hypertension in Bronchopulmonary Dysplasia. Altit, G., Bhombal, S., Hopper, R. K., Tacy, T. A., Feinstein, J. *J Perinatol*. 2019 Jan 7.

Subcutaneous Treprostinil in Pediatric Patients With Failing Single-ventricle Physiology. Handler, S. S., Ogawa, M. T., Hopper, R. K., Sakarovitch, C., Feinstein, J. A. *J Heart Lung Trans* 2018.

Right Ventricular Stroke Work Correlates with Outcomes in Pediatric Pulmonary Arterial Hypertension. Yang, W., Marsden, A. L., Ogawa, M. T., Sakarovitch, C., Hall, K. K., Rabinovitch, M., Feinstein, J. A. *Pulm Circ*. 2018 Jul-Sep.

Relationship Between Pulmonary Vascular Resistance and Right Ventricular Dysfunction Assessed by MRI in Pediatric Pulmonary Arterial Hypertension. Hopper, R. K., Chen, H., Ogawa, M., Feinstein, J. A. *Amer Thoracic Soc*. 2018.



Michael Fischbein, MD, PhD

Associate Professor of Cardiothoracic Surgery (Adult Cardiac Surgery)

Director of Thoracic Aortic Surgery

Program Director, Department of Cardiothoracic Surgery

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EDUCATION/TRAINING

MD Boston University (1995)

PHD UCLA (2001)

RESIDENCY UCLA (2003)

FELLOWSHIP Stanford University (2006)

BOARD CERTIFICATION

Thoracic Surgery, American Board of Thoracic Surgery,
General Surgery, American Board of Surgery

CLINICAL FOCUS

Cardiothoracic Surgery
Aortic Diseases
Thoracic Surgery
Anomalous Coronary Artery (ACA)
Aortic Stenosis
Bicuspid Aortic Valve Disease
Coarctation of the Aorta
Coronary Artery Disease

HONORS & AWARDS

Donald Morton Research Award,
Department of Surgery - UCLA School of Medicine (2003)

Ronald K. Tompkins Golden Apple
Teaching Award, UCLA School of Medicine (2003)

Golden Scalpel Award for Teaching
Excellence, Division of General Surgery - UCLA School of Medicine (2003)

MEMBER

American Heart Assoc. Society of Thoracic Surgeons, San Francisco Surgical Society, Western Thoracic Surgical Society Assoc for Academic Surgery, American College of Surgeons, Society of University Surgeons

CURRENT RESEARCH

Our group is interested the molecular and genetic mechanisms of aortic aneurysm/dissection development, and the molecular mechanisms of aneurysm formation in Marfan Syndrome. Clinical research interests include thoracic aortic diseases (aneurysms, dissections).

SELECTED PUBLICATIONS

Anatomically Specific Reactive Oxygen Species Production Participates in Marfan Syndrome Aneurysm Formation. Emrich F, Penov K, Arakawa M, Dhablania N, Burdon G, Pedroza AJ, Koyano TK, Kim YM, Raaz U, Connolly AJ, Iosef C, Fischbein MP. *J Cell Mol Med*, 2019; Aug 11.

Statins Reduce Thoracic Aortic Aneurysm Growth in Marfan Syndrome Mice via Inhibition of the Ras-Induced ERK (Extracellular Signal-Regulated Kinase) Signaling Pathway. Sato T, Arakawa M, Tashima Y, Tsuboi E, Burdon G, Trojan J, Koyano T, Youn YN, Penov K, Pedroza A, Shabazzi M, Palmon I, Nguyen M, Connolly A, Yamaguchi A, Fischbein MP. *JAHA*, 2018; e008543.

Long-term miR-29b Suppression Reduces Aneurysm Formation in a Marfan Mouse Model. Okamura H, Emrich F, Trojan J, Chiu P, Dalal AR, Arakawa M, Sato T, Penov K, Koyano T, Pedroza A, Connolly AJ, Rabinovitch M, Alvira C, Fischbein MP. *Physiol Rep*. 2017 Apr;5(8).

Enhanced Caspase Activity Contributes to Aortic Wall Remodeling and Early Aneurysm Development in a Murine Model of Marfan Syndrome. Emrich FC, Okamura H, Dalal AR, Penov K, Merk DR, Raaz U, Hennigs JK, Chin JT, Miller MO, Pedroza AJ, Craig JK, Koyano TK, Blankenberg FG, Connolly AJ, Mohr FW, Alvira CM, Rabinovitch M, Fischbein MP. *Arterioscler Thromb Vasc Biol.*; 2015, Jan; 35 (1): 146-54.

Assessment of Elastin Deficit in a Marfan Mouse Aneurysm Model Using an Elastin-Specific Magnetic Resonance Imaging Contrast Agent. Okamura H, Pisani LJ, Dalal AR, Emrich F, Dake BA, Arakawa M, Onthank DC, Cesati RR, Robinson SP, Milanese M, Kotek G, Smit H, Connolly AJ, Adachi H, McConnell M, Fischbein MP. *Circ Cardiovasc Imaging* 2014; July 7 (4): 690-6.

miR-29b Participates in Early Aneurysm Development in Marfan Syndrome. Merk D, Chin JT, Dake BA, Maegdefessel L, Miller MO, Kimura N, Tsao PS, Iosef C, Berry G, Mohr FW, Spin J, Alvira CM, Robbins RC, Fischbein MP. *miR-29b Participates in Early Aneurysm Development in Marfan Syndrome.* *Circ Research* 2011; 110 (2); 312-24.



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EDUCATION/TRAINING

MD Dartmouth Medical School

PHD Dartmouth College

MEDICINE RESIDENCY
UCSF

CARDIOLOGY FELLOWSHIP
UCSF

BOARD CERTIFICATION
Diplomate, ABIM

Interventional Cardiovascular Medicine,
ABIM

CLINICAL FOCUS

Interventional Cardiology

HONORS & AWARDS

FDA Medical Device Advisory Panel

CO-FOUNDER

Latterall Venture Partners;
Tri-Ventures

FELLOW

American College of Cardiology

MEMBER

American Medical Association; American
Federation of Clinical Research;
American Society of Echocardiography

CURRENT RESEARCH

My laboratory includes 17 postdoctoral fellows and graduate engineering students focusing on state-of-the-art technologies in Cardiovascular Medicine. I have led or participated in over 150 clinical trials and published over 450 manuscripts/chapters. In addition, I head the Stanford/Asia MedTech innovation program. I have been principle/founder of eighteen medical device companies in the San Francisco Bay Area; twelve of these start-ups have transitioned to large medical device companies. I serve on several boards of directors and have advised dozens of medical device startups as well as multinational healthcare companies in the design and development of new diagnostic and therapeutic devices in the cardiovascular arena.

Technology in medicine is very important, and is ultimately going to be important for patients.

SELECTED PUBLICATIONS

Intravascular ultrasound predictors of 4-year clinical outcomes following absorb bioresorbable scaffold implantation: Insights from the absorb Japan Trial. Nishi, T., Okada, K., Kitahara, H., Kameda, R., Ikutomi, M., Hollak, B., Yock, P., Popma, J., Kusano, H., Cheong, W., Sudhir, K., Fitzgerald, P., Honda, Y., Kimura, T. *ELSEVIER SCIENCE INC.* 2019: 1305.

Periarterial Neovascularization and Attenuated-Signal Plaque Predict Long-Term Mortality after Heart Transplantation: Risk Stratification with IVUS-Determined Coronary Inflammatory Findings. Kashiwayama, K., Okada, K., Kitahara, H., Kameda, R., Hollak, M., Luikart, H., Yock, P., Yeung, A., Fitzgerald, P., Khush, K., Fearon, W., Honda, Y. *ELSEVIER SCIENCE INC.* 2019: 1428.

A First-In-Human Study of the Second-Generation, Thin-Strut, Everolimus-Eluting Bioresorbable Scaffold: 6-Month IVUS and OCT From the Fast Clinical Trial. Kameda, R., Okada, K., Ikutomi, M., Hollak, M., Yock, P., Popma, J., Seneviratne, S., Erglis, A., Walters, D., Whitbourn, R., Layland, J., Stewart, J., El-Jack, S., Christen, T., Meredith, I., Fitzgerald, P., Honda, Y. *ELSEVIER SCIENCE INC.* 2019: 1111

A Y-shaped Bifurcation-dedicated Stent for the Treatment of De Novo Coronary Bifurcation Lesions: An IVUS Analysis From the BRANCH Trial. Sakata K, Koo BK, Waseda K, Nakatani D, Yock PG, Whitbourn R, Worthley SG, Ormiston J, Webster M, Wilkins GT, Honda Y, Meredith IT, Fitzgerald PJ. *EuroIntervention.* 2014, Aug 30.

Baseline and 9 Months IVUS Analysis of the Bifurcation-dedicated Biolimus A9-eluting Axxess Stent System: The DIVERGE IVUS Substudy. Buyschaert I, Sanidas E, Hasegawa T, Koo BK, Honda Y, Fitzgerald PJ, Verheye S. *Catheter Cardiovasc Interv.*; 2014, Dec 1; 84(7):1062-70.



Dominik Fleischmann, MD

Professor, Radiology
Chief, Cardiovascular Imaging
Director of CT, Stanford HealthCare
Medical Director, Stanford 3DQ Lab

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radiology.stanford.edu/patient/clinical_sections/computedtomography
3dradiology.stanford.edu

EDUCATION/TRAINING

MD University of Vienna

MEDICINE RESIDENCY

University of Vienna

RESEARCH RADIOLOGY FELLOWSHIP

Stanford University

BOARD CERTIFICATION

Diagnostic Radiology (EU)

CLINICAL FOCUS

Non-Invasive Cardiovascular Imaging
Clinical Image Processing
Diagnostic Radiology

HONORS & AWARDS

Senior Faculty of the Year Award,
Stanford Radiology (2011, 2012)

CHAIR

Refresher Course Subcommittee
(Vascular), Radiological Society of North
America (RSNA) (2009-201)

FELLOW

Society of Computed Body Tomography
and MR (SCBT/MR)

MEMBER

American Heart Association
North American Society for
Cardiovascular Imaging

ASSOCIATE EDITOR

Radiology (Cardiac Imaging)

DEPUTY EDITOR

Radiology – Cardiothoracic Imaging

EXECUTIVE & STEERING COMMITTEE

MEMBER Stanford Cardiovascular
Institute

CURRENT RESEARCH

My research area broadly covers cardiovascular imaging, ranging from technical optimization of image acquisition for improving temporal and spatial resolution, to the application of novel imaging technologies for detecting, staging and treatment planning of cardiovascular diseases, post-processing and modelling, and individual risk stratification based on data extracted from high-resolution imaging.

I have a strong clinical and research interest in acute aortic diseases, where my lab develops novel clinically applicable tools to measure and monitor patients with aortic aneurysms and dissections. We are the primary site of a multicenter international effort to improve treatment decisions for patients with so-called uncomplicated type B aortic dissection.

Currently we only use a tiny fraction of the wealth of information contained in modern multidimensional imaging data. This is the time to exploit these data.

A picture says more than a thousand words;
now imagine what three-, four- and more
dimensional visualization can do.

SELECTED PUBLICATIONS

Acute Limited Tears of the Thoracic Aorta. Chin AS, Willemink MJ, Kino A, Hinostroza V, Sailer AM, Fischbein MP, Dake MD, Mitchell RS, Berry G, Miller DC, Fleischmann D. *J Am Coll Cardiol.* 2018 June 19;71(24):2773-2785.

Incremental Value of Calcifications of the Aortomitral Continuity After Transcatheter Aortic Valve Replacement. Willemink MJ, Maret E, Moneghetti KJ, Kim JB, Haddad F, Kobayashi Y, Nishi T, Cauwenberghs N, Kuznetsova T, Higashigaito K, Sailer AM, Yeung AC, Lee AM, Miller DC, Fischbein M, Fearon WF, Fleischmann D. *Radiology: Cardiothoracic Imaging*, 2019.

Improving Spatial Resolution at CT: Development, Benefits, and Pitfalls. Wang J, Fleischmann D. *Radiology.* 2018 June 26;289(1).

The Effect of Iodinated Contrast Medium Volume on Post-contrast Acute Kidney Injury after Contrast-enhanced CT in 3,450 Patients. Koci M, Graber-Naidich A, Sucha D, Mastrodicasa D, Turner VL, Cheng XS, Willemink MJ, Fleischmann D. *Oral presentation at Radiological Society of North America Annual Meeting*, Chicago, IL Dec 2019.



Victor Froelicher, MD

Professor Emeritus, Medicine - Cardiovascular Medicine

Professor (by courtesy), Orthopedics

Consultant, Stanford Sports Cardiology Clinic

VAPAHSC Cardiologist Consultant

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EDUCATION/TRAINING

MD University of Pittsburg

MEDICINE RESIDENCY & INTERNSHIP
Wilford Hall USAFMC Medical Center

CARDIOLOGY FELLOWSHIP
University of Alabama

BOARD CERTIFICATION
Internal Medicine, ABIM
Cardiology, ABIM

CLINICAL FOCUS

Ambulatory and Resting
Electrocardiography, Sports Cardiology

HONORS & AWARDS

FORMER CHIEF AND ASSISTANT CHIEF OF CARDIOLOGY (1983-1992)
Long Beach VAMC and UC Irvine

MILITARY SERVICE
Lt Col USAFMC (1963-1977)
FORMER ASSISTANT CHIEF OF
CARDIOLOGY Wilford Hall USAFMC

FORMER DIRECTOR Cardiac
Catheterization Lab and Exercise Testing
School of Aerospace Medicine

FELLOW
American College of Cardiology (ACC);
American Heart Association; American
College of Sports Medicine

CURRENT RESEARCH

My research and clinical interests include cardiovascular screening of athletes of all ages, non-invasive electrocardiography (rest and ambulatory), ECG patches, atrial fibrillation, and automated arrhythmia analysis.

SELECTED PUBLICATIONS

The Journal of Cardiopulmonary Rehabilitation and Prevention at 40 Years and Its Role in the Evolution of Cardiac Rehabilitation. Ades, P. A., Balady, G. J., Berra, K., Franklin, B. A., Froelicher, V., Hamm, L. F., Kaminsky, L. A., Williams, M. A. *Journal of Cardiopulmonary Rehabilitation and Prevention*, 2020; 40 (1): 2-8.

Impact of the Distance From the Chest Wall to the Heart on Surface ECG Voltage in Athletes. Hedman, K., Patti, A., Moneghetti, K. J., Hsu, D., Christle, J. W., Ashley, E., Hadley, D., Haddad, F., Froelicher, V. *BMJ Open Sport & Exercise Medicine*, 2020; 6 (1): e000696.

Comparison of the Stanford ECG Left Atrial Criteria With the International ECG Criteria for Sports Screening. Hock, J., Wheeler, M., Singh, T., Ha, L. D., Hadley, D., Froelicher, V. *Clinical Journal of Sport medicine: Official Journal of the Canadian Academy of Sport Medicine*, 2019.

The Association Between ECG Voltage and Left-ventricular Mass, Sex, Body Size and the Distance Between the Heart and Chest Wall in College Athletes. Hedman, K., Moneghetti, K. J., Hsu, D., Christle, J. W., Haddad, F., Froelicher, V. *F. Oxford Unvi. Press.* 2019: 2649.

Limitations of Electrocardiography for Detecting Left Ventricular Hypertrophy or Concentric Remodeling in Athletes. Hedman, K., Moneghetti, K. J., Hsu, D., Christle, J. W., Patti, A., Ashley, E., Hadley, D., Haddad, F., Froelicher, V. *The American Journal of Medicine*, 2019.



Christopher Gardner, PhD

Rehnborg Farquhar Professor

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WEB nutrition.stanford.edu

EDUCATION/TRAINING

PHD University of California, Berkeley

HONORS & AWARDS

Chair of the American Heart Association's Nutrition Committee (2022-2024)

Outstanding Faculty Advisor, Program in Human Biology (2011-2012)

Teaching Award, Stanford Prevention Research Center (2011)

Teaching Award, Stanford Prevention Research Center (2005)

CURRENT RESEARCH

I have been involved in more than a dozen human intervention trials involving more than 2,000 participants. These have examined the potential health benefits of garlic, soy, antioxidants, fish oil, ginkgo biloba, vegetarian diets, and weight loss diets. My current research involves diet interventions exploring the impact on the microbiome and immune function/inflammation. In the past few years my long-term research interests have shifted to include a line of inquiry that falls more under the umbrella of food systems research. This shift came from the realization and appreciation that focusing on "health" as a motivator can drastically limit the potential impact for change. This led me to seek out colleagues at Stanford in the fields of business, law, education, earth sciences, medicine, and many disciplines from humanities and sciences. I was recently funded (2021) to create a Plant-Based Diet Initiative. I am currently in the process of building on the idea that Stanford is uniquely positioned geographically, culturally, and academically, to address national and global crises in obesity and diabetes that are directly related to problems with our food systems. My current nutrition and food research involves institutional food settings such as universities, worksites, hospitals, and schools. I serve on the Scientific Advisory board of the Culinary Institute of America and have many colleagues that are chefs striving to elevate the unapologetic deliciousness of food, while also addressing human and environmental health. My long-term goal is to contribute to and accelerate positive changes in the food environment and social norms.

The river delights to lift us free, if only we dare let go. Our true work is this voyage, this adventure.

— Richard Bach

SELECTED PUBLICATIONS

Gut Microbiota-Targeted Diets Modulate Human Immune Status. Wastyk HC, Fragiadakis GK, Perelman D, Dahan D, Merrill BD, Yu B, Topf M, Gonzalez CG, Robinson JL, Elias JE, Sonnenburg ED, Gardner CD, Sonnenburg JL. *Cell*. 2021;184:4137-4153.

Effect of Low-fat vs. Low-carbohydrate Diet on 12-month Weight Loss in Overweight Adults and the Association With Genotype Pattern or Insulin Secretion: A Randomized Clinical Trial [the Diet Intervention Examining The Factors Interacting with Treatment Success (DIETFITS)] study. Gardner CD, Trepanowski JF, Del Gobbo LC, Hauser ME, Rigdon J, Ioannidis JPA, Desai M, King AC. *JAMA* 2018;319(7):667-79.

Maximizing the Intersection of Human Health and the Health of the Environment Regarding the Amount and Type of Protein Produced and Consumed in the US. Gardner CD, Hartle JC, Garrett RD, Offringa LC, Wasserman AS. *Nutr Rev* 2019;77:197-215.

Nutrition Therapy for Adults With Diabetes or Prediabetes: A Consensus Report. Evert AB, Dennison M, Gardner CD, Garvey WT, Lau KHK, MacLeod J, Mitri J, Pereira RF, Rawlings K, Robinson S, Saslow L, Uelmen S, Urbanski PB, Yancy WS Jr. *Diabetes Care*. 2019 May;42(5):731-754.

Increasing Vegetable Intake by Emphasizing Tasty and Enjoyable Attributes: A Randomized Controlled Multi-site Intervention for Taste-focused Labeling. Turnwald B, Gardner CD, Crum A. et al., *Psych Science*. 2019;30:1603-1615.



Francois Haddad, MD

Clinical Associate Professor, Medicine (Cardiovascular)
Director, Stanford CVI Biomarker and Phenotypic Core Laboratory

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EDUCATION/TRAINING

MD University of Montreal

PHD(c) University of Montreal

RESIDENCY Montreal University

CARDIOVASCULAR IMAGING FELLOWSHIP

Montreal Heart Institute

HEART FAILURE/TRANSPLANT & PULMONARY VASCULAR DISEASE FELLOWSHIP Stanford University

BOARD CERTIFICATION

Cardiology, Royal College of Physicians
Internal Medicine, Royal College of Physicians

CLINICAL FOCUS

Cardiology

Right Heart Failure

Precision Medicine and Biomarker focused research

Cardio-immunology

Heart Transplantation

HONORS & AWARDS

American Heart Association 3CPR Council

Fellow American Heart Association

Expert Panelist, American Thoracic Association

Task Force member, WHO Pulmonary Hypertension Committee (2013 - 2018)

Right Heart Expert Panel, American Thoracic Society (2015 - 2018)

CURRENT RESEARCH

My research focuses on precision cardiovascular health. Our laboratory focuses on (1) identifying the most useful imaging and circulating biomarkers to guide management of cardiovascular health and disease; (2) on elucidating the mechanisms of heart failure with preserved ejection fraction and metabolic cardiomyopathy; (3) on developing novel therapeutics for right heart failure and (4) on cardio-immunology. Our laboratory focuses on applying precision imaging, exercise testing and biomarker to facilitate translational studies in heart failure, pulmonary hypertension, diabetes mellitus and stem cell therapy.

Our mission is to contribute to precision cardiovascular health through comprehensive physiological phenotyping and a focused approach to biomarker discovery. We are developing new imaging and biomarker platforms as well as new computational approaches to biomarker discovery.

SELECTED PUBLICATIONS

A Longitudinal Big Data Approach for Precision Health. Schüssler-Fiorenza Rose SM, Contrepois K, Moneghetti KJ, Zhou W, Mishra T, Mataraso S, Dagan-Rosenfeld O, Ganz AB, Dunn J, Hornburg D, Rego S, Perelman D, Ahadi S, Sailani MR, Zhou Y, Leopold SR, Chen J, Ashland M, Christle JW, Avina M, Limcaoco P, Ruiz C, Tan M, Butte AJ, Weinstock GM, Slavich GM, Sodergren E, McLaughlin TL, Haddad F, Snyder MP. *Nat Med.* 2019 May;25(5):792-804.

Approaching Higher Dimension Imaging Data Using Cluster-Based Hierarchical Modeling in Patients with Heart Failure Preserved Ejection Fraction. Kobayashi Y, Tremblay-Gravel M, Boralkar KA, Li X, Nishi T, Amsallem M, Moneghetti KJ, Bouajila S, Selej M, Ozen MO, Demirci U, Ashley E, Wheeler M, Knowlton KU, Kouznetsova T, Haddad F. *Sci Rep.* 2019 Jul 18;9(1):10431.

The 2013 ACC/AHA Risk Score and Subclinical Cardiac Remodeling and Dysfunction: Complementary in Cardiovascular Disease Prediction. Cauwenberghs N, Hedman K, Kobayashi Y, Vanassche T, Haddad F, Kuznetsova T. *Int J Cardiol.* 2019 Dec 15;297:67-74.

Autoantibody Profiling on a Plasmonic Nano-gold Chip for the Early Detection of Hypertensive Heart Disease. Li X, Kuznetsova T, Cauwenberghs N, Wheeler M, Maecker H, Wu JC, Haddad F, Dai H. *Proc Natl Acad Sci USA.* 2017 Jul 3;114(27):7089-7094.

Noninvasive Imaging in the Assessment of the Cardiopulmonary Vascular Unit. Noordegraaf, A. V., Haddad, F., Bogaard, H. J., Hassoun, P. M. *Circulation*; 2015; 131 (10): 899-913.



Frank Hanley MD

Lawrence Crowley, MD Endowed Professor in Child Health
Cardiothoracic Surgery

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EDUCATION/TRAINING

MD Tufts University

INTERNSHIP UCSF Medical Center

RESIDENCY UCSF Medical Center

FELLOWSHIP UCSF Medical Center

BOARD CERTIFICATION

Thoracic Surgery, ABTS

CLINICAL FOCUS

Cardiac Surgery

Cardiothoracic Surgery, Pediatric

Thoracic Surgery

HONORS & AWARDS

Outstanding Graduating Student in Surgery (Martin J Loeb Award), Tufts Medical School (1978)

Alpha Omega Alpha medical society, University of California, San Francisco (1986)

Outstanding Resident Teaching Award, University of California, San Francisco (1986)

Outstanding Surgical Chief Resident Award, University of California, San Francisco (1986)

Excellence in Teaching Award in the Department of Surgery, University of California, San Francisco (1992-94)

Lawrence Crowley, MD, Endowed Professorship in Child Health, Stanford (2004)

CURRENT RESEARCH

Dr. Hanley's research and clinical work focuses on the development of interventional techniques for fetal and neonatal treatment of congenital heart disease, pulmonary, vascular physiology, and the neurologic impact of open-heart surgery. He developed and pioneered the unifocalization procedure, in which a single procedure is used to repair a complex and life-threatening congenital heart defect rather than several staged open-heart surgeries as performed by other surgeons. Currently, Lucile Packard Children's Hospital is a worldwide referral site for patients requiring these procedures. Hanley is also actively involved in exploring new approaches for the surgical repair of pediatric heart disease and is developing evidence-based guidelines for clinical care.

SELECTED PUBLICATIONS

Postoperative Outcomes of Children With Tetralogy of Fallot, Pulmonary Atresia, and Major Aortopulmonary Collaterals Undergoing Reconstruction of Occluded Pulmonary Artery Branches Asija, R., Koth, A. M., Velasquez, N., Chan, F. P., Perry, S. B., Hanley, F. L., McElhinney, D. *Annals of Thoracic Surgery*. 2016; 101 (6): 2329-2334.

Pulmonary Valve Repair for Patients With Acquired Pulmonary Valve Insufficiency. Said, S. M., Mainwaring, R. D., Ma, M., Tacy, T. A., Hanley, F. L. *Annals of Thoracic Surgery*. 2016; 101 (6): 2294-2301.

Surgical Repair of 115 Patients With Anomalous Aortic Origin of a Coronary Artery From a Single Institution. Mainwaring, R. D., Murphy, D. J., Rogers, I. S., Chan, F. P., Petrossian, E., Palmon, M., Hanley, F. L. *World Journal for Pediatric & Congenital Heart Surgery*. 2016; 7 (3): 353-359

Exploring the Role of Polycythemia in Patients With Cyanosis After Palliative Congenital Heart Surgery. Siehr, S. L., Shi, S., Hao, S., Hu, Z., Jin, B., Hanley, F., Reddy, V. M., McElhinney, D. B., Ling, X. B., Shin, A. Y. *Pediatric Critical Care Medicine*. 2016; 17 (3): 216-222

Mitral Stenosis and Aortic Atresia-A Risk Factor for Mortality After the Modified Norwood Operation in Hypoplastic Left Heart Syndrome. Siehr, S. L., Maeda, K., Connolly, A. A., Tacy, T. A., Reddy, V. M., Hanley, F. L., Perry, S. B., Wright, G. E. *Annals of Thoracic Surgery*. 2016; 101 (1): 162-168.

Critical Role of Coaptive Strain in Aortic Valve Leaflet Homeostasis: Use of a Novel Flow Culture Bioreactor to Explore Heart Valve Mechanobiology. Maeda, K., Ma, X., Hanley, F. L., Riemer, R. K. *Journal of the American Heart Association*. 2016; 5 (8).



Robert A. Harrington, MD

Arthur L. Bloomfield Professor of Medicine

Chair, Department of Medicine, Stanford University School of Medicine

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CURRENT RESEARCH

My research focuses on redefining the care of patients with acute ischemic heart disease while building local, national and international collaborations for the efficient conduct of innovative clinical research and trying to better understand and improve upon the methodology of clinical trials.

Society needs academic centers to step up and figure out how we are going to deliver high-quality, equitable health care while also advancing science and educating the next generation of clinical leaders.

SELECTED PUBLICATIONS

Comparative Effectiveness of Aspirin Dosing in Cardiovascular Disease. Jones WS, Mulder H, Wruck LM, Pencina MJ, Kripalani S, Muñoz D, Crenshaw DL, Effron MB, Re RN, Gupta K, Anderson RD, Pepine CJ, Handberg EM, Manning BR, Jain SK, Girotra S, Riley D, DeWalt DA, Whittle J, Goldberg YH, Roger VL, Hess R, Benziger CP, Farrehi P, Zhou L, Ford DE, Haynes K, Harrington RA, Hernandez AF; ADAPTABLE Team. *N Engl J Med.* 2021 May 27;384(21):1981-1990. doi: 10.1056/NEJMoa2102137. Epub 2021 May 15

COVID-19 at 1 Year: American Heart Association Presidents Reflect on the Pandemic. Elkind MSV, Harrington RA, Lloyd-Jones DM. *Circulation.* 2021 Mar 2;143(9):e746-e748. doi: 10.1161/CIRCULATIONAHA.120.053439. Epub 2021 Mar

Management of Antithrombotic Therapy after Acute Coronary Syndromes. Rodriguez F, Harrington RA. *N Engl J Med.* 2021 Feb 4;384(5):452-460. doi: 10.1056/NEJMra1607714.

Generating evidence for therapeutic effects: the need for well-conducted randomized trials. Califf RM, Curtis LH, Harrington RA, Hernandez AF, Peterson ED. *J Clin Invest.* 2021 Jan 19;131(2):e146391. doi: 10.1172/JCI146391.

Call to Action: Rural Health: A Presidential Advisory From the American Heart Association and American Stroke Association. Harrington RA, Califf RM, Balamurugan A, Brown N, Benjamin RM, Braund WE, Hipp J, Konig M, Sanchez E, Joynt Maddox KE. *Circulation.* 2020 Mar 10;141(10):e615-e644. doi: 10.1161/CIR.0000000000000753. Epub 2020 Feb 10

Advancing Healthcare Reform: The American Heart Association's 2020 Statement of Principles for Adequate, Accessible, and Affordable Health Care: A Presidential Advisory From the American Heart Association. Warner JJ, Benjamin IJ, Churchwell K, Firestone G, Gardner TJ, Johnson JC, Ng-Osorio J, Rodriguez CJ, Todman L, Yaffe K, Yancy CW, Harrington RA; American Heart Association Advocacy Coordinating Committee. *Circulation.* 2020 Mar 10;141(10):e601-e614. doi: 10.1161/CIR.0000000000000759. Epub 2020 Feb 3.

EDUCATION/TRAINING

MD Tufts University

MEDICINE RESIDENCY

University of Massachusetts

INTERVENTIONAL

CARDIOLOGY FELLOWSHIP

Duke University

BOARD CERTIFICATION

ABIM Internal Medicine, ABIM

Cardiovascular Disease, ABIM

CLINICAL FOCUS

Cardiovascular Disease

HONORS & AWARDS

Elected member: Institute of Medicine/
National Academy of Medicine

Elected member: Association of
University Cardiologists

Elected member: Association of
American Physicians

Master, American College of Cardiology

2017 Clinical Research Prize, American
Heart Association

President 2019-2020, American Heart
Association



Paul A. Heidenreich, MD, MS

Professor and Vice-Chair for Quality, Department of Medicine
 Professor (by courtesy), Health Research and Policy
 Chief of Medicine, VA Palo Alto Health Care System

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EDUCATION/TRAINING

MD University of Chicago

MS Health Services Research, Stanford University

INTERNAL MEDICINE RESIDENCY
UCSF

CARDIOVASCULAR IMAGING
FELLOWSHIP UCSF

CLINICAL CARDIOLOGY FELLOWSHIP
UCSF

BOARD CERTIFICATION
 Cardiovascular Disease, ABIM
 Internal Medicine, ABIM
 Transthoracic plus Transesophageal
 Certification in Adult
 Echocardiography, NBE

CLINICAL FOCUS

Cardiac Imaging

HONORS & AWARDS

American Heart Association, Quality of Care and Outcomes Research Council, Life-Time Achievement Award (2020)

American Heart Association, Award of Meritorious Achievement (2020)

ELITE REVIEWER
Journal of the American College of Cardiology (ACC)

FELLOW
ACC; American Heart Association

MEMBER
 American College of Physicians;
 American Society of Echocardiography

CURRENT RESEARCH

My current research interests include: 1) the cost-effectiveness of new cardiovascular technologies (for example, tests to screen asymptomatic patients for left ventricular systolic dysfunction); 2) interventions to improve the quality of care of patients with heart disease (for example, clinical reminders and home monitoring); 3) outcomes research using existing clinical and administrative datasets; and 4) use of echocardiography to predict prognosis. I am the Director of Echocardiography, VA Palo Alto Health Care System and a Research Associate of Primary Care and Outcomes Research Center.

Both heart failure and atrial fibrillation impose an important economic and health burden on western societies that is only going to worsen as their populations age.

SELECTED PUBLICATIONS

Trends in Readmission and Mortality Rates Following Heart Failure Hospitalization in the Veterans Affairs Health Care System From 2007 to 2017. Parizo JT, Kohsaka S, Sandhu AT, Patel J, Heidenreich PA. *JAMA Cardiol.* 2020 Sep 1;5(9):1042-1047.

Trends in Left Ventricular Ejection Fraction for Patients With a New Diagnosis of Heart Failure. Tisdale RL, Haddad F, Kohsaka S, Heidenreich PA. *Circ Heart Fail.* 2020 Sep;13(9):e006743.

2020 ACC/AHA Clinical Performance and Quality Measures for Adults With Heart Failure: A Report of the American College of Cardiology/American Heart Association Task Force on Performance Measures. Heidenreich PA, Fonarow GC, Breathett K, Jurgens CY, Pisani BA, Pozehl BJ, Spertus JA, Taylor KG, Thibodeau JT, Yancy CW, Ziaeian B. *J Am Coll Cardiol.* 2020 Nov 24;76(21):2527-2564.

2020 Update to the 2016 ACC/AHA Clinical Performance and Quality Measures for Adults With Atrial Fibrillation or Atrial Flutter: A Report of the American College of Cardiology/American Heart Association Task Force on Performance Measures. Heidenreich PA, Estes NAM 3rd, Fonarow GC, Jurgens CY, Kittleson MM, Marine JE, McManus DD, McNamara RL. *Circ Cardiovasc Qual Outcomes.* 2021 Jan;14(1):e000100.



Sarah Heilshorn, PhD

Lee Otterson Faculty Scholar

Associate Professor, Materials Science and Engineering

Associate Professor (by courtesy), Chemical Engineering

Associate Professor (by courtesy), Bioengineering

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EDUCATION/TRAINING

MS California Institute of Technology

PHD California Institute of Technology

RESEARCH FELLOWSHIP UC Berkeley

HONORS & AWARDS

NIH Director's New Innovator Award

National Science Foundation Career Award

UK-US Stem Cell Collaboration Development Award

Young Talent Award, State Key Laboratory of Molecular Engineering Polymers, China

ASSOCIATE EDITOR

Science Advances

ELECTED POSITIONS

Board of Directors, Materials Research Society

Fellow, Royal Society of Chemistry

Fellow, American Institute for Medical and Biological Engineering

CURRENT RESEARCH

I combine my diverse training in engineering, chemistry, and biology to design new materials that mimic those found in our own bodies for applications in tissue engineering and regenerative medicine. Current topics of investigation include the design of injectable materials to improve stem cell transplantation, protein engineered materials for regenerative medicine scaffolds, and peptide-based self-assembly materials for enhanced drug delivery.

I have advised PhD students from six different academic programs at Stanford: chemistry, chemical engineering, bio engineering, materials science, mechanical engineering, and MD/PhD.

SELECTED PUBLICATIONS

Engineered Stem Cell Mimics to Enhance Stroke Recovery. George PM, Oh B., Dewi RE, Hua T., Cai L., Levinson A., Liang X., Krajina BA, Bliss TM, Heilshorn SC, Steinberg GK. *Biomaterials*, 2018, 178:63-72.

Bioengineering Strategies to Accelerate Stem Cell Therapeutics. Madl CM, Heilshorn SC, Blau H. *Nature*, 2018, 557:335-342.

Protein-engineered Hydrogels Enhance the Survival of Induced Pluripotent Stem Cell-derived Endothelial Cells for Treatment of Peripheral Arterial Disease. Foster A., Dewi R., Cai L., Hou L., Strassberg Z., Alcazar C., Heilshorn SC., Huang N. *Biomaterials Science*, 2018, 6:614-622.

Maintenance of Neural Progenitor Cell Stemness in 3D Hydrogels Requires Matrix Remodelling. Madl CM, LeSavage BL, Dewi R., Dinh C., Stowers R., Khariton M., Lampe K., Nguyen D., Chaudhuri O., Enejder A., Heilshorn SC. *Nature Materials*, 2017, 16:1233-1242.



William Hiesinger, MD

Assistant Professor, Department of Cardiothoracic Surgery
Surgical Director, Mechanical Circulatory Support Program

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EDUCATION/TRAINING

MD University of Pennsylvania

BA Dartmouth College

SURGICAL RESIDENCY & INTERNSHIP

University of Pennsylvania

RESEARCH FELLOWSHIP

University of Pennsylvania

CARDIOTHORACIC SURGERY FELLOWSHIP

University of Pennsylvania

BOARD CERTIFICATION

Surgery (ABS)

Thoracic Surgery (ABTS)

CLINICAL FOCUS

Cardiothoracic Surgery

HONORS & AWARDS

Keith Reemtsma Surgical Resident of the Year Award, UPenn (2014)

Jonathan E. Rhoads Research Award, UPenn (2011)

Vivien Thomas Young Investigator Award Finalist, AHA (2010)

Alpha Omega Alpha (AOA) Honor Medical Society, UPenn (2007)

Clyde F. Baker Research Prize, Department of Surgery, UPenn (2007)

I. S. Ravdin Prize, Department of Surgery, UPenn (2007)

COMMITTEES

Society of Thoracic Surgeons Workforce on Surgical Treatment of End-Stage Cardiopulmonary Disease, National Committee (2017 - Present)

American Heart Association, Council for Cardiothoracic & Vascular Surgery (2017 - Present)

CURRENT RESEARCH

My research focus is on the application of novel computational and bioengineering methods towards understanding and treating heart failure. My research group spans the disciplines of cellular and molecular biology, protein engineering, machine learning, and fluid mechanics. Our current projects include the development of a novel precision engineered chemokine platform to treat heart failure, and the application of single cell transcriptomics to understand the effects of chemokines in myocardial recovery. Additionally, we are developing a custom machine learning pipeline to predict outcomes from pre-operative echocardiograms alone, and we are exploring the use of computational fluid dynamics to understand how changes in blood flow influences outcomes in our patients.

SELECTED PUBLICATIONS

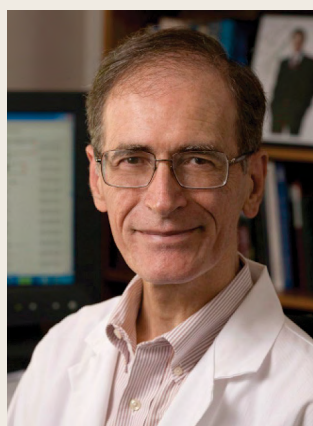
Use of Patient-Specific Computational Models for Optimization of Aortic Insufficiency after Implantation of Left Ventricular Assist Device. Kasinpila P, Kong S, Fong R, Shad R, Kaiser A, Marsden A, Woo YJ, Hiesinger W. *J Thoracic Cardiovasc Surg* 2020 (in press).

A Modified Implantation Technique for Temporary Right Ventricular Assist Device: Enabling Ambulation and Less Invasive Decannulation. Rinewalt D, Shudo Y, MacArthur JW, Woo YJ, Hiesinger W. *J Card Surg*. 2019 Oct;34(10):1083-1085.

Building a Detter Bridge: Remodeling, Recovery, and a Better Understanding of the Biologic Foundation of Mechanical Circulatory Support. Hiesinger W, Atluri P. *J Thorac Cardiovasc Surg*. 2015 Nov;150(5):1342-3.

Computational Protein Design to Reengineer Stromal Cell-derived Factor-1a Generates an Effective and Translatable Angiogenic Polypeptide Analog. Hiesinger W, Perez-Aguilar JM, Atluri P, Marotta NA, Frederick JR, Fitzpatrick JR 3rd, McCormick RC, Muenzer JR, Yang EC, Levit RD, Yuan LJ, MacArthur JW, Saven JG, Woo YJ. *Circulation*. 2011 Sep 13;124(11 Suppl):S18-26.

Oxygen-dependent Quenching of Phosphorescence Used to Characterize Improved Myocardial Oxygenation Resulting From Vasculogenic Cytokine Therapy. Hiesinger W, Vinogradov SA, Atluri P, Fitzpatrick JR 3rd, Frederick JR, Levit RD, McCormick RC, Muenzer JR, Yang EC, Marotta NA, MacArthur JW, Wilson DF, Woo YJ. *J Appl Physiol*. 2011 May;110(5):1460-5.



Mark Hlatky, MD

Professor, Medicine - Primary Care and Outcomes Research
Professor, Medicine - Cardiovascular Medicine

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PROFILE med.stanford.edu/profiles/mark-hlatky

EDUCATION/TRAINING

MD University of Pennsylvania

MEDICINE RESIDENCY

University of Arizona

CARDIOLOGY FELLOWSHIP

Duke University

ROBERT WOOD JOHNSON CLINICAL SCHOLAR UCSF

BOARD CERTIFICATION

Internal Medicine, ABIM

Cardiovascular Disease, ABIM

CLINICAL FOCUS

General Cardiology

HONORS & AWARDS

DISTINGUISHED SCIENTIST AWARD

American College of Cardiology (ACC)
American Heart Association (AHA)

LIFETIME ACHIEVEMENT AWARD

AHA Quality of Care and Outcomes
Research Council

FELLOW

American College of Cardiology;
American Heart Association

MEMBER

ACC/AHA Task Force on Clinical Practice
Guidelines;
AHA Clinical Cardiology Council
AHA Quality of Care and Outcomes
Research Council

SCIENTIFIC ADVISOR

Office of Clinical Affairs, Blue Cross Blue
Shield Association

FORMER CHAIR

Dept. of Health Research and Policy

CURRENT RESEARCH

My major interests are in cardiovascular health services research, outcomes research, evidence-based medicine, and cost-effectiveness analysis. I introduced data collection about economic and quality of life endpoints in several randomized trials, principally trials of therapies for cardiovascular disease (coronary angioplasty, stents, and bypass surgery; diabetes management). Currently, I am leading the EPOCH (Effect of Preeclampsia on Cardiovascular Health) study.

I am interested in determining what “works” in medical care, whether it provides enough value to be worth the money we spend on it, and how to foster the adoption of effective and efficient practices.

SELECTED PUBLICATIONS

Hypoglycemia and Elevated Troponin in Patients With Diabetes and Coronary Artery Disease. Rezende PC, Everett BM, Brooks MM, Vlachos H, Orchard TJ, Frye RL, Bhatt DL, Hlatky MA. *J Am Coll Cardiol* 2018;72:1778-1786.

PCSK9 inhibitors: Economics and Policy. Hlatky, M.A., Kazi, D.S.; *J Am Coll Cardiol* 2017; 70:2677-2687.

Functional Testing or Coronary Computed Tomography Angiography in Patients With Stable Coronary Artery Disease. Jørgensen ME, Andersson C, Nørgaard BL, Abdulla J, Shreibati JB, Torp-Pedersen C, Gislason GH, Shaw RE, Hlatky MA. *J Am Coll Cardiol* 2017; 69:1761-1770.

Economic Outcomes of Treatment Strategies for Type 2 Diabetes Mellitus and Coronary Artery Disease in the Bypass Angioplasty Revascularization Investigation 2 Diabetes Trial. Hlatky, M. A., Boothroyd, D. B., Melsop, K. A., Kennedy, L., Rihal, C., Rogers, W. J., Venkitachalam, L., Brooks, M. M.; *Circulation*; 2009; 120 (25): 2550-U69

Criteria for Evaluation of Novel Markers of Cardiovascular Risk: A Scientific Statement From the American Heart Association. Hlatky, M. A., Greenland, P., Arnett, D. K., Ballantyne, C. M., Criqui, M. H., Elkind, M.S., Go, A. S., Harrell, F. E., Hong, Y., Howard, B. V., Howard, V. J., Hsue, P. Y., Kramer, C. M., McConnell, J. P., Normand, S. T., O'Donnell, C. J., Smith, S. C., Wilson, P. W.; *Circulation*; 2009; 119 (17): 2408-2416.

Coronary Artery Bypass Surgery Compared With Percutaneous Coronary Interventions for Multivessel Disease: A Collaborative Analysis of Individual Patient Data From Ten Randomised Trials. Hlatky, M. A., Boothroyd, D. B., Bravata, D. M., Boersma, E., Booth, J., Brooks, M. M., Carrie, D., Clayton, T. C., Danchin, N., Flather, M., Hamm, C. W., Hueb, W. A., Kaehler, J., Kelsey, S. F., King, S. B., Kosinski, A. S., Lopes, N., McDonald, K. M., Rodriguez, A., Serruys, P., Sigwart, U., Stables, R. H., Owens, D. K., Pocock, S. J.; *Lancet*; 2009; 373 (9670): 1190-1197.



Yasuhiro Honda, MD, FACC, FAHA

Clinical Professor, Medicine - Cardiovascular Medicine
Director, Stanford Cardiovascular Core Analysis Laboratory (CCAL)

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CURRENT RESEARCH

My laboratory is recognized worldwide as a leading centralized resource of image analysis in the conduct of research studies and clinical trials in the field of cardiovascular medicine. Specifically, we have served as a core laboratory for over 145 national or international multi-center trials of new medical devices or pharmacological treatments, utilizing advanced cardiovascular imaging techniques, such as intravascular ultrasound (IVUS), catheter-based optical coherence tomography (OCT) / frequency domain imaging (OFDI), and intravascular near-infrared spectroscopy (NIRS). The data provided from my laboratory have contributed not only to the FDA's approval process of new treatment technologies, but also academically to our understanding of cardiovascular disease by generating over 420 scientific articles published in peer-reviewed journals.

Advances in diagnostic technologies will enable us to better understand pathophysiology and will pave the way for new treatment strategies for our patients.

SELECTED PUBLICATIONS

Microcirculatory resistance predicts allograft rejection and cardiac events after heart transplantation. Ahn JM, Zimmermann FM, Gullestad L, Angeras O, Karason K, Russell K, Lunde K, Okada K, Luikart H, Khush KK, Honda Y, Pijls NHJ, Lee SE, Kim JJ, Park SJ, Solberg OG and Fearon WF. *J Am Coll Cardiol.* 2021;78:2425-2435.

Impact of diastolic vessel restriction on quality of life in symptomatic myocardial bridging patients treated with surgical unroofing: preoperative assessments with intravascular ultrasound and coronary computed tomography angiography. Hashikata T, Honda Y, Wang H, Pargaonkar VS, Nishi T, Hollak MB, Rogers IS, Nieman K, Yock PG, Fitzgerald PJ, Schnitger I, Boyd JH and Tremmel JA. *Circ Cardiovasc Interv.* 2021;14:e011062.

Intravascular imaging to guide pci for acute myocardial infarction: shifting from "whether" to "how". Honda Y. *JACC Cardiovasc Interv.* 2021;14:2444-2446.

Intravascular ultrasound predictors of long-term outcomes following ABSORB bioresorbable scaffold implantation: A pooled analysis of the ABSORB III and ABSORB Japan trials. Nishi T, Okada K, Kitahara H, Kameda R, Ikutomi M, Imura S, Hollak MB, Yock PG, Popma JJ, Kusano H, Cheong WF, Sudhir K, Fitzgerald PJ, Ellis SG, Kereiakes DJ, Stone GW, Honda Y, Kimura T. *J Cardiol.* 2021;78:224-229.

Deep learning-based intravascular ultrasound segmentation for the assessment of coronary artery disease. Nishi T, Yamashita R, Imura S, Tateishi K, Kitahara H, Kobayashi Y, Yock PG, Fitzgerald PJ and Honda Y. *Int J Cardiol.* 2021;333:55-59.

Head-to-head comparison of quantitative measurements between intravascular imaging systems: An in vitro phantom study. Nishi T, Imura S, Kitahara H, Kobayashi Y, Yock PG, Fitzgerald PJ and Honda Y. *Int J Cardiol Heart Vasc.* 2021;36:100867.

EDUCATION/TRAINING

MD Kyoto University

MEDICINE RESIDENCY

Kobe General Hospital

CARDIOLOGY FELLOWSHIP

Kobe General Hospital

RESEARCH FELLOWSHIP

Stanford University

CLINICAL FOCUS

Advanced Cardiovascular Imaging
Interventional Cardiology
Intravascular Diagnostics

HONORS & AWARDS

INTERNATIONAL COMMITTEE & TASK FORCE

International Working Group for Intravascular Optical Coherence Tomography Standardization and Validation

STEERING COMMITTEE MEMBER

Stanford Trans-Pacific Cardiovascular Research Scholarship Program

FELLOW

American College of Cardiology;
American Heart Association

EDITORIAL BOARD

Cardiovascular Intervention and Therapeutics



Ngan F. Huang, PhD

Assistant Professor, Cardiothoracic Surgery - Adult Cardiac Surgery
Biomedical Engineer, VA Palo Alto Health Care System

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LAB huanglab.stanford.edu

EDUCATION/TRAINING

PHD UC Berkeley and UCSF

BS Massachusetts Institute of Technology

HONORS & AWARDS

Society for Vascular Medicine Jay D. Coffman Young Investigator Award First Place

American Heart Association, Council on Peripheral Vascular Disease Robert W Hobson II MD Early Career Investigator Award

Rising Star Award, Cellular and Molecular Bioengineering Annual Conference

Young Innovator Award, Biomedical Engineering Society

Young Innovator Award, Tissue Engineering and Regenerative Medicine-Americas

American Heart Association, Council on Peripheral Vascular Disease, Jay D. Coffman Young Investigator Award, 2nd Place

Fellow of the American Heart Association (FAHA)

STEERING COMMITTEE MEMBER

Stanford Cardiovascular Institute

MEMBER

Bio-X; Child Health Research Institute
CHEM-H (Stanford Chemistry, Engineering & Medicine for Human Health)

CURRENT RESEARCH

My research laboratory aims to quantify the chemical and biophysical interactions between cells and extracellular matrix (ECM) proteins that regulate cell fate specification into cardiovascular lineages. Using high-throughput ECM-microarrays, tunable hydrogels, and spatially patterned nanofibrillar scaffolds, we are studying how the ECM influences lineage commitment processes such as differentiation, transdifferentiation, and nuclear reprogramming. The fundamental insights of cell-ECM interactions are applied towards translational applications with respect to improving the survival and regenerative capacity of transplanted cells, as well as for engineering vascularized tissues. We are also collaborating with industry partners to develop biomaterials-based approaches for treatment of critical limb ischemia and volumetric muscle loss and in small and large animal models.

I believe that a fully functional tissue-engineered heart can be realized in my lifetime.

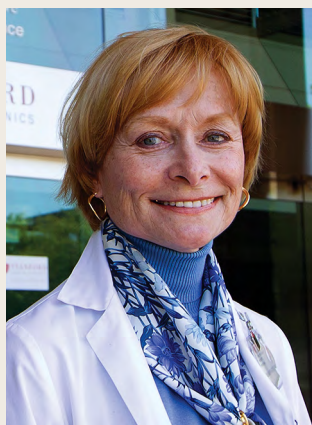
SELECTED PUBLICATIONS

Peri-Adventitial Delivery of Smooth Muscle Cells in Porous Collagen Scaffolds For Treatment of Experimental Abdominal Aortic Aneurysm. Mulorz J, Shayan M, Hu C, Alcazar C, Chan AHP, Briggs M, Wen Y, Walvedar AP, Ramasubramanian A, Spin JM, Chen B, Tsao PS, Huang NF. *Biomater Sci*9:6903–6914, 2021.

Transplantation of Insulin-like Growth Factor-1 Laden Scaffolds Combined with Exercise Promotes Neurovascular Regeneration and Angiogenesis in a Muscle Injury Preclinical Model. Alcazar C, Hu C, Rando TA, Huang NF, Nakayama KH. *Biomater Sci* 8:5376-5389, 2020. doi: 10.1039/d0bm00990c.

Delivery of hepatocyte growth factor mRNA from nanofibrillar scaffolds in a pig model of peripheral arterial disease. Zaitseva TS, Yang G, Dionyssiou D, Zamani M, Sawamura S, Yakubov E, Ferguson J, Hallet RL, Fleischmann D, Paukshto MV, Huang NF. *Regen Med* 15:1761-1773, 2020.

Delivery of Human Stromal Vascular Fraction Cells on Nanofibrillar Scaffolds for Treatment of Peripheral Arterial Disease. Hu C, Zaitseva TS, Alcazar C, Tabada P, Sawamura S, Yang G, Borrelli MR, Wan DC, Nguyen DH, Paukshto MV, Huang NF. *Front Bioeng Biotechnol* 8:689, 2020. doi: 10.3389/fbioe.2020.00689. eCollection 2020.



Sharon Hunt, MD

Professor Emeritus, Medicine - Cardiovascular Medicine
Medical Director, Post-Heart Transplant Programs

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EDUCATION/TRAINING

MD Stanford University

MEDICINE RESIDENCY & INTERNSHIP
Stanford University

CARDIOLOGY FELLOWSHIP
Stanford University

BOARD CERTIFICATION
Advanced Heart Failure Transplant
Cardiology, ABIM
Core Cardiology, ABIM
Internal Medicine, ABIM

CLINICAL FOCUS

Clinical Heart Transplant

HONORS & AWARDS

LIFETIME ACHIEVEMENT AWARD
International Society for Heart and Lung
Transplantation (ISHLT; 2012)

American Society of Transplantation
Senior Achievement Award in Clinical
Transplantation

Laennec Master Clinician Award,
American Heart Association

David A Ryland Clinical Teaching Award,
Stanford University

FORMER CHAIR (1999-2006)
ACC/AHA Committee to rewrite heart
failure guidelines

FORMER CHAIR (2008-12)
ABIM Test Committee on Advanced Heart
Failure and Transplant Cardiology

FORMER CO-CHAIR (2011-12)
ISHLT Guidelines for post transplant
patient management

CURRENT RESEARCH

Dr. Hunt is a pioneering figure in the field of cardiology and has received numerous awards, including the Lifetime Achievement Award from the International Society for Heart and Lung Transplantation. Her research and clinical work focus on advancing long-term postoperative care for heart transplant recipients. She enjoys both taking care of patients and the opportunity to mentor cardiology fellows at Stanford.

The holy grail of immune tolerance remains beyond our reach at this time, but has the potential to completely alter the heart transplant landscape.

SELECTED PUBLICATIONS

Women Leaders in Cardiac Transplantation: A Historical and Personal Perspective. Hunt SA. *Circulation*. 2019;139:1005-1006.

Less Risky Immunosuppression in Heart Transplantation? Hunt SA. *J Amer Coll Cardiology*. 2019;73(21):2689-90.

Innovations in Ventricular Assist Devices for End Stage Heart Failure. Miller RJH, Teuteberg JJ, Hunt SA. *Annu Rev Med*. 2019;70:33-44.

Cardiac Allograft Vasculopathy: It Really Has Changed Over Time. Hunt, SA. *JACC: Heart Failure*. 2017;5:902-3.

Major Advantages and Critical Challenge for Proposed United States Heart Allocation System. Stevenson LW, Kormos RL, Young JB, Kirklin JK, Hunt SA. *J Heart Lung Transplant*. 2016; 35:547-549.

Heart Transplant Recipient Selection Issues: Limited assets, Infinite possibilities. Hunt SA. *J Heart Lung Transplant* 31:675-6, 2012.

Clinical and Functional Correlates of Early Microvascular Dysfunction After Heart Transplantation. Haddad F, Khazanie P, Deuse T, Weisschaar D, Zhou J, Nam CW, Vu TA, Gomari FA, Skhiri M, Simos A, Schnittger I, Vrtovec B, Hunt SA, Fearon WF. *Circ Heart Fail* 5:759-768, 2012.



John P. A. Ioannidis, MD, DSc

Professor, Medicine - Stanford Prevention Research Center
 Professor, Epidemiology and Population Health
 Professor (by courtesy), Statistics
 Professor (by courtesy), Biomedical Data Science
 Co-Director, Meta-Research Innovation Center at Stanford (METRICS)

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EDUCATION/TRAINING

MD University of Athens

DSc University of Athens

INTERNAL MEDICINE RESIDENCY

Harvard University

INFECTIOUS DISEASE FELLOWSHIP

Tufts University

BOARD CERTIFICATION

Internal Medicine (Europe)

Infectious Disease (Europe)

HONORS & AWARDS

Albert Stuyvenberg Medal

European Award for Excellence in Clinical Science

Chanchlani Award for Global Health

Medal for Distinguished Service, Teachers College, Columbia University

Honorary PhDs from Erasmus University Rotterdam, University of Athens, University of Tilburg

Einstein Fellow

ELECTED MEMBER

U.S. National Academy of Medicine

European Academy of Sciences and Arts Association of American Physicians (also President Elect)

European Academy of Cancer Sciences

American Epidemiological Society

Academy Sciences of Bologna

FORMER PRESIDENT

Society for Research Synthesis Methodology

EDITORIAL BOARD MEMBER

35 major international journals

CURRENT RESEARCH

I have worked in the fields of evidence-based medicine, clinical and molecular epidemiology, human genome epidemiology, statistical methods and mathematical modeling, predictive and personalized medicine and health, and the sociology of science. I have a strong interest in large-scale evidence (in particular randomized trials and meta-analyses) and empirical evaluation of bias in biomedical research. I am interested in understanding how to improve research practices and in the interdisciplinary enhancement of existing research methods for study design and analysis in biomedicine and beyond.

I am privileged to have learned and to continue to learn from interactions with students and scientists from all over the world and to be constantly reminded that I know next to nothing.

SELECTED PUBLICATIONS

The Importance of Predefined Rules and Prespecified Statistical Analyses do not Abandon Significance. Ioannidis, JA. *JAMA*, 2019; 321 (21): 2067–68.

A Standardized Citation Metrics Author Database Annotated for Scientific Field. Ioannidis, JP., Baas, J., Klavans, R., Boyack, K. W. *PLoS Biology*, 2019; 17 (8): e3000384.

Reproducible Research Practices, Transparency, and Open Access Data in the Biomedical Literature, 2015-2017. Wallach, J. D., Boyack, K. W., Ioannidis, JP. *PLoS Biology*, 2018; 16 (11): e2006930.

The Proposal to Lower P Value Thresholds to .005. Ioannidis, JPA. *JAMA*, 2018; 319 (14): 1429–30.

Meta-research: Why Research on Research Matters. Ioannidis, JA. *PLOS Biology*, 2018; 16 (3): e2005468.

Meta-assessment of Bias in Science. Fanelli, D., Costas, R., Ioannidis, JP. *Proceedings of the National Academy of Sciences of the USA*, 2017; 114 (14): 3714-3719.



Ioannis Karakikes, PhD

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EDUCATION/TRAINING

PHD University of Essex, UK

POSTDOCTORAL TRAINING

Imperial College, London, UK
Ichan School of Medicine, NY

HONORS & AWARDS

Best Manuscript Award, *Circulation Research* 2018

K99/R00 Pathway to Independence Award, NIH/NHLBI (2012)

CURRENT RESEARCH

The Karakikes Lab aims to uncover fundamental new insights into the molecular mechanisms and functional consequences of pathogenic mutations associated with familial cardiovascular diseases.

The overarching goal of our studies is to improve our understanding of the pathogenesis of familial cardiomyopathies, such as Hypertrophic Cardiomyopathy (HCM) and Dilated Cardiomyopathy (DCM). We utilize isogenic human induced pluripotent stem cells (iPSCs) as a platform for disease modeling to gain insights on how rare mutations affect the cardiomyocyte biology. By establishing a better understanding of the biology of the disease, our studies represent a first definitive step in elucidating the genotype-phenotype associations in HCM and DCM toward applying a precision medicine approach to the treatment of genetic cardiomyopathies.

SELECTED PUBLICATIONS

The Unfolded Protein Response as a Compensatory Mechanism and Potential Therapeutic Target in PLN R14del Cardiomyopathy. Feyen DAM, Perea-Gil I, Maas R, Harakalova M, Gavidia AA, Ataam AJ, Wu TH, Vink A, Pei J, Vadgama N, Suurmeijer AJ, Te Rijdt WP, Vu M, Amatya PL, Prado M, Zhang Y, Dunkenberger L, Sluijter JPG, Asselbergs FW, Mercola M, Karakikes I. *Circulation*. 2021 Aug 3;144(5):382-392.

A Novel Recessive Mutation in SPEG Causes Early Onset Dilated Cardiomyopathy. Levitas A, Muhammad E, Zhang Y, Perea Gil I, Serrano R, Diaz N, Arafat M, Gavidia AA, Kapiloff MS, Mercola M, Etzion Y, Parvari R, Karakikes I. *Plos Genetics*. 2020 Sep 14;16(9):e1009000.

Generation of AAVS1 integrated doxycycline-inducible CRISPR-Prime Editor human induced pluripotent stem cell line. Bharucha N, Ataam JA, Gavidia AA, Karakikes I. *Stem Cell Research*. 2021 Nov 24;57:102610.

Pharmacological Silencing of miR-152 Prevents Pressure Overload-Induced Heart Failure. LaRocca TJ, Maricela PM, Seeger T, Perea-Gil I, Neofytou E, Mecham BH, Ameen M, Chang ACY, Pandey G, Wu JC, Karakikes I. *Circulation: Heart Failure*. 2020 Mar;13(3):e006298.



Michael S. Kapiloff, MD, PhD

Inhard Family Professor

Professor (Research) - Ophthalmology

Professor (by courtesy), Medicine - Cardiovascular Medicine

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EDUCATION/TRAINING

PHD University of California, San Diego

MD University of California, San Diego

RESIDENCY

University of Utah and Primary
Children's Medical Centers

RESEARCH FELLOWSHIP

Oregon Health and Science University

HONORS & AWARDS

FELLOW

American Heart Association (2008)
American Physiological Society,
Cardiovascular Section (2014)

MEMBER

American Society for Clinical
Investigation (2011)

Micah Batchelor Award For Excellence In
Children's Health Research, University
of Miami (2013)

CURRENT RESEARCH

Dr. Kapiloff is currently involved in full-time basic science and translational research. His laboratory studies the basic molecular mechanisms underlying the response of the retinal ganglion cell and cardiac myocyte to disease. The longstanding interest of his laboratory is the role in intracellular signal transduction of multimolecular complexes organized by scaffold proteins. Recently, his lab has been involved in the translation of these concepts into new therapies, including the development of new AAV gene therapy biologics for the prevention and treatment of heart failure and for neuroprotection in the eye.

As we acquire a more profound understanding of the molecular underpinnings of the function of our hearts, new therapies will emerge that will provide new hope for diseases that we only assume will take so many of our loved ones away from us.

SELECTED PUBLICATIONS

Calcineurin A β -specific anchoring confers isoform-specific compartmentation and function in pathological cardiac myocyte hypertrophy. Li, X., Li, J., Martinez, E.C., Froese, A., Passariello, C.L., Henshaw, K., Rusconi, F., Li, Y., Yu, Q., Thakur, H., Nikolaev, V.O. and Kapiloff, M.S. *Circulation*, 142(10):948-962, 2020

Signalosome-Regulated Serum Response Factor Phosphorylation Determining Myocyte Growth in Width versus Length As a Therapeutic Target For Heart Failure. Li, J., Tan, Y., Passariello, C.L., Martinez, E.C., Kritzer, M.D., Li, X., Li, X., Li, Y., Yu, Q., Ohgi, K., Thakur, H., MacArthur, Jr., J.W., Ivey, J.R., Woo, Y.J., Emter, C.A., Dodge-Kafka, K.L., Rosenfeld, M.G., and Kapiloff, M.S. *Circulation*, 142(22):2138-2154, 2020

Regulation of Neuronal Survival and Axon Growth by a Perinuclear cAMP Compartment. Boczek, T., Cameron, E.G., Yu, W., Xia, X., Shah, S.H., Chabeco, B.C., Galvao, J., Nahmou, M., Li, J., Thakur, H., Goldberg, J.L., and Kapiloff, M.S. *Journal of Neuroscience*, 39(28):5466-5480, 2019

Anchored p90 Ribosomal S6 Kinase 3 is Required for Cardiac Myocyte Hypertrophy. Li, J., Kritzer, M.D., Michel, J.J., Le, A., Thakur, H., Gayanilo, M., Passariello, C.L., Negro, A., Daniai, J.B., Oskouei, B., Sanders, M., Hare, J.M., Hanauer, A., Dodge-Kafka, K.L., and Kapiloff, M.S. *Circulation Research*, 112:128-139, 2013



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EDUCATION/TRAINING

MD Harvard University, University of California, San Francisco

RESIDENCY / CARDIOLOGY FELLOWSHIPS

University of California, San Francisco

BOARD CERTIFICATION

Advanced Heart Failure and Transplant Cardiology, American Board of Internal Medicine Cardiovascular Disease

HONORS & AWARDS

R01 Research Project Grant, NIH (2019)

International Society for Heart and Lung Transplantation/Enduring Hearts Award (2018)

R01 Research Project Grant, National Institutes of Health (2014)

CURRENT RESEARCH

As Director of Heart Transplant Research in the Division of Cardiovascular Medicine, my research focuses on the evaluation and selection of donors for heart transplantation; the pathogenesis of post-transplant complications, including acute rejection and cardiac allograft vasculopathy; and non-invasive diagnosis of post-transplant complications. I serve as Associate Director of the International Society for Heart and Lung Transplantation (ISHLT) Thoracic Transplant Registry and as the heart transplant lead for the ISHLT 2020 annual scientific sessions. I am Associate Editor for the American Journal of Transplantation and am on the editorial boards of the Journal of Heart and Lung Transplantation and Circulation Heart Failure. I am also the Program Director of the Advanced Heart Failure and Transplant Cardiology fellowship at Stanford.

SELECTED PUBLICATIONS

Great Variability in Donor Heart Acceptance Practices Across the United States. Khush KK, Ball RL. *American Journal of Transplantation*. 2019, Dec 27.

Adding Insult on Injury: Immunogenic Role for Donor-derived Cell-free DNA? Dholakia S, De Vlaminck I, Khush KK. *Transplantation*. 2020 March 20.

The International Thoracic Organ Transplant Registry of the International Society for Heart and Lung Transplantation: 37th Adult Heart Transplantation Report-2020: Focus on Deceased Donor Characteristics. Khush KK, Potena L, Cherikh WS, Chambers DC, Harhay MO, Hayes D Jr, Hsich E, Sadavarte A, Singh TP, Zuckermann A, Stehlik J. *J Heart Lung Transplant*. 2020 Jul 24: S1053-2498(20) 31660-0.

Evaluation of Variation in Insurance Payor Mix Among Heart Transplant Centers. Parizo JT, Desai M, Rodriguez F, Sandhu AT, Khush KK. *J Heart Lung Transplant*. 2020 Sep 30: S1053-2498(20)31764-2.



Joshua W. Knowles, MD, PhD, FAHA, FACC

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CURRENT RESEARCH

Dr. Knowles is a physician-scientist whose overall research theme has been the genetic basis of cardiovascular disease across the continuum from Discovery, to the development of Model Systems, to the Translation of these findings both into the clinic and the Public Health aspect of genetics. His discovery and basic translational efforts center on understanding the genetic basis cardiovascular disease using GWAS studies coupled with exploration in model systems. His clinical translational focus is on Familial Hypercholesterolemia (FH) and he is the volunteer Chief Research Advisor of the FH Foundation (FHF) which is a patient-led organization dedicated to increasing awareness of FH, identifying and treating patients with FH and screening family members to prevent deleterious outcomes. He helped lead the FHF efforts to establish a national patient registry (CASCADE FH), apply for an ICD10 code for FH and is now using cutting-edge “big-data” approaches to identify previously undiagnosed FH patients in electronic medical records (FIND FH). He has published over 100 papers with research projects currently funded by the National Institutes of Health, the American Heart Association, the American Diabetes Association and the Doris Duke Charitable Foundation.

Stanford is contributing at all levels to using the tools of human genetics to improve human health.

SELECTED PUBLICATIONS

An integrated approach to identify environmental modulators of genetic risk factors for complex traits. Balliu B, Carcamo-Orive I, Gloudemans MJ, Nachun DC, Durrant MG, Gazal S, Park CY, Knowles DA, Wabitsch M, Quertermous T, Knowles JW, Montgomery SB. *Am J Hum Genet.* 2021 Oct 7;108(10):1866-1879. doi: 10.1016/j.ajhg.2021.08.014. Epub 2021 Sep 27.

Statins Are Associated With Increased Insulin Resistance and Secretion. Abbasi F, Lamendola C, Harris CS, Harris V, Tsai MS, Tripathi P, Abbas F, Reaven GM, Reaven PD, Snyder MP, Kim SH, Knowles JW. *Arterioscler Thromb Vasc Biol.* 2021 Nov;41(11):2786-2797. doi: 10.1161/ATVBAHA.121.316159. Epub 2021 Aug 26.

Genetics of Type 2 Diabetes: Opportunities for Precision Medicine: JACC Focus Seminar. Kim DS, Gloyd AL, Knowles JW. *J Am Coll Cardiol.* 2021 Aug 3;78(5):496-512. doi: 10.1016/j.jacc.2021.03.346.

FAM13A affects body fat distribution and adipocyte function. Fathzadeh M, Li J, Rao A, Cook N, Chennamsetty I, Seldin M, Zhou X, Sangwung P, Gloudemans MJ, Keller M, Attie A, Yang J, Wabitsch M, Carcamo-Orive I, Tada Y, Lusi AJ, Shin MK, Molony CM, McLaughlin T, Reaven G, Montgomery SB, Reilly D, Quertermous T, Ingelsson E, Knowles JW. *Nat Commun.* 2020 Mar 19;11(1):1465. doi: 10.1038/s41467-020-15291-z.

Mitochondrial Dysfunction, Insulin Resistance, and Potential Genetic Implications. Sangwung P, Petersen KF, Shulman GI, Knowles JW. *Endocrinology.* 2020 Apr 1;161(4):bqaa017. doi: 10.1210/endo/bqaa017.

EDUCATION/TRAINING

MD UNC-Chapel Hill

PHD UNC-Chapel Hill

MEDICINE RESIDENCY & INTERNSHIP
Stanford University

CARDIOLOGY FELLOWSHIP
Stanford University

BOARD CERTIFICATION
Internal Medicine, ABIM
Cardiovascular Disease, ABIM

CLINICAL FOCUS

Genetic forms of heart disease, familial hypercholesterolemia, lipidology

HONORS & AWARDS

CHIEF MEDICAL ADVISOR
Research Advisor of the Familial Hypercholesterolemia (FH) Foundation

American Heart Association National Fellow to Faculty Transition Award

Future Leaders in CV Medicine Fellowship Award

FELLOW
American College of Cardiology;
American Heart Association

DIPLOMATE
American Board of Clinical Lipidology

STEERING COMMITTEE
Stanford Cardiovascular Institute

Doris Duke Foundation Clinical Researcher



Brian Kobilka, MD

Helene Irwin Fagan Chair in Cardiology
Professor, Molecular and Cellular Physiology
Professor, Medicine - Cardiovascular Medicine
Professor (by courtesy), Chemical and Systems Biology

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EDUCATION/TRAINING

MD Yale University

INTERNAL MEDICINE RESIDENCY
Washington University

RESEARCH FELLOWSHIP
Duke University

BOARD CERTIFICATION
Internal Medicine, ABIM

HONORS & AWARDS

Nobel Prize in Chemistry (2012)

Earl and Thressa Stadtman
Distinguished Scientist Award, ASBMB

Louis and Artur Lucian Award, McGill
University

ELECTED HONORARY MEMBER
Royal Irish Academy

ELECTED MEMBER
National Academy of Sciences

GUEST PROFESSOR
Tsinghua University, Beijing, China

ADJUNCT PROFESSOR
Monash University, Melbourne, Australia

DOCTEUR HONORIS CAUSA
Free University, Brussels, Belgium

John Daly Memorial Lecture, NIH

MEMBER
American Chemical Society; American
Society for Pharmacology and
Experimental Therapeutics; American
Society for Biochemistry and Molecular
Biology; American Society of Clinical
Investigation; British Pharmacological
Society

CURRENT RESEARCH

The goal of my lab is to characterize the structure and mechanism of activation of G protein coupled receptors (GPCRs). GPCRs are the largest group of cellular receptors for hormones and neurotransmitters in the body. They play central roles in the network of cellular communication that orchestrates the physiological processes essential for life. Disruption of one or more components of this complex communication network can lead to a broad spectrum of diseases ranging from cardiovascular and metabolic disorders, to neuropsychiatric and neurodegenerative disorders. GPCRs are therefore important targets for drug discovery. We apply biochemical and biophysical tools to investigate the molecular mechanism of GPCR signaling in cells, and the structural basis for regulation of GPCR function by drugs. We are also working to discover approaches for the more efficient and economical development of safer and more effective therapeutics targeting these receptors.

It has been a great privilege to be part of the Stanford community, which provides a unique environment for interdisciplinary collaborations, and attracts the most talented and innovative students and fellows.

SELECTED PUBLICATIONS

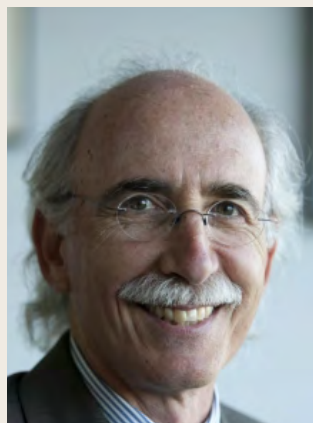
Structure of the Mu-opioid Receptor-Gi Protein Complex. Koehl, A., Hu, H., Maeda, S., Zhang, Y., Qu, Q., Paggi, J.M., Latorraca, N.R., Hilger, D., Dawson, R., Matile, H., Schertler, G.F.X., Granier, S., Weis, W.I., Dror, R.O., Manglik, A., Skiniotis, G. and Kobilka, B.K. *Nature*, 558(7711), 547-552 (2018).

Structural Insights Into Binding Specificity, Efficacy and Bias of a Beta2AR Partial Agonist. Masureel, M., Zou, Y., Picard, L.P., van der Westhuizen, E., Mahoney, J.P., Rodrigues, J., Mildorf, T.J., Dror, R.O., Shaw, D.E., Bouvier, M., Pardon, E., Steyaert, J., Sunahara, R.K., Weis, W.I., Zhang, C. and Kobilka, B.K. *Nat Chem Biol*, 14(11), 1059-1066 (2018).

Structural Insights Into the Process of GPCR-G Protein Complex Formation. Liu, X., Xu, X., Hilger, D., Aschauer, P., Tiemann, J.K.S., Du, Y., Liu, H., Hirata, K., Sun, X., Guixa-Gonzalez, R., Mathiesen, J.M., Hildebrand, P.W. and Kobilka, B.K. *Cell*, 177(5), 1243-1251 e12 (2019).

Structural Insights Into the Activation of Metabotropic Glutamate Receptors. Koehl, A., Hu, H., Feng, D., Sun, B., Zhang, Y., Robertson, M.J., Chu, M., Kobilka, T.S., Laermans, T., Steyaert, J., Tarrasch, J., Dutta, S., Fonseca, R., Weis, W.I., Mathiesen, J.M., Skiniotis, G. and Kobilka, B.K. *Nature* 2019.

Structures of the M1 and M2 Muscarinic Acetylcholine Receptor/G-protein Complexes. Maeda, S., Qu, Q., Robertson, M.J., Skiniotis, G. and Kobilka, B.K. *Science*, 364(6440), 552-557 (2019).



Fredric Kraemer, MD

Stanford University Professor in Endocrinology

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EDUCATION/TRAINING

MD New York University School of Medicine

INTERNSHIP Kings County Hospital

RESIDENCY Kings County Hospital

FELLOWSHIP

Stanford University School of Medicine

BOARD CERTIFICATION

Endocrinology, Diabetes, and Metabolism (ABIM)

HONORS & AWARDS

Stanford University Professorship in Endocrinology, Stanford University (2002)

SmithKline Beecham Junior Faculty Award In Diabetes, SmithKline Beecham (1998)

Hume Faculty Scholar, Stanford University (1984-1988)

Mellon Foundation Fellow, Stanford University (1983-1984)

Special Emphasis Research Career Award, NIH (1982-1987)

CURRENT RESEARCH

Our research interests are in the general area of cellular lipid and lipoprotein metabolism. The work is aimed primarily at understanding the mechanisms regulating cholesterol and triglyceride accumulation in cells. We utilize a variety of techniques from cell biology, biochemistry, and molecular biology. Current research projects focus on the trafficking of cholesterol for steroid hormone synthesis, uptake and mobilization of fatty acids by cells and interplay between adipose cell and bone metabolism.

SELECTED PUBLICATIONS

Tissue Specific Ablation of ACSL4 Results in Disturbed Steroidogenesis. Wang W., Hao X., Han L., Yan Z., Shen W.-J., Hasbargen K., Bittner S., Cortez Y., Greenberg A.S., Azhar S., Kraemer F.B. *Endocrinology* 160:2517-2528, 2019.

Liver-specific Knockdown of Long-chain Acyl-CoA Synthetase 4 Reveals its Key Role in VLDL-TG Metabolism and Phospholipid Synthesis in Mice Fed a High-fat Diet. Singh A.B., Kan C.F.K., Kraemer F.B., Sobel R.A., Liu J. *Am. J. Physiol. Endocrinol. Metab.* 316:E880-E894, 2019.

Plasma Membrane Cholesterol Trafficking in Steroidogenesis. Deng B., Shen W.-J., Dong D., Azhar S., Kraemer F.B. *FASEB J.* 33:1389-1400, 2019.

SR-B1: A Unique Multifunctional Receptor for Cholesterol Influx and Efflux. Shen W.-J., Azhar S., Kraemer F.B. *Annu. Rev. Physiol.* 80:95-116, 2018.

WNT-activated Bone Grafts Repair Osteonecrotic Lesions in Aged Animals. Salmon B., Liu B., Shen E., Chen T., Li J., Gillette M., Ransom R.C., Ezran M., Johnson C.A., Castillo A.B., Shen W.-J., Kraemer F.B., Smith A.A., Helms J.A. *Sci. Rep.* 7(1):14254, 2017.

SNARE-mediated Cholesterol Movement to Mitochondria Supports Steroidogenesis in Rodent Cells. Lin Y., Hou X., Hanssen R., Khor V.K., Cortez Y., Roseman A.N., Azhar S., Kraemer F.B. *Mol. Endocrinol.* 30:234-247, 2016.



Mark A. Krasnow, MD, PhD

Endowed Chair, The Paul and Mildred Berg Professorship in Biochemistry
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Executive Director, Wall Center for Pulmonary Vascular Diseases

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EDUCATION/TRAINING

MD University of Chicago

PHD University of Chicago

HELEN HAY WHITNEY FELLOW
Stanford University

CLINICAL FOCUS

Lung Development and Stem Cells
Neural Control of Breathing
Lung Diseases
Genetic Model Organisms for Medicine

HONORS & AWARDS

Lucille P. Markey Scholar Award

NSF Presidential Young Investigator Award

Kaiser Family Foundation Award for Preclinical Teaching

ELECTED FELLOW

American Academy of Arts and Sciences; American Association for the Advancement of Science

FOUNDING EDITORIAL BOARD

Public Library of Science Journals

Scientific Advisory Board

Centre ValBio, Madagascar; Pediatric Research Center, Hannover Medical School; Vesalius Research Center

FORMER CHAIR

Department of Biochemistry, Stanford University

FORMER PRESIDENT

North American Drosophila Board of Directors

CURRENT RESEARCH

My laboratory uses genetic, genomic, and biochemical approaches to map the development of the lung and identify stem and progenitor cells and the molecular pathways that control them. We are also mapping the neural circuit and the genetic and molecular basis of breathing. We are interested in understanding the normal processes and how they go awry in devastating human diseases such as lung cancer, pulmonary fibrosis, pulmonary hypertension and Sudden Infant Death Syndrome. I am an Investigator at the Howard Hughes Medical Institute and the Executive Director of the Vera Moulton Wall Center for Pulmonary Vascular Disease.

The tube is a fundamental unit of organ design. Understanding how tubes form and are maintained could unlock the secrets of many pulmonary and cardiovascular diseases and suggest new ways of treating them.

SELECTED PUBLICATIONS

Breathing Control Center Neurons That Promote Arousal in Mice. Yackle K, Schwarz LA, Kam K, Sorokin JM, Huguenard JR, Feldman JL, Luo L, Krasnow MA. *Science*. 2017 Mar 31;355(6332):1411-1415.

Oxygen Regulation of Breathing Through an Olfactory Receptor Activated by Lactate. Chang, A. J., Ortega, F. E., Riegler, J., Adison, D. V., Krasnow, M. A.; *Nature*; 2015; 527 (7577): 240.

Formation of a Neurosensory Organ by Epithelial Cell Slithering. Kuo, C. S., Krasnow, M. A.; *Cell*; 2015; 163 (2): 394-405.

Subcellular Trafficking of FGF Controls Tracheal Invasion of Drosophila Flight Muscle. Peterson SJ, Krasnow MA. *Cell*. 2015 Jan 15; 160 (1-2): 313-23.

Reconstructing Lineage Hierarchies of the Distal Lung Epithelium Using Single-cell RNA-seq. Treutlein B, Brownfield DG, Wu AR, Neff NF, Mantalas GL, Espinoza FH, Desai TJ, Krasnow MA, Quake SR.; *Nature*; 2014 May 15; 509 (7500): 371-5.

Alveolar Progenitor and Stem Cells in Lung Development, Renewal and Cancer. Desai TJ, Brownfield DG, Krasnow MA; *Nature*; 2014; Mar 13; 507 (7491): 190-4.



Ellen Kuhl, PhD

Walter B Reinhold Professor in the School of Engineering
Robert Bosch Chair of Mechanical Engineering
Professor of Mechanical Engineering, and, by courtesy, Bioengineering

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EDUCATION/TRAINING

MS Leibniz University of Hannover
(1995)

PHD University of Stuttgart (2000)

CLINICAL FOCUS

Human Heart Modeling
Heart Failure
Drug Safety Evaluation
Personalized Medicine

HONORS & AWARDS

ASME Ted Belytschko Applied Mechanics Award, American Society of Mechanical Engineers (2021)

ASME Fellow, American Society of Mechanical Engineers (2017)

Humboldt Research Award, Alexander von Humboldt Stiftung (2016)

AIMBE Fellow, American Institute for Medical and Biological Engineering (2014)

CURRENT RESEARCH

Kuhl is the Walter B. Reinhold Professor in the School of Engineering and Robert Bosch Chair of Mechanical Engineering at Stanford University. She is a Professor of Mechanical Engineering and, by courtesy, Bioengineering. She received her PhD from the University of Stuttgart in 2000 and her Habilitation from the University of Kaiserslautern in 2004. Her area of expertise is Living Matter Physics, the design of theoretical and computational models to simulate and predict the behavior of living systems. Ellen has published more than 200 peer-reviewed journal articles and edited two books; she is an active reviewer for more than 50 journals at the interface of engineering and medicine and an editorial board member of seven international journals in her field. She is a founding member of the Living Heart Project, a translational research initiative to revolutionize cardiovascular science through realistic simulation with 400 participants from research, industry, and medicine from 24 countries. Ellen is the current Chair of the US National Committee on Biomechanics and a Member-Elect of the World Council of Biomechanics. She is a Fellow of the American Society of Mechanical Engineers and of the American Institute for Mechanical and Biological Engineering. She received the National Science Foundation Career Award in 2010, was selected as Midwest Mechanics Seminar Speaker in 2014, and received the Humboldt Research Award in 2016 and the ASME Ted Belytschko Applied Mechanics Award in 2021. Ellen is an All American triathlete, a multiple Boston, Chicago, and New York marathon runner, and a Kona Ironman World Championship finisher.

SELECTED PUBLICATIONS

Sex differences in drug-induced arrhythmogenesis. Peirlinck M, Sahli Costabal F, Kuhl E. *Front Physiology*. 2021; 12:708435.

Precision medicine in human heart modeling. Perspectives, challenges and opportunities. Peirlinck M, Sahli Costabal F, Yao J, Guccione JM, Tripathy S, Wang Y, Ozturk D, Segars P, Morrison TM, Levine S, Kuhl E. *Biomech Model Mechanobiol*. 2021; 20:803-831.

Classifying drugs by their arrhythmogenic risk using machine learning. Sahli Costabal F, Seo K, Ashley E, Kuhl E. *Biophys J*. 2020; 118:1-12.

Physics-informed neural networks for cardiac activation mapping. Sahli Costabal F, Yang Y, Perdikaris P, Hurtado DE, Kuhl E. *Front Phys*. 2020; 8:42.

Integrating machine learning and multiscale modeling: Perspectives, challenges, and opportunities in the biological, biomedical, and behavioral sciences. Alber M, Buganza Tepole A, Cannon W, De S, Dura-Bernal S, Garikipati K, Karniadakis G, Lytton WW, Perdikaris P, Petzold L, Kuhl E. *npj Digital Medicine*; 2019; 2:115.

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Calvin Kuo, MD, PhD

Maureen Lyles D'Ambrogio Professor, Medicine - Hematology
Professor, by courtesy, of Chemical and Systems Biology
Co-Lead, Cancer Biology Program, Stanford Cancer Institute
Vice Chair, Department of Medicine

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EDUCATION/TRAINING

MD Stanford University

PHD Stanford University

INTERNAL MEDICINE RESIDENCY

Brigham and Women's Hospital

Medical Oncology FELLOWSHIP

Dana-Farber/Partners

BOARD CERTIFICATION

Medical Oncology, ABIM

CLINICAL FOCUS

Hematology

HONORS & AWARDS

NIH Transformative R01 Award

Burroughs Wellcome Foundation
New Investigator in Pharmacological
Sciences

Kimmel Foundation Scholar in
Translational Science

American Heart Association Innovative
Science Award

SAMANTHA JANOWER RESEARCH CHAIR
Brain Tumor Society

PRESIDENT-ELECT

American Heart Association Silicon
Valley Chapter

ELECTED MEMBER

American Society for Clinical
Investigation

American Association of Physicians

CURRENT RESEARCH

A major focus of my laboratory is the definition of molecular mechanisms of central nervous system angiogenesis and blood-brain barrier regulation, using knockout mouse and adenoviral approaches. In particular, we have generated conditional floxed alleles for the orphan G-protein coupled receptor GPR124 expressed in brain endothelial cells, revealing embryonic lethality from highly specific developmental CNS angiogenesis phenotypes, and allowing testing of essential requirements of this receptor during adulthood and diseases such as stroke or brain tumors. We are interested in developing novel pharmacologic modulators of blood-brain barrier permeability. We also study the endothelial-expressed miR-126/Egfl7 locus using floxed mouse alleles. Additional parts of the lab work in stem cell biology and 3D organoid culture of diverse human organs. This has led to a strong interest in lung stem cell biology and regenerative medicine.

If we knew what we were doing it wouldn't be called research, would it? — Albert Einstein

SELECTED PUBLICATIONS

Essential Regulation of CNS Angiogenesis by the Orphan G Protein-coupled Receptor GPR124. Kuhnert F, Mancuso MR, Wang H, Young WL, Heilshorn S and Kuo CJ. *Science*. Nov 12;330(6006):985-9. (2010).

Oligodendrocyte Precursors Migrate Along Vasculature in the Developing Nervous System. Tsai HH, Munji R, Davalos D, Tien AC, Kuo CJ, Chan JR, Daneman D, Fancy SPJ. *Science* (2016) Jan 22;351(6271):379-84.

Gpr124 is Essential for Blood-brain Barrier Integrity in Central Nervous System Disease. Chang J, Mancuso MR, Maier C, Liang X, Yuki K, Yang L, Kwong JW, Wang J, Rao V, Vallon M, Kosinski C, Zhang JJ, Mah AT, Xu L, Li L, Gholamin S, Reyes TF, Li R, Kuhnert F, Corney DC, Cheshier SH, Shortliffe LD, Wu X, Snyder M, Chan P, Giffard RG, Chang HY, Andreasson K, Kuo CJ. *Nature Medicine* (2017) Mar 13.

Oncogenic Transformation of Diverse Gastrointestinal Tissues in Primary Organoid Culture. Li X, Nadauld L, Ootani A, Corney DC, Pai RK, Gevaert O, Cantrell MA, Rack PG, Neal JT, Chan CW, Yeung T, Gong X, Yuan J, Wilhelmy J, Robine S, Attardi LD, Plevritis SK, Hung KE, Chen CZ, Ji HP, Kuo CJ. *Nature Medicine*. (2014) Jul;20(7):769-77.

Surrogate Wnt Agonists That Phenocopy Canonical Wnt and Beta-catenin Signalling. Janda CY, Dang LT, You C, Chang J, de Lau W, Zhong ZA, Yan KS, Marecic O, Siepe D, Li X, Moody JD, Williams BO, Clevers H, Piehler J, Baker D, Kuo CJ, Garcia KC. *Nature* (2017) May 11;545(7653):234-237.



Anson Lee, MD

Assistant Professor of Cardiothoracic Surgery (Adult Cardiac Surgery)

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LAB med.stanford.edu/ctsurgery/research/leelab.html

EDUCATION/TRAINING

MD Washington University School of Medicine

INTERNSHIP Washington University School of Medicine

RESIDENCY Washington University School of Medicine

FELLOWSHIP Washington University School of Medicine

BOARD CERTIFICATION
Thoracic and Cardiovascular Surgery (ABTS)

CLINICAL FOCUS

Arrhythmia Surgery

Atrial Fibrillation

Adult Cardiac Surgery

Heart and lung transplantation

HONORS & AWARDS

Thoracic Surgical Foundation STSA Research Award

Bio-X Interdisciplinary Initiatives Program Seed Grant

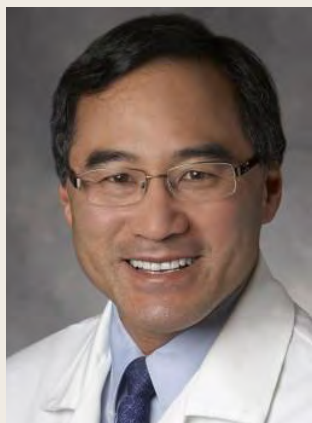
CURRENT RESEARCH

My lab is working to advance the understanding of the mechanisms of cardiac arrhythmias and to apply that understanding to develop potential therapies to treat atrial fibrillation and other disorders of cardiac rhythm. We have investigations at the genomic level, whole organ tissue level, and clinical studies in humans. We are developing new high resolution mapping tools to characterize atrial fibrillation, and are using cell culture to examine arrhythmias at the cellular level. Utilizing the knowledge from these investigations, we are also developing minimally invasive surgical techniques to treat arrhythmia.

We have to do better. If our success rates with coronary artery disease were as bad as our results with atrial fibrillation, we would all be out of business.

SELECTED PUBLICATIONS

Maze Permutations During Minimally Invasive Mitral Valve Surgery. Lee AM. *Ann Cardiothorac Surg.* 2015 Sep;4(5):463-8.



David Lee, MD

Associate Professor of Medicine (Cardiovascular Medicine)

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EDUCATION/TRAINING

MD University of Minnesota

RESIDENCY Stanford University

FELLOWSHIP Stanford University

BOARD CERTIFICATION

Interventional Cardiology (ABIM)

CLINICAL FOCUS

Cardiology

Interventional Cardiology

HONORS & AWARDS

President, Western States Affiliate,
American Heart Association

CURRENT RESEARCH

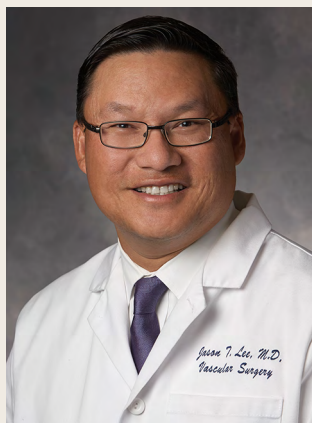
My current research is largely focused on developing new technology for interventional cardiology. I helped develop catheter-based renal denervation as a treatment for hypertension, and my current studies have focused on RDN as primary therapy alone or in combination with medications. My other projects include a novel set of devices for mitral valve interventions and a large-bore vascular closure device.

SELECTED PUBLICATIONS

Catheter-based Renal Denervation in Patients With Uncontrolled Hypertension in the Absence of Antihypertensive Medications (SPYRAL HTN-OFF MED): A Randomised, Sham-controlled, Proof-of-concept Trial. Townsend RR, Mahfoud F, Kandzari DE, Kario K, Pocock S, Weber MA, Ewen S, Tsioufis K, Tousoulis D, Sharp ASP, Watkinson AF, Schmieder RE, Schmid A, Choi JW, East C, Walton A, Hopper I, Cohen DL, Wilensky R, Lee DP, Ma A, Devireddy CM, Lea JP, Lurz PC, Fengler K, Davies J, Chapman N, Cohen SA, DeBruin V, Fahy M, Jones DE, Rothman M, Böhm M; SPYRAL HTN-OFF MED trial investigators*. *Lancet* 2017; 390:2160-2170.

Prasugrel Plus Aspirin Beyond 12 Months is Associated With Improved Outcomes After TAXUS Liberté Paclitaxel-eluting Coronary Stent Placement. Garratt KN, Weaver WD, Jenkins RG, Pow TK, Mauri L, Kereiakes DJ, Winters KJ, Christen T, Allocco DJ, Lee DP. *Circulation* 2015;131(1):62-73.

Twelve or 30 Months of Dual Antiplatelet Therapy After Drug-eluting Stents. Mauri L, Kereiakes DJ, Yeh RW, Driscoll-Shempp P, Cutlip DE, Steg PG, Normand SL, Braunwald E, Wiviott SD, Cohen DJ, Holmes DR Jr, Krucoff MW, Hermiller J, Dauerman HL, Simon DI, Kandzari DE, Garratt KN, Lee DP, Pow TK, Ver Lee P, Rinaldi MJ, Massaro JM; DAPT Study Investigators. *N Engl J Med.* 2014;371:2155-66.



Jason T. Lee, MD

Professor, Surgery
Director, Endovascular Surgery
Program Director, Vascular Surgery Residency/Fellowship

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CURRENT RESEARCH

My clinical research interests focus on developing and refining endovascular techniques to treat complex aortic pathology related to aneurysms and dissections, particularly as Stanford's local principal investigator for numerous endograft trials, and having also accumulated one of the largest series of fenestrated and snorkel/chimney procedures for juxtarenal aortic aneurysms in the country. As a surgical educator and former Robert Wood Johnson Faculty Physician Scholar, my lab has demonstrated that endovascular simulation for students and trainees translates to increased learner interest, more efficient surgical training, and improved operative performance. We are currently collaborating with multiple institutions designing national standards for technical skills assessment. Our lab most recently has been collaborating through the CVI on computational flow modeling to help best predict which strategy of endograft might be best suited for particular anatomy. I maintain an active busy practice also with a niche interest in athletic vascular compressive disorders. And finally, I recently assumed the Division Chief Role for our Vascular Surgery Group, and am committed to continued excellence in our division from a clinical care, research, and education standpoint.

Don't bet against technology - continued device innovation and technical improvements will provide patients with much less invasive ways to cure their vascular diseases.

SELECTED PUBLICATIONS

Patient-specific computational flow modelling for assessing hemodynamic changes following FEVAR. Tran K, Yang W, Marsden A, Lee JT. *J Vasc Surg-Vascular Science* 2021;2:53-69.

Bicycle exercise ABI recovery time as a novel metric for evaluating the hemodynamic significance of external iliac endofibrosis in competitive cyclists. Tran K, Dossahboy S, Sorondo S, Lee JT. *J Vasc Surg Cases Innov Tech* 2021;7:681-85.

Validity evidence for vascular skills assessment: the feasibility of FVS in general surgery residency. Schmiederer IS, Kearse LE, Korndorffer JR, Lee E, Sgroi MD, Lee JT. *J Surg Educ*, epub ahead of print August 23, 2021.

Predictors of sac regression after fenestrated EVAR. Li M, Stern JR, Tran K, Deslarzes-Dubuis C, Lee JT. *J Vasc Surg*, epub ahead of print Sep 8, 2021.

Fenestrated EVAR with large device diameters (34- to 36-mm) is associated with increased rates of type 1 and 3 endoleak and reintervention. Deslarzes-Dubuis C, Stern JR, Tran K, Colvard BJ, Lee JT. *Ann Vasc Surg*, epub ahead of print Oct 14, 2021.

ZFEN Outcomes for patients treated inside versus outside of IFU. Stern JR, Deslarzes-Dubuis C, Tran K, Lee JT. *JEVT*, epub ahead of print Jan 7, 2022.

EDUCATION/TRAINING

MD UCSD

General Surgery Residency

Harbor-UCLA Medical Center

Vascular Surgery Fellowship

Stanford University

BOARD CERTIFICATION

Vascular Surgery, ABS

CLINICAL FOCUS

Complex Endovascular Aneurysm Repair
Fenestrated/Parallel/Branched Aortic Repair

Thoracic Dissection/Thoracoabdominal Aneurysm Therapy

Surgical Simulation and Education

Vascular Disorders in Athletes

Thoracic Outlet Syndrome

HONORS & AWARDS

Society for Vascular Surgery-
Distinguished Fellow, Vice Program
Chair 2022-2024

President, Vascular and Endovascular
Surgery Society (2021-2022)

President, Association of Program
Directors in Vascular Surgery (2022-
2024)

Director, Vascular Surgery Board,
American Board of Surgery (2019-2025)



Nicholas Leeper, MD

Professor, Surgery - Vascular Surgery
 Professor, Medicine - Cardiovascular Medicine
 Chief, Vascular Medicine
 Director, Vascular Research

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EDUCATION/TRAINING

MD University of Chicago

INTERNAL MEDICINE RESIDENCY
 UCSF

CARDIOLOGY FELLOWSHIP
 Stanford University

VASCULAR MEDICINE FELLOWSHIP
 Stanford University

BOARD CERTIFICATION
 Cardiovascular Disease, ABIM
 Vascular Medicine, ABVM

CLINICAL FOCUS

Vascular Medicine

HONORS & AWARDS

AWARDS

Established Investigator Award,
 American Heart Association

Distinguished Research in Vascular
 Biology Award, ATVB Council

Jeffrey M. Hoeg Award for Basic Science
 and Clinical Research Recipient

American Society for Clinical
 Investigation (ASCI) inductee

CHAIR

Gordon Research Conference on
 Atherosclerosis, Incoming Chair

ATVB Early Career Committee,
 Immediate Past Chair

STEERING COMMITTEE

Stanford Cardiovascular Institute

TRUSTEE

Society for Vascular Medicine

CURRENT RESEARCH

As much as half of an individual's lifetime risk for cardiovascular disease is genetic in nature. My laboratory is focused on defining and understanding the heritable factors which account for this risk. Specifically, we employ agnostic, genome-wide approaches to prioritize candidates for molecular investigation. Currently, our main focus is on a process known as "efferocytosis" (Latin: to carry the dead to the grave) and developing novel translational therapies which can stimulate phagocytic removal of apoptotic debris from the necrotic core of the atherosclerotic plaque.

In questions of science the authority of a thousand is
 not worth the humble reasoning of a single individual.

— Galileo Galilei

SELECTED PUBLICATIONS

The pleiotropic benefits of statins include the ability to reduce CD47 and amplify the effect of pro-efferocytic therapies in atherosclerosis. Jarr KU, Ye J, Kojima Y, Ye Z, Gao H, Baylis R, Smith BR, Weissman IL, Maegdefessel L, Leeper NJ. *Nature Cardiovascular Research*. 2022 (in press).

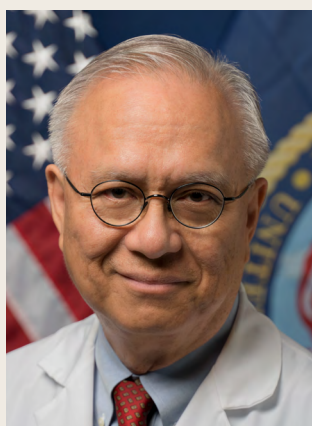
Impact of CD47 blockade on vascular inflammation. Jarr K, Nakamoto R, Doan BH, Kojima Y, Weissman IL, Advani RH, Iagaru A, Leeper NJ. *New England Journal of Medicine*. 2021, Jan 28;384(4):382-383.

Pro-efferocytic Nanoparticles are Specifically Taken up by Lesional Macrophages and Prevent Atherosclerosis. Flores, A.M., Hosseini-Nassab, N., Jarr, K.U., Ye, J. Smith, B.R., Leeper, N.J. *Nature Nanotechnology*. Feb;15(2):154-161, 2020

Clonally-expanding smooth muscle cells promote atherosclerosis by escaping efferocytosis and activating the complement cascade. Wang Y, Nanda V, Drenzo D, Ye J, Xiao S, Kojima Y, Bjorkegren JLM, Owens GK, Ingelsson E, Weissman IL, Leeper NJ. *PNAS*, 2020, Jul 7;117(27):15818-15826.

Canagliflozin and Cardiovascular and Renal Events in Type 2 diabetes. Neal, B., Perkovic, V., Mahaffey, K. W., de Zeeuw, D., Fulcher, G., Erondur, N., Shaw, W., Law, G., Desai, M., Matthews, D. R. *The New England Journal of Medicine*. 2017; 377 (7): 644-57.

CD47-blocking Antibodies Restore Phagocytosis and Prevent Atherosclerosis. Kojima, Y., Volkmer, J., McKenna, K., Civelek, M., Lusis, A. J., Miller, C. L., DiRenzo, D., Nanda, V., Ye, J., Connolly, A. J., Schadt, E. E., Quertermous, T., Betancur, P., Maegdefessel, L., Matic, L. P., Hedin, U., Weissman, I. L., Leeper, N. J. *Nature*. 2016; 536 (7614): 86-90; 377 (7): 644-57.



Lawrence Leung, MD

Maureen Lyles D'Ambrogio Professor of Medicine, Hematology
VA Palo Alto Health Care System

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DIVISION hematology.stanford.edu

EDUCATION/TRAINING

MD Columbia University

MEDICINE RESIDENCY

Cornell University Medical Center

HEMATOLOGY-ONCOLOGY FELLOWSHIP

Cornell University Medical Center

BOARD CERTIFICATION

Hematology, ABIM

Internal Medicine, ABIM

Oncology, ABIM

CLINICAL FOCUS

Bleeding and Thrombotic Disease

HONORS & AWARDS

EDITOR-IN-CHIEF

UpToDate - Hematology

American Board of Internal Medicine (ABIM), Hematology subspecialty board (2003-2010)

ELECTED MEMBER

American Society for Clinical Investigation; Association of American Physicians

FORMER CHIEF

Division of Hematology, Stanford University (1995-2004)

FORMER CHIEF

Medical Service, VA Palo Alto Health Care System (2004-2011)

FORMER DIRECTOR

Vascular Biology and Medicine, Gilead Sciences (1992-1994)

CURRENT RESEARCH

My laboratory studies how thrombin, the key enzyme in the coagulation cascade, interacts with its various substrates to regulate hemostasis, inflammation, and innate immunity. Thrombin interacts with the endothelial cell cofactor thrombomodulin to activate protein C and procarboxypeptidase B (pCPB). Activated CPB inactivates a number of proinflammatory mediators and regulates the proinflammatory activities of thrombin in a homeostatic fashion.

Our long-term goal is to define the molecular links important in the crosstalk between hemostasis, thrombosis, inflammation and innate immunity, thereby developing clinically useful diagnostic and therapeutic reagents.

Our long-term goal is to define the molecular links important in the crosstalk between hemostasis, thrombosis, inflammation and innate immunity, thereby developing clinically useful diagnostic and therapeutic reagents.

SELECTED PUBLICATIONS

Chemerin regulates formation and function of brown adipose tissue: ablation results in increased insulin resistance with high fat challenge and aging. Zhang Y, Shen WJ, Qiu S, Dempsey G, Zhao L, Zhou Q, Hao X, Dong D, Stahl A, Kraemer FB, Leung LL, Morser J. *FASEB J*. 2021; 35:e21687.

Both plasma basic carboxypeptidases, carboxypeptidase B2 and carboxypeptidase N, regulate vascular leakage activity in mice. Zhou Q, Zhao L, Shao Z, Declerk P, Leung LLK, Morser J. *J Thromb Haemost*. 2022; 20:238-244.

Thrombin cleavage initiates osteopontin's tumor promoting activity. Peraramelli S, Zhou Q, Zhou Q, Wanko B, Zhao L, Nishimura T, Leung TH, Mizuno S, Ito M, Myles T, Stulnig TM, Morser J, Leung LLK. 2022. *J Thromb Haemost*. In press.

Carboxypeptidase B2 and N Play Different Roles in Regulation of Activated Complements C3a and C5a in Mice. Morser J, Shao Z, Nishimura T, Zhou Q, Zhao L, Higgins J, Leung LLK. *CJ. Thromb. Haemost*. 2018, 16:991-1002. (Commentary: Foley JH, Conway EM. *JTH* 16:987-990).

Decoding the Genomics of Abdominal Aortic Aneurysm. Li J, Pan C, Zhang S, Spin J, Deng A, Leung LLK, Dalman RL, Tsao PS, Snyder M. *Cell* 2018, 174:1361-1372.



Craig Levin, PhD

Professor of Radiology and, by courtesy, of Physics, of Electrical Engineering, and of Bioengineering

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EDUCATION/TRAINING

PHD Yale University

HONORS & AWARDS

Edward J. Hoffman Medical Imaging Scientist Award (2020);

Coulter Foundation Translational Research Award (2017, 2018 and 2019);

Japanese Society for the Promotion of Science (JSPS) Invitation Fellowship (2015)

Academy of Radiology Research (ARR) Distinguished Investigator Recognition Award (2012)

Elected to the American Institute for Medical and Biological Engineering's (AIMBE) College of Fellows (2012)

CURRENT RESEARCH

Our research interests are to explore and create new instrumentation and signal processing algorithm concepts for *in vivo* imaging of molecular signatures of disease in living subjects. These novel cameras efficiently image emissions from molecular contrast agents to probe disease biology in tissues residing deep within the body using measurements made from outside the body. The technology goals are to advance the sensitivity and spatial, spectral, and/or temporal resolutions, to create new camera geometries for special biomedical applications, to understand the entire imaging process comprising the subject tissues, radiation transport, and imaging system, and to provide the best available image quality and quantitative accuracy. The ultimate goal is to introduce these new imaging tools into studies of molecular mechanisms and treatments of disease in living subjects.

It is better to light a candle than to curse the darkness — attributed to William L. Watkinson

SELECTED PUBLICATIONS

Scalable electronic readout design for a 100 ps coincidence time resolution TOF-PET system. Pourashraf S, Gonzalez-Montoro A, Won JY, Lee MS, Cates JW, Zhao ZX, Zhao, Lee JS, Levin CS. *PHYSICS IN MEDICINE AND BIOLOGY*. April 2021. DOI:10.1088/1361-6560/abf1bc.

Pseudo CT Image Synthesis and Bone Segmentation From MR Images Using Adversarial Networks With Residual Blocks for MR-Based Attenuation Correction of Brain PET Data. Tao L, Fisher J, Anaya E, Li X, Levin CS. *IEEE TRANSACTIONS ON RADIATION AND PLASMA MEDICAL SCIENCES* Volume: 5 Issue: 2 Pages: 193-201 DOI: 10.1109/TRPMS.2020.2989073 Published: MAR 2021 .

Ionizing photon interactions modulate the optical properties of crystals with femtosecond scale temporal resolution. Tao L, Coffee RN, Jeong D, Levin CS. *PHYSICS IN MEDICINE AND BIOLOGY*, DOI: 10.1088/1361-6560/abd951, FEB 21 2021.

Results of a Prospective Trial to Compare Ga-68-DOTA-TATE with SiPM-Based PET/CT vs. Conventional PET/CT in Patients with Neuroendocrine Tumors. Baratto L, Toriihara A, Hatami N, Aparici CM, Davidzon G, Levin CS, Igaru, A. *DIAGNOSTICS*, DOI: 10.3390/diagnostics11060992, JUN 2021.

New PET technologies - embracing progress and pushing the limits. Aide N, Lasnon C, Kesner A, Levin CS, Buvat I, Igaru A, Hermann K, Badawi RD, Cherry SR, Bradley KM, McGowan DR. *EUROPEAN JOURNAL OF NUCLEAR MEDICINE AND MOLECULAR IMAGING*. DOI: 10.1007/s00259-021-05390-4, AUG 2021.



Eldrin F. Lewis, MD, MPH

Simon H. Stertz, MD Professor of Medicine and Division Chief, Cardiovascular Medicine, Department of Medicine

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CURRENT RESEARCH

Dr. Lewis is an internationally recognized clinical expert in the field of advanced heart failure, heart transplantation, and mechanical circulatory support. He has an interest in preventing the development of and progression of heart failure by investigating novel strategies and therapies for treating these co-morbid illnesses. He also performs quality of life research to better understand how to improve these outcomes and include them into medical decision making. His work has included understanding the biological and social factors that influence patient reported outcomes and progression of disease from risk factors (e.g., diabetes, chronic kidney disease and hypertension) to heart failure. He has been involved in numerous clinical trials across the spectrum of cardiovascular diseases that aim to improve patient outcomes and quality of life. These include several innovative approaches to prevent the progression of disease, reduce the rate of readmission following heart failure hospitalization, improve patient understanding prior to surgical interventions, and improve the clinical usefulness of quality of life assessments. Over a decade ago, Dr. Lewis initiated a patient questionnaire on symptoms and concerns that became a routine part of clinical care. He also is leading efforts to better understand and reduce health inequities. He holds leadership positions in national organizations, including Chair of Scientific Publishing Committee and Council on Clinical Cardiology in the AHA.

SELECTED PUBLICATIONS

Identification of Racial Inequities in Access to Specialized Inpatient Heart Failure Care at an Academic Medical Center. Eberly LA, Richterman A, Beckett AG, Wispelwey B, Marsh RH, Cleveland Manchanda EC, Chang CY, Glynn RJ, Brooks KC, Boxer R, Kakoza R, Goldsmith J, Loscalzo J, Morse M, Lewis EF. *Circ Heart Fail.* 2019 Nov;12(11).

Associations Between Depressive Symptoms and HFpEF-Related Outcomes. Chandra A, Alcala MAD, Claggett B, Desai AS, Fang JC, Heitner JF, Liu J, Pitt B, Solomon SD, Pfeffer MA, Lewis EF. *JACC Heart Fail.* 2020 Dec;8(12):1009-1020

Angiotensin Receptor-Neprilysin Inhibition in Acute Myocardial Infarction. Pfeffer MA, Claggett B, Lewis EF, Granger CB, Køber L, Maggioni AP, Mann DL, McMurray JJV, Rouleau JL, Solomon SD, Steg PG, Berwanger O, Cikes M, De Pasquale CG, East C, Fernandez A, Jering K, Landmesser U, Mehran R, Merkely B, Vaghaiwalla Mody F, Petrie MC, Petrov I, Schou M, Senni M, Sim D, van der Meer P, Lefkowitz M, Zhou Y, Gong J, Braunwald E; PARADISE-MI Investigators and Committees. *N Engl J Med.* 2021 Nov 11;385(20):1845-1855

Vadadustat in Patients with Anemia and Non-Dialysis-Dependent CKD. Chertow GM, Pergola PE, Farag YMK, Agarwal R, Arnold S, Bako G, Block GA, Burke S, Castillo FP, Jardine AG, Khawaja Z, Koury MJ, Lewis EF, Lin T, Luo W, Maroni BJ, Matsushita K, McCullough PA, Parfrey PS, Roy-Chaudhury P, Sarnak MJ, Sharma A, Spinowitz B, Tseng C, Tumlin J, Vargo DL, Walters KA, Winkelmayer WC, Wittes J, Eckardt KU; PROTECT Study Group. *N Engl J Med.* 2021 Apr 29;384(17):1589-1600

EDUCATION/TRAINING

MD University of Pennsylvania

MPH Harvard School of Public Health

RESIDENCIES / FELLOWSHIPS

Internal Medicine Residency - Brigham and Women's Hospital

Cardiovascular Medicine Fellowship - Brigham and Women's Hospital

Advanced Heart Failure and Transplant Cardiology - Brigham and Women's Hospital

CLINICAL FOCUS

Heart Failure

Managing Advanced Stages of Heart Disease

Improvement of Patients' Quality of Life

MEMBERSHIPS

Massachusetts Medical Society (1995 - present)

Association of Black Cardiologists (2018 - present)

American College of Cardiology (2000 - present)

American Heart Association (2004 - present)

Heart Failure Society of American (2004 - present)



Ronglih Liao, PhD

Professor of Medicine, Cardiovascular Medicine

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CURRENT RESEARCH

Our laboratory has played an international leading role in the study of amyloid light chain (AL) cardiomyopathy, a rare and fatal form of cardiovascular disease. We have described the underlying pathophysiologic basis for amyloid cardiomyopathy and found that the circulating amyloidogenic light chain proteins that characterize this disease directly result in a specific cardiotoxic response. Consequently, our research work has redefined AL cardiomyopathy and has raised new treatment approaches. In line with our goal of revealing novel therapeutic strategies for patients with cardiovascular disease, our efforts have also focused on characterizing and harnessing endogenous cardiac regenerative mechanisms. Our group initially demonstrated the therapeutic potential of exogenous primitive muscle cells delivered to the injured heart. This work was among the earliest milestones in the field and served as the basis for an international trial of cell-based therapy. We aim to reveal the molecular mechanisms regulating the endogenous regenerative capacity of the heart and to harness such repair mechanisms for the treatment of cardiovascular disease.

If we knew what it was we were doing, it would not be called research, would it?
—Albert Einstein

SELECTED PUBLICATIONS

Fibrosis and Diastolic Dysfunction. Schimmel K, Jung M, Foinquinos A, San José G, Beaumont J, Bock K, Grote-Levi L, Xiao K, Bär C, Pfanne A, Just A, Zimmer K, Ngoy S, López B, Ravassa S, Samolovac S, Janssen-Peters H, Remke J, Scherf K, Dangwal S, Piccoli MT, Kleemiss F, Kreutzer FP, Kenneweg F, Leonardy J, Hobuß L, Santer L, Do QT, Geffers R, Braesen JH, Schmitz J, Brandenberger C, Müller DN, Wilck N, Kaever V, Bähre H, Batkai S, Fiedler J, Alexander KM, Wertheim BM, Fisch S, Liao R, Diez J, González A, Thum T. *Circulation*. Mar 3;141(9):751-767.

Improved Quantification of Cardiac Amyloid Burden in Systemic Light Chain Amyloidosis: Redefining Early Disease? Cuddy SAM, Bravo PE, Falk RH, El-Sady S, Kijewski MF, Park MA, Ruberg FL, Sanchorawala V, Landau H, Yee AJ, Bianchi G, Di Carli MF, Cheng SC, Jerosch-Herold M, Kwong RY, Liao R, Dorbala S. *ACC Cardiovasc Imaging*. 2020 Jun;13(6):1325-1336.

Outcomes in Patients with Cardiac Amyloidosis Undergoing Heart Transplantation. Barrett CD, Alexander KM, Zhao H, Haddad F, Cheng P, Liao R, Wheeler MT, Liedtke M, Schrier S, Arai S, Weisshaar D, Witteles RM. *JACC Heart Fail*. 2020 Jun;8(6):461-468.

MicroRNA-21 regulate right ventricular remodeling secondary to Pulmonary secondary to Pulmonary arterial pressure overload. Chang WT, Fisch S, Dangwal S, Mohebbi J, Fiedler A.G, Chen M, Hsu S-H, Yang Y., Qiu Y., Alexander K.M., Frederick Y. Chen, Liao R. *JMCC*. 2021 Feb 4;154:106-114.

Improve Cardiac Coronary Flow Under Hemodynamic Pressure Overload. Chang WT, Fisch S, Dangwal S, Chen M, Cheng S, Chen ZC, Liao R. *Hypertension Res*. 2021 Feb 10.

EDUCATION/TRAINING

PHD University of Alabama at Birmingham

POSTDOCTORAL TRAINING

Harvard Medical School/Beth Israel Hospital

HONORS & AWARDS

Fellow of American Heart Association

Fellow of American Physiological Society

2016 Stanley J. Sarnoff Sprit Award, Sarnoff Cardiovascular Research Foundation

2019 AHA GPM Mentoring Award, Council on Genomic and Precision Medicine (GPM), American Heart Association

2020 AHA Thomas Smith Memorial Lecturer (BCVS Council)



Bryant Lin, MD, MEng

Clinical Associate Professor, Department of Medicine,
Division of Primary Care and Population Health
Co-Director, Center for Asian Health Research and Education
Director, Medical Humanities and Arts

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EDUCATION/TRAINING

MD Tufts University School of Medicine

MEng MIT EECS

Internal Medicine Residency Tufts Medical Center

Research Fellowship Stanford University, Cardiology and Biodesign

BOARD CERTIFICATION Internal Medicine, ABIM

CLINICAL FOCUS

Diagnostic/Consultative Medicine
Atrial Fibrillation

Diabetes

Hypertension

HONORS & AWARDS

Training Director, Joe and Linda Chlapaty DECIDE Center at Stanford University

Stanley Ho Visiting Professorship
Chinese University of Hong Kong

Advisory Board, Future Blood Testing for Inclusive Monitoring and Personalised Analytics Network+, University of Reading

CURRENT RESEARCH

Bryant Lin, MD, MEng is a primary care physician, educator and researcher. The cornerstone of Dr. Lin's work is keeping medicine focused on humans - patients, providers, families and trainees - and not lost in technology and algorithms. His research and educational interests span (1) Developing and testing novel medical technologies, (2) Improving the health of Asian populations with Precision and Population Health, and (3) Increasing expression and interconnections in the Health Community with the Humanities and Arts. He serves as the Training Director for the Joe and Linda Chlapaty DECIDE Center which has created a novel shared decision-making tool for atrial fibrillation anti-coagulation and is an investigator in several active clinical trials in Diabetes and Atrial Fibrillation. Three years ago, he co-founded and currently co-directs, with Dr. Latha Palaniappan, the Center for Asian Health Research and Education (CARE) which aims to improve the health of Asians everywhere. As part of his role as Director of Medical Humanities and Arts, Dr. Lin has an active interest in storytelling and film-making. He co-directs an undergraduate seminar, MED 53Q "Storytelling in Medicine", with Dr. Lauren Edwards and is working with a group of students on a documentary on end-of-life care at a Japanese-American Senior Home in the Bay Area.

SELECTED PUBLICATIONS

Increased Self-Reported Racial/Ethnic Discrimination and Concern for Physical Assault Due to the COVID-19 Pandemic in Chinese, Vietnamese, Korean, Japanese, and Filipino Americans. Ha SK, Nguyen AT, Sales C, Chang RS, Ta H, Srinivasan M, Chung S, Palaniappan L., Lin B. *Journal of Asian Health*. 2021; 1(1).

Resonant vibration of the sinonasal cavities for the treatment of nasal congestion. Khanwalkar A, Johnson J, Zhu W, Johnson E, Lin B, Hwang PH. *Int Forum Allergy Rhinol*. 2021 Aug 6. Study 3.

Machine Learning Clustering for Blood Pressure Variability: Validation from the SPRINT to the Hong Kong Community Cohort. Tsoi K, Chan N, Yiu K, Poon S, Ho K, Lin B. *Journal of Hypertension*, 2021 April;39:e69.

Blood Thinners for Atrial Fibrillation Stroke Prevention. Pundi KN, Baykaner T, Hills M, Lin B, Morin D, Sears S, Wang PJ, Stafford RS. *Circulation: Arrhythmia and Electrophysiology*, 2021 June;14(6):e009389.



Michael Longaker, MD

Deane P. and Louise Mitchell Professor in the School of Medicine and Professor (by courtesy) of Bioengineering and Materials Science and Engineering

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WEB longakerlab.com

EDUCATION/TRAINING

MD Harvard Medical School

GENERAL SURGERY INTERNSHIP UCSF Medical Center

GENERAL SURGERY RESIDENCY UCSF Medical Center

PLASTIC & RECONSTRUCTIVE SURGERY RESIDENCY NYU Medical Center

CRANIOFACIAL SURGERY FELLOWSHIP UCLA Medical Center

BOARD CERTIFICATION

General Surgery (ABS), Plastic Surgery (ABPS)

CLINICAL FOCUS

Plastic Surgery

HONORS & AWARDS

American Society for Clinical Investigation (2004)

National Academy Of Medicine (2007)

Association Of American Physicians (2008)

I.S. Ravdin Lecture In Basic Medical Sciences, American College Of Surgeons (2009)

France-Karl Award, American Surgical Association (2011)

Sheen Award, Bank Of America/American College Of Surgeons (2012)

66Th. Volume Of The Surgical Forum Is Dedicated To Michael T. Longaker, MD, MBA, FACS (2015)

PSF Career Research Award, Plastic Surgery Foundation (2016)
Lifetime Achievement Award, Society of University of Surgeons (2020)
Stanford Cardiovascular Institute

CURRENT RESEARCH

Michael Longaker's extensive research experience includes the cellular and molecular biology of extracellular matrix with specific applications to the differences between fetal and post-natal wound healing, the biology of keloids and hypertrophic scars, the cellular and molecular events in craniofacial development and stem cell biology. In addition, his research investigates craniofacial development and skeletal stem cell biology. He has a unique understanding of wound healing, fetal wound healing research, developmental biology, tissue engineering, and stem cell biology.

The harder I work, the luckier I get.
— Thomas Jefferson

SELECTED PUBLICATIONS

Articular cartilage regeneration by activated skeletal stem cells in mouse and human. Murphy MP, Koepke LS, Lopez MT, Tong X, Ambrosi TH, Gulati GS, Marecic O, Wang Y, Ransom RC, Hoover MY, Steininger H, Zhao L, Walkiewicz MP, Quarto N, Levi B, Wan DC, Weissman IL, Goodman SB, Yang F, Longaker MT*, Chan CKF* (*Corresponding authors). *Nature Medicine*.26(10):1583-1592. 2020 PMID: 32807933

Preventing Engrailed-1 activation in fibroblasts yields wound regeneration without scarring. Mascharak S, desJardins-Park H, Davitt M, Borrelli M, Moore A, Chen K, Duoto B, Chinta M, Foster D, Shen A, Januszyk M, Kwon S, Wernig G, Wan DC, Lorenz HP, Gurtner GC*, Longaker MT*. (*Corresponding authors). *Science*. 372(6540):eaba2374.

Aged Skeletal Stem Cells Generate an Inflammatory Degenerative Niche. Ambrosi TH, Marecic O, McArdle A, Sinha R, Gulati GS, Tong X, Wang Y, Steininger HM, Hoover MY, Koepke LS, Murphy MP, Sokol J, Seo E, Tevlin R, Lopez M, Brewer RE, Mascharak S, Lu L, Ajanaku O, Conley SD, Seita J, Moori M, Neff NF, Sahoo D, Yang F, Weisman IL, Longaker MT*, Chan CKF* (*Corresponding authors). *Nature*. 2021 Sep;597(7875):256-262. doi: 10.1038/s41586-021-03795-7

JUN promotes hypertrophic skin scarring via CD36 in preclinical in vitro and in vivo models. Griffin M, Borrelli MR, Garcia JT, Januszyk M, King M, Lerbs T, Cui L, Moore AL, Shen AH, Mascharak S, Deleon NMD, Adem S, Taylor WL, desJardins-Park HE, Gastou M, Patel RA, DuotoBA, Sokol J, Wei Y, Foster D, Chen K, Wan DC, Gurtner GC, Lorenz HP, Chang HY, Wernig G*, Longaker MT* (*Corresponding authors). *Science Translational Medicine* 13(609). 2021 Sep 1. DOI: 10.1126/scitranslmed.abb3312.

Integrated spatial multi-omics reveals fibroblast fate during tissue repair. Foster DS, Januszyk M, Yost KE, Chinta MS, Gulati GS, Nguyen AT, Burcham AR, Salhotra A, Ransom RC, Henn D, Chen K, Mascharak S, Tolentino K, Titan AL, Jones RE, da Silva O, Leavitt WT, Marshall CD, desJardins-Park HE, Hu MS, Wan DC, Wernig G, Wagh D, Collier J, Norton JA, Gurtner GC, Newman A, Chang HY*, Longaker MT* (*Corresponding authors). *Proc Natl Acad Sci* 2021 Oct 12;118(41):e2110025118. doi: 10.1073/pnas.2110025118.



George Lui, MD

Clinical Associate Professor, Medicine (Cardiovascular Medicine)
and Pediatrics (Cardiology)
Medical Director, Adult Congenital Heart Program

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EDUCATION/TRAINING

MD Yale University School of Medicine

RESIDENCY Harvard Combined Internal Medicine and Pediatrics Residency

FELLOWSHIP Columbia University Medical Center

BOARD CERTIFICATION

Internal Medicine (ABIM); Cardiovascular Disease (ABIM); Adult Congenital Heart Disease (ABIM); Adult Comprehensive Echocardiography (NBE)

CLINICAL FOCUS

Adult Congenital Heart Disease
Cardiovascular Disease
Echocardiography

HONORS & AWARDS

E. William Hancock Teaching Award in Division of Cardiovascular Medicine, Stanford University (2015)

Outstanding Research Award in Pediatric Cardiology, American Heart Association (2009)

Norma Bailey Berniker Prize, Yale University (2002)

CURRENT RESEARCH

I am currently working with the Centers for Disease Control and Prevention on the Surveillance of Congenital Heart Defects Among Children, Adolescents and Adults. The goal of this project is to build on existing infrastructure for population-based CHDs surveillance to (i) estimate congenital heart defect prevalence in individuals ages 1-45, (ii) examine age-specific mortality, (iii) improve understanding of healthcare utilization, comorbidities and outcome, (iv) improve understanding of racial/ethnic and socioeconomic patterns in healthcare use, and (v) validate billing codes for congenital heart defects in healthcare claims data.

There are more than a million U.S. adults living with congenital heart disease. I hope that we can enhance the quality of care and longevity for these individuals through our clinical expertise, education, and research.

SELECTED PUBLICATIONS

Population-Based Surveillance of Congenital Heart Defects Among Adolescents at Three Sites in the United States. Lui GK, McGarry C, Bhatt A, Book W, Riehle-Colarusso TJ, Dunn JE, Glidewell J, Gurvitz M, Hoffman T, Hogue CJ, Hsu D, Obenhaus S, Raskind-Hood C, Rodriguez III FH, Zaidi A, Van Zutphen AR. *Am J Card*. 2019; 124: 137-143.

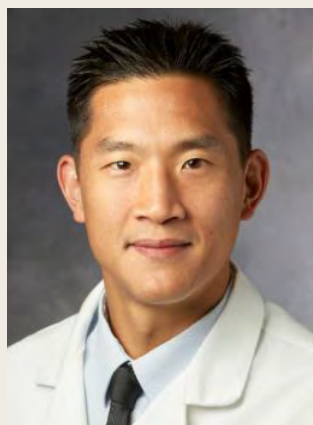
Outcome of En bloc Combined Heart and Liver Transplantation in the Adolescent and Adult Failing Fontan. Vaikunth S, Concepcion W, Daugherty D, Fowler M, Lutchman G, Maeda K, Rosenthal D, Teuteberg, JY, Woo J, Lui GK. *Clinical Transplantation*, 2019; 33: e13540.

Maternal Comorbidities and Adverse Delivery Events in Pregnant Women with Congenital Heart Disease. Schlichting LE, Insaf T, Zaidi A, Lui G, Van Zutphen AR. *J Am Coll Cardiol*. 2019; 73: 2181-2191.

Guidelines for Performing a Comprehensive Transesophageal Echocardiographic Examination in Children and All Patients with Congenital Heart Disease: Recommendations from the American Society of Echocardiography. Puchalski MD, Lui GK, Miller-Hance WC, Brook MM, Young, LT, Bhat A, Roberson DA, Mercer-Rosa L, Miller OI, Prira DA, Burch T, Carron HD, Wong PC. *J Am Soc Echocardiography*, 2019; 32: 173-215.

Characteristics of Adults with Congenital Heart Defects at Three U.S. Surveillance Sites. Gurvitz M, Dunn J, Bhatt A, Book W, Glidewell M, Hogue C, Lin A, Lui G, McGarry C, Raskind-Hood C, Van Zutphen A, Zaidi A, Jenkins K, Riehle-Colarusso T. *J Am Coll Cardiol* 2020; 76: 175-182

Proximity to Risk-Appropriate Perinatal Hospitals for Pregnant Women with Congenital Heart Defects in New York State. Schlichting LE, Insaf TZ, Zaidi AN, Lui GK, Van Zutphen AR. *BMC Pregnancy and Childbirth* 2020; 20: 338



Michael Ma, MD

Assistant Professor
Department of Cardiothoracic Surgery
Department of Pediatric Cardiac Surgery
Surgical Director, Complex Biventricular Reconstruction
Surgical Director, Pediatric Advanced Cardiac Therapies

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CURRENT RESEARCH

My lab is dedicated to improving outcomes for children born with complex heart disease, by melding clinical surgical expertise with novel techniques in bio and mechanical engineering. Just as virtual computer-based simulation, prototyping, and failure analysis have delivered innovation in other disciplines, our team studies congenital heart defects and their surgical treatments using computational fluid dynamics and ex-vivo biomechanical simulations to inform large animal experiments that can lead to clinically meaningful discoveries for these patients.

My academic and clinical endeavors are motivated by the palpable hope (and fear) that parents impart when they entrust their child with complex heart disease to our care.

EDUCATION/TRAINING

MD Columbia University

BS Stanford University, Chemical Engineering

RESIDENCY

Stanford University

FELLOWSHIP

Lucile Packard Children's Hospital

BOARD CERTIFICATION

Thoracic and Cardiovascular Surgery (ABTS)

CLINICAL FOCUS

Complex Biventricular

Reconstruction Transplantation and Mechanical Support

Pulmonary Artery Reconstruction

Neonatal and Infant Cardiac Surgery

HONORS & AWARDS

Alpha Omega Alpha

NIH KL2 Mentored Career Development Grant

Pat O. Daily Award for Clinical Excellence in Cardiac Surgery

Section Editor 'Congenital Heart International Professionals Journal Watch'

SELECTED PUBLICATIONS

Complex Pulmonary Artery Reconstruction. Ma M, Reinhartz O, Mainwaring RD, Hanley FL. *Operative Techniques in Thoracic and Cardiovascular Surgery*. 2019; 24: 163-175.

Corrected Transposition: Anatomic Repair Using the Hemi-mustard Atrial Baffle and Bidirectional Superior Cavopulmonary Connection. Ma M, Mainwaring RD, Hanley FL. *Seminars in Thoracic and Cardiovascular Surgery, Pediatric Cardiac Surgery Annual*. 2019; 22: 51-56.

Use of a Supramolecular Polymeric Hydrogel as an Effective Post-operative Pericardial Adhesion Barrier. Stapleton LM, Steele AN, Wang H, Hernandez HL, Yu AC, Paulsen MJ, Smith AA, Roth GA, Thakore AD, Lucian HJ, Totherow KP, Baker SW, Tada Y, Farry JM, Eskandari A, Hironaka CE, Jaatinen KJ, Williams KM, Bergamasco H, Marschel C, Chadwick B, Grady F, Ma M, Appel EA, Woo YJ. *Nature Biomedical Engineering*. 2019; 3 (8): 611-620.

Modeling Conduit Choice for Valve-sparing Aortic Root Replacement on Biomechanics With a 3-dimensional-printed Heart Simulator. Paulsen MJ, Kasinpila K, Imbrie-Moore A, Wang H, Hironaka CE, Koyano TK, Fong R, Chiu P, Goldstone AB, Steele AN, Stapleton LM, Ma M, Woo YJ. *Journal of Thoracic and Cardiovascular Surgery*. 2019; 158 (2): 392-403.

Comprehensive Management of Major Aortopulmonary Collaterals in the Repair of Tetralogy of Fallot. Ma M, Mainwaring RD, Hanley FL. *Seminars in Thoracic and Cardiovascular Surgery, Pediatric Cardiac Surgery Annual*. 2018; 21: 75-82.

A Novel Inflow Cannulation Strategy for Pediatric Mechanical Circulatory Support in Small Left Ventricles. Ma M, Yarlagadda VV, Rosenthal DN, Maeda K. *Journal of Thoracic and Cardiovascular Surgery*. 2017; e1-2.



John W. MacArthur, MD

Assistant Professor
Department of Cardiothoracic Surgery
Surgical Director, Lung Transplantation

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INSTAGRAM [jwmacarthur](https://www.instagram.com/jwmacarthur)

EDUCATION/TRAINING

MD Vagelos College of Physicians and Surgeons, Columbia University

BS Fordham University

SURGERY RESIDENCY & INTERNSHIP

University of Pennsylvania

RESEARCH FELLOWSHIP

University of Pennsylvania

CARDIOTHORACIC SURGERY FELLOWSHIP

Stanford University

CARDIOTHORACIC TRANSPLANT FELLOWSHIP

Stanford University

BOARD CERTIFICATION

Surgery (ABS)

Thoracic Surgery (ABTS)

CLINICAL FOCUS

Cardiothoracic Surgery

MEMBERSHIPS

Diplomat of the American Board of Surgery (2016)

Diplomat of the American Board of Thoracic Surgery (2019)

HONORS & AWARDS

Jonathan E. Rhoads Research Award, University of Pennsylvania (2014)

Vivien Thomas Young Investigator Award, American Heart Association (2013)

CURRENT RESEARCH

My research focus is on the application of novel cell based and bioengineering methods towards understanding and treating ischemic heart disease and heart failure.

SELECTED PUBLICATIONS

Bioengineered Analog of Stromal Cell-derived Factor 1 α Preserves the Biaxial Mechanical Properties of Native Myocardium After Infarction. Wang, H., Wisneski, A., Paulsen, M. J., Imbrie-Moore, A., Wang, Z., Xuan, Y., Hernandez, H. L., Lucian, H. J., Eskandari, A., Thakore, A. D., Farry, J. M., Hironaka, C. E., von Bornstaedt, D., Steele, A. N., Stapleton, L. M., Williams, K. M., Wu, M. A., MacArthur, J. W., Woo, Y. *Journal of the Mechanical Behavior of Biomedical Materials*. 2019; 96: 165–71.

SDF 1- α Attenuates Myocardial Injury Without Altering the Direct Contribution of Circulating Cells. Goldstone AB, Burnett CE, Cohen JE, Paulson MJ, Eskandari A, Edwards BB, Ingason AB, Steele AN, Patel JB, MacArthur JW, Shizuru JA, Woo YJ. *J Cardiovasc Transl Res*. 2018;11(4):274-284.

3D-printed Vascular Networks Direct Therapeutic Angiogenesis in Ischemia. Mirabella T, MacArthur JW, Cheng D, Ozaki CK, Woo YJ, Ynag M, Chen CS. *Nat Biomed Eng*. 2017;1:0083.

Preclinical Evaluation of the Engineered Stem Cell Chemokine Stromal Cell-derived Factor 1- α Analogue in a Translational Ovine Myocardial Infarction Model. MacArthur JW, Cohen JE, McGarvey J, Shudo Y, Patel JB, Trubelja A, Fairman A, Edwards BB, Hung G, Goldstone AB, Hiesinger W, Atluri P, Wilensky RL, Pilla J, Gorman JH, Gorman RC, Woo YJ. *Circ Res*. 2014;114:650-9.

Sustained Release of Engineered Stromal Cell-derived Factor 1- α From Injectable Hydrogels Effectively Recruits Endothelial Progenitor Cells and Preserves Ventricular Function Following Myocardial Infarction. MacArthur JW, Purcell BP, Shudo Y, Cohen JE, Fairman A, Trubelja A, Patel J, Hsiao P, Yang E, Lloyd K, Hiesinger W, Atluri P, Burdick JA, Woo YJ. *Circulation*. 2013;128:S79-86.



Merritt Maduke, PhD

Associate Professor of Molecular and Cellular Physiology

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EDUCATION/TRAINING

PHD University of California, San Diego

HONORS & AWARDS

Faculty Scholar, Esther Ehrman Lazard (2003-2005)

Scientist Development Award, American Heart Association (2004-2007)

Cranefield Award, Society of General Physiologists (2008)

Spark Scholar, Stanford University (2010)

Stanford Leadership Development Program (2016-2017)

President, Society of General Physiologists (2018-2019)

CURRENT RESEARCH

Ion transit across cell membranes is central to cardiovascular function. The Maduke laboratory studies the molecular mechanisms of the proteins that catalyze ion transit – ion channels and transporters. We use a combination of biophysical methods to investigate protein structure and dynamics, electrophysiological analyses to measure function, and chemical design (in collaboration with the Du Bois laboratory) to develop small-molecule tools. We also apply our expertise in ion channels towards understanding the mechanism by which ultrasound modulates neural activity. Finally, we are working on an interdisciplinary preclinical project (Chiu, Dror, Smith, and Pao labs) to evaluate the CLC-Ka chloride channel as a therapeutic target for treating pathologic water retention (hyponatremia).

Nothing will work if you don't.

— Maya Angelou.

SELECTED PUBLICATIONS

A CLC-ec1 mutant reveals global conformational change and suggests a unifying mechanism for the CLC Cl⁻/H⁺ transport cycle. Chavan, T.S., Cheng, R.C., Jiang, T., Mathews, I.I., Stein, R.A., Koehl, A., Mchaourab, H.S., Tajkhorshid, E., and Maduke, M.. *Elife* 9:e53479. doi: 10.7554/eLife.53479.

Development and validation of a potent and specific inhibitor for the CLC-2 chloride channel. Koster, A.K. Reese, A.L. Kuryshv, Y. Wen, X., Lu, A.C., McKiernan, K.A., Gray, E.E., Wu, C., Beenhakker, M.P., Huguenard, J.R., Maduke, M., Du Bois, J. *Proc. Natl. Acad. Sci* doi: 10.1073/pnas.2009977117, 2020.

Spike-frequency dependent inhibition and potentiation of neural activity by ultrasound. Prieto, M.L., Firouzi, K., Khuri-Yakub, B.T., Madison, D.V., Maduke, M. *J Gen Physiol* 152 (11): e202012672. PMCID: PMC5914535, 2020.

A selective class of inhibitors for the CLC-Ka chloride channel. Koster, A.K., Wood, C.A.P., Thomas Tran, R., Chavan, T.S., Almqvist, J., Choi, K.H., Du Bois, J., Maduke, M. *PNAS* May 22;115(21):E4900-E4909. doi: 10.1073/pnas.1720584115. PMCID: PMC6003504, 2018. Commentary: DOI: 10.1073/pnas.1805589115

Water Access Points and Hydration Pathways in CLC H⁺/Cl⁻ Transporters. Han, W., Cheng, R.C., Maduke, M. and Tajkhorshid, E. *PNAS*, 111: 1819–1824, 2014.



Holden Maecker, PhD

Professor (Research), Microbiology & Immunology
Director, Human Immune Monitoring Center

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EDUCATION/TRAINING

PHD Stanford University

POSTDOCTORAL TRAINING Stanford University

HONORS & AWARDS

PI, Stanford Cancer Immune Monitoring and Analysis Center (CIMAC)

CURRENT RESEARCH

A major theme in our group is to define metrics of immune competence in various settings, including cancer immunotherapy, organ transplantation, allergy, and chronic viral infection. We use CyTOF mass cytometry, often in combination with other technologies, to broadly survey immune features at the cellular level, then examine links between features or groups of features and clinical outcome. A long-term goal is to create an assay of global immune competence that could predict risk for various immune-related outcomes in both healthy individuals and in disease.

It's hard to tell the poison from the cure; harder still to know the reason why. — Sting

SELECTED PUBLICATIONS

Activated natural killer cells predict poor clinical prognosis in high-risk B- and T-cell acute lymphoblastic leukemia. Duault C, Kumar A, Taghi Khani A, Lee SJ, Yang L, Huang M, Hurtz C, Manning B, Ghoda L, McDonald T, Lacayo NJ, Sakamoto KM, Carroll M, Tasian SK, Marcucci G, Yu J, Caligiuri MA, Maecker HT, Swaminathan S. *Blood*. 2021 Oct 21;138(16):1465–1480. PMID: PMC8532198

Immune profiling of COVID-19: preliminary findings and implications for the pandemic. Maecker HT. *J Immunother Cancer*. 2021 May;9(5).

Transcriptional changes in peanut-specific CD4+ T cells over the course of oral immunotherapy. Wang W, Lyu S-C, Ji X, Gupta S, Manohar M, Dhondalay GKR, Chinthrajah S, Andorf S, Boyd SD, Tibshirani R, Galli SJ, Nadeau KC, Maecker HT. *Clin Immunol*. 2020 Oct;219:108568.

A novel utility to correct for plate/batch/lot and nonspecific binding artifacts in luminex data. Maecker HT, Rosenberg-Hasson Y, Kolstad KD, Steen VD, Chung LS. *J Immunol*. 2020 May 6

Penalized supervised star plots: Example application in influenza-specific CD4+ T cells. Holmes TH, Subrahmanyam PB, Wang W, Maecker HT. *Viral Immunol*. 2019 Jan 30;32(2):102–109.

The anatomy of single cell mass cytometry data. Olsen LR, Leipold MD, Pedersen CB, Maecker HT. *Cytometry A*. 2019 Feb;95(2):156–172.



Kenneth W. Mahaffey, MD

Professor, Medicine – Cardiovascular Medicine
Vice Chair of Clinical Research, Medicine

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EDUCATION/TRAINING

MD University of Washington

MEDICINE RESIDENCY

University of Arizona Health Sciences

CHIEF RESIDENT

University of Arizona Health Sciences

CARDIOLOGY FELLOWSHIP

Duke University

BOARD CERTIFICATION

Cardiovascular Medicine, ABIM

CLINICAL FOCUS

Adult Cardiology

HONORS & AWARDS

CHAIR

MI and Death Definitions Working Group, Standardized Data Collection of Cardiovascular Trials Initiative (FDA)

CONSULTANT

Endocrinologic and Metabolic Drugs Advisory Committee

FELLOW

American College of Cardiology
American Heart Association

FORMER ASSOCIATE DIRECTOR

Duke Clinical Research Institute (DCRI)

CURRENT RESEARCH

My primary research focus is the design and conduct of multicenter clinical trials and analyses of important clinical cardiac issues using large patient databases. My research has focused on the evaluation of pharmaceutical agents for the treatment of acute coronary syndromes, atrial fibrillation, hyperlipidemia, and diabetes mellitus. I am also interested in evaluation of digital and mobile technologies and the integration of these technologies in clinical evaluation and care. I am the founder and director of the Stanford Center for Clinical Research an academic research organization to support clinical research. I am the Vice Chair of Clinical Research in the Department of Medicine.

We need to bring the key stakeholders together—academia, industry, regulatory agencies and other important bodies—to do research more efficiently.

SELECTED PUBLICATIONS

Large-Scale Assessment of a Smartwatch to Identify Atrial Fibrillation. Perez MV, Mahaffey KW, Hedlin H, Rumsfeld JS, Garcia A, Ferris T, Balasubramanian V, Russo AM, Rajmane A, Cheung L, Hung G, Lee J, Kowey P, Talati N, Nag D, Gummidipundi SE, Beatty A, Hills MT, Desai S, Granger CB, Desai M, Turakhia MP; Apple Heart Study Investigators. *N Engl J Med*, 2019 Nov 14;381(20):1909-1917.

Canagliflozin and Renal Outcomes in Type 2 Diabetes and Nephropathy. Perkovic V, Jardine MJ, Neal B, Bompont S, Heerspink HJL, Charytan DM, Edwards R, Agarwal R, Bakris G, Bull S, Cannon CP, Capuano G, Chu PL, de Zeeuw D, Greene T, Levin A, Pollock C, Wheeler DC, Yavin Y, Zhang H, Zinman B, Meininger G, Brenner BM, Mahaffey KW; CREDENCE Trial Investigators. *N Engl J Med*, 2019 Jun 13;380(24):2295-2306.



David J. Maron, MD

C.F. Rehnborg Professor of Medicine
Clinical Professor, Medicine - Cardiovascular Medicine
Chief, Stanford Prevention Research Center
Director, Preventive Cardiology

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EDUCATION/TRAINING

MD University of Southern California

MEDICINE RESIDENCY UCLA

**CARDIOVASCULAR DISEASE
EPIDEMIOLOGY FELLOWSHIP**
Stanford University

**ROBERT WOOD JOHNSON CLINICAL
SCHOLAR** Stanford University

CARDIOLOGY FELLOWSHIP
Stanford University

BOARD CERTIFICATION
Internal Medicine, ABIM
Cardiovascular Disease, ABIM
Clinical Lipidology, ABCL

CLINICAL FOCUS

Primary and Secondary Prevention of
Coronary Artery Disease
Lipid Disorders

HONORS & AWARDS

C.F. Rehnborg Endowed Professorship,
Stanford University

NEJM Editorial Board selected the
ISCHEMIA trial as one of the NEJM
Notable Articles of 2020

NEJM Journal Watch Cardiology selected
ISCHEMIA and ISCHEMIA-CKD as their
2020 Top Stories

AHA named the primary report of the
ISCHEMIA trial as one of the top heart
disease and stroke research advances
of 2020

Clinical Research Forum selected the
ISCHEMIA trial to receive a Top Ten
Clinical Research Achievement Award
for 2020

CURRENT RESEARCH

My research is devoted to the application of evidence-based medicine for the prevention and treatment of coronary artery disease. I am Co-Chair of the ISCHEMIA and ISCHEMIA-CKD trials, large international NIH/NHLBI-funded trials that compared the effectiveness of conservative versus invasive management of patients with stable coronary disease and at least moderate ischemia on stress testing, with or without advanced chronic kidney disease. My current work includes the long-term follow-up of the ISCHEMIA trial participants, using Project Baseline to find new signals that indicate the onset or progression of coronary artery disease, using an artificial intelligence deep-learning algorithm to identify incidental coronary artery calcification on routine chest CT scans so that patients and their physicians can be notified to implement preventive interventions, and conducting a trial of remote patient monitoring and health coaching to manage uncontrolled hypertension

SELECTED PUBLICATIONS

ISCHEMIA Research Group: Initial Invasive or Conservative Strategy for Stable Coronary Disease. Maron DJ, Hochman JS, Reynolds HR, Bangalore S, O'Brien SM, Boden WE, Chaitman BR, Senior R, López-Sendón J, Alexander KP, Lopes RD, Shaw LJ, Berger JS, Newman JD, Sidhu MS, Goodman SG, Ruzyllo W, Gosselin G, Maggioni AP, White HD, Bhargava B, Min JK, Mancini GBJ, Berman DS, Picard MH, Kwong RY, Ali ZA, Mark DB, Spertus JA, Krishnan MN, Elghamazy A, Moorthy N, Hueb WA, Demkow M, Mavromatis K, Bockeria O, Peteiro J, Miller TD, Szwed H, Doerr R, Keltai M, Selvanayagam JB, Steg PG, Held C, Kohsaka S, Mavromichalis S, Kirby R, Jeffries NO, Harrell FE Jr, Rockhold FW, Broderick S, Ferguson TB Jr, Williams DO, Harrington RA, Stone GW, Rosenberg Y. *N Engl J Med.* 2020 Apr 9;382(15):1395-1407.

ISCHEMIA-CKD Research Group. Management of coronary disease in patients with advanced kidney disease. Bangalore S, Maron DJ, O'Brien SM, Fleg JL, Kretov EI, Briguori C, Kaul U, Reynolds HR, Mazurek T, Sidhu MS, Berger JS, Mathew RO, Bockeria O, Broderick S, Pracon R, Herzog CA, Huang Z, Stone GW, Boden WE, Newman JD, Ali ZA, Mark DB, Spertus JA, Alexander KP, Chaitman BR, Chertow GM, Hochman JS. *N Engl J Med.* 2020;382:1608-1618

ISCHEMIA Research Group. Health-status Outcomes with Invasive or Conservative Care in Coronary Disease. Spertus JA, Jones PG, Maron DJ, O'Brien SM, Reynolds HR, Rosenberg Y, Stone GW, Harrell FE Jr, Boden WE, Weintraub WS, Baloch K, Mavromatis K, Diaz A, Gosselin G, Newman JD, Mavromichalis S, Alexander KP, Cohen DJ, Bangalore S, Hochman JS, Mark DB. *N Engl J Med.* 2020 Apr 9;382(15):1408-1419.

ISCHEMIA-CKD Research Group. Health Status after Invasive or Conservative care in Coronary and Advanced Kidney Disease. Spertus JA, Jones PG, Maron DJ, Mark DB, O'Brien SM, Fleg JL, Reynolds HR, Stone GW, Sidhu MS, Chaitman BR, Chertow GM, Hochman JS, Bangalore S, N Engl J Med. 2020 Apr 23;382(17):1619-1628.

Healthy Behavior, Risk Factor Control, and Survival in the COURAGE Trial. Maron DJ, Mancini GBJ, Hartigan PM, Spertus JA, Sedlis SP, Kostuk WJ, Berman DS, Teo KK, Weintraub WS, Boden WE. *J Am Coll Cardiol* 2018;72:2297-2305



Alison Marsden, PhD

Professor of Pediatrics (Cardiology) and of Bioengineering
and (by courtesy) of Mechanical Engineering

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CURRENT RESEARCH

Alison Marsden is Professor and Wall Center scholar in the departments of Pediatrics, Bioengineering, and, by courtesy, Mechanical Engineering at Stanford University. From 2007-2015 she was a faculty member in the Mechanical and Aerospace Engineering Department at the University of California San Diego. She graduated with a bachelor's degree in Mechanical Engineering from Princeton University in 1998, and a PhD in Mechanical Engineering from Stanford in 2005. She was a postdoctoral fellow at Stanford University in Bioengineering and Pediatric Cardiology from 2005-07. She was the recipient of a Burroughs Wellcome Fund Career Award at the Scientific Interface (2007), an NSF CAREER award (2011), received the UCSD graduate student association faculty mentor award (2014) and MAE department teaching award (2015). She is a fellow of the Biomedical Engineering Society, the American Physics Society, the American Institute for Medical and Biological Engineering, and the Society for Industrial and Applied Mathematics. She has published over 140 peer reviewed journal papers, and has received funding from the NSF, NIH, DoD, and several private foundations. She serves on the editorial boards of several journals including *PLOS Computational Biology*, *Scientific Reports*, *Current Opinion in Biomedical Engineering*, and *Cardiovascular Engineering and Technology*. She is on the advisory board for the Burroughs Wellcome Fund. Her work focuses on the development of numerical methods for cardiovascular blood flow simulation, medical device design, optimization to large-scale fluid mechanics simulations, and application of engineering tools to impact patient care in cardiovascular surgery and congenital heart disease.

Failure is closer to success than inaction.

— Earl Bakken

SELECTED PUBLICATIONS

Gradual loading ameliorates maladaptation in computational simulations of vein graft growth and remodeling. Ramachandra, A. B., Humphrey, J. D., Marsden, A. L. *Journal of the Royal Society Interface*, Vol. 14 (130), May 2017

Hemodynamic performance of tissue-engineered vascular grafts in Fontan patients. Schwarz, E.L., Kelly, J.M., Blum, K., Hor, K., Yates, A.R., Zbinden, J., Verma, A., Lindsey, S.E., Ramachandra, A.B., Szafron, J., Humphrey, J.D., Shinoka, T., Marsden, A.L., Breuer, C.K. *NP J Regenerative Medicine*, Vol. 6(38), (2021)

Geometric Uncertainty in Patient-Specific Cardiovascular Modeling with Convolutional Dropout Networks. Maher, G., Fleeter, C., Schiavazzi, D., Marsden, A. *Computer Methods in Applied Mechanics and Engineering*, Vol. 386, (2021).

Computational modeling of blood component transport related to coronary artery thrombosis in Kawasaki disease. Grande Gutiérrez N, Alber M, Kahn AM, Burns JC, Mathew M, McCrindle BW, et al. *PLoS Comput Biol* 17(9), (2021).

Preoperative Computed Tomography Angiography Reveals Leaflet-Specific Calcification and Excursion Patterns in Aortic Stenosis. Chen, I.Y., Vedula, V., Malik, S.B., Liang, T., Chung, K.S., Nguyen, P.K., Sayed, N., Tsao, P.S., Giacomini, J.C., Marsden, A.L., Wu, J.C. *Circulation: Cardiovascular Imaging*, 14(12), (2021).

EDUCATION/TRAINING

PHD Stanford University

HONORS & AWARDS

Career Award at the Scientific Interface, Burroughs Wellcome Fund

Career Award, National Science Foundation

Teacher of the Year Award, MAE Department, UCSD

Vera Moulton Wall Center Faculty Scholar

FELLOW

Fellow, Biomedical Engineering Society

Fellow, American Physical Society Division of Fluid Dynamic

Fellow, American Institute of Medical and Biological Engineering

Fellow, Society for Industrial and Applied Mathematics

ADVISORY BOARDS

Burroughs Wellcome Fund Career Awards at the Scientific Interface

Additional Ventures Foundation

University of British Columbia School of Biomedical Engineering



Nicholas Melosh, PhD

Associate Professor of Material Science and Engineering and of Photon Science

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EDUCATION/TRAINING

PHD University of California, Santa Barbara

HONORS & AWARDS

Citation Award, American College of Sports Medicine, 2022

CURRENT RESEARCH

The focus of my research is engineering cell access and dynamic bio-electronic interfaces. I am very interested in how to design new structures that will seamlessly integrate with biological systems to address problems in molecular delivery, iPSC development, cell sampling, and electrical recording. This involves both fundamental work such as to deeply understand how lipid membranes interact with inorganic surfaces, electrokinetic phenomena in biologically relevant solutions, and applying this knowledge into new device designs. Examples of this include “nanostraw” drug delivery platforms for direct delivery or extraction of material through the cell wall using a biomimetic gap-junction made using nanoscale semiconductor processing techniques. We also engineer materials and structures for electrical interfaces and highly parallel stimulation and recording. For instance, we have created inorganic electrodes that mimic the hydrophobic banding of natural transmembrane proteins, allowing them to ‘fuse’ into the cell wall, providing a tight electrical junction for solid-state patch clamping. In addition to significant efforts at engineering surfaces at the molecular level, we also work on ‘bridge’ projects that span between engineering and biological/clinical needs.

One of the most exciting developments over the past ten years is the merging of engineered devices and biological problems to make clinical impacts.

SELECTED PUBLICATIONS

Physical activity, cardiorespiratory fitness and population attributable risk. Myers J, Vainshelboim B, Kamil-Rosenberg S, Chan K, Kokkinos P. *Mayo Clin Proc* 96:342-349, 2021.

Physical activity, cardiorespiratory fitness, and the metabolic syndrome. Myers J, Kokkinos P, Nyelin E. *Nutrients* 11:1652-1670, 2019.

Non-Destructive Nanostraw Intracellular Sampling for Longitudinal Cell Monitoring. Cao Y, Hjort M, Chen H, Birey F, Leal-Ortiz S, Han C, Santiago J, Paşca S, Wu J, & Melosh NA. 2017 *Proc Natl Acad Sci USA*, Vol. 114, pp. 1866-1874.

Nanotechnology and Neurophysiology. Angle MR, Cui B, & Melosh NA (2015). *Current Opinion in Neurobiology*. 2015 Jun;32:132-40.

Quantification of Nanowire Penetration Into Living Cells. M. Xu, A. Aalipour, S. Leal-Ortiz, A. H. Mekhdjian, X. Xie, A. R. Dunn, C. C. Garner, N. A. Melosh. 2014 *Nature Communications*:1-8.

Fusion of Biomimetic ‘Stealth’ Probes Into Lipid Bilayer Cores. B. D. Almquist, N. A. Melosh. 2010 *Proc Natl Acad Sci USA*, Vol. 107, pp. 5815-5820.



Doff McElhinney, MD

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CURRENT RESEARCH

My interests are in outcomes research, transcatheter device therapy for congenital heart disease, and collaborative translational investigation related to the pathophysiology, evaluation, and management of pediatric and adult congenital heart disease. I am Director of the Lucile Packard Children's Hospital Stanford Heart Center, Program for Clinical and Translational Research.

SELECTED PUBLICATIONS

Relative Risk Factors for Cardiac Erosion Following Transcatheter Closure of Atrial Septal Defects: A Case-control Study. McElhinney DB, Quartermain MD, Kenny D, Alboliras E, Amin Z. *Circulation* 2016;133:1738-46.

Transcatheter Pulmonary Valve Replacement Reduces Tricuspid Regurgitation in Patients With Right Ventricular Volume/Pressure Overload. Jones TK, Rome JJ, Armstrong AK, Berger F, Hellenbrand WE, Cabalka AK, Benson LN, Balzer DT, Cheatham JP, Eicken A, McElhinney DB. *J Am Coll Cardiol* 2016;68:1525-35.

Programmatic Approach to Management of Tetralogy of Fallot With Major Aortopulmonary Collateral Arteries: A 15-year Experience With 458 Patients. Bauser-Heaton H, Borquez A, Han B, Ladd M, Asija R, Downey L, Koth A, Algaze CA, Wise-Faberowski L, Perry SB, Shin A, Peng LF, Hanley FL, McElhinney DB. *Circ Cardiovasc Interv*. 2017 Apr;10(4). PMID: 28356265.

Relationships Among Conduit Type, Pre-stenting, and Outcomes in Patients Undergoing Transcatheter Pulmonary Valve Replacement in the Prospective North American and European Melody Valve Trials. Cabalka AK, Hellenbrand WE, Eicken A, Kreutzer J, Gray RG, Bergersen L, Berger F, Armstrong AK, Cheatham JP, Zahn EM, McElhinney DB. *JACC Cardiovasc Interv* 2017;10:1746-59.

Transcatheter Pulmonary Valve Replacement Using the Melody Valve for Treatment of Dysfunctional Surgical Bioprostheses: A Multicenter Study. Cabalka AK, Asnes JD, Balzer DT, Cheatham JP, Gillespie MJ, Jones TK, Justino H, Kim DW, Lung TH, Turner DR, McElhinney DB. *J Thorac Cardiovasc Surg* 2018;155:1712-24.

Intentional Fracture of Bioprosthetic Valve Frames in Patients Undergoing Valve-in-valve Transcatheter Pulmonary Valve Replacement. Shahanavaz S, Asnes JD, Grohmann J, Qureshi AM, Rome JJ, Tanase D, Crystal MA, Latson LA, Morray BH, Hellenbrand W, Balzer DT, Gewillig M, Love JC, Berdjis F, Gillespie MJ, McElhinney DB. *Circ Cardiovasc Interv*. 2018;11:e006453. doi: 10.1161/CIRCINTERVENTIONS.118.006453.

Endocarditis After Transcatheter Pulmonary Valve Replacement. McElhinney DB, Sondergaard L, Armstrong AK, Bergersen L, Padera RF, Balzer DT, Lung TH, Berger F, Zahn EM, Gray RG, Hellenbrand WE, Kreutzer J, Eicken A, Jones TK, Ewert P. *J Am Coll Cardiol* 2018;72:2717-28.

EDUCATION/TRAINING

MD University of California, San Francisco, School of Medicine

RESIDENCY Children's Hospital of Philadelphia

FELLOWSHIP Boston Children's Hospital

BOARD CERTIFICATION
American Board of Pediatrics

American Board of Pediatrics, Pediatric Cardiology
Adult Congenital Heart Disease,
American Board of Internal Medicine

HONORS & AWARDS

EDITORIAL BOARD
Associate Editor, Catheterization and Cardiovascular Interventions

GUEST EDITOR
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Mark Mercola, PhD

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CURRENT RESEARCH

Our goal is to discover new therapeutic targets and therapeutics for heart failure, and to remove the adverse cardiac effects of oncology drugs. Over the past two decades, our studies laid the groundwork for the efficient production of heart cells from pluripotent stem cells, and for automated, high throughput screening of genes, proteins and small molecules for the ability to ameliorate disease symptoms. Our current pipeline starts with cardiomyopathy and arrhythmia models generated using patient and genome edited iPSCs and uses them in screens to find new therapeutic targets and develop novel therapeutic strategies. The most advanced projects are now in preclinical, large animal testing.

There is so much we can do now to understand the human condition that would have been unimaginable only a few years ago—in many ways we live in the best of times.

SELECTED PUBLICATIONS

Disruption of NOTCH Signaling by a Small Molecule Inhibitor of the Transcription Factor RBPJ. Hurtado C, Safarova A, Smith M, Chung R, Bruyneel AAN, Gomez-Galeno J, Oswald F, Larson CJ, Cashman JR, Ruiz-Lozano P, Janiak P, Suzuki T, Mercola M. *Sci Rep.* 2019 Jul 25;9(1):10811.

High-throughput Screening of Tyrosine Kinase Inhibitor Cardiotoxicity With Human Induced Pluripotent Stem Cells. Sharma A, Burridge PW, McKeithan WL, Serrano R, Shukla P, Sayed N, Churko JM, Kitani T, Wu H, Holmström A, Matsa E, Zhang Y, Kumar A, Fan AC, Del Álamo JC, Wu SM, Moslehi JJ, Mercola M, Wu JC. *Sci Transl Med.* 2017 Feb 15;9(377).

Will iPSC-cardiomyocytes Revolutionize the Discovery of Drugs for Heart Disease? Bruyneel AA, McKeithan WL, Feyen DA, Mercola M. *Curr Opin Pharmacol.* 2018 Oct;42:55-61.

miRNAs That Induce Human Cardiomyocyte Proliferation Converge on the Hippo Pathway. Diez-Cuñado M, Wei K, Bushway PJ, Maurya MR, Perera R, Subramaniam S, Ruiz-Lozano P, Mercola M. *Cell Rep.* 2018 May 15;23(7):2168-2174.

miR-25 Tough Decoy Enhances Cardiac Function in Heart Failure. Jeong D, Yoo J, Lee P, Kepreotis SV, Lee A, Wahlquist C, Brown BD, Kho C, Mercola M, Hajjar RJ. *Mol Ther.* 2018 Mar 7;26(3):718-729.

An Automated Platform for Assessment of Congenital and Drug-Induced Arrhythmia with hiPSC-Derived Cardiomyocytes. McKeithan WL, Savchenko A, Yu MS, Cerignoli F, Bruyneel AAN, Price JH, Colas AR, Miller EW, Cashman JR, Mercola M. *Front Physiol.* 2017;8:766.

Id Genes are Essential for Early Heart Formation. Cunningham TJ, Yu MS, McKeithan WL, Spiering S, Carrette F, Huang CT, Bushway PJ, Tierney M, Albini S, Giacca M, Mano M, Puri PL, Sacco A, Ruiz-Lozano P, Riou JF, Umbhauer M, Duester G, Mercola M, Colas AR. *Genes Dev.* 2017 Jul 1;31(13):1325-1338.

EDUCATION/TRAINING

PHD UCLA

BA UCLA

HONORS & AWARDS

American Cancer Society Postdoctoral Fellowship (1986)

Richard A. Smith Prize for Scientific Excellence, Dana-Farber Cancer Institute (1989)

Basil O'Connor Award, March of Dimes Birth Defects Foundation (1991)

Established Investigator Award, American Heart Association (1997)

National Institutes of Health MERIT Award (2007)



D. Craig Miller, MD

Thelma and Henry Doelger Professor in Cardiovascular Surgery
Department of Cardiothoracic Surgery

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EDUCATION/TRAINING

MD Stanford University School of Medicine CA

BA Stanford University, Basic Medical Sciences (1969)
Dartmouth College, Chemistry/
Mathematics (1968)

RESIDENCY Stanford University School of Medicine CA (1975, 1977)

BOARD CERTIFICATION

Thoracic Surgery, American Board of Thoracic Surgery (1979) Recertified, 1988, 1998, 2008, 2017.

HONORS & AWARDS

President, American Association for Thoracic Surgery, 2007-2008

President, Western Thoracic Surgical Association, 1994-1995

Eugene Braunwald Mentorship Award, American Heart Association, 2009

Distinguished Scientist of the American Heart Association, 2003

Antoine Marfan Award, National Marfan's Foundation, 2001

Wilfred Bigelow Award, Canadian Cardiovascular Society, 2000

Distinguished Achievement Award, American Heart Assoc. Cardiovascular Surgery & Anesthesia Council, 2008

William W. L. Glenn lecturer, American Heart Association, 2002

David J. Dugan Distinguished Service Award (Western Thoracic Surgical Association) 2016

CURRENT RESEARCH

Cardiac and heart valve disease with experimental laboratory large animal projects focused on the investigation of left ventricular and cardiac mechanics, bioenergetics, and LV and mitral valve physiology and pathophysiology. Current thrust is aimed at understanding the mitral valve and subvalvular mitral apparatus and transmural LV wall strains, thickening, and myolaminar fiber-sheet mechanics.

Clinical research interests include thoracic aortic diseases (aortic dissection, aneurysm) and cardiac valvular disease, including surgical treatment, endovascular thoracic aortic stent-graft repair, mitral valve repair, and valve-sparing aortic root replacement.

Those who cannot remember the past are
condemned to repeat it.

— George Santayana (1863-1952)

SELECTED PUBLICATIONS

Rationale and Results of the Stanford Modification of the David V Reimplantation Technique for Valve-sparing Aortic Root Replacement. Miller, D. C. *Journal of Thoracic and Cardiovascular Surgery* 2015; 149 (1): 112-114.

Stroke After Surgical Versus Transfemoral Transcatheter Aortic Valve Replacement in the PARTNER Trial. Kapadia, S. R., Huded, C. P., Kodali, S. K., Svensson, L. G., Tuzcu, E. M., Baron, S. J., Cohen, D. J., Miller, D. C., Thourani, V. H., Herrmann, H. C., Mack, M. J., Szerlip, M., Makkar, R. R., Webb, J. G., Smith, C. R., Rajeswaran, J., Blackstone, E. H., Leon, M. B., PARTNER Trial Investigators *Journal of the American College of Cardiology* 2018; 72 (20): 2415-26.

Transcatheter or Surgical Aortic-Valve Replacement in Intermediate-Risk Patients. Leon, M. B., Smith, C. R., Mack, M. J., [5 authors], Miller, D. C., Herrmann, H. C., Doshi, D., Cohen, D. J., Pichard, A. D., [15 authors] P., Hahn, R. T., Jaber, W. A., Anderson, W. N., Alu, M. C., Webb, J. G. *New England Journal of Medicine* 2016; 374 (17): 1609-1620.

5-year Outcomes of Transcatheter Aortic Valve Replacement or Surgical Aortic Valve Replacement for High Surgical Risk Patients With Aortic Stenosis (PARTNER 1): A Randomised Controlled Trial. Mack, M. J., Leon, M. B., Smith, C. R., Miller, D. C., Moses, J. W., Tuzcu, E. M., Webb, J. G., Douglas, P. S., Anderson, W. N., Blackstone, E. H., Kodali, S. K., Makkar, R. R., Fontana, G. P., Kapadia, S., Bavaria, J., Hahn, R. T., Thourani, V. H., Babaliaros, V., Pichard, A., Herrmann, H. C., Brown, D. L., Williams, M., Akin, J., Davidson, M. J., Svensson, L. G. *Lancet* 2015; 385 (9986): 2477-2484.



Daria Mochly-Rosen, PhD

George D. Smith Professor of Translational Medicine
Professor, Chemical and Systems Biology
Co-director, SPARK - Stanford's Translational Research Program
President and Founder, SPARK GLOBAL

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EDUCATION/TRAINING

PHD Weizmann Institute of Science

HONORS & AWARDS

NIH Merit award

Janice Pfeffer Distinguished Lecturer

FOUNDER AND DIRECTOR

SPARK Translational Research Program

FOUNDING MEMBER International Society for Heart Research (ISHR)

ADVISORY BOARD

Takeda/Stanford Alliance for Innovative Medicines (AIM); Vlaams Instituut voor Biotechnologie (VIB) Advisory Board, Belgium; California Life Sciences Association Board

LEADERSHIP Senior Associate Dean for Research, Stanford University (2006-13); Child Health Initiative, Stanford University; Council of Councils, NIH; Council on Basic Cardiovascular Sciences, American Heart Association (AHA); Peer Review Advisory Committee to the Director of the NIH

PRECEPTOR

Sarnoff Cardiovascular Research Foundation Fellowship Program

PRESIDENTIAL LECTURE

International Symposium on Cerebral Blood Flow, Metabolism and Function

FORMER ELECTED MEMBER

Council of the ISHR

MEMBER American Society for Biochem and Molec Biology; Council on Stroke, AHA; Heart Failure Society of America; ISHR; Society for Neuroscience; UCSF-Stanford CERSI External Advisory Board

CURRENT RESEARCH

Our basic research focuses on elucidating molecular events that contribute to heart diseases, generating tools to interfere with these pathologies and the translation of them into drug leads. We have used both rationally designed peptides and small molecules to regulate key signaling events and metabolism in the myocardium. Our research has led to several clinical trials using drugs that were developed in our laboratory at Stanford. My passion for translational research led me to create and co-direct SPARK that helps scores of inventors at Stanford move their early research discoveries to clinical trials and/or to licensing for drug development. I am the Founder and Co-director of SPARK - Stanford's Translational Research Program and the Founder and President of SPARK GLOBAL, a network of translational scientists without borders, now in ~70 institutes on six continents.

I believe that it is our social responsibility to ensure that basic and clinical discoveries are translated into products that benefit patients. By providing the knowhow and the tools, together with industry experts we are making it happen.

SELECTED PUBLICATIONS

ALDH2 and Cardiovascular Disease. Chen CH, Ferreira JCB, Mochly-Rosen D. *Adv Exp Med Biol*, 1193:53-67, 2019.

SAM β A, a Selective Antagonist of Mitofusin 1- β IIPKC Association, Improves Heart Failure Outcome in Rats. Ferreira JC, Campos CS, Qvit N, Qi X, Bozi BHM, Bechara LRG, Lima VM, Queliconi QB, Disatnik MH, Dourado PMM, Kowaltowski AJ, Mochly-Rosen D. *Nature Commun*, 10(1):329, 2019.

Drp1/Fis1-mediated Mitochondrial Fragmentation Leads to Lysosomal Dysfunction in Cardiac Models of Huntington's Disease. Joshi AU, Ebert AE, Haileselassie B, Mochly-Rosen D. *J Mol Cell Cardiol*, 130:160-169, 2019.

Engineered Substrate-specific Delta PKC Antagonists to Enhance Cardiac Therapeutics. Qvit N, Kornfeld OS, Mochly-Rosen D. *Angew Chem Int*. 2016; 55: 15672-15679.

Mitochondrial Reactive Oxygen Species at the Heart of the Matter: New Therapeutic Approaches for Cardiovascular Diseases. Kornfeld OS, Hwang S, Disatnik MH, Chen CH, Qvit N, Mochly-Rosen D. *Circ Res*. 2015; 116:1783-99.

Selective Phosphorylation Inhibitor of Delta Protein Kinase C-pyruvate Dehydrogenase Kinase Protein-protein Interactions: Application for Myocardial Injury, In Vivo. Qvit N, Disatnik MH, Sho E, Mochly-Rosen D. *J Am Chem Soc*. 2016; 138:7626-35.



Jonathan Myers, PhD

Clinical Professor, Medicine - Cardiovascular Medicine

Research Coordinator, Exercise Physiology Lab, VA Palo Alto Health Care System

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CURRENT RESEARCH

Our research group focuses on clinical applications of exercise testing and training in patients with cardiovascular disease. We coordinate several national and international data bases designed to address cardiopulmonary exercise test, clinical, and lifestyle factors and their association with health outcomes. We provide collaborators with the means to use exercise as a medium to study mechanisms of disease and improve outcomes. Current projects include the effects of training on peripheral vascular disease, renal failure, gene expression, coronary disease, and mild cognitive impairment.

If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health. — Hippocrates

SELECTED PUBLICATIONS

Association between cardiorespiratory fitness and health care costs: The Veterans Exercise Testing Study. Myers J, Doom R, King R, Fonda H, Abella J, Froelicher V, Chan K, Kokkinos P. *Mayo Clinic Proceedings*. 2017 Nov 28.

A reference equation for normal standards for VO2 max: Analysis from the Fitness Registry and the Importance of Exercise Database (FRIEND Registry). Progress in Cardiovascular Diseases. Myers J, Kaminsky L, Lima R, Christle J, Ashley E, Arena R. *Prog Cardiovasc Dis*. 2017 Jun-Jul;60(1):21-29.

Cardiorespiratory fitness and reclassification of risk for incidence of heart failure: The Veterans Exercise Testing Study. Myers J, Kokkinos P, Chan K, Dandekar E, Yilmaz B, Nagare A, Faselis C, Soofi M. *Circ Heart Fail*. 2017 Jun;10(6).

Cardiorespiratory fitness and incidence of major adverse cardiovascular events in US veterans: A cohort study. Kokkinos PF, Faselis C, Myers J, Narayan P, Sui X, Zhang J, Lavie CJ, Moore H, Karasik P, Fletcher R. *Mayo Clin Proc*. 2017; 92 (1): 39-48.

Prognosis: Does exercise training reduce adverse events in heart failure? Myers J, Brawner CA, Haykowsky MJF, Taylor RS. *Heart Failure Clinics*. 2015; 11:59-72.

Physical activity and cardiorespiratory fitness as major markers of cardiovascular risk: Their independent and interwoven importance to health status. Myers J, McAuley P, Lavie C, Despres JP, Arena R, Kokkinos P. *Progress in Cardiovascular Diseases*. 2015; 57:306-314.

Improved reclassification of mortality risk by assessment of physical activity in patients referred for exercise testing. Myers J, Nead KT, Chang P, Abella J, Kokkinos P, Leeper NJ. *Am J Med*. 2015; 128:396-402.

EDUCATION/TRAINING

PHD University of Southern California

MS San Diego State University

BA UC Santa Barbara

HONORS & AWARDS

Michael L. Pollock Established Investigator Award, American Association of Cardiovascular and Pulmonary Rehabilitation (2007)

Steven N. Blair Award for Excellence in Physical Activity Research, American Heart Association, 2017

Research Career Scientist Award, Veterans Administration Rehabilitation Research and Development Service (2004, 2009, 2016)

ADVISORY BOARD

American Heart Association Council on Epidemiology & Prevention; Fitness registry and the importance of exercise national database (FRIEND Registry); European Society of Preventive Medicine

FELLOW

American Association of Cardiovascular and Pulmonary Rehabilitation; American College of Cardiology; American College of Sports Medicine; American Heart Association

MEMBER

AHA Council on Epidemiology and Prevention; AHA Council on Nutrition, Physical Activity and Metabolism



Kari Nadeau, MD, PhD

Naddisy Foundation Professor of Medicine and Pediatrics
Senior Fellow at the Woods Institute
Fellow, CIGH, and Professor, by courtesy, of Otolaryngology and of
Epidemiology and Population Health
Director Sean N Parker Center for Allergy and Asthma Research
at Stanford University

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CENTER WEBSITE <https://med.stanford.edu/allergyandasthma/about-us.html>

CURRENT RESEARCH

She and her team are focused in areas of vaccine allergies, asthma, cardiovascular disease, global climate change and health by studying air pollution and wildfire exposures, particularly in underserved areas. As one of the globe's foremost experts in adult and pediatric allergy, immunology, and asthma, her research is laying the groundwork for a variety of potential future therapies to prevent and cure allergies and asthma. Her lab has joined the global effort to treat patients with COVID-19 and to understand the effects of SARS-CoV-2 on the immune system, including those with cancer, autoimmune disease, and with allergic disease, such as food allergy, allergic asthma, and atopic dermatitis. Her team has experience and expertise in cell cultures, cellular assays, immunophenotyping, proteomics, and metabolomics. They have currently biobanked plasma and immune cells from over 500 patients with COVID-19 and Dr. Nadeau is one of the leaders of the Stanford COVID-19 Biobank so there is synergy and sharing of all samples. She has successfully worked with global leaders, NIH, FDA, EPA, and policy makers to apply scientific evidence towards making sustained impacts in human and planetary health. She has worked with community outreach, underserved populations, and actively engage in community-based participation. She has overseen over 40 clinical trials and cohort studies in air pollution, immunology, asthma, allergy, and COVID 19, and have overseen 4 birth cohorts and 2 pregnancy cohorts and enrolled over 6,000 patients in longitudinal studies. She was part of the Children's Environmental Health Studies through the NIEHS and EPA. Her accomplishments to date include over 320 peer-reviewed publications: her laboratory has published over 12 peer-reviewed manuscripts per year, many in high-impact journals.

SELECTED PUBLICATIONS

Systems vaccinology of the BNT162b2 mRNA vaccine in humans. Arunachalam PS, Scott MKD, Hagan T, Li C, Feng Y, Wimmers F, Grigoryan L, Trisal M, Edara VV, Lai L, Chang SE, Feng A, Dhingra S, Shah M, Lee AS, Chinthrajah S, Sindher SB, Mallajosyula V, Gao F, Sigal N, Kowli S, Gupta S, Pellegrini K, Tharp G, Maysel-Auslender S, Hamilton S, Aoued H, Hrusovsky K, Roskey M, Bosinger SE, Maecker HT, Boyd SD, Davis MM, Utz PJ, Suthar MS, Khatri P, Nadeau KC*, Pulendran B*. *Nature*. 2021 Aug;596(7872):410-416.

Immune imprinting, breadth of variant recognition and germinal center formation in human SARS-CoV-2 infection and vaccination. Röltgen K, Nielsen S, et al. Davis MM, Pulendran B, Troxell M, Sigal G, Natkunam Y, Pinsky B, Nadeau KC*, Boyd, SD*. *Cell*. Accepted 2022 Jan 21. In print.

Immune biomarkers link air pollution exposure to blood pressure in adolescents. Prunicki M, Cauwenberghs N, Ataam JA, Movassagh H, Kim JB, Kuznetsova T, Wu JC, Maecker H, Haddad F, Nadeau K. *Environ Health*. 2020 Oct 16;19(1):108.

Immunologic effects of forest fire exposure show increases in IL-1 β and CRP. Prunicki MM, Dant CC, Cao S, Maecker H, Haddad F, Kim JB, Snyder M, Wu J, Nadeau K. *Allergy*. 2020 Sep;75(9):2356-2358.

EDUCATION/TRAINING

MD Harvard Medical School)

PhD Harvard Medical School

Residency Children's Hospital of Boston
Special Alternative Pathway

Fellowship Stanford-UCSF Allergy,
Asthma, and Immunology Program

CLINICAL FOCUS

Stanford Hospital and Clinics

Lucile Packard Children's Hospital

AWARDS/GRANTS

Member, AAP

Member, ASCI



Sanjiv Narayan, MD, MSc

Professor of Medicine (Cardiovascular Medicine)

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LAB <https://narayanlab.stanford.edu>

CURRENT RESEARCH

I direct an NIH-funded translational laboratory which applies bioengineering and computational approaches to better understand heart rhythm disorders and develop novel therapies to treat patients. We developed the first computational systems to map atrial fibrillation and ventricular fibrillation to identify localized driver mechanisms as personalized targets for therapy. The accuracy of mapping has been confirmed by optical mapping of human atria, and this is now an active field of research and device innovation. We also apply computational and machine learning tools to better understand and treat life-threatening ventricular arrhythmias. Some of these discoveries have been spun-off into commercial entities. We are dedicated to mentorship, and at least one trainee in our lab has won a grant or research prize each year since 2003.

Our mantra is bedside-to-bench-to-bedside research integrating bioengineering and computational methods with sound physiological understanding.

SELECTED PUBLICATIONS

Machine Learned Cellular Phenotypes in Cardiomyopathy Predict Sudden Death. Rogers AJ, Selvalingam A, Alhusseini MI, Krummen DE, Corrado C, Abuzaid F, Baykaner T, Meyer C, Clopton P, Giles W, Bailis P, Niederer S, Wang PJ, Rappel W-J, Zaharia M, Narayan SM. *Circ Res.* 2021 Jan 22;128(2):172-184.

Electrical Substrate Ablation for Refractory Ventricular Fibrillation: Results of the AVATAR Study Krummen DE, Ho G, Hoffmayer KS, Schweis F, Baykaner T, Rogers AJ, Han FT, Hsu JC, Viswanathan MN, Wang PJ, Rappel WJ, Narayan SM. *Circ Arrhythm Electrophysiol.* 2021 Feb 7.

Deep Learning for Cardiovascular Medicine: A Practical Primer. Krittawong C, Johnson KW, Rosenson RS, Wang Z, Aydar M, Baber U, Min JK, Tang WHW, Halperin JL, Narayan SM. *Eur Heart J.* 2019;40(25):2058-2073.

Integration of Novel Monitoring Devices with Machine Learning Technology for Scalable Cardiovascular Management. Krittawong C, Rogers AJ, Johnson KW, Wang Z, Turakhia M, Halperin JL, Narayan SM. *Nat Rev Cardiol.* 2021 Feb;18(2):75-91.

Wavefront Field Mapping Reveals a Physiologic Network Between Drivers Where Ablation Terminates Atrial Fibrillation. Leef G, Shenasa F, Bhatia NK, Rogers AJ, Sauer W, Miller JM, Swerdlow M, Tamboli M, Alhusseini MI, Armenia E, Baykaner T, Brachmann J, Turakhia MP, Atienza F, Rappel WJ, Wang PJ, Narayan SM. *Circ Arrhythm Electrophysiol.* 2019 Aug;12(8):e006835.

Treatment of Atrial Fibrillation by the Ablation of Localized Sources: The CONventional Ablation For Atrial Fibrillation With and Without Focal Impulse and Rotor Modulation (CONFIRM) Trial. Narayan SM, Krummen DE, Shivkumar K, Clopton PS, Rappel WJ, Miller JM. *J Am Coll Cardiol.* 2012; 60(7):628-36.

Atrial Fibrillation. Narayan SM, Cain ME, Smith, JM. *Lancet.* 1997; 350: 943-950.

EDUCATION/TRAINING

MBChB U. of Birmingham, England (1987)

MRCP Royal College of Physicians of London, England (1990)

MSc U. of Birmingham, England (1990)

MD U. of Birmingham, England (1994)

FRCP Royal College of Physicians of London, England (2005)

AWARDS/GRANTS

PI of R01 HL149134 "Machine Learning of Atrial fibrillation"

PI of R01 HL83359 "Machine Learning of Atrial fibrillation"

Co-PI of R01 HL122384 "Patient-Directed Computational Analysis of AF"



Mark R. Nicolls, MD

Professor, Medicine - Division of Pulmonary, Allergy and Critical Care Medicine
 Chief, Division of Pulmonary, Allergy and Critical Care Medicine
 Director, Lung Immunology
 Endowed Chair: The Stanford Professor of Pulmonary and Critical Care Medicine

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DIVISION pulmonary.stanford.edu

EDUCATION/TRAINING

MD Stanford University

MEDICINE RESIDENCY & INTERNSHIP
 Stanford University

**PULMONARY AND CRITICAL CARE
 MEDICINE FELLOWSHIP**
 University of Colorado

BOARD CERTIFICATION
 Pulmonary Disease, ABIM

CLINICAL FOCUS

Heart/Lung Transplantation
 Lung Transplantation
 Pulmonary Hypertension
 Lymphedema

HONORS & AWARDS

ELECTED MEMBER
 American Society for Clinical
 Investigation (ASCI)

DIRECTOR
 Stanford Lung Immunology Program
 Stanford University Remodeled Airways
 Tissue Bank
 Stanford Center for Advanced Lung
 Disease (CALD)

CO-FOUNDER
 Northern California Scleroderma
 Research Consortium

EXECUTIVE STEERING COMMITTEE
 Vera Moulton Wall Center for Pulmonary
 Vascular Disease

CHAIRMAN OF THE BOARD
 Palo Alto Veterans Institute for Research

EDITORIAL BOARD
 European Respiratory Journal

CURRENT RESEARCH

I specialize in the treatment of lung transplant patients. I have practiced pulmonary and critical care medicine for 20 years. We focus on how the immune system contributes to vascular injury leading to a variety of diseases and pathology with a special focus on lung transplantation, pulmonary hypertension, COPD, and lymphedema.

SELECTED PUBLICATIONS

Safety and Efficacy of B-Cell Depletion with Rituximab for the Treatment of Systemic Sclerosis-associated Pulmonary Arterial Hypertension: A Multicenter, Double-Blind, Randomized, Placebo-controlled Trial. Zamanian RT, Badesch D, Chung L, Domsic RT, Medsger T, Pinckney A, Keyes-Elstein L, D'Aveta C, Spychala M, White RJ, Hassoun PM, Torres F, Sweatt AJ, Molitor JA, Khanna D, Maecker H, Welch B, Goldmuntz E, Nicolls MR. *Am J Respir Crit Care Med*. 2021 Jul 15;204(2):209-221. doi: 10.1164/rccm.202009-3481OC.

Microhemorrhage-associated Tissue Iron Enhances the Risk for *Aspergillus fumigatus* Invasion in Murine Tracheal Transplantation. Hsu JL, Manouvakhova OV, Clemons KV, Inayathullah M, Tu AB, Sobel RA, Tian W, Nazik H, Pothineni VR, Pasupneti S, Jiang X, Dhillon GS, Bedi H, Rajadas J, Haas H, Aurelian L, Stevens DA, Nicolls MR. *Science Translational Medicine*, 2018.

A Dominant Role for Regulatory T Cells in Protecting Females Against Pulmonary Hypertension. Tamosiuniene R, Manouvakhova O, Mesange P, Saito T, Qian J, Sanayal M, Lin YC, Nguyen L, Luria A, Tu A, Sante J, Rabinovitch M, Fitzgerald DJ, Graham BB, Habtezion A, Voelkel NF, Aurelian L, Nicolls MR. *Circ. Res.*, 2018 Mar 15.117.312058.

Endothelial HIF-2 α is Required for the Maintenance of Airway Microvasculature. Jiang X, Tian W, Tu AB, Pasupneti S, Shuffle E, Dahms P, Zhang P, Cai H, Dinh TT, Liu B, Cain C, Giaccia AJ, Butcher EC, Simon MC, Semenza GL, Nicolls MR. *Circulation*, 2019; Jan 22;139(4):502-517.

Phenotypically Silent Bone Morphogenetic Protein Receptor 2 Mutations Predispose Rats to Inflammation-Induced Pulmonary Arterial Hypertension by Enhancing the Risk for Neointimal Transformation. Tian W, Jiang X, Sung YK, Shuffle E, Wu TH, Kao PN, Tu AB, Dorfmueller P, Cao A, Wang L, Peng G, Kim Y, Zhang P, Chappell J, Pasupneti S, Dahms P, Maguire P, Chaib H, Zamanian R, Peters-Golden M, Snyder MP, Voelkel NF, Humbert M, Rabinovitch M, Nicolls MR. *Circulation*, 2019 Oct 22;140(17):1409-1425.



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EDUCATION/TRAINING

MD Radboud University, Nijmegen NL

PHD Erasmus University, Rotterdam NL

INTERNSHIP Radboud University

RESIDENCY

Erasmus University Medical Center

FELLOWSHIP Massachusetts General
Hospital Department of Radiology

HONORS & AWARDS

BOARDS

President-Elect, Society of
Cardiovascular Computed Tomography
Associate editor JACC cardiovascular
imaging

CURRENT RESEARCH

Dr. Nieman is a cardiologist and associate professor in the departments of cardiovascular medicine and radiology. He investigates advanced cardiac imaging techniques, and current research interest include stress myocardial perfusion CT, CT-based fractional flow reserve, machine-learning approaches to disease differentiation, imaging-guided decision making and the clinical value of cardiac CT in ischemic heart disease. Dr. Nieman was born in the Netherlands, obtained his medical degree at the Radboud University in Nijmegen (1998), and completed his cardiology training at the Erasmus University Medical Center in Rotterdam (2008). His research in cardiac CT at the Erasmus University resulted in a PhD degree in 2003. In 2004 he performed an imaging fellowship at the Massachusetts General Hospital (Harvard Medical School) in Boston, MA. Dr Nieman became faculty at Erasmus (cardiology/radiology) in 2008 and was scientific director of cardiac CT and MRI and clinical director of the intensive cardiac care unit until he joined Stanford in 2016.

SELECTED PUBLICATIONS

Low-dose coronary calcium scoring CT using a dedicated reconstruction filter for kV-independent calcium measurements. Jubran A, Mastrodicasa D, van Praagh GD, Willemink MJ, Kino A, Wang J, Fleischmann D, Nieman K. *Eur Radiol.* 2022 Jan 6. doi: 10.1007/s00330-021-08451-2. Epub ahead of print.

Best Practices for Imaging Cardiac Device-Related Infections and Endocarditis: A JACC: Cardiovascular Imaging Expert Panel Statement. Dilsizian V, Budde RPJ, Chen W, Mankad SV, Lindner JR, Nieman K. *JACC Cardiovasc Imaging.* 2021 Dec 7:S1936-878X(21)00766-X. doi: 10.1016/j.jcmg.2021.09.029. Epub ahead of print.

Dynamic Myocardial Perfusion CT for the Detection of Hemodynamically Significant Coronary Artery Disease. Nous FMA, Geisler T, Kruk MBP, Alkadhi H, Kitagawa K, Vliegenthart R, Hell MM, Hausleiter J, Nguyen PK, Budde RPJ, Nikolaou K, Kepka C, Manka R, Sakuma H, Malik SB, Coenen A, Zijlstra F, Klotz E, van der Harst P, Artzner C, Dedic A, Pugliese F, Bamberg F, Nieman K. *JACC Cardiovasc Imaging.* 2022 Jan;15(1):75-87. doi: 10.1016/j.jcmg.2021.07.021. Epub 2021 Sep 15.

Coronary Computed Tomographic Angiography for Complete Assessment of Coronary Artery Disease. Serruys PW, Hara H, Garg S, Kawashima H, Nørgaard BL, Dweck MR, Bax JJ, Knuuti J, Nieman K, Leipsic JA, Mushtaq S, Andreini D, Onuma Y. *JACC State-of-the-Art Review.* J Am Coll Cardiol. 2021 Aug 17;78(7):713-736. doi: 10.1016/j.jacc.2021.06.019.

Impact of machine-learning CT-derived fractional flow reserve for the diagnosis and management of coronary artery disease in the randomized CRESCENT trials. Nous FMA, Budde RPJ, Lubbers MM, Yamasaki Y, Kardys I, Bruning TA, Akkerhuis JM, Kofflard MJM, Kietselaer B, Galema TW, Nieman K. *Eur Radiol.* 2020 Jul;30(7):3692-3701. doi:10.1007/s00330-020-06778-w. Epub 2020 Mar 12.



Patricia K. Nguyen, MD

Assistant Professor, Medicine - Cardiovascular Medicine

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EDUCATION/TRAINING

MD Johns Hopkins Medical School

MEDICINE RESIDENCY

Columbia University

CARDIOLOGY FELLOWSHIP

Stanford University

BOARD CERTIFICATION

Internal Medicine, ABIM

Cardiovascular Medicine, ABIM

CLINICAL FOCUS

Cardiovascular Imaging

HONORS & AWARDS

American Heart Association Research Award, Western States Affiliates

American College of Cardiology Foundation/GE Healthcare Award

American College of Cardiology Foundation/Merck Fellow

FELLOW

American College of Cardiology

MEMBER

American Heart Association

CURRENT RESEARCH

Dr. Nguyen is a cardiologist and assistant professor in the Division of Cardiovascular Medicine at Stanford University. She is also Director of Advanced Imaging and Co-Director of the Cardiac Rehabilitation Program at the VA Palo Alto Medical center. She graduated from Johns Hopkins Medical School and finished her internal medicine residency at New York Presbyterian Hospital. She then completed her fellowship in cardiovascular medicine and advanced imaging at Stanford University. Her laboratory focuses on developing better diagnostic and therapeutic strategies for the management of coronary artery disease. Her research projects include studies evaluating how stem cells can be applied for treatment of coronary heart disease, how the adaptive immune system contributes to atherosclerosis, and how exercise improves cardiovascular health.

[Humans] love to wonder, and that is the seed of science... — Ralph Waldo Emerson

SELECTED PUBLICATIONS

The Gift of Light: Using Multiplexed Optical Imaging to Probe Cardiac Metabolism in Health and Disease. Wardak M, Nguyen PK. *Circ Cardiovasc Imaging*. 2018, Mar;11(3):e007597.

Prolonged Survival of Transplanted Stem Cells After Ischemic Injury via the Slow Release of Pro-survival Peptide Analogs Crosslinked to an Injectable Collagen mMatrix. Lee AS, Inayathullah M, Lijkwan M, Zhao X, Sun W, Park S, Hong W, Parekh MB, Malkovskiy A, Lau E, Qin X, Pothineni VR, Sanchez-Freire V, Zhang WY, Kooreman N, Ebert AD, Chan C, Nguyen PK, Rajadas J, Wu JC. *Nature Biomedical Engineering*. 2018 Jan;2(2):104-113.

Brief Report: External Beam Radiation Therapy for the Treatment of Human Pluripotent Stem Cell-derived Teratomas. Lee AS, Tang C, Hong WX, Park S, Bazalova M, Nelson G, Sanchez-Freire, Bakerman I, Zhang W, Neofytou E, Connolly A, Chan CK, Graves EE, Weissman IL, Nguyen PK, and Wu JC. *Stem Cells*. 2017, August; 35(8): 1994-2000.

Sex-based Differences in Myocardial Gene Expression in Recently Deceased Organ Donors With No Prior Cardiovascular Disease. InanlooRahatloo K, Liang G, Vo Davis, Ebert A, Nguyen I, Nguyen PK. *Plos One*. 2017, 12(8): e0183874.



Detlef Obal, MD, PhD, DESA

Assistant Professor, University Medical Line, Department of Anesthesiology, Perioperative, and Pain Medicine

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LAB oballab.stanford.edu

EDUCATION/TRAINING

MD/PhD University of Düsseldorf, Germany

PhD University of Louisville, KY

Anesthesiology Residency University of Düsseldorf

Neuroanesthesia Residency University of Düsseldorf

BOARD CERTIFICATION

German Board of Anesthesiology

European Society of Anesthesiology

CLINICAL FOCUS

Anesthesiology

Perioperative Care, Personalized Medicine

HONORS & AWARDS

American Society of Anesthesiology
- Subcommittee on Experimental Circulation Member (2019)

MCHRI TIP grant recipient (2019)

Cardiovascular Institute Seed Grant (2018)

Dean's Citation Award, University of Louisville (2014)

Diploma of the European Society of Anesthesiology (2005)

First Prize - Best abstract
Euroanesthesia congress, Glasgow, Scotland (2003)

CURRENT RESEARCH

My lab utilizes human induced pluripotent stem cells to evaluate the impact of anesthetics on both cardiovascular function and cardiac development. The current opioid crisis directed our attention to the function of GPCR within the cardiovascular system and the impact of chronic opioid receptor stimulation on the three different opioid receptors expressed within cardiovascular tissue. Utilizing single molecular tracking techniques and high throughput screening methods, we try to understand how chronic opioid administration affects cardiac function and receptor distribution within cardiomyocytes and endothelial cells. The longterm goal is to understand the impact of chronic receptor stimulation on the individual receptor function and its interplay with other cell membrane components in patient specific cells and tissue. Peripartum administration of opioids has become a common problem in the US. Therefore, we are investigating the role of endogenous and exogenous opioids on cardiac development. The role of opioid receptors within the developing heart is barely understood. My lab utilizes 2D and 3D cell models, as well as in vivo experiments to determine how chronic opioid administration affects cardiomyocyte and endothelial cell differentiation and their cell interaction during early stages of heart development. Our efforts will help to elucidate the fundamental role opioids play within the cardiovascular system.

It always seems impossible until it's done.
- Nelson Mandela.

SELECTED PUBLICATIONS

Personalized Pharmacology: Inducible Pluripotent Stem Cells - a Potent Tool to Develop Individualized Opioids and Anesthetics; Invited Review. Obal D, Joseph Wu. *British Journal of Pharmacology* 2020; Oct 177 (20): 4581-4594.

Understanding "state-of-the-art" technologies in basic anesthesia research - a guide to understanding current basic science approaches. Obal D, Norris A, McKinstry-Wu A, Wu S, Tawfik VL. *Anesth Analg.* 2020; 131 (2): 450-463.

Cardiomyocyte-restricted overexpression of extracellular superoxide dismutase increases nitric oxide bioavailability and reduces infarct size after ischemia/reperfusion. Obal D, Dai S, Keith R, Dimova N, Kingery J, Zheng YT, Zweier J, Velayutham M, Prabhu SD, Li Q, Conklin D, Yang D, Bhatnagar A, Bolli R, Rokosh G. *Basic Res Cardiol.* 2012 Nov;107(6):305. doi: 10.1007/s00395-012-0305-1. Epub 2012 Oct 26. PubMed PMID: 23099819.

Genetic Deficiency of Glutathione S-Transferase P Increases Myocardi-al Sensitivity to Ischemia-Reperfusion Injury. Conklin DJ, Guo Y, Jagatheesan G, Kilfoil PJ, Haberzettl P, Hill BG, Baba SP, Guo L, Wetzelberger K, Obal D, Rokosh DG, Prough RA, Prabhu SD, Velayutham M, Zweier JL, Hoetker JD, Riggs DW, Srivastava S, Bolli R, Bhatnagar A. *Circ Res.* 2015 Aug 14;117(5): 437-49.



Latha Palaniappan, MD, MS

Professor of Medicine - General Medical Disciplines

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EDUCATION/TRAINING

INTERNSHIP & RESIDENCY Kaiser Foundation Hospital, CA

MD University of Michigan School of Medicine MI

BOARD CERTIFICATION Internal Medicine, American Board of Internal Medicine

MS Stanford University, Epidemiology

BA University of Michigan

CLINICAL FOCUS

Internal Medicine

HONORS & AWARDS

"Top Physician", Consumers Research Council of America

Fellow, American College of Physicians

Fellow, American College of Cardiology

Healthcare Hero Award, Silicon Valley Business Journal

CURRENT RESEARCH

My work focuses on the study of diverse populations, chronic disease, and prevention. My group specifically seeks to address the gap in knowledge of health in Asian subgroups and other understudied racial/ethnic minorities (PACS 5R01DK081371, CASPER R01HL126172, and CAUSES R01MD007012). I co-founded (with Dr. Bryant Lin) the Center for Asian Health Research and Education (CARE) at Stanford in 2018. My current work examines the clinical effectiveness of structured physical activity programs for diabetes management (Initiate and Maintain Physical Activity in Clinics - IMPACT, 5R18DK096394), as well as best exercise regimens for normal-weight diabetics (Strength Training Regimen for Normal Weight Diabetics - STRONG-D, 2R01DK081371). I implement evidence based genetic and pharmacogenetic testing in Primary Care Clinics as the Scientific Director of Precision Genomics and Pharmacogenomics in Primary Care. I am the faculty lead of the Precision Health Biobank at Stanford, a population based biobank designed to accelerate genetic and other -omics discovery.

SELECTED PUBLICATIONS

Socioeconomic Differences in the Epidemiologic Transition From Heart Disease to Cancer as the Leading Cause of Death in the United States, 2003 to 2015: An Observational Study. Hastings KG, Boothroyd DB, Kapphahn K, Hu J, Rehkopf DH, Cullen MR, Palaniappan L. *Ann Intern Med.* 2018 Nov 13.

Evaluating the Clinical Implementation of Structured Exercise: A Randomized Controlled Trial Among Non-insulin Dependent Type II Diabetics. Faruqi L, Wong, M., Bonde, S., Wong, C. W., Walai, K., West, W., Goni, D. T., Araya, S., Azamey, S., Nacif-Coelho, C., Raghuram, S. S., Vera, K., Mittal, A., Cde, L. G., Christensen, M., Johannsen, N., Haddad, F., Moharir, M., Palaniappan, L. *Contemp Clin Trials.* 2018 Nov;74:25-31.

Public Health and Health Systems: Implications for the Prevention and Management of Type 2 Diabetes in South Asia. Hills AP, Misra A, Gill JMR, Byrne NM, Soares MJ, Ramachandran A, Palaniappan L, Street SJ, Jayawardena R, Khunti K, Arena R. *Lancet Diabetes Endocrinol.* 2018 Dec;6(12):992-1002.

Clinical and Personal Utility of Genetic Risk Testing. David SP, Palaniappan L. *Am Fam Physician.* 2018 May 1;97(9):600-602.

Leading Causes of Death among Asian American Subgroups (2003-2011). Hastings, K. G., Jose, P. O., Kapphahn, K. I., Frank, A. T., Goldstein, B. A., Thompson, C. A., Eggleston, K., Cullen, M. R., Palaniappan, LP; *PLOS One*; 2015; 10 (4).



Marco V. Perez, MD

Associate Professor, Medicine - Cardiovascular Medicine

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WEB familyheart.stanford.edu

EDUCATION/TRAINING

MD Harvard University

RESIDENCY & INTERNSHIP

Massachusetts General Hospital

FELLOWSHIP Stanford University

BOARD CERTIFICATION

American Board of Internal Medicine (ABIM), Cardiovascular Disease,

HONORS & AWARDS

NIH/NHLBI 1R01HL136390-01 (PI)

Apple Heart Study, Apple Inc. (Co-PI)

NIH/NHLBI HHSN268201100003C (Co-I)

Weston Havens Foundation Grant (PI)

CURRENT RESEARCH

Dr. Marco Perez's research goal is to better understand the fundamental causes of cardiovascular disease through the study of genetics and epidemiology. His group studies the genetic variations and environmental exposures that are associated with conditions such as atrial fibrillation and heart failure. He has led the studies of atrial fibrillation in Women's Health Initiative, one of the largest nation-wide population-based cohorts. He is currently conducting a large study monitoring for silent or asymptomatic atrial fibrillation in women from the WHI randomized to exercise intervention, and is co-PI in the Apple Heart Study, a clinical trial using the Apple Watch to screen for atrial fibrillation. He is interested in understanding the paradox that atrial fibrillation is less common in African Americans and Hispanics, despite a greater burden of risk factors such as hypertension. As director of the Stanford Inherited Arrhythmia Clinic, he evaluates families with rare inherited arrhythmias associated with sudden death such as Long QT and Brugada Syndromes and explores their links with novel genes. He is particularly interested in studying the genetic causes of very early onset atrial fibrillation. He also studies how best to use the electrocardiogram to identify patients at risk for atrial fibrillation and athletes at risk for life-threatening arrhythmias due to conditions such as hypertrophic cardiomyopathy. His genetic studies have led to the discovery of promising novel therapeutic targets that his group is now studying at a functional level.

SELECTED PUBLICATIONS

Apple Heart Study Investigators. Large-Scale Assessment of a Smartwatch to Identify Atrial Fibrillation. Perez MV, Mahaffey KW, Hedlin H, Rumsfeld JS, Garcia A, Ferris T, Balasubramanian V, Russo AM, Rajmane A, Cheung L, Hung G, Lee J, Kowey P, Talati N, Nag D, Gummidipundi SE, Beatty A, Hills MT, Desai S, Granger CB, Desai M, Turakhia MP; *N Engl J Med*. 2019 Nov 14;381(20):1909-1917.

Broad Genetic Testing in a Clinical Setting Uncovers a High Prevalence of Titin Loss-of-Function Variants in Very Early-Onset Atrial Fibrillation. Goodyer WR, Dunn K, Caleshu C, Jackson M, Wylie J, Moscarello T, Platt J, Reuter C, Smith A, Trela A, Ceresnak SR, Motonaga KS, Ashley E, Yang P, Dubin AM, Perez M. *Circ Genom Precis Med*. 2019 Oct 22.

Long-Term Exposures to Air Pollution and the Risk of Atrial Fibrillation in the Women's Health Initiative Cohort. Hart JE, Hohensee C, Laden F, Holland I, Whitsel EA, Wellenius GA, Winkelmayr WC, Sarto GE, Warsinger L, Manson JE, Greenland P, Kaufman J, Albert C, Perez MV. *Environ Health Perspect*. 2021 Sep;129(9):97007.

Sedentary Behavior and Atrial Fibrillation in the Objective Physical Activity and Cardiovascular Health (OPACH) Study. Brian C. Boursiquot, MD, MS, John Bellettiere, PhD, MPH, Michael J. LaMonte, PhD, MPH, Andrea Z. LaCroix, PhD, MPH, Marco V. Perez, MD. *J Am Heart Assoc*, 2022 (in press).



Ada Poon, PhD

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WEB biosystems.stanford.edu

EDUCATION/TRAINING

PHD UC Berkeley

HONORS & AWARDS

CZ Biohub Investigator, Chan Zuckerberg Biohub (2017)

CAREER Award, NSF (2013)

Research Grant recipient, Okawa Foundation (2010)

Terman Fellow, Stanford (2008)

CURRENT RESEARCH

Our research focuses on providing theoretical foundations and engineering innovations for realizing microelectronics that seamlessly integrate with the body. Such systems will allow precise recording or perturbation of physiological processes for advancing basic scientific discovery, and restoring or augmenting biological functions for clinical applications. Although microelectronics can be made extremely small, existing methods for powering them involve large batteries or energy harvesting modules. The size of these powering components severely constrains the integration of microelectronics in living systems. The main thrust of our research aims to address these obstacles through fundamental understanding of power transfer physics with advances in low-power integrated circuits in order to demonstrate the injection of fully operational sensors, electrodes, light sources, and other electronics deep inside the body. An array of these tiny probes enables measurement or perturbation of physiological parameters in previously inaccessible locations and over long time periods.

Angels can fly because they take themselves lightly. — G.K. Chesterton

SELECTED PUBLICATIONS

Wirelessly Powering Miniature Implants for Optogenetic Stimulation. Yeh AJ, Ho JS, Tanabe Y, Neofytou E, Beygui RE, Poon ASY. *Appl Phys Lett*. 2013; 103: 163701.

Midfield Wireless Powering of Subwavelength Autonomous Devices. Kim S, Ho JS, Poon ASY. *Phys Rev Lett*. 2013; 110: 203905.

Midfield Wireless Powering for Implantable Systems. Ho JS, Kim S, Poon ASY. *Proc IEEE*. 2013; 101(6): 1369-78.

Wireless Power Transfer to a Cardiac Implant. Kim S, Ho JS, Chen LY, Poon ASY. *Appl Phys Lett*. 2012; 101: 073701.

A mm-sized Wirelessly Powered and Remotely Controlled Locomotive Implantable Device. Yakovlev A, Pivonka D, Meng TH, Poon ASY. *Proc IEEE Intl Solid-State Circuits Conf. (ISSCC)* 2012; 302-4.



Richard Popp, MD

Professor of Medicine (Emeritus)

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EDUCATION/TRAINING

MD Johns Hopkins School of Medicine

FELLOW Indiana University

CLINICAL FOCUS

Ultrasound Diagnostics

HONORS & AWARDS

Albion Walter Hewlett Award, Stanford University School of Medicine (2017)

Gold Medal, European Society of Cardiology (2015)

Lifetime Honorary Medical Staff Appointment, Stanford Hospital and Clinics (2013)

Rambam Award, Rambam Medical Center, Haif, Israel (2012)

Richard L. Popp Master Teacher and Mentor Award," Given yearly by The American Society of Echocardiography, (Initiated 2001)

CURRENT RESEARCH

Richard Popp is Professor of Medicine (Emeritus 2005) at Stanford University. Dr. Popp is a clinical Cardiologist who focused his research on development of all forms of ultrasound with more than 300 scientific publications. Dr. Popp was Senior Associate Dean for Academic Affairs at Stanford from 1995-2000. He continues to teach in the Stanford Biodesign Innovation Program. He was Chair the Conflict of Interest Committee at the Medical School from 2000 to 2018. Dr. Popp was President of the American College of Cardiology, the American Society of Echocardiography and the Association of University Cardiologists. He is the previous Chairman of the American Board of Internal Medicine's Cardiovascular Diseases Subspecialty Board. He has received several special recognitions including The Rambam Award in Israel in 2012, the Gold Medal of the European Society of Cardiology in 2016 and the Albion Walter Hewlett Award of Stanford University in 2017. Dr. Popp was an H-P fellow and Principal Medical Consultant to Hewlett-Packard Laboratories and Agilent Labs for many years. He was an advisor and consultant to Acuson, ATL, H-P Medical Ultrasound Division and Varian.

SELECTED PUBLICATIONS

Outcomes from a Postgraduate Biomedical Technology Innovation Training Program: The First 12 Years of Stanford Biodesign. Brinton TJ, Kurihara CQ, Camarillo DB, Pietzsch JB, Gorodsky J, Zenios SA, Doshi R, Shen C, Kumar UN, Uday N. Mairal A, Watkins J, Popp RL, Wang PJ, Makower J, Krummel TM, and Yock PG. *Annals of Biomedical Engineering*, 2013; 41(9): 1803–1810.

Assessment of left ventricular function by echocardiography: a technique in evolution. Picard MH, Popp RL, Weyman AE. *J Am Soc Echocardiogr*. 2008 Jan;21(1):14-21. doi: 10.1016/j.echo.2007.11.007.

Comparison of three-dimensional echocardiography to two-dimensional echocardiography and fluoroscopy for monitoring of endomyocardial biopsy. Amitai ME, Schnittger I, Popp RL, Chow J, Brown P, Liang DH. *Am J Cardiol*. 2007 Mar 15;99(6):864-6. doi: 10.1016/j.amjcard.2006.10.050. Epub 2007 Jan 31.



Stephen Quake, PhD

Lee Otterson Professor in the School of Engineering
and Professor of Bioengineering, Applied Physics, and (by courtesy), of Physics

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LAB quakelab.stanford.edu

EDUCATION/TRAINING

PHD University of Oxford

HONORS & AWARDS

Max Delbruck Prize in Biological Physics,
American Physical Society (2016)

Raymond and Beverly Sackler Prize
for Convergence Research, National
Academy of Sciences (2016)

Gabbay Prize for Biotechnology and
Medicine (2015)

Elected Member, American Academy of
Arts and Sciences (2014)

Elected Member, National Academy of
Inventors (2013)

Elected Member, National Academy of
Sciences (2013)

Elected Member, National Academy of
Engineering (2013)

Inventor of the Year, Silicon Valley
Intellectual Property Law Association
(2013)

Nakasone Prize of the Human Frontiers
of Science Program, . (2013)

Elected Member, Institute of Medicine
(now National Academy of Medicine)
(2012)

Lemelson-MIT Prize for outstanding mid-
career inventors, . (2012)

Promega Biotechnology Research Award,
American Society of Microbiology (2011)

Raymond and Beverly Sackler
International Prize in Biophysics (2011)

Elected Fellow, The American Physical
Society (2010)

CURRENT RESEARCH

Professor Quake's interests lie at the nexus of physics, biology and biotechnology. His group pioneered the development of Microfluidic Large Scale Integration (mLSI), demonstrating the first integrated microfluidic devices with thousands of mechanical valves. This technology is helping to pave the way for large scale automation of biology at the nanoliter scale, and he and his students have been exploring applications of lab-on-a-chip technology in functional genomics, genetic analysis, and structural biology. Professor Quake is also active in the field of single molecule biophysics.

SELECTED PUBLICATIONS

Role of Epithelial to Mesenchymal Transition Associated Genes in Mammary Gland Regeneration and Breast Tumorigenesis. Sikandar SS, Kuo AH, Kalisky T, Cai S, Zabala M, Hsieh RW, Lobo NA, Scheeren FA, Sim S, Qian D, Dirbas FM, Somlo G, Quake SR, Clarke MF. *Nat Commun.* 2017 Nov 21;8(1):1669.

Classifying Drosophila Olfactory Projection Neuron Subtypes by Single-cell RNA Sequencing. Li H, Horns F, Wu B, Xie Q, Li J, Li T, Luginbuhl DJ, Quake SR, Luo L. *Cell.* 2017 Nov 16;171(5):1206-1220.e22

T Cell Receptor Sequencing of Early-stage Breast Cancer Tumors Identifies Altered Clonal Structure of the T Cell Repertoire. Beausang JF, Wheeler AJ, Chan NH, Hanft VR, Dirbas FM, Jeffrey SS, Quake SR. *Proc Natl Acad Sci USA.* 2017 Nov 14.

Noninvasive Prenatal Diagnosis of Single-gene Disorders by use of Droplet Digital PCR. Camunas-Soler J, Lee H, Hudgins L, Hintz SR, Blumenfeld YJ, El-Sayed YY, Quake SR. *Clin Chem.* 2017 Nov 2.

Single-cell RNA-Seq Analysis of Infiltrating Neoplastic Cells at the Migrating Front of Human Glioblastoma. Darmanis S, Sloan SA, Croote D, Mignardi M, Chernikova S, Samghabadi P, Zhang Y, Neff N, Kowarsky M, Caneda C, Li G, Chang SD, Connolly ID, Li Y, Barres BA, Gephart MH, Quake SR. *Cell Rep.* 2017 Oct 31;21(5):1399-1410.

Single-cell Transcriptional Dynamics of Flavivirus Infection. Zanini F, Pu Szu-Yuan, Bekerman E, Einav S, Quake SR. *Posted to Biorxiv* on Oct. 14, 2017.



Thomas Quertermous, MD

William G. Irwin Professor in Cardiovascular Medicine

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EDUCATION/TRAINING

MD University of Chicago

MEDICINE RESIDENCY & INTERNSHIP

University of Chicago

CARDIOLOGY FELLOWSHIP

Massachusetts General Hospital

RESEARCH FELLOWSHIP

Harvard Medical School

BOARD CERTIFICATION

Cardiology, ABIM

HONORS & AWARDS

ESTABLISHED INVESTIGATOR

American Heart Association

Pfizer New Faculty Award

University of Chicago Distinguished Service Award

MD Degree with honors

FORMER HJ MORGAN CHAIR IN

MEDICINE Vanderbilt University

FORMER DIRECTOR

Donald W. Reynolds Cardiovascular Clinical Research Center

MEMBER

American Society for Clinical Investigation (Young Turks); Association of University Cardiologists

WILLIAM G. IRWIN CHAIR IN MEDICINE

Stanford University

CURRENT RESEARCH

My laboratory is interested in the molecular mechanisms that mediate vascular disease pathophysiology and the risk for these diseases. The approach is primarily genetic, using human cohorts and large scale genome wide studies to identify genes that associate with disease and risk, and molecular genetic studies to define the mechanisms of these associations. At the human level, we collaborate with a number of centers around the world through the CARDIoGRAM+ C4D consortium to further identify coronary heart disease loci, and our group serves as the organizing center searching for loci that associate with gold standard measures of insulin sensitivity, the GENESIS study. For loci identified through these studies, we work to identify mechanisms by which causal variation is responsible for altered gene structure or function, and employ cellular and genetic mouse models to identify how encoded factors participate in the disease process.

When not working on disease genes, I enjoy listening to blues music.

SELECTED PUBLICATIONS

Smad3 regulates smooth muscle cell fate and governs adverse remodeling and calcification of atherosclerotic plaque. Cheng P, Wirka RC, Kim JB, Nguyen T, Kundu R, Zhao Q, Pedroza AJ, Nagao M, Iyer D, Fischbein MP, Quertermous T. *Nature Cardiovascular Research*, in press.

ZEB2 Shapes the Epigenetic Landscape of Atherosclerosis. Cheng P, Wirka RC, Clarke LS, Zhao Q, Kundu R, Nguyen T, Nair S, Sharma D, Kim H-D, Shi H, Assimes T, Kim JB, Kundaje A, and Quertermous T. *Circulation*. 2022. Doi: 10.1161/CIRCULATIONAHA.121.057789, In press.

Atheroprotective roles of smooth muscle cell phenotypic modulation and the TCF21 disease gene as revealed by single-cell analysis. Wirka RC, Wagh D, Paik DT, Pjanic M, Nguyen T, Miller CL, Kundu R, Nagao M, Collier J, Koyano TK, Fong R, Woo YJ, Liu B, Montgomery SB, Wu JC, Zhu K, Chang R, Alamprese M, Tallquist MD, Kim JB, Quertermous T. *Nature Medicine*, 2019, 25:1280-1289.



Marlene Rabinovitch, MD

Endowed Chair, Dwight and Vera Dunlevie Professorship in Pediatric Cardiology
Director, Basic Science and Engineering Initiative, Stanford Children's Health
Betty Irene Moore Children's Heart Center

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EDUCATION/TRAINING

MD McGill University

PEDIATRICS RESIDENCY & INTERNSHIP

University of Colorado

PEDIATRIC CARDIOLOGY FELLOWSHIP

Baylor College of Medicine

PEDIATRIC CARDIOLOGY FELLOWSHIP

Harvard Medical School

PEDIATRIC CARDIOLOGY RESEARCH

FELLOWSHIP Harvard Medical School

BOARD CERTIFICATION

General Pediatrics, ABP

Pediatric Cardiology, ABP

CLINICAL FOCUS

Pulmonary Hypertension, Pulmonary
Vascular Diseases, Vascular Biology
Congenital Heart Disease

HONORS & AWARDS

The American Heart Association
Distinguished Scientist Lecturer

Robert F. Grover Prize, Assembly on
Pulmonary Circulation, American
Thoracic Society

J. Burns Amberson Lecturer

American Heart Association (AHA) Basic
Research Prize

AHA Distinguished Scientist Award

ATS, Recognition Award for Scientific
Accomplishment

Louis and Artur Lucian Award for
Research in Circulatory Diseases

SCIENTIFIC ADVISORY BOARD

Children's Discovery Institute,
Washington Univ; NHLBI Lung Repair
and Regeneration Cons; Max Planck
Institute for Heart and Lung Research

CURRENT RESEARCH

We investigate mechanisms leading to pulmonary arterial hypertension (PAH) with the view that we might better treat this devastating condition that has no cure except for lung transplantation. We discovered relationships between degradation of elastin by an endogenous elastase, loss of pre-capillary vessels, and proliferation of vascular cells and showed that suppression of elastase activity could reverse experimentally-induced PAH; we are now embarking on a translational project to bring elastase inhibitors into the clinic. We focus on inflammation and autoimmunity in PAH. CyToF and multiple high throughput approaches are applied in immunophenotyping patients and experimental models of PAH. In addition, we investigate the use of induced pluripotent stem cells to understand the genetic and epigenetic factors that cause PAH. We recently discovered molecular pathways downstream of bone morphogenetic protein receptor (BMPR)2 explaining how activation of this receptor protects EC from apoptosis preventing obliteration and loss of pre-capillary arteries and attenuates proliferation of SMC and fibroblasts. Using human cells and genetically modified mice, we elucidate interactions between BMPR2 signaling and PPAR γ mediated gene regulation. We relate mutant BMPR2 to heightened GM-CSF mediated macrophage recruitment, and PPAR γ to DNA damage/repair mechanisms and preservation of mitochondrial function.

The patient with pulmonary hypertension still mystifies even the most astute of physicians.

SELECTED PUBLICATIONS

BMPR2 Preserves Mitochondrial Function and DNA Integrity During Reoxygenation to Promote Endothelial Survival and Reverse Pulmonary Hypertension. Diebold I, Hennigs JK, Miyagawa K, Li CG, Nickel NP, Kaschwich M, Cao A, Wang L, Reddy S, Chen P-I, Nakahira K, Alejandre Alcazar MA, Hopper RK, Ji L, Feldman BJ, Rabinovitch M. *Cell Metab* 2015 Apr 7;21(4):596-608.

Patient-Specific iPSC Derived Endothelial Cells Uncover Pathways that Protect Against Pulmonary Hypertension in BMPR2 Mutation Carriers. Gu M, Shao N-Y, Silin Sa S, Li D, Termglinchan V, Ameen M, Karakikes I, Sosa G, Grubert F, Lee J, Cao A, Taylor S, Ma Y, Zhao Z, Chappell J, Hamid R, Austin ED, Gold JD, Wu JC, Snyder MP, Rabinovitch M. *Cell Stem Cell*. 2017 Apr 6;20(4):490-504.

Smooth Muscle Contact Drives Endothelial Regeneration by BMPR2-Notch1 Mediated Metabolic and Epigenetic Changes. Miyagawa K, Shi, Chen P-I, Hennigs JK, Zhao Z, Wang M, Li CG, Saito T, Taylor S, Sa S, Cao A, Wang L, Snyder MP, Rabinovitch M. *Circulation Research* 2019.



Jayakumar Rajadas, PhD

Founding Faculty Director, Advanced Drug Delivery and Regenerative Biomaterials Laboratory (ADDReB) Stanford CVI

Assistant Professor, Division of Pulmonary, Allergy, and Critical Care

Assistant Director, Cardiovascular Pharmacology, Stanford CVI

Adjunct Full Professor, UCSF

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CURRENT RESEARCH

As the founding Director of the Advanced Drug Delivery and Regenerative Biomaterials Laboratory of Stanford Cardiovascular Institute, I have developed a wide spectrum of research projects ranging from small molecular design to smart drug delivery materials. My 32 years of research focuses on the application of biophysical techniques to development of drug delivery systems. I have been studying how protein aggregation in cardiomyocytes and neurons affects their functions. I have shown that misfolded protein accumulation is involved in the dysregulation of calcium homeostasis and cellular function. My lab colleagues and I have discovered therapeutic and neuro immune modulating effects of α A, B crystallin and later tested clinically. My lab has discovered the therapeutic effect of Disulfiram and Azilocillin for treatment of persistent Lyme disease, an unmet medical condition. For the past few years, we have been working on developing tissue organoids to study the drug efficacy. We recently observed glioblastoma organoids are electrically active, and they respond to neurotransmitter receptor-modulating drugs.

Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less. -Marie Curie

SELECTED PUBLICATIONS

Transdermal Deferoxamine Prevents Pressure-induced Diabetic Ulcers. Duscher D, Neofytou E, Wong VW, Maan ZN, Rennert RC, Inayathullah M, Januszyk M, Rodrigues M, Malkovskiy AV, Whitmore AJ, Walmsley GG, Galvez MG, Whittam AJ, Brownlee M, Rajadas J, Gurtner GC. *Proc Natl Acad Sci USA*. 2015, 112(1):94-99.

[Pyr1]-Apelin-13 Delivery via Nano-liposomal Encapsulation Attenuates Pressure Overload-induced Cardiac Dysfunction. Serpooshan V, Sivanesan S, Huang X, Mahmoudi M, Malkovskiy AV, Zhao M, Inayathullah M, Wagh D, Zhang XJ, Metzler S, Bernstein D, Wu JC, Ruiz-Lozano P, Rajadas J, *Biomaterials*, 2015, 37:289-98.

A Thermo-sensitive Delivery Platform for Topical Administration of Inflammatory Bowel Disease Therapies. Sidhartha R. Sinha, Linh P. Nguyen, Mohammed Inayathullah, Andrey Malkovskiy, Frezghi Habte, Jayakumar Rajadas, Aida Habtezion. *Gastroenterology*. 2015, 149: 52-55.

Prolonged Survival of Transplanted Stem Cells After Ischemic Injury via the Slow Release of Pro-survival Peptide Analogs Crosslinked to an Injectable Collagen Matrix. Lee AS, Inayathullah M, Lijkwan MA, Zhao X, Park WSS, Hong WX, Parekh MB, Malkovskiy AV, Lau E, Qin X, Pothineni VR, Sanchez-Freire V, Zhang WY, Kooreman N, Ebert AD, Chan CK, Nguyen PK, JRajadas J, Wu JC. *Nature Biomedical Engineering*, 2018 Feb;2(2):104-113.

Endothelial APLNR Regulates Tissue Fatty Acid Uptake and is Essential for Apelin's Glucose-lowering Effects. Hwangbo C, Wu J, Papangeli I, Adachi T, Sharma B, Park S, Zhao L, Ju H, Go GW, Cui G, Inayathullah M, Job JK, Rajadas J, Kwei SL, Li MO, Morrison AR, Quertermous T, Mani A, Red-Horse K, Chun HJ. *Sci Transl Med*. 2017 Sep 13;9(407).

EDUCATION/TRAINING

PHD Indian Institute of Technology

HONORS & AWARDS

YOUNG INVESTIGATOR AWARDS

Young Scientist Award in Chemistry, Council of Scientific and Industrial Research, India

TANSA Award, Government of Tamil Nadu, India

VISITING SCIENTIST

CNRS - National Centre for Scientific Research, France; ETH Zurich;

National Institute on Aging (NIA)

NIH CONSULTING PROFESSOR

Department of Chemical Engineering, Stanford University

VISITING PROFESSOR (STANFORD UNIVERSITY)

Department of Biological Sciences;
Department of Chemical Engineering;
Department of Psychiatry

STEERING COMMITTEE MEMBER

Stanford Cardiovascular Institute

FORMER FOUNDING CHAIR (INDIA)

Bioorganic and Neurochemistry Laboratory, CLRI, Council of Scientific and Industrial Research

ADJUNCT FULL PROFESSOR (UCSF)

Department of Bioengineering and Therapeutic Sciences
School of Pharmacy, University of California San Francisco



Kristy Red-Horse, PhD

Associate Professor of Biology and the Institute of Stem Cell Biology and Regenerative Medicine
Investigator, Howard Hughes Medical Institute

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EDUCATION/TRAINING

PHD University of California, San Francisco

POSTDOCTORAL TRAINING

Genentech, Inc.

POSTDOCTORAL TRAINING

Stanford University

HONORS & AWARDS

Searle Scholar 2013–2016

New York Stem Cell Foundation

Robertson Investigator 2015–2020

CURRENT RESEARCH

My laboratory studies how coronary vessels of the heart develop during embryogenesis and how they regenerate following cardiac injury. The unifying theme among all of our projects is to study coronary development and regeneration at cellular resolution within the context of the intact organ. Our long-term goal is to contribute knowledge towards the advancement of clinical treatments for cardiovascular disease.

SELECTED PUBLICATIONS

Coronary blood vessels from distinct origins converge to equivalent states during mouse and human development. Phansalkar R, Krieger J, Zhao M, Kolluru SS, Jones RC, Quake SR, Weissman I, Bernstein D, Winn VD, D'Amato G, Red-Horse K. *Elife*. 2021 Dec 15;10:e70246. doi: 10.7554/eLife.70246.

Dach1 Extends Artery Networks and Protects Against Cardiac Injury. Raftrey, B., Williams, I. M., Rios Coronado, P. E., Fan, X., Chang, A. H., Zhao, M., Roth, R. K., Trimm, E., Racelis, R., D'Amato, G., Phansalkar, R., Nguyen, A., Chai, T., Gonzalez, K. M., Zhang, Y., Ang, L. T., Loh, K., Bernstein, D., & Red-Horse, K. (2021). doi 10.1161/CIRCRESAHA.120.318271.

Enhancing cardiovascular research with whole-organ imaging. Rios Coronado PE, Red-Horse K. *Curr Opin Hematol*. 2021 May 1;28(3):214-220.

DACH1 Stimulates Shear Stress Guided Endothelial Cell Migration and Coronary Artery Growth Through the CXCL12-CXCR4 Signaling Axis. Andrew H. Chang, Brian C. Raftrey, Gaetano D'Amato, Vinay N. Surya, Aruna Poduri, Heidi I. Chen, Andrew B. Goldstone, Joseph Woo, Gerald G. Fuller, Alexander R. Dunn, and Kristy Red-Horse. (2017) *Genes and Development*, 31:1308-1324.

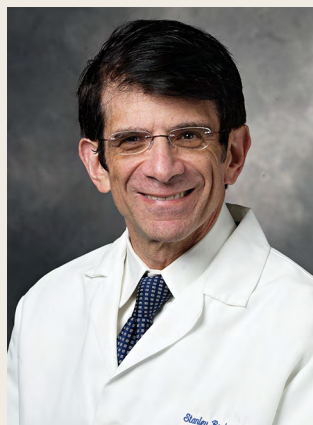
Alternative Progenitor Cells Compensate to Rebuild the Coronary Vasculature in Apj- and Elabela-deficient Hearts. Bikram Sharma, Lena Ho, Heidi I. Chen, Andrew B. Goldstone, Y. Joseph Woo, Thomas Quertermous, Bruno Reversade, and Kristy Red-Horse. (2017) *Developmental Cell*, Sep 25;42(6):655-666

Endothelial Cells Respond to the Direction of Mechanical Stimuli Through SMAD Signaling to Regulate Coronary Artery Size. Aruna Poduri, Andrew H Chang, Brian Raftrey, Mike Van, Kristy Red-Horse. *Development*, Sep 15;144(18):3241-3252.

Coronary Artery Development: Progenitor Cells and Differentiation Pathways. Sharma B, Chang A, Red-Horse K. (2016) *Annu Rev Physiol*. Dec 9.

Pericytes are Epicardial-derived Intermediate Progenitors for Coronary Artery Smooth Muscle. Volz, K, Chen, H, Poduri, A, McKay, A, Jacobs, A, Kofler, N, Kitajewski, J, Weissman, I, and Red-Horse, K. (2015) *eLife*. Oct: 19(4).

The Sinus Venosus Contributes to Coronary Vasculature Through VEGFC-stimulated Angiogenesis. Chen HI, Sharma B, Akerberg BN, Numi HJ, Kivelä R, Saharinen P, Aghajanian H, McKay AS, Bogard PE, Chang AH, Jacobs AH, Epstein JA, Stankunas K, Alitalo K, Red-Horse K. *Development*. 2014 Dec;141(23):4500-12.



Stanley G. Rockson, MD

Allan and Tina Neill Professor of Lymphatic Research
and Medicine Chief of Consultative Cardiology
Director, Stanford Center for Lymphatic and Venous Disorders

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EDUCATION/TRAINING

MD Duke University

MEDICINE RESIDENCY & INTERNSHIP

Harvard University

CARDIOLOGY FELLOWSHIP

Harvard University

BOARD CERTIFICATION

Internal Medicine, ABIM
Cardiovascular Disease, ABIM

CLINICAL FOCUS

Lymphatic and Venous Disease
Peripheral Vascular Disease
Consultative Cardiology

HONORS & AWARDS

Morris and Caroline Barkon Lecture,
University of Pittsburgh

Pioneer Award, Lymphatic Research
Foundation

E. William Hancock Cardiovascular
Medicine Teaching Award, Stanford
University

Franklin G. Ebaugh Jr. Award for
Mentoring Medical Students, Stanford
University

CHAIR, SCIENTIFIC ADVISORY

COMMITTEE Lymphatic Research
Foundation

FELLOW

American College of Cardiology;
American College of Angiology;
American College of Physicians; Society
of Vascular Medicine and Biology

CURRENT RESEARCH

I have devoted the last fifteen years of my career to the clinical and translational investigation of lymphatic vascular disease. More specifically, my laboratory and clinical research team focus on: biomarker identification and validation in lymphatic vascular disease; applications of therapeutic lymphangiogenesis; drug therapies for acquired lymphedema; and pharmacologic prevention of cancer-induced lymphedema. Having studied and characterized lymphatic vascular disease in small animal models, we are increasingly attempting to apply these insights to the human clinical problem of lymphedema. In 1995, I co-founded, and currently direct, the Stanford Center for Lymphatic and Venous Disorders, a specialized center for the diagnostic evaluation and focused therapy of lymphedema and allied diseases.

I agree with Woody Allen: 'I don't want to achieve immortality through my work. I want to achieve it by not dying.'

SELECTED PUBLICATIONS

Cancer-associated Secondary Lymphoedema. Rockson SG, Keeley V, Kilbreath S, Szuba A, Towers A. *Nat Rev Dis Primers*. 2019 Mar 28;5(1):22.

Lymphedema after Breast Cancer Treatment. Rockson SG. *N Engl J Med*. 2018; 379(20):1937-1944.

Pilot Studies Demonstrate the Potential Benefits of Anti-inflammatory Therapy in Human Lymphedema. Rockson SG, Tian W, Jiang X, Kuznetsova T, Haddad F, Zampell J, Mehrara B, Sampson JP, Roche L, Kim J, Nicolls MR. *JCI Insight*. 2018; 3(20). pii: 123775. [Epub ahead of print]

Lymphatic Dysfunction, Leukotrienes, and Lymphedema. Jiang X, Nicolls MR, Tian W, Rockson SG. *Annu Rev Physiol*. 2018; 80:49-70.

Regulatory T Cells Mediate Local Immunosuppression in Lymphedema. García Nores GD, Ly CL, Savetsky IL, Kataru RP, Ghanta S, Hespe GE, Rockson SG, Mehrara BJ. *J Invest Dermatol*. 2018; 138(2):325-335.



Fatima Rodriguez, MD, MPH

Assistant Professor of Medicine, Cardiovascular Medicine
Affinity Lead, Preventive Cardiology, Stanford University
Research and Scientific Director, CardioClick
Director of Population Health, Systems Utilization Research for
Stanford Medicine

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EDUCATION/TRAINING

MD Harvard Medical School

MPH Harvard School of Public Health

RESIDENCY Brigham and Women's Hospital, Harvard Medical School

FELLOWSHIP Stanford University, Cardiovascular Medicine

BOARD CERTIFICATION

Internal Medicine, ABIM

Cardiovascular Disease, ABIM

CLINICAL FOCUS

Cardiovascular Disease, Prevention, Familial Hypercholesterolemia, Cardiovascular Risk Assessment, Coronary Artery Calcification, Chronic Coronary Disease

HONORS & AWARDS

Fellow, American College of Cardiology (2018)

McCormick Galiban Faculty Award, Stanford University (2018)

Harold Amos Medical Faculty Development Award, American Heart Association (2019-2023)

Fellow, American Heart Association Council on Epidemiology and Prevention (2019)

Chair Diversity Investigator Award, Stanford University Department of Medicine (2020)

Integrated Plan Star Award – Health Equity in Telemedicine, Stanford Health Care (2020)

Douglas P. Zipes Distinguished Young Scientist Award, American College of Cardiology (2022)

CURRENT RESEARCH

My research focuses on developing innovative approaches to understanding and eliminating cardiovascular disease health disparities across diverse and understudied populations. My research group, HEART (Health Equity Advancement through Research and Technology), has established a collaborative network of investigators and a platform for mentorship and education. We aim to identify sources of inequities in cardiovascular disease prevalence, incidence, and care by race, ethnicity, language, and sex. We have also documented extensive barriers to guideline adherence in cardiovascular disease prevention recommendations and how these result in adverse clinical outcomes. I have authored over 140 peer-reviewed manuscripts, invited commentaries, and book chapters in these subject areas. As a preventive cardiologist, I am particularly interested in improving cardiovascular risk prediction and treatment recommendations for historically marginalized and understudied racial/ethnic patient groups using novel AI/ML approaches in the electronic health record. I am also interested in Hispanic cardiovascular health and prevention, and have published work highlighting the importance of disaggregation of Hispanic individuals by background, acculturation, and socioeconomic factors. This work has called into question previous notions of Hispanic cardiovascular health and its significance heterogeneity in the population. Finally, my research explores reasons and solutions to increase workforce diversity in cardiovascular medicine and representation of diverse groups in guideline-informing clinical trials.

With great power, comes great responsibility. —
Uncle Ben (Spiderman)

SELECTED PUBLICATIONS

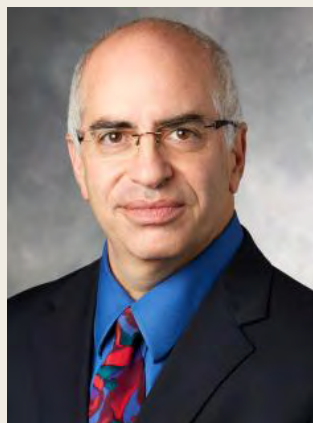
Association of Statin Adherence with Mortality in Patients with Atherosclerotic Cardiovascular Disease. Rodriguez F, Maron DJ, Knowles JW, Virani SS, Lin S, Heidenreich PA. *JAMA Cardiol.* 2019;4(3):206-213.

Machine Learning and Atherosclerotic Cardiovascular Disease Risk Prediction in a Multi-Ethnic Population. Ward A, Sarraju A, Chung S, Li J, Harrington RA, Heidenreich PA, Palaniappan L, Scheinker D, Rodriguez F. *NPJ Digit Med.* 2020;3(1):125.

Management of Antithrombotic Therapy after Acute Coronary Syndromes. Rodriguez F, Harrington RA. *N Engl J Med.* 2021;384(5):452-460.

Racial and Ethnic Differences in Presentation and Outcomes for Patients Hospitalized with COVID-19: Findings from the American Heart Association's COVID-19 Cardiovascular Disease Registry. Rodriguez F, Solomon N, de Lemos JA, Das SR, Morrow DA, Bradley SM, Elkind MSV, Williams Iv JH, Holmes D, Matsouaka RA, Gupta D, Gluckman TJ, Abdalla M, Albert MA, Yancy CW, Wang TY. *Circulation.* 2021;143(24):2332-2342.

Stanford Cardiovascular Institute



David Rosenthal, MD

Professor of Pediatrics (Pediatric Cardiology)

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EDUCATION/TRAINING

MD Albert Einstein College of Medicine

INTERNSHIP Columbia Presbyterian Medical Center

RESIDENCY Columbia Presbyterian Medical Center

FELLOWSHIP Yale School of Medicine

BOARD CERTIFICATION
Pediatric Cardiology (ABP)

CLINICAL FOCUS

Pediatric Cardiology

Cardiology (Heart)

Pediatric Heart Failure

Heart Transplantation

Cardiomyopathies

Ventricular Assist Devices

CURRENT RESEARCH

As director of the PACT program for pediatric heart failure and transplantation at Lucile Packard Children's Hospital and Stanford University, I am primarily interested in improving clinical care for children with heart failure and heart transplantation. This includes improving survival and functional outcomes of children treated with mechanical circulatory support; and improved utilization of heart donors. We are actively involved in the creation of a national learning network to share, develop and disseminate best practices in this field as a way of complementing traditional research activities.

SELECTED PUBLICATIONS

Temporary Circulatory Support in U.S. Children Awaiting Heart Transplantation. Yarlagadda VV, Maeda K, Zhang Y, Chen S, Dykes JC, Gowen MA, Shuttleworth P, Murray JM, Shin AY, Reinhartz O, Rosenthal DN, McElhinney DB, Almond CS. *J Am Coll Cardiol*. 2017 Oct 31;70(18):2250-2260.

Impact of a Modified Anti-thrombotic Guideline on Stroke in Children Supported With a Pediatric Ventricular Assist Device. Rosenthal DN, Lancaster CA, McElhinney DB, Chen S, Stein M, Lin A, Doan L, Murray JM, Gowen MA, Maeda K, Reinhartz O, Almond CS. *J Heart Lung Transplant*. 2017 Nov;36(11):1250-1257.

Rehospitalization After Pediatric Heart Transplantation: Incidence, Indications, and Outcomes. Hollander SA, McElhinney DB, Almond CS, McDonald N, Chen S, Kaufman BD, Bernstein D, Rosenthal DN. *Pediatr Transplant*. 2017 Feb;21(1).



Elsie Gyang Ross, MD

Assistant Professor of Surgery, Division of Vascular Surgery and Medicine, Biomedical Informatics Research

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LAB med.stanford.edu/rosslab.html

EDUCATION/TRAINING

MSc Health Policy, Planning and Financing

MD Stanford University School of Medicine

RESIDENCY

0+5 Stanford University Vascular Surgery Integrated

CLINICAL FOCUS

Vascular Surgery

Preventative health

Peripheral vascular disease

Carotid disease

Venous disease

AAA

HONORS & AWARDS

US-UK Fulbright Scholar, US-UK Fulbright Commission (2008-09)

Soros Fellow, Paul & Daisy Soros Fellowship for New Americans (2008-2010)

Association for Academic Surgery Young Investigators Award, Association for Academic Surgery (AAS)

Society of University Surgeons Junior Faculty Award, Society of University Surgeons (SUS) 2018-2019

NIH-NHLBI funded K01 Award

Doris Duke Clinical Scientist Career Development Award (2021)

CURRENT RESEARCH

Artificial intelligence and machine learning to identify patients at risk for, or already affected by, PAD through analysis of unstructured electronic health records.

Big data and advanced analytics will help physicians and surgeons deliver higher quality care to the right patients at the right time. My goal is to ensure that we develop the right tools for our vascular patients and remain on the cutting edge of the data science revolution.

SELECTED PUBLICATIONS

US National Trends in Vascular Surgical Practice During the COVID-19 Pandemic. Ho VT, Eberhard AV, Asch SM, Leeper NJ, Fukaya E, Arya S, Ross EG. *JAMA Surg.* 2021 Apr 15;156(7):681-3. doi: 10.1001/jamasurg.2021.1708. Online ahead of print

Comparison of Pre-Amputation Evaluation in Patients with and without Chronic Kidney Disease. Subramanian N, Han J, Leeper NJ, Ross EG, Montez-Rath ME, Chang TI. *Am J Nephrol.* 2021;52(5):388-395. doi: 10.1159/000516017. Epub 2021 May 6

Leveraging Machine Learning and Artificial Intelligence to Improve Peripheral Artery Disease Detection, Treatment, and Outcomes. Flores AM, Demas F, Leeper NJ, Ross EG. *Circ Res.* 2021 Jun 11;128(12):1833-1850. doi: 10.1161/CIRCRESAHA.121.318224. Epub 2021 Jun 10

Dynamic changes in chromatin accessibility are associated with the atherogenic transitioning of vascular smooth muscle cells. Wang Y, Gao H, Wang F, Ye Z, Mokry M, Turner AW, Ye J, Koplev S, Luo L, Alsaigh T, Adkar SS, Elishaev M, Gao X, Maegdefessel L, Björkegren JLM, Pasterkamp G, Miller CL, Ross EG, Leeper NJ. *Cardiovasc Res.* 2021 Nov 24;cvab347. doi: 10.1093/cvr/cvab347. Online ahead of print

Unsupervised Learning for Automated Detection of Coronary Artery Disease Subgroups. Flores AM, Schuler A, Eberhard AV, Olin JW, Cooke JP, Leeper NJ, Shah NH, Ross EG. *J Am Heart Assoc.* 2021 Dec 7;10(23):e021976. doi: 10.1161/JAHA.121.021976. Epub 2021 Nov 30

Evaluation of Regional Variations in Length of Stay After Elective, Uncomplicated Carotid Endarterectomy. Ross, EG and Mell, MW. *Journal of Vascular Surgery.* 2019 July 4.



Stephen J. Roth, MD, MPH

Professor, Pediatrics

Interim Chief Quality Officer and the Christopher G. Dawes Endowed Director of Quality at Lucile Packard Children's Hospital and Stanford Children's Health
Interim Associate Dean of Maternal and Child Health (Quality and Safety) at the School of Medicine

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DEPARTMENT pedcard.stanford.edu

EDUCATION/TRAINING

MD Yale University

MPH Harvard School of Public Health

MEDICINE RESIDENCY & INTERNSHIP
Boston Children's Hospital

PEDIATRIC CARDIOLOGY FELLOWSHIP
Boston Children's Hospital

RESEARCH FELLOWSHIP
Harvard Medical School

BOARD CERTIFICATION
Pediatric Cardiology, ABP

CLINICAL FOCUS

Pediatric Cardiology
Pediatric Cardiac Intensive Care

HONORS & AWARDS

Clinical Investigator Development
Award, NIH

PRESIDENT
Western Society of Pediatric Cardiology
(2016-18)

BOARD OF DIRECTORS
Pediatric Cardiac Intensive Care Society
(2009-12, 2013-16)

**FORMER STEERING COMMITTEE
MEMBER**
Pediatric Heart Network, NIH

CURRENT RESEARCH

My clinical and translational research interests focus on improving the outcomes of newborns, infants, and children following cardiopulmonary bypass surgery for congenital heart defects. Mortality for these patients is fortunately now low, but morbidity related to prolonged ICU stay persists and can have a lifelong impact on neurologic development and functional outcomes.

It is estimated that there are now 2 million people living in the United States with congenital heart disease. More than half of these individuals are now adults. This represents both great success in treating congenital heart disease in children as well as a major challenge for cardiovascular health care providers and the institutions caring for adult survivors.

SELECTED PUBLICATIONS

Establishing Entrustable Professional Activities in Pediatric Cardiac Critical Care. Werho DK, DeWitt AG, Owens ST, McBride ME, van Schaik S, Roth SJ. *Pediatric Critical Care Medicine* 2022 (in press).

Surgical Algorithm and Results for Repair of Pulmonary Atresia with Ventricular Septal Defect and Major Aortopulmonary Collaterals. Mainwaring RD, Patrick WL, Roth SJ, Kamra K, Wise-Faberowski L, Palmon M, Hanley FL. *Journal of Thoracic and Cardiovascular Surgery* 2018;156:11-94-1204.

Diagnostic Errors in Pediatric Cardiac Intensive Care. Bhat PN, Costello JM, Aiyagari RM, Sharek PJ, Algaze CA, Mazwi ML, Roth SJ, Shin AY. *Cardiology in the Young* 2018;28:675-682.



Karim Sallam, MD

Assistant Professor of Medicine - Cardiovascular Medicine

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EDUCATION/TRAINING

MD University of Pittsburgh

RESIDENCY

Stanford University

FELLOWSHIPS

Stanford University

POSTDOCTORAL TRAINING

Stanford University

BOARD CERTIFICATION

Internal Medicine, American Board of Medicine

Cardiovascular Disease, American Board of Medicine

Advanced Heart Failure and Transplant Cardiology, American Board of Medicine

CLINICAL FOCUS

Cardiovascular Medicine

Inherited Cardiomyopathy

Advanced Heart Failure

HONORS & AWARDS

Cardiovascular Medicine Teaching Award 2017, 2018

William W. Parmley Young Author Achievement Award 2017

E. William Hancock Award for Teaching by a Division of Cardiovascular Medicine Faculty, 2016

ACC Rising Start at Annual Scientific Session 2012

MEMBER

American Heart Association

American College of Cardiology

CURRENT RESEARCH

Our research focuses on improving diagnosis, risk stratification and treatment of cardiomyopathy disorders by leveraging clinical data and transnational models of disease. Through improved understanding of genotype-specific mechanisms of disease and better fidelity in defining phenotype, my lab aims to improve care for cardiomyopathy patients. We are currently examining arrhythmic features of cardiomyopathy and cardiomyopathy-arrhythmia overlap syndromes and using patient-specific induced pluripotent stem cell derived cardiomyocytes to augment risk stratification and therapy for those patients. In parallel we utilize multicellular cardiac models to improve our understanding of mechanisms of cardiac graft dysfunction in transplanted hearts.

Talent wins games, but teamwork and intelligence win championships. — Michael Jordan

SELECTED PUBLICATIONS

Modeling Effects of Immunosuppressive Drugs on Human Hearts Using iPSC-Derived Cardiac Organoids and Single Cell RNA Sequencing. Sallam K, Thomas D, Gaddam S, Lopez N, Beck A, Beach L, Rogers AJ, Zhang H, Chen IY, Ameen M, Hiesenger W, Teuteberg JT, Rhee JW, Wang KC, Sayed N, Wu JC. *Circulation*. In Press

Electronic Cigarettes: Where There Is Smoke There Is Disease. Wu JC, Rhee JW, Sallam K. *J Am Coll Cardiol*. 2019 Dec 24;74(25):3121-3123.

Modelling Diastolic Dysfunction in Induced Pluripotent Stem Cell-derived Cardiomyocytes From Hypertrophic Cardiomyopathy Patients. Wu H, Yang H, Rhee JW, Zhang JZ, Lam CK, Sallam K, Chang ACY, Ma N, Lee J, Zhang H, Blau HM, Bers DM, Wu JC. *Eur Heart J*. 2019 Dec 1;40(45):3685-3695.

Activation of PDGF Pathway Links LMNA Mutation to Dilated Cardiomyopathy. Lee J, Termglinchan V, Diecke S, Itzhaki I, Lam CK, Garg P, Lau E, Greenhaw M, Seeger T, Wu H, Zhang JZ, Chen X, Gil IP, Ameen M, Sallam K, Rhee JW, Churko JM, Chaudhary R, Chour T, Wang PJ, Snyder MP, Chang HY, Karakikes I, Wu JC. *Nature*. 2019 Aug;572(7769):335-340

Targeted and Selective Treatment of Pluripotent Stem Cell-derived Teratomas Using External Beam Radiation in a Small-animal Model. Sallam, K., Wha-Rhee, J., Chour, T., D'addabbo, J., Lee, A. S., Graves, E., Nguyen, P. K. *J. Vis. Exp.* 2019 Feb17;(144), e58115

Sirolimus Adverse Event Profile in a Non-Clinical Trial Cohort of Heart Transplantation Patients. Sallam K, Bhumireddy GP, Evuri VD, Abella JP, Haddad F, Valentine HA, Nguyen PK, Pham MX. *Ann Transplant*. 2021 Jan 19;26:e923536. PMC7824988

Patient-Specific and Genome-Edited Induced Pluripotent Stem Cell-Derived Cardiomyocytes Elucidate Single-Cell Phenotype of Brugada Syndrome. Liang P*, Sallam K*, Wu H*, Li Y, Itzhaki I, Garg P, Zhang Y, Termglinchan V, Lan F, Gu M, Gong T, Zhuge Y, He C, Ebert AD, Sanchez-Freire V, Churko J, Hu S, Sharma A, Lam CK, Scheinman MM, Bers DM, and Wu JC. *J Am Coll Cardiol*. 2016;68(19):2086-2096.



EDUCATION/TRAINING

MD University of Mumbai, India

PhD Rutgers New Jersey Medical School

FELLOWSHIP Stanford University

POSTDOCTORAL TRAINING

Stanford University

HONORS & AWARDS

American Heart Association, Arteriosclerosis, Thrombosis, and Vascular Biology council Young Investigator Award

Society for Vascular Medicine Jay D. Coffman Young Investigator Award

American Heart Association, Arteriosclerosis, Basic Cardiovascular Sciences council Travel Award

HMRI, President's Award, Peer Reviewed Publication

American Heart Association, Arteriosclerosis, Thrombosis, and Vascular Biology council Travel Award

Stanford Cardiovascular Institute Manuscript Award

MEMBERSHIP

Medical Council of India (MCI)

American Heart Association (AHA)

American Association for Advancement of Science (AAAS)

Society of Vascular Medicine (SVM)

International Society of Stem Cell Research (ISSCR)

Stanford cardiovascular Institute (CVI)

Stanford Maternal & Child Health Research Institute (MCHRI)

Nazish Sayed, MD, PhD

Assistant Professor

Stanford Cardiovascular Institute

Division of Vascular Surgery, Department of Surgery

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CURRENT RESEARCH

We investigate the underlying mechanisms of heart disease through the lens of the vasculature. My lab's research is focused on the development of novel technologies that drive innovation in regenerative medicine, disease modeling, and drug testing in vascular biology. By employing the human induced pluripotent stem cell (iPSC) technology my lab aims to understand the role of the endothelium in the development of cardiac diseases, including those due to inherited genetic variants or environmental insults (such as type 2 diabetes) or exposure to cardiotoxic drugs (cardio-oncology). We have established an endothelial regeneration program, where we leverage the innate immune system to regenerate endothelial cells from scar-forming fibroblasts.

Do not judge me by my success, judge me by how many times I fell down and got back up again.
- Nelson Mandela.

SELECTED PUBLICATIONS

Inflammatory age predicts multi-morbidity, immunosenescence and cardiovascular aging in humans. Sayed N, Huang Y, Gao T, Haddad F, Tibshirani R, Hastie T, Cui L, Kuznetsova T, Rosenberg-Hasson Y, Ostan R, Monti D, Lehallier B, Shen-Orr S, Maecker H, Dekker CL, Wyss-Coray T, Franceschi C, Jovic V, Montoya J, Wu JC, Davis MM, Furman D. *Nature Aging*. (2021); 1(7):598.

Building Multi-Dimensional Induced Pluripotent Stem Cells-Based Model Platforms to Assess Cardiotoxicity in Cancer Therapies. Thomas D, Shenoy S, Sayed N. *Front. Pharmacol*. 2021;12:607364.

Generation of Human iPSCs by Protein Reprogramming and Stimulation of TLR3 Signaling. Liu C, Ameen M, Himmati S, Thomas D, Sayed N. *Methods Mol Biol*. 2021;2239:153-162.

Clinical trial in a dish using iPSCs shows lovastatin improves endothelial dysfunction and cellular cross-talk in LMNA cardiomyopathy. Sayed N, Liu C, Ameen M, Himmati F, Zhang JZ, Khanamiri S, Moonen JR, Wnorowski A, Cheng L, Rhee JW, Gaddam S, Wang KC, Sallam K, Boyd JH, Woo YJ, Rabinovitch M, Wu JC. *Sci Transl Med*. 2020;12(554):eaax9276.

HIF1α Regulates Early Metabolic Changes due to Activation of Innate Immunity in Nuclear Reprogramming. Liu C, Ruan H, Himmati F, Zhao MT, Chen CC, Makar M, Chen IY, Sallam K, Mocarski ES, Sayed D, Sayed N. *Stem Cell Reports*. 2020;14(2):192-200.

Molecular Signatures of Beneficial Class Effects of Statins on Human Induced Pluripotent Stem Cell-Derived Cardiomyocytes. Tian L, Oikonomopoulos A, Liu C, Kitani T, Shrestha R, Chen CL, Ong SG, Smeets M, Karakikes I, Sayed N, Wu JC. *Circulation*. 2020;141(14):1208-1210.

Human-Induced Pluripotent Stem Cell Model of Trastuzumab-Induced Cardiac Dysfunction in Patients With Breast Cancer. Kitani T, Ong SG, Lam CK, Rhee JW, Zhang JZ, Oikonomopoulos A, Ma N, Tian L, Lee J, Telli ML, Witteles RM, Sharma A, Sayed N, Wu JC. *Circulation*. 2019;139(21):2451-2465.



Ingela Schnittger, MD

Professor, Medicine - Cardiovascular Medicine

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CURRENT RESEARCH

My main research continues to be in the field of echocardiography. Several areas of research are currently being pursued: 1) Coronary artery myocardial bridge; anatomic, physiologic and hemodynamic assessment. Clinical manifestations and treatment. 2) Exercise/stress echocardiography. 3) Echocardiographic evaluation of Cardiac structures and function.

Our team wants to spread the word, to educate the medical community that myocardial bridge is a real thing.

SELECTED PUBLICATIONS

Relationship Between Coronary Atheroma, Epicardial Adipose Tissue Inflammation, and Adipocyte Differentiation Across the human Myocardial Bridge. McLaughlin, T., Schnittger, I., Nagy, A., Zanley, E., Xu, Y., Song, Y., Nieman, K., Tremmel, J.A., Dey, D., Boyd, J., Sacks, H. *Journal of American Heart Association*. 2021. DOI 10.1161/JAHA.121.021003

Impact of Diastolic Vessel Restriction on Quality of Life in Symptomatic Myocardial Bridging Patients Treated with Surgical Unroofing: Preoperative Assessment with Intravascular Ultrasound and Coronary Computed Tomography Angiography. Hashikata, T., Honda, Y., Wang, H., Pargaonkar, V.S., Nishi, T., Hollak, M.B., Rogers, I.S., Nieman, K., Yock, P.G., Fitzgerald, P.J., Schnittger, I., Boyd, J., Tremmel, J.A. *Circulation Cardiovascular Intervention*. 2021. DOI 10.1161/CIRCINTERVENTIONS.121.011062

Abnormal Shear Stress and Residence Time are Associated with Proximal Coronary Atheroma in the Presence of Myocardial Bridging. Yong, A.S., Pargaonkar, V.S., Wong, C.C., Javadzdegan, A., Yamada, R., Tanaka, S., Kimura, T., Rogers, I.S., Sen, I., Kritharides, L., Schnittger, I., Tremmel, J.A. *International Journal of Cardiology*. 2021. DOI 10.1016/j.ijcard.2021.08.011

Invasive Assessment of Myocardial Bridging in Patients with Angina and No Obstructive Coronary Artery Disease. Pargaonkar V., Kimura, T., Kameda R., Tanaka S., Yamada R., Schwartz J., Perl L., Rogers I., Honda Y., Fitzgerald P., Schnittger I., Tremmel J.A. *EuroIntervention* 2020. DOI 10.4244/EIJ-D-20-00779

Off-Pump Mini Thoracotomy Versus Sternotomy for Left Anterior Descending Myocardial Bridge Unroofing. Wang, H., Pargaonkar, V. S., Hironaka, C. E., Bajaj, S. S., Abbot, C. J., O'Donnell, C. T., Miller, S. L., Honda, Y., Rogers, I. S., Tremmel, J. A., Fischbein, M. P., Mitchell, R. S., Schnittger, I., Boyd, J. H. *The Annals of Thoracic Surgery*. 2020. DOI 10.1016/j.athoracsur.2020.11.023

Accuracy of a novel stress echocardiography pattern for myocardial bridging in patients with angina and no obstructive coronary artery disease –A retrospective and prospective cohort study. Vedant S. Pargaonkar, Ian S. Rogers, Jessica Su, Signe Helene Forsdahl, Ryo Kameda, Donald Schreiber, Frandics P. Chan, Hans-Christoph Becker, Dominik Fleischmann, Jennifer A. Tremmel, Ingela Schnittger. *Int J of Card*. 2020. DOI:https://doi.org/10.1016/j.ijcard.2020.02.006

EDUCATION/TRAINING

MD Karolinska Institute, Sweden

INTERNSHIP Seraphimer Hospital, Sweden

FELLOWSHIP Stanford University

RESIDENCY Seraphimer Hospital, Sweden; University of Connecticut Health Center; Stanford University

FELLOWSHIP (2nd) Stanford University

The American Board of Internal Medicine, Internal Medicine, ABIM (1980 - present)

The American Board of Internal Medicine, Cardiovascular Disease, ABIM (1983 - present)

North American Society of Pacing & Electrophysiology, Cardiac Pacing, NASPE (1988 - present)

Special Competence in Echocardiography Exam [ASEeXAM], Echo (1998 - present)

Recertification Examination of Special Competence in Adult Echocardiography, Echo (2018-present)

CLINICAL FOCUS

Cardiovascular disease

Coronary artery myocardial bridge

Echocardiography



Nigam Shah, MD

Professor, Department of Medicine and Biomedical Data Science
Associate Dean for Research

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LAB <http://shahlab.stanford.edu>

CURRENT RESEARCH

We analyze multiple types of health data (EHR, Claims, Wearables, Weblogs, and Patient blogs), to answer clinical questions, generate insights, and build predictive models for the learning health system. We answer clinical questions to enable better medical decisions using EHR and Claims data, via a bedside consult service that enables the use of aggregate patient data at the point of care. We make predictions that allow taking mitigating actions. We characterize the fairness and examine the ethical implications of using machine learning in clinical care. We have built models for predicting future increases in cost, identifying slow healing wounds, missed diagnoses of depression and for improving palliative care.

Our goal is to find ways to bring AI into clinical use safely, ethically and cost-effectively.

SELECTED PUBLICATIONS

Learning decision thresholds for risk stratification models from aggregate clinician behavior. Patel, B. S., Steinberg, E., Pfohl, S. R., Shah, N. H. *Journal of the American Medical Informatics Association* 2021.

ACE: the Advanced Cohort Engine for searching longitudinal patient records. Callahan, A., Polony, V., Posada, J. D., Banda, J. M., Gombor, S., Shah, N. H. *Journal of the American Medical Informatics Association* 2021.

A framework for making predictive models useful in practice. Jung, K., Kashyap, S., Avati, A., Harman, S., Shaw, H., Li, R., Smith, M., Shum, K., Javitz, J., Vetteth, Y., Seto, T., Bagley, S. C., Shah, N. H. *Journal of the American Medical Informatics Association* 2020.

Estimate the hidden deployment cost of predictive models to improve patient care. Morse, K. E., Bagely, S. C., Shah, N. H. *Nature Medicine* 2020;26 (1): 18–19.

Developing a delivery science for artificial intelligence in healthcare. Li, R. C., Asch, S. M., Shah, N. H. *NPJ Digital Medicine* 2020;3: 107.

Finding missed cases of familial hypercholesterolemia in health systems using machine learning. Banda, J. M., Sarraju, A., Abbasi, F., Parizo, J., Pariani, M., Ison, H., Briskin, E., W and, H., Dubois, S., Jung, K., Myers, S. A., Rader, D. J., Leader, J. B., Murray, M. F., Myers, K. D., W Illemon, K., Shah, N. H., Knowles, J. W. *NPJ DIGITAL MEDICINE* 2019.

EDUCATION/TRAINING

MBBS Baroda Medical College

PhD Penn State University

POSTDOCTORAL TRAINING Stanford University

CLINICAL FOCUS

Machine learning

Medical Informatics

HONORS & AWARDS

Fellow, American Society for Clinical Investigation (ASCI), 2016

Fellow, American College of Medical Informatics (ACMI), 2015



Yasuhiro Shudo, MD, PhD

Clinical Associate Professor, Department of Cardiothoracic Surgery

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LAB <https://www.shudolab.com/>

EDUCATION/TRAINING

MD Osaka University Medical School

PhD Osaka University Graduate School of Medicine

Postdoctoral University of Pennsylvania and Stanford University

Fellowship Stanford University

HONORS & AWARDS

Young Investigator's Award Competition, Osaka University Graduate School of Medicine

Young Investigator's Award Competition, October (2010)

Japanese Heart Failure Society, The Best Subject Award, February (2011)

Circulation Journal Award (2013)

Circulation Top 10 Paper (2014)

Travel Grant, Japan Surgical Society (2016)

Member on the CVSA Membership & Communications Committee of the Council on Cardiovascular Surgery and Anesthesia, American Heart Association (2019)

BOARD CERTIFICATION

Board Certified Surgeon, Japan (2007)

Board Certified Member of Japanese Circulation Society, Japan (2012)

Board Certified Cardiovascular Surgeon, Japan (2014)

CURRENT RESEARCH

My laboratory focuses on tissue engineered stem cell sheet biology for the end-stage heart failure, as a heart failure surgeon and clinician-researcher. In addition, our projects include bioengineering, biomechanical, and biostatistical approaches to treat heart failure. We hope our proposed research can be successfully translated to the clinical arena to impact progression to heart failure.

Developing new ideas based on study of the past.

SELECTED PUBLICATIONS

Spatially-Oriented, Temporally-Sequential SMC-EPC Bi-Level Cell-Sheet Neovascularizes Ischemic Myocardium. Shudo Y, Cohen JE, MacArthur JW, Atluri P, Hsiao PF, Yang EC, Fairman AS, Trubelja A, Patel J, Miyagawa S, Sawa Y, Woo YJ. *Circulation* 2013 Sep 10;128 (26 Suppl 1): S59-68. [Selected by Editor-in-Chief as one of the 2013 Top Ten Discoveries in Circulation]

Layered smooth muscle cell-endothelial progenitor cell sheets derived from the bone marrow augment postinfarction ventricular function. Shudo Y, Goldstone AB, Cohen JE, Patel JB, Hopkins MS, Steele AN, Edwards BB, Kawamura M, Miyagawa S, Sawa Y, Woo YJ. *J Thorac Cardiovasc Surg* 2017 Sep;154(3):955-963.

Three dimensional multi-layered microstructure using needle array bioprinting system. Shudo Y, MacArthur JW, Kunitomi Y, Joubert LM, Kawamura M, Ono J, Jaatinen KJ, Eskandari A, Hironaka CE, Thakore AD, Miyagawa S, Sawa Y, Woo YJ. *Tissue Eng Part A*. 2020;26(5-6):350-357. PMID: 32085692.

Evaluation of risk factors for heart-lung transplant recipient outcome: An analysis of the United Network for Organ Sharing Database. Shudo Y, Wang H, Lingala B, He H, Kim FY, Hiesinger W, Lee AM, Boyd JH, Currie M, Woo YJ. *Circulation* 2019;140(5):1261-1272.



Michael Snyder, PhD

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

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EDUCATION/TRAINING

PHD California Institute of Technology

HONORS & AWARDS

Pioneer Award, HUPPO

Connecticut Medal of Science

Burroughs Wellcome Scholar Award

Lewis B. Cullman Professor of MCDB

EXECUTIVE COMMITTEE

HUPPO

SCIENTIFIC ADVISORY COMMITTEE

EMBL

SCIENTIFIC ADVISORY COMMITTEE

Northeast Structural Genomics Consortium

SCIENTIFIC ADVISORY BOARD

Integrated Genomics Project, University of Toronto

SCIENTIFIC ADVISORY BOARD

Duke University Systems Biology Center

PRINCIPAL INVESTIGATOR

Yale Center of Excellence in Genome Sciences

FORMER COUNCIL MEMBER

Genetics Society of America

FORMER DIRECTOR

Yale Center for Genomics and Proteomics

FORMER CHAIR

Department of Molecular, Cellular and Developmental Biology, Yale University

CURRENT RESEARCH

Precision health relies on the ability to assess disease risk at an individual level. We detect early preclinical conditions and initiate preventive strategies to better manage health and make health-related discoveries, to identify relevant molecular pathways associated with standard clinical measures, and to assess the impact of personalized longitudinal big data on a understanding health and early detection of disease.

I'm a believer in the future—genomics will move medicine from 'diagnose and treat' to 'predict and prevent'.

SELECTED PUBLICATIONS

REAL-TIME ALERTING SYSTEM FOR COVID-19 AND OTHER STRESS EVENTS USING WEARABLE DATA.

Alavi, A., Bogu, G. K., Wang, M., Rangan, E. S., Brooks, A. W., Wang, Q., Higgs, E., Celli, A., Mishra, T., Metwally, A. A., Cha, K., Knowles, P., Alavi, A. A., Bhasin, R., Panchamukhi, S., Celis, D., Aditya, T., Honkala, A., Rolnik, B., Hunting, E., Dagan-Rosenfeld, O., Chauhan, A., Li, J. W., Bejikian, C., Krishnan, V., McGuire, L., Li, X., Bahmani, A., Snyder, M. P. *NATURE MEDICINE*. 2022

Longitudinal Multi-omics of Host-microbe Dynamics in Prediabetes. Zhou W, Sailani MR, Contrepois K, Zhou Y, Ahadi S, Leopold SR, Zhang MJ, Rao V, Avina M, Mishra T, Johnson J, Lee-McMullen B, Chen S, Metwally AA, Tran TDB, Nguyen H, Zhou X, Albright B, Hong BY, Petersen L, Bautista E, Hanson B, Chen L, Spakowicz D, Bahmani A, Salins D, Leopold B, Ashland M, Dagan-Rosenfeld O, Rego S, Limcaoco P, Colbert E, Allister C, Perelman D, Craig C, Wei E, Chaib H, Hornburg D, Dunn J, Liang L, Rose SMS, Kukurba K, Piening B, Rost H, Tse D, McLaughlin T, Sodergren E, Weinstock GM, Snyder M. *Nature*. 2019 May;569(7758):663-671.

A Longitudinal Big Data Approach for Precision Health. Schüssler-Fiorenza Rose SM, Contrepois K, Moneghetti KJ, Zhou W, Mishra T, Mataraso S, Dagan-Rosenfeld O, Ganz AB, Dunn J, Hornburg D, Rego S, Perelman D, Ahadi S, Sailani MR, Zhou Y, Leopold SR, Chen J, Ashland M, Christle JW, Avina M, Limcaoco P, Ruiz C, Tan M, Butte AJ, Weinstock GM, Slavich GM, Sodergren E, McLaughlin TL, Haddad F, Snyder MP. *Nat Med*. 2019 May;25(5):792-804.

Smooth Muscle Contact Drives Endothelial Regeneration by BMPR2-Notch1 Mediated Metabolic and Epigenetic Changes. Miyagawa K, Shi M, Chen PI, Hennigs JK, Zhao Z, Wang M, Li CG, Saito T, Taylor S, Sa S, Cao A, Wang L, Snyder MP, Rabinovitch M. *Circ Res*. 2018 Nov 21.



Edda Spiekerkoetter, MD

Associate Professor of Medicine, Pulmonary and Critical Care Medicine
Director, Stanford Hereditary Hemorrhagic Telangiectasia (HHT) Center of Excellence

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LAB med.stanford.edu/spiekerkoetterlab.html

CURRENT RESEARCH

My research focuses on the importance of the Bone Morphogenetic Protein Receptor 2 (BMPR2) signaling pathway in pulmonary vascular disease with a focus on pulmonary arterial hypertension (PAH) and hereditary hemorrhagic telangiectasia (HHT) as well as right ventricular (RV) adaptation to an increased afterload. In 2000, two independent groups discovered mutations in the BMPR2 pathway as the genetic basis for pulmonary arterial hypertension (PAH). Over the past years more mutations, either directly involved in the BMPR2 pathway (ENDOGLIN, ALK1, SMAD9) or indirectly linked to the BMPR2 pathway (CAVEOLIN-1), were discovered, emphasizing the central role of BMPR2 signaling in familial PAH. Furthermore, reduced BMPR2 expression and signaling is a feature of other sporadic or idiopathic forms of PAH. Hypothesizing that increasing BMPR2 signaling might improve PAH, we performed a High-Throughput Screen of FDA approved drugs and identified the immunosuppressive drug FK506 (Tacrolimus) as the main BMPR2 activator. FK506 rescued endothelial dysfunction in PAH, prevented and reversed PH in rodent models of experimental PH (JCI 2013) and reduced the degree of RV cardiac fibrosis. This discovery has led to the compassionate use of the compound in end-stage PAH patients (AJRCCM 2015) as well as a phase II clinical trial to test the safety, tolerability and efficacy of low-dose FK506 in PAH at Stanford (ERJ 2017). A second repurposed drug, Enzastaurin, that reverses experimental PAH by increasing BMPR2 expression through the novel BMPR2 modifier gene FHIT (Fragile Histidine Triad) is ready to be tested clinically. Furthermore, my lab is interested in the molecular and histological events that govern RV failure and recovery using the PA banding and de-banding mouse model that we recently developed as well as the role of the BMPR2 pathway in pulmonary arteriovenous malformations in HHT.

Ever tried. Ever failed. No matter. Try again. Fail again. Fail better. — Samuel Beckett

SELECTED PUBLICATIONS

Fragile Histidine Triad (FHIT), a Novel Modifier Gene in Pulmonary Arterial Hypertension. Dannewitz Prosseda S, Tian X, Kuramoto K, Boehm M, Sudheendra D, Miyagawa K, Zhang F, Solow-Cordero D, Saldivar JC, Austin ED, Loyd JE, Wheeler L, Andruska A, Donato M, Wang L, Huebner K, Metzger RJ, Khatri P, Spiekerkoetter E. Am J Respir Crit Care Med. 2019 Jan 1;199(1):83-98.

Drug Repositioning in Pulmonary Arterial Hypertension: Challenges and Opportunities. Grinnan D, Trankle C, Andruska A, Bloom B, Spiekerkoetter E. Pulm Circ. 2019 Jan-Mar;9(1):2045894019832226.

Delineating the Molecular and Histological Events That Govern Right Ventricular Recovery Using a Novel Mouse Model of PA De-banding. Boehm M, Tian X, Mao Y, Ichimura K, Dufva MJ, Ali K, Prosseda SD, Shi Y, Kuramoto K, Reddy S, Kheifets VO, Metzger RJ, Spiekerkoetter E. Cardiovasc Res. 2019 Nov 18.

EDUCATION/TRAINING

MD University Hospital Freiburg, Germany

RESIDENCY and PCCM FELLOWSHIP Medizinische Hochschule Hannover, Germany

POSTDOCTORAL RESEARCH FELLOWSHIP Pediatric Cardiology, Stanford

PCCM FELLOWSHIP Stanford Hospital and Clinics

HONORS & AWARDS

Cardiovascular Institute Stanford: Seed Grant-BMP signaling in the RV

Wall Center of Pulmonary Vascular Disease and SPARK and Spectrum: Stanford Seed Grant - Phase II Clinical Trial

Pulmonary Hypertension Association K08 Career development grant

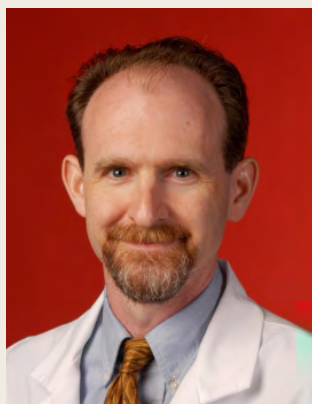
American Society of Clinical Investigation's (ASCI) 2015 Young Physician-Scientist Award

Pulmonary Vascular Research Institute (PVRI)

R01 Grant HL128734: Targeting Novel BMPR2 modifiers in Pulmonary Hypertension with Repurposed Drugs

DoD Grant PR161256: Targeting BMPR2 Signaling to Improve Right Ventricular Function in Congenital Heart Disease

DoD Grant PR181774: Understanding and Targeting Pulmonary Arteriovenous Malformations (AVMs) Using Repurposed Drugs



Joshua M. Spin, MD, PhD

Clinical Assistant Professor, Medicine – Cardiovascular Medicine
Attending, Stanford Marfan Center
Staff Cardiologist, VAPAHCS – Research Scientist, PAVIR

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PROFILE med.stanford.edu/profiles/Joshua-Spin

FEATURED RESEARCH pavir.org/what-we-do/featured-projects/nicotine-and-aortic-aneurysm/

EDUCATION/TRAINING

MD Boston University School of Medicine

PhD Boston University School of Medicine

Residency Stanford University, Medicine

Cardiology Fellowship Stanford University

Board Certification Cardiovascular Medicine, ABIM

CLINICAL FOCUS

Marfan Syndrome and Aortic Disorders

Aortic Aneurysm

Cardiovascular Disease

HONORS & AWARDS

Antoine Marfan Award (National Marfan Foundation) –Stanford Marfan Clinic (2018)

Stanford CARE Seed Grant (2021)

Stanford CVI Manuscript Award (2014)

Stanford CVI Seed Grants PI (2011, 2021)

Stanford MCHRI Seed Grant (2021)

Donald W. Reynolds Fellowship (2004)

Stanford Dean's Fellowship (2002)

CURRENT RESEARCH

My laboratory research focuses on investigations of vascular disease mechanisms, particularly fundamental issues related to the biology of vascular smooth muscle cells, atherosclerosis, and thoracic and abdominal aortic aneurysm, and in identifying translational therapeutic applications. These studies have included examination of gene patterns and pathways that characterize atherogenesis, and attempts to clarify differentiation and phenotypic switching in vascular SMCs. Current projects seek to understand the possible roles of microRNAs in the pathophysiology and treatment of aortic aneurysm, and recently we have begun delving into the vascular disease risks associated with nicotine and e-cigarettes. Our most recent work suggests that nicotine exposure may lead to increases in aneurysm development risk across generations via epigenetic mechanisms.

SELECTED PUBLICATIONS

Genetic architecture of abdominal aortic aneurysm in the Million Veteran Program. Klarin D, Verma S, Judy R, Dikilitas O, Wolford B, Paranjpe I, Levin M, Pan C, Tcheandjieu C, Spin JM, Lynch J, Assimes T, Nyronning L, Mattsson E, Edwards T, Denny J, Larson E, Lee MT, Carrell D, Zhang Y, Jarvik G, Gharavi A, Harley J, Mentch F, Pacheco J, Hakonarson H, Skogholt A, Thomas L, Gabrielsen M, Hveem K, Nielsen J, Zhou W, Fritsche L, Huang J, Natarajan P, Sun Y, DuVall S, Rader D, Cho K, Chang K-M, Wilson P, O'Donnell C, Kathiresan S, Scali S, Berceci S, Willer C, Jones G, Bown M, Nadkarni G, Kullo I, Ritchie M, Damrauer S, Tsao P. *Circulation*, 2020. 17.

Non-coding RNAs in aneurysmal aortopathy. Spin JM, Li DY, Maegdefessel L, Tsao PS. *Vasc Pharm*, 2018

Decoding the Genomics of Abdominal Aortic Aneurysm. Li J, Pan C, Zhang S, Spin JM, Deng A, Leung LLK, Dalman RL, Tsao PS, Synder M. *Cell*, 2018.

miR-24 limits aortic vascular inflammation and murine abdominal aneurysm development. Spin JM*, Maegdefessel L*, Raaz U, Eken SM, Toh R, Azuma J, Adam M, Nagakami F, Heymann HM, Chernugobova E, Jin H, Roy J, Hultgren R, Caidahl K, Schrepfer S, Hamsten A, Eriksson P, McConnell MV, Dalman RL, Tsao PS. *Nature Communications*, 2014

Dichloroacetate prevents restenosis in preclinical animal models of vessel injury. Deuse T, Hua X, Wang D, Maegdefessel L, Heeren J, Scheja L, Bolaños JP, Rakovic A, Spin JM, Stubbendorff M, Ikeno F, Länger F, Zeller T, Schulte-Uentrop L, Stoehr A, Itagaki R, Haddad F, Eschenhagen T, Blankenberg S, Kiefmann R, Reichenspurner H, Velden J, Klein C, Yeung A, Robbins RC, Tsao PS, Schrepfer S. *Nature*, 2014.

MicroRNA-21 blocks abdominal aortic aneurysm development and nicotine-augmented expansion. Maegdefessel L, Azuma J, Toh R, Deng A, Merk DR, Raiesdana A, Leeper NJ, Raaz U, Schoelmerich AM, McConnell MV, Dalman RL, Spin JM, Tsao PS. *Science Translational Medicine*, 2012 46.

Inhibition of microRNA-29b reduces murine abdominal aortic aneurysm development. Maegdefessel L, Azuma J, Toh R, Merk DR, Deng A, Chin JT, Raiesdana A, Leeper NJ, McConnell MV, Dalman RL, Spin JM, Tsao PS. *J Clin Invest*, 2012 49.



James Spudich, PhD

Douglass M. and Nola Leishman Professor of Cardiovascular Disease
Professor, Biochemistry

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PROFILE med.stanford.edu/profiles/james-spudich

LAB spudlab.stanford.edu

EDUCATION/TRAINING

PHD Stanford University

HONORS & AWARDS

University of Illinois Alumni
Achievement Award

Biophysical Society Founders Award

Massry Prize

Ahmed H. Zewail Award Gold Medal

Albert Lasker Basic Medical Research
Award

Wiley Prize in Biomedical Sciences

The Arthur Kornberg and Paul Berg
Lifetime Achievement Award in

Biomedical Sciences

E.B. Wilson Medal, American Society for
Cell Biology (ASCB)

Biophysics Society Award for

Outstanding Investigator in the Field of
Single Molecule Biology

American Heart Association Research
Prize

CO-FOUNDER AND FORMER FIRST

DIRECTOR Interdisciplinary Program
in Bioengineering, Biomedicine and
Biosciences – Bio-X

ELECTED FELLOW

American Academy of Arts and
Sciences; American Association for the
Advancement of Science

ELECTED MEMBER

National Academy of Sciences

ADJUNCT PROFESSOR

National Center for Biological Sciences,
TFIR, Bangalore, India

CURRENT RESEARCH

Our general research interest is the structure and function of molecular motors in vitro and in vivo, with emphasis on understanding the molecular basis of muscle contraction. Our major areas of specific interest are the molecular basis of energy transduction that leads to ATP-driven myosin movement on actin, the roles of the myosin family of molecular motors in eukaryotic cells, the regulation of actin and myosin interaction and their assembly states, and the biochemistry and regulation of the attachment of molecular motors to their corresponding cargo.

The detailed understanding we have developed of how myosin transduces the chemical energy of ATP hydrolysis into mechanical movement has led us to our current focus on human hypertrophic cardiomyopathy (HCM) caused by missense mutations in human β -cardiac myosin. Our goal is to elucidate the molecular basis of hyper-contraction seen clinically resulting from HCM mutations. We postulated that a majority of HCM mutations shift β -cardiac myosin heads from a sequestered off-state to an active on-state for interaction with actin, resulting in the hyper-contraction seen clinically. This is different from earlier prevailing views, and is the basis of all of our current research. We now have extensive evidence for this hypothesis using a combination of the various high-resolution technologies we have developed over the years as well as new approaches. Our work is now providing possible paths forward for therapeutic intervention for cardiomyopathy patients.

SELECTED PUBLICATIONS

Three Perspectives on the Molecular Basis of Hypercontractility Caused by Hypertrophic Cardiomyopathy Mutations. Spudich, J.A. (2019). *Pflugers Arch.* 2019 May; 471(5):701-717. Review.

Controlling load-dependent kinetics of β -cardiac Myosin at the Single-molecule Level. Liu, C., Kawana, M., Song, D., Ruppel, K.M. and Spudich, J.A. (2018). *Nat Struct Mol Biol.* 25:505-514.

Mavacamten Stabilizes a Folded-back Sequestered Super-relaxed State of β -cardiac Myosin. Anderson, R.L., Trivedi, D.V., Sarkar, S.S., Henze, M., Ma, W., Gong, H., Rogers, C.S., Wong, F.L., Morck, M.M., Seidman, J.G., Ruppel, K.M., Irving, T.C., Cooke, R., Green, E.M and Spudich, J.A. (2018). *Proc Natl Acad Sci USA.* 2018 Aug 28;115(35):E8143-E8152.

The Myosin Mesa and the Basis of Hyper-contraction Caused by Hypertrophic Cardiomyopathy Mutations. Nag, S., Trivedi, D.V., Sarkar, S.S., Adhikari, A.S., Sunitha, M.S., Sutton, S., Ruppel, K.M., Spudich, J.A. (2017). *Nat Struct Mol Biol.* 24:525-533.



Marcia L. Stefanick, PhD

Professor, Medicine - Stanford Prevention Research Center
Professor, Obstetrics and Gynecology

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PROFILE med.stanford.edu/profiles/marcia-stefanick

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CENTER med.stanford.edu/whsdm.html

EDUCATION/TRAINING

PHD Stanford University

HONORS & AWARDS

Iris F. Litt Faculty Fellowship, Clayman Institute of Gender Research (2009-2010 and 2019-2020)

PHS-NRS Award - Training Grant in Systems Biology (1976-1981)

Cardiovascular Disease Prevention Training Grant (1983-1986)

Principal Investigator of the Western Regional Center for the Women's Health Initiative Extension (2010-2015)

DIRECTOR

Stanford Women's Health and Sex Differences in Medicine (WHSDM) Center

MEMBER

Advisory Committee of the NIH Office of Research on Women's Health

Education Committee, Stanford Cardiovascular Institute

Medical School Faculty Senate

FELLOW

American College of Sports Medicine

American Heart Association (AHA)

AHA Council on Arteriosclerosis, Thrombosis and Vascular Biology

FORMER CHAIR

Steering and Executive Committees, Women's Health Initiative (1998-2011)

FORMER CO-CHAIR

University Faculty Senate (2018-2019)

CURRENT RESEARCH

My research focuses on chronic disease prevention—heart disease, cancer, and osteoporosis—and aging, in both women and men. As Stanford's principal investigator (PI) of the multi-ethnic Women's Health Initiative (WHI), I conducted large randomized controlled trials (RCT) of diet, menopausal hormone therapy, and calcium & vitamin D supplementation designed to evaluate population-based strategies to prevent heart disease, stroke, cancer, fractures and dementia, and I mentor Stanford Medicine junior and senior faculty and fellows on WHI analyses. I am currently PI of the large WHI Strong & Healthy (WHISH) RCT testing the hypothesis that physical activity reduces major cardiovascular events in older women; and PI of the Osteoporotic Fractures in Men (Mr OS) Study of bone and muscle loss (sarcopenia) and physical function in older men. I am also founding Director of the Stanford Women's Health and Sex Differences in Medicine (WHSDM, "wisdom") Center which funds research and provides an educational program on sex and gender health issues.

Menopausal hormone therapy should not be used to prevent cardiovascular disease in women; the focus should be on lifestyle, i.e., physical activity and weight control.

SELECTED PUBLICATIONS

Use of Medicare Data to Identify Coronary Heart Disease Outcomes in the Women's Health Initiative. Hlatky MA, Ray RM, Burwen DR, Margolis KL, Johnson KC, Kucharska-Newton A, Manson JE, Robinson JG, Safford MM, Allison M, Assimes TL, Bavy AA, Berger J, Cooper-DeHoff RM, Heckbert SR, Li W, Liu S, Martin LW, Perez MV, Tindle HA, Winkelmayer WC, Stefanick ML. *Circ Cardiovasc Qual Outcomes*, 2014; 7(1): 157-62.

Menopausal Hormone Therapy and Health Outcomes During the Intervention and Extended Post-stopping Phases of the Women's Health Initiative Randomized Trials. Manson JE, Chlebowski RT, Stefanick ML, [13 authors], Beresford SA, Cauley JA, Eaton CB, Gass M, Hsia J, Johnson KC, Kooperberg C, Kuller LH, Lewis CE, Liu S, Martin LW, Ockene JK, O'Sullivan MJ, Powell LH, Simon MS, Van Horn L, Vitolins MZ, Wallace RB. *JAMA*, 2013; 310(13): 1353-68.

The Relationship of Cardiovascular Disease to Physical Functioning in Women Surviving to Age 80 and Over in the Women's Health Initiative. Stefanick ML, Brunner RL, Leng XI, PhD3, Limacher MC, Bird CE, Garcia DO, Hogan PE, Mackey RH, Johnson KC, LaMonte MJ, LaCroix A, Robinson JG, Seguin RA, Tindle HA, Wassertheil-Smoller S. *J Gerontology: Medical Sciences*, 2016 Mar, 71 Suppl 1:S42-53.



Elif Seda Selamet Tierney, MD

Associate Professor of Pediatrics (Cardiology)
 Director of Pediatric Vascular Research Laboratory
 Director of Research, Non-Invasive Imaging
 Lucile Packard Children's Hospital at Stanford University

EMAIL tierneys@stanford.edu

PROFILE <https://profiles.stanford.edu/elif-seda-selamet-tierney>

LAB med.stanford.edu/pediatricvascularlab.html

CURRENT RESEARCH

I am a pediatric cardiologist specialized in echocardiography and a clinician-scientist with an area of expertise in non-invasive vascular testing and tele-lifestyle interventions in children. I have received grants from the NIH/NHLBI, American Heart Association, the Marfan Foundation, the Child Health Research Institute at Stanford, and the Cardiovascular Institute at Stanford to explore non-invasive assessment of vascular health of at-risk children focusing on Kawasaki Disease and Marfan Syndrome and the role of telehealth in interventions to improve cardiac and vascular health in children with heart conditions. In continuation of my work at Boston Children's Hospital, I have established a Pediatric Vascular Research Laboratory. Through our Laboratory, I serve as a specialist in non-invasive vascular measures and provide technical and data capture support to research teams locally and outside my institution. My interest in vascular health led to investigating interventions to improve cardiovascular health of children and adolescents at risk. Since the most common challenge in these interventions is adherence and attrition due to distance, school, or work, I tapped into the telehealth world. With this effort, in two pilot studies, one in obese adolescents and another in pediatric heart transplant patients, our team demonstrated excellent adherence rates in an exercise and program via live video-conferencing and significant improvement in exercise capacity and endothelial function. Currently I am conducting a randomized clinical trial to study the impact of exercise delivered via live video-conferencing in single ventricle patients. My long-term goal is to make this active focus on heart-healthy lifestyle part of routine clinical practice by making it easily accessible, feasible, and sustainable. In addition, for almost a decade I have been actively involved in the Pediatric Heart Network with leading roles in multi-center protocols which gave me the experience to leverage my efforts to the national arena.

SELECTED PUBLICATIONS

Variation in Pharmacologic Management of Patients with Kawasaki Disease with Coronary Artery Aneurysms. Selamet Tierney ES, Runeckles K, Tremoulet AH, Dahdah N, Portman MA, Mackie AS, Harahsheh AS, Lang SM, Choueiter NF, Li JS, Manlhiot C, Low T, Mathew M, Friedman KG, Raghuveer G, Norozi K, Szmuszkovicz JR, McCrindle BW; International Kawasaki Disease Registry. *J Pediatr.* 2022 Jan;240:164-170.e1. doi: 10.1016/j.jpeds.2021.08.072. Epub 2021 Aug 30.

Tele-Clinic Visits in Pediatric Patients with Marfan Syndrome Using Parentally Acquired Echocardiography. Chen A, Pun R, Collins RT, Chen JH, Stauffer KJ, Wang R, Alexander S, MacMillen Lechich K, Murphy DJ, Chung S, Selamet Tierney ES. *J Pediatr.* 2021 May;232:140-146. doi: 10.1016/j.jpeds.2021.01.004. Epub 2021 Jan 13.

Echocardiographic Surveillance in Children After Tetralogy of Fallot Repair: Adherence to Guidelines? Annavajjhala V, Valente AM, Lopez L, Sachdeva R, Glickstein JS, Natarajan SS, Buddhe S, Altmann K, Soriano BD, Colquitt JL, Altman CA, Sasaki N, Sakarovitch C, Tacy TA, Geva T, Selamet Tierney ES. *Int J Cardiol.*, 2019 Oct 12.

EDUCATION/TRAINING

MD Istanbul University CMF Medicine, Istanbul, Turkey

INTERNSHIP/RESIDENCY in Pediatrics
 SUNY Stony Brook, NY

FELLOWSHIP in Pediatric Cardiology
 Columbia University, NY

ADVANCED FELLOWSHIP in Pediatric Cardiology/Imaging Columbia University, NY

FACULTY Instructor in Pediatrics, Pediatric Cardiology, Harvard Medical School

Assistant Professor in Pediatrics, Pediatric Cardiology, Harvard Medical School

HONORS & AWARDS

Resident Research Award, Suffolk County Pediatric Society, NY

Fellow, American Society of Echocardiography
 American College of Cardiology

National Scientist Development Award, American Heart Association

Outstanding Research Award, American Heart Association, International Kawasaki Disease

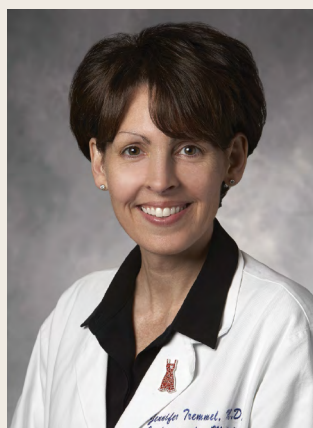
Spectrum Child Health Research Institute Grant Support Award

Cardiovascular Institute Grant Award

Grant in Aid, American Heart Association- Western States Affiliate

National Marfan Fdn Faculty Grant

CHRI Faculty Scholar Award



Jennifer A. Tremmel, MD, MS

Assistant Professor, Medicine - Cardiovascular Medicine
Clinical Director, Women's Heart Health at Stanford

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PROFILE med.stanford.edu/profiles/jennifer-tremmel

CLINIC stanfordhospital.org/cardiovascularhealth/womenHeartHealth

EDUCATION/TRAINING

MD University of Iowa

MS Harvard University School of Public Health

MEDICINE RESIDENCY

Dartmouth-Hitchcock Medical Center

GENERAL CARDIOLOGY FELLOWSHIP

Stanford University

PREVENTIVE CARDIOLOGY FELLOWSHIP

Stanford University

INTERVENTIONAL CARDIOLOGY FELLOWSHIP

Stanford University

BOARD CERTIFICATION

Cardiology, ABIM

Interventional Cardiology, ABIM

CLINICAL FOCUS

Interventional Cardiology
Women's Cardiovascular Disease

HONORS & AWARDS

Society for Cardiovascular Angiography and Interventions (SCAI) Emerging Leader Mentorship Fellow

NIH Career Development Award

EDITORIAL BOARD MEMBER
Catheterization and Cardiovascular Interventions

EXECUTIVE COUNCIL MEMBER

SCAI Transradial Working Group

LEADERSHIP COUNCIL MEMBER

American College of Cardiology Women in Cardiology Section

CURRENT RESEARCH

As the Clinical Director of the Women's Heart Health at Stanford, I support several ongoing research studies focusing on women and sex differences in cardiovascular disease. We are studying patients who have chest pain, but normal appearing coronary arteries on angiography to understand sex differences in vascular function abnormalities, such as endothelial dysfunction, microvascular disease, and myocardial bridging. We are also investigating the best therapies for such patients, and have found that mindfulness-based stress reduction may reduce chest pain episodes. In addition, we are investigating the role of insomnia treatment for improving cardiac risk factors, trying to find ways of getting more women to cardiac rehab, and testing interventions to improve the cardiac health of women around the time of pregnancy.

The study of sex differences isn't just about the study of women. It's about taking a more careful look at both women and men.

SELECTED PUBLICATIONS

Myocardial Bridging. Tremmel JA, Schnittger I. *J Am Coll Cardiol.* 2014 Nov 18;64(20):2178-9.

Continuous Glow Left Ventricular Assist Device Placement Complicated by Aortic Valve Thrombus and Myocardial Infarction. Kim JB, Rhee JW, Brenner DA, Ha R, Banerjee D, Yeung AC, Tremmel JA. *Int J Cardiol.* 2014 Oct 20;176(3):e102-3.

Best Practices for Transradial Angiography and Intervention: A Consensus Statement From the Society for Cardiovascular Angiography and Intervention's Transradial Working Group. Rao SV, Tremmel JA, Gilchrist IC, Shah PB, Gulati R, Shroff AR, Crisco V, Woody W, Zoghbi G, Duffy PL, Sanghvi K, Krucoff MW, Pyne CT, Skelding KA, Patel T, Pancholy SB; Society for Cardiovascular Angiography and Intervention's Transradial Working Group. *Catheter Cardiovasc Interv.* 2014 Feb;83(2):228-36.



Sandra Tsai, MD, MPH

Clinical Associate Professor, Medicine
Primary Care, Population Health, and Cardiovascular Institute

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EDUCATION/TRAINING

MD University of Texas Southwestern Medical Center

MEDICINE RESIDENCY & INTERNSHIP
UT Southwestern, Dallas, TX

RESEARCH FELLOWSHIP
Stanford University

BOARD CERTIFICATION
Internal Medicine, ABIM

HONORS & AWARDS

Fellow, AHA 34th Seminar on the Epidemiology and Prevention of CVD

CURRENT RESEARCH

My research focuses on the development of behavioral modification strategies to improve cardiovascular health in pregnant women at risk for blood pressure complications, such as preeclampsia. We are interested in understanding how improvements in cardiovascular risk factors during pregnancy may affect rates of pregnancy complications and future cardiovascular risk. We collaborate with the Stanford Department of Obstetrics to care for women who either start pregnancy obese or gain too much weight during pregnancy.

SELECTED PUBLICATIONS

Hypertensive Disorders of Pregnancy. Naderi, S., Tsai, S.A. & Khandelwal, A. *Curr Atheroscler Rep*, (2017) 19:15.

Impact of a Genetic Risk Score for Coronary Artery Disease on Reducing Cardiovascular Risk: A Pilot Randomized Controlled Study. Knowles, J. W., Zarafshar, S., Pavlovic, A., Goldstein, B. A., Tsai, S., et al. *Front Cardiovasc Med* (2017);4: 53.

Trends in Menopausal Hormone Therapy use of US Office-based Physicians, 2000–2009. Tsai, S. A., Stefanick, M. L., Stafford, R. S. 2011. *Menopause*. 2011 Apr;18(4):385-92.

Gender Differences in Weight-related Attitudes and Behaviors Among Overweight and Obese Adults in the United States. Tsai SA, Lv N, Xiao L, Ma J. *Am J Mens Health*. 2015 Jan 15.

Association of the Cardiometabolic Staging System With Individual Engagement and Quality of Life in the US Adult Population. Tsai SA, Xiao L, Lv N, Liu Y, Ma J. *Obesity*. 2017 Sep;25(9):1540-1548.

Association of Triglyceride to HDL Ratio With Cardiometabolic Outcomes. Yang M, Rigdon J, Tsai SA. *J Investig Med*. 2018 Dec 9.



Philip S. Tsao, PhD

Professor, Medicine - Cardiovascular Medicine

Associate Chief of Staff for Precision Medicine, VAPAHCS

Director, VA Epidemiology Research and Information Center for Genomics at VAPAHCS

EMAIL ptsao@stanford.edu

PROFILE med.stanford.edu/profiles/Philip-Tsao

CURRENT RESEARCH

My laboratory's primary interests are in understanding the molecular underpinnings of vascular disease as well as assessing disease risk. We use a wide range of biochemical, molecular, and physiological techniques to make primary observations in cell systems as well as preclinical models. Furthermore, we continue to extend our findings to human subjects in order to confirm their clinical applicability. Current research projects include the role of microRNAs in regulating atherosclerosis and abdominal aortic aneurysm disease and identification of biomarkers (genetic and protein) for risk assessment. I am Director of the VA Palo Alto Epidemiology Research and Information Center (ERIC) for Genomics as well as Co-Principal Investigator of the VA's national Million Veteran Program.

The Stanford Cardiovascular Institute is a place where clinicians and basic scientists can seamlessly collaborate on important clinical issues.

SELECTED PUBLICATIONS

Genetic architecture of abdominal aortic aneurysm in the Million Veteran Program. Klarin D, Verma SS, Judy R, Dikilitas O, Wolford BN, Paranjpe I, Levin MG, Pan C, Tcheandjieu C, Spin JM, Lynch J, Assimes TL, Aldstedt Nyronning L, Mattsson E, Edwards TL, Denny J, Larson E, Lee MTM, Carrell D, Zhang Y, Jarvik GP, Gharavi AG, Harley J, Mentch F, Paheco JA, Hakonarson H, Skogholt AH, Thomas L, Gabrielsen ME, Hveem K, Nielsen JB, Zhou W, Fritsche L, Huang J, Natarajan P, Sun YV, DuVall SL, Rader DJ, Cho K, Chang KM, Wilson PWF, O'Donnell CJ, Kathiresan S, Scali ST, Berceli SA, Willer C, Jones GT, Bown MJ, Nadkarni G, Kullo IJ, Ritchie M, Damrauer SM, Tsao PS. Veterans Affairs Million Veteran Program. *Circulation* 2020; 142: 1633-1646. PMID: 32981348.

Genome-wide Association Study of Peripheral Artery Disease in the Million Veteran Program. Klarin D, Lynch J, Aragam K, Chaffin M, Assimes TL, Huang J, Lee KM, Shao Q, Huffman JE, Sun YV, Vujkovic M, Freiberg MS, Wang L, Chen J, Saleheen D, Lee JS, Miller DR, Reaven P, Alba PR, Patterson OV, DuVall SL, Boden WE, Beckman JA, Gaziano JM, Concato J, Rader DJ, Cho K, Chang K-M, Wilson PWF, O'Donnell CJ, Kathiresan S, Tsao PS, Damrauer SM, on behalf of the VA Million Veteran Program. *Nature Med*, 2019.

Decoding the Genomics of Abdominal Aortic Aneurysm. Li J, Pan C, Zhang S, Spin JM, Deng A, Leung LLK, Dalman RL, Tsao PS, Snyder M. *Cell*, 2018;174:1361-1372.

Cloud-based Interactive Analytics for Terabytes of Genomic Variants Data. Pan C, McInnes G, Deflaux N, Snyder M, Bingham J, Datta S, Tsao PS. *Bioinformatics*, 2017 33: 3709-3715.

Dichloroacetate Prevents Restenosis in Preclinical Animal Models of Vessel Injury. Deuse T, Hua X, Wang D, Maegdefessel L, Heeren J, Scheja L, Bolaños JP, Rakovic A, Spin JM, Stubbendorff M, Ikeno F, Länger F, Zeller T, Schulte-Uentrop L, Stoeckel A, Itagaki R, Haddad F, Eschenhagen T, Blankenberg S, Kieffmann R, Reichenspurner H, Velden J, Klein C, Yeung A, Robbins RC, Tsao PS, Schrepfer S. *Nature*, 2014 May 29;509(7502):641-4.

EDUCATION/TRAINING

PHD Thomas Jefferson University

HONORS & AWARDS

CO-DIRECTOR, CVI T32: Mechanisms and Innovation in Vascular Disease

ESTABLISHED INVESTIGATOR AWARD
American Heart Association

DEPARTMENT OF MEDICINE FACULTY
MENTORING AWARD
Stanford University

EXECUTIVE & STEERING COMMITTEE
Stanford Cardiovascular Institute

FELLOW
ATVB Council of the American Heart Association

VISITING PROFESSOR
University of Nis, Serbia (2013)
Kobe University School of Medicine,
Kobe, Japan (2014)
University of Erlangen, Germany (2015)

SPECIAL RECOGNITION AWARD
for Vascular Biology
ATVB Council of the AHA

MEMBER
American Heart Association;
American Society of Human Genetics

CONSULTING EDITOR
Arteriosclerosis, Thrombosis, and Vascular Biology



Mintu P. Turakhia, MD, MAS

Professor, Medicine - Cardiovascular Medicine
Co-Founder and Director, Stanford Center for Digital Health
Chief, Cardiac Electrophysiology at the VA Palo Alto Health Care System

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EDUCATION/TRAINING

MD, MAS UCSF

MEDICINE RESIDENCY & INTERNSHIP

Brigham and Women's Hospital

FELLOWSHIP

Cardiology & Cardiac
Electrophysiology, UCSF

Stanford Biodesign Faculty Fellow

BOARD CERTIFICATION

Cardiac Electrophysiology, ABIM
Cardiovascular Disease, ABIM
Internal Medicine, ABIM

CLINICAL FOCUS

Catheter ablation, Atrial Fibrillation,
Ventricular Tachycardia, Sudden
Cardiac Death, Pacemakers, Implantable
Defibrillators, Digital Health

HONORS & AWARDS

Rock Health Top 50 in Digital Health
Luminary Award, 2021

VA Career Development Award

American Heart Association (AHA)
National Scientist Development Award

Gilead Sciences Scholars Program in
Cardiovascular Disease

American College of Cardiology (ACC)
Foundation Emerging Faculty Fellow

E. William Hancock Stanford Faculty
Teaching Award

AHA Top Ten Scientific Advances in
Cardiology

FELLOW: ACC; AHA; Heart Rhythm
Society; American Soc Clinical Inv

Associate Editor *JAMA Cardiology*

Cardiology Today Next Gen Innovator

Awardee, American Thrombosis
Investigator Initiated Research Program

CURRENT RESEARCH

I am a cardiac electrophysiologist, outcomes researcher, and clinical trialist. The goal of my research is to improve the outcomes of the treatment of heart rhythm disorders, with a focus on atrial fibrillation (AF), which affects 5 million Americans and can cause stroke and heart failure. By using large administrative, medical record, registry, and implantable device data, my group takes a "Big Data" approach to fill evidence gaps in understanding quality of care, predicting AF-related complications, and comparing effectiveness of treatment strategies. This has led to important contributions in health services and outcomes research that have reshaped professional society guidelines and clinical practice. More recently, we have extended our work to answer questions regarding atrial fibrillation screening, medication adherence, and digitally-enabled treatment strategies. Dr. Marco Perez and I are co-PIs of the Apple Heart Study, a fully digital and virtual end-to-end study to evaluate whether smartwatches can effectively and accurately identify atrial fibrillation. This work has allowed a large team at Stanford to develop the infrastructure for pragmatic studies using smartphone applications and wearable sensors and devices.

Atrial fibrillation is one of the most commonly treated conditions in all of health care. Yet, it is astonishing how little we understand the disease, how to best treat it, and who is at highest risk for complications.

SELECTED PUBLICATIONS

Large-Scale Assessment of a Smartwatch to Identify Atrial Fibrillation. Perez MV, Mahaffey KW, Hedlin H, Rumsfeld JS, Garcia A, Ferris T, Balasubramanian V, Russo AM, Rajmane A, Cheung L, Hung G, Lee J, Kowey P, Talati N, Nag D, Gummidipundi SE, Beatty A, Hills MT, Desai S, Granger CB, Desai M, Turakhia MP; Apple Heart Study Investigators. *N Engl J Med.* 2019 Nov 14;381(20):1909-1917.

Practice Variation in Anticoagulation Prescription and Outcomes After Device-Detected Atrial Fibrillation. Perino AC, Fan J, Askari M, Heidenreich PA, Keung E, Raitt MH, Piccini JP, Ziegler PD, Turakhia MP. *Circulation.* 2019 May 28;139(22):2502-2512.

Technology-Enabled Clinical Trials: Transforming Medical Evidence Generation. Marquis-Gravel G, Roe MT, Turakhia MP, Boden W, Temple R, Sharma A, Hirshberg B, Slater P, Craft N, Stockbridge N, McDowell B, Waldstreicher J, Bourla A, Bansilal S, Wong JL, Meunier C, Kassahun H, Coran P, Bataille L, Patrick-Lake B, Hirsch B, Reites J, Mehta R, Muse ED, Chandross KJ, Silverstein JC, Silcox C, Overhage JM, Califf RM, Peterson ED. *Circulation.* 2019 Oct 22;140(17):1426-1436.



Paul J. Utz, MD

Professor of Medicine

Associate Dean for Medical Student Research, Stanford School of Medicine

Director Emeritus, Stanford Medical Scientist Training Program

Faculty Director and Founder, Stanford Institutes of Medical Research (SIMR)

Associate Director of Education, Institute for Immunity, Transplantation and Infection (ITI), Division of Immunology & Rheumatology

Vice Chair of RECOVER Committee on Immunology and Hematology

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EDUCATION/TRAINING

MD Stanford University

MEDICINE RESIDENCY & INTERNSHIP

Brigham and Women's Hospital

CLINICAL IMMUNOLOGY AND RHEUMATOLOGY FELLOWSHIP

Brigham and Women's Hospital

RESEARCH FELLOWSHIP

Dana Farber Cancer Institute

BOARD CERTIFICATION

Medicine, ABIM Eligible

Rheumatology, ABIM Eligible

CLINICAL FOCUS

Immunology

Rheumatology

HONORS & AWARDS

ELECTED

The Kunkel Society; American Society for Clinical Investigation

The Mary Jane Kugel Award, Juvenile Diabetes Research Foundation

Department of Medicine Teaching Award, Stanford Medicine

Mayo Clinic, Distinguished Visiting Professor, Department of Medicine

Immunology and Rheumatology Division Teaching Award, Stanford University School of Medicine

Rheumatology Visiting Professor and Grand Rounds Speaker, UC Denver

Speaker, Immunology Seminar Series and Grand Rounds, University of Pittsburgh

CURRENT RESEARCH

My lab actively collaborates with many investigators on the Stanford campus, and across the world to disseminate and implement newly-invented technologies. We study autoimmune diseases, including systemic lupus erythematosus, rheumatoid arthritis, scleroderma, myositis, primary biliary cirrhosis, Sjögren's disease, type I diabetes, vasculitis, multiple sclerosis, and mixed connective tissue disease. In addition to better understanding the pathogenic mechanisms involved in autoimmunity, we are developing bench-to-bedside technologies for immune diseases. Our group made several breakthrough inventions, such as protein arrays, peptide arrays, HIT, lysate arrays, Intel arrays, and EpiTOF. Additionally, I am Director of the Leadership Center of Francis Collins' \$41M Accelerating Medicines Partnership in RA/SLE initiative.

I am Founder and Program Director for the Stanford Institutes of Medicine Research (SIMR) Program for high school students, which has hosted ~900 students in labs over 20 years. I also developed the Stanford EXPLORE Lecture Series. This program covers the basic science fundamentals represented by various research areas at Stanford Medicine. In 2018, I was appointed Stanford Associate Dean for Medical Student Research to promote physician investigator development across the physician-scientist career continuum. I will continue to provide high-level oversight of SIMR and the MSTP while focusing on new efforts to create programs such as a new Physician Scientist Career Development Program and Berg Scholars Program for MD students to build careers as investigators and leaders.

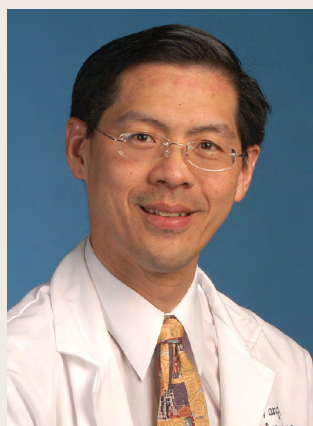
SELECTED PUBLICATIONS

Single-cell Chromatin Modification Profiling Reveals Increased Epigenetic Variations With Aging. Cheung P, Vallania F, Warsinske HC, Donato M, Schaffert S., Chang SE, Dekker CL, Davis MM, Utz PJ, Khatri P, Kuo AJ. 2018. *Cell*, 173:1385-1397.

KLRD1-expressing Natural Killer Cells Predict Influenza Susceptibility. Bongen E, Vallania F, Utz PJ, Khatri P. 2018. *Genome Med.*, 10:45.

Single-cell Epigenetics – Chromatin Modification Atlas Unveiled by Mass Cytometry. Cheung P, Vallania F, Dvorak M, Chang SE, Schaffert S, Donato M, Rao AM, Mao R, Utz PJ, Khatri P, Kuo AJ. 2018 *Clin. Immunol.* S1521-6616(18):30363-2.

Quantification of cDNA on GMR Biosensor Array Towards Point-of-care Gene Expression Analysis. Ravi N, Rizzi G, Chang SE, Cheung P, Utz PJ, Wang SX. 2018. *Biosens Bioelectron.* S0956-5663(18)30736-X.



Paul J. Wang, MD

Professor, Medicine (Cardiovascular Medicine)
Professor, by courtesy, of Bioengineering
Director, Cardiac Arrhythmia Service and Cardiac Electrophysiology

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LAB stanfordhospital.org/cardiovascularhealth/arrhythmia/team

EDUCATION/TRAINING

MD Columbia University College of Physicians and Surgeons

MEDICINE RESIDENCY & INTERNSHIP

New York Presbyterian Medical Center

CARDIOVASCULAR DISEASE

FELLOWSHIP

Brigham and Women's Hospital

BOARD CERTIFICATION

Internal Medicine, ABIM

Cardiovascular Disease, ABIM

Clinical Cardiac Electrophysiology, ABIM

CLINICAL FOCUS

Cardiac Electrophysiology , Cardiac Arrhythmias

HONORS & AWARDS

DIRECTOR

Arrhythmia Advanced Treatment Center, Stanford Cardiovascular Health

CO-DIRECTOR

Stanford Center for Arrhythmia Research

MEMBER

American Heart Association Council on Clinical Cardiology; Committee on Council Operations

CO-DIRECTOR

Stanford Biodesign New Arrhythmia Technologies Retreat

RECIPIENT

2017 American Heart Association Clinical Cardiology Distinguished Achievement Award

EDITOR-IN-CHIEF

Circulation: Arrhythmia and Electrophysiology

CURRENT RESEARCH

My research centers on the development of innovative approaches to the treatment of arrhythmias, including catheter ablation techniques, implantable devices, and less invasive treatments. My clinical research includes atrial fibrillation, ventricular tachycardia, supraventricular arrhythmias and implantable devices. I have collaborations with Bioengineering, Mechanical Engineering, and Electrical Engineering. I am the Center Director for the AHA Strategically Focused Research Network Joe and Linda Chlapy DECIDE Grant for Shared Decision Making in Atrial Fibrillation Stroke Prevention. I am the project director of the AHA Health Technologies and Innovation Strategically Focused Research Network. Some goals of my research program are to create: 1) a more effective methods of catheter ablation, 2) more reliable implantable pacemakers and leads, 3) a combined surgical-catheter approach to ablation, 4) noninvasive methods of ablation, 5) new solutions to prevent sudden cardiac death.

Advances in engineering, biology, chemistry, computer science, material science, and physics will result in major developments in arrhythmia therapy and device innovation. We are poised to make significant contributions in this area.

SELECTED PUBLICATIONS

Electrical Substrate Ablation for Refractory Ventricular Fibrillation: Results of the AVATAR Study. Krummen, D. E., Ho, G., Hoffmayer, K. S., Schweis, F., Baykaner, T., Rogers, A. J., Han, F. T., Hsu, J. C., Viswanathan, M. N., Wang, P. J., Rappel, W. J., Narayan, S. M. *Circ Arrhythm Electrophysiol.* 2021 Mar;14(3):e008868. doi: 10.1161/CIRCEP.120.008868. Epub 2021 Feb 7.

Turning Practicing Surgeons Into Health Technology Innovators: Outcomes From the Stanford Biodesign Faculty Fellowship. Fuerch, J. H., Wang, P., Van Wert, R., Denend, L. *Surg Innov* 2021 Feb;28(1):134-143. doi: 10.1177/1553350620984338. Epub 2021 Feb 18.

Machine Learned Cellular Phenotypes in Cardiomyopathy Predict Sudden Death. Rogers AJ, Selvalingam A, Alhusseini MI, Krummen DE, Corrado C , Abuzaid F, Baykaner T , Meyer C, Clopton P, Giles W, Bailis P, Niederer S , Wang PJ, Rappel WJ, Zaharia M, Narayan SM. *Circ Res* 2021 Jan 22;128(2):172-184. doi: 10.1161/CIRCRESAHA.120.317345. Epub 2020 Nov 10.

Activation of PDGF Pathway Links LMNA Mutation to Dilated Cardiomyopathy. Lee J, Termglinchan V, Diecke S, Itzhaki I, Lam CK, Garg P, Lau E, Greenhaw M, Seeger T, Wu H, Zhang JZ, Chen X, Gil IP, Ameen M, Sallam K, Rhee JW, Churko JM, Chaudhary R, Chour T, Wang PJ, Snyder MP, Chang HY, Karakikes I, Wu JC. *Nature*, 2019 July 17.

New Concepts in Sudden Cardiac Arrest to Address an Intractable Epidemic: JACC State-of-the-art Review. Narayan SM, Wang PJ, Daubert JP. *J Am Coll Cardiol*, 2019, 01 08;73(1):70-88.



Irving Weissman, MD

Virginia and DK Ludwig Professor for Clinical Investigation in Cancer Research
Professor, Developmental Biology and Pathology
Professor (by courtesy), Biology and Neurosurgery
Director, Institute for Stem Cell Biology and Regenerative Medicine
Director, Stanford Ludwig Center for Cancer Stem Cell Research and Medicine

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LAB stemcell.stanford.edu/about/Laboratories/weissman

EDUCATION/TRAINING

MD Stanford University

HONORS & AWARDS

NATIONAL ACADEMY OF SCIENCE COUNCIL National Academy of Science

Max Delbruck Medal, University of Berlin

Jessie Stevenson Kovalenko Medal,
National Academy of Sciences Council

California Scientist of the Year

Robert Koch Award, Koch Foundation,
Berlin, Germany

Lewis S. Rosenstiel Award for
Distinguished Work in Basic Medical
Science

FELLOW

American Association for the
Advancement of Science

ELECTED MEMBER

Institute of Medicine, National Academy
of Sciences; American Philosophical
Society

BOARD OF SCIENTIFIC ADVISORS

National Cancer Institute

BOARD OF DIRECTORS

Institute for Systems Biology;
International Society for Stem Cell
Research (ISSCR)

SCIENTIFIC ADVISORY BOARD

Gladstone Institutes; Institute of Medical
Biology, A*STAR, Singapore

BOARD OF SCIENTIFIC COUNSELORS

Memorial Sloan Kettering Cancer Center

CURRENT RESEARCH

My laboratory studies stem cell biology and regenerative medicine. We are particularly interested in hematopoiesis, hematopoietic stem cells (HSCs), leukemia, and the clonal events leading from HSC to leukemia. Our research encompasses the phylogeny and developmental biology of blood-forming cells and immune systems. My laboratory was the first to identify and isolate the blood-forming hematopoietic stem cell (HSC) from mice, and we have defined, by lineage analysis, the stages of development between the stem cells and mature progeny. We also discovered the human HSC, a human brain-forming stem cell population, mouse skeletal muscle stem cells, and an osteochondral stem cell in mice. Another research focus of my laboratory is cancer stem cell biology. In recent years, we have studied the potential of CD47 (a molecule on the surface of cancer stem cells that protects them by providing a 'don't eat me' signal to phagocytic cells of the innate immune system) as a cancer therapeutic, and identifying cancer stem cells from a variety of blood and solid cancers.

In every aspect of stem cell and progenitor cell biology, and its applications to regenerative medicine, I believe it must start with purification, purification, and purification; substituting impure or unsubstantiated cell populations will in the end only confuse the scientist and the clinical trialist.

SELECTED PUBLICATIONS

PD-1 Expression by Tumour-associated Macrophages Inhibits Phagocytosis and Tumour Immunity. Gordon SR, Maute RL, Dulken BW, Hutter G, George BM, McCracken MN, Gupta R, Tsai JM, Sinha R, Corey D, Ring AM, Connolly AJ, Weissman IL. *Nature*. (2017) May 25;545(7655):495-499.

Unifying Mechanism for Different Fibrotic Diseases. Wernig G, Chen SY, Cui L, Van Neste C, Tsai JM, Kambham N, Vogel H, Natkunam Y, Gilliland DG, Nolan G, Weissman IL. *Proc Natl Acad Sci USA*. (2017) 114(18):4757-62.

The Role of Efferocytosis in Atherosclerosis. Kojima Y, Weissman IL, Leeper NJ. *Circulation*. (2017) 135(5):476-89.

CD47-blocking Antibodies Restore Phagocytosis and Prevent Atherosclerosis. Kojima, Y, JP Volkmer, K McKenna, M Civelek, AJ Lusis, CL Miller, D Drenzo, V Nanda, J Ye, AJ Connolly, EE Schadt, T Quertermous, P Betancur, L Maegdefessel, LP Matic, U Hedin, IL Weissman, and NJ Leeper (2016). *Nature*. 536(7614): 86-90.

Evolution of Normal and Neoplastic Tissue Stem Cells: Progress After Robert Hooke. Weissman, I. (2015) *Philos Trans R Soc Lond B Biol Sci*. Oct 19;370(1680):20140364.



Cornelia M. Weyand, MD, PhD

Professor, Medicine - Immunology and Rheumatology
Chief, Division of Immunology and Rheumatology
Director, Center for Translational Medicine

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DIVISION immunology.stanford.edu

EDUCATION/TRAINING

MD University of Aachen

DR. MED University of Bonn

PHD University of Heidelberg

MEDICINE RESIDENCY

Hannover Medical School

RHEUMATOLOGY FELLOWSHIP

Stanford University

BOARD CERTIFICATION

Internal Medicine (Germany)

Rheumatology (Germany)

CLINICAL FOCUS

Vasculitis

HONORS & AWARDS

Henry Kunkel Young Investigator Award

Henry Christian Award for Excellence in Research

Ciba-Geigy Award for Excellence in Rheumatology Research

Carol Nachmann Award for Rheumatology

Paul Klemperer Award, New York Academy of Medicine

Mayo Distinguished Alumni Award

MEMBER

American Society for Clinical Investigation; Association of American Physicians

CURRENT RESEARCH

My laboratory examines autoimmune and autoinflammatory disease, with emphasis on immune defects in vasculitis, coronary artery disease and rheumatoid arthritis. The heart of this work is to develop new strategies to suppress unwanted inflammation and to boost beneficial immune responses. We have approached this goal by defining and characterizing immune defects on a mechanistic level and by bed-to-bench and bench-to-bed translation. In large vessel vasculitis, we have defined mechanisms that protect the vessel wall from inflammatory attack and have characterized how the immune privilege of the vessel wall breaks down to enable vasculitis. Vasculitogenic T cells aberrantly express the oncogene NOTCH1, and vasa vasorum endothelial cells express the NOTCH ligand Jagged1. Also, deficiency of the immuno-inhibitory PD1/PD-L1 checkpoint causes unleashing of auto-aggressive T cells. Rheumatoid arthritis is an autoimmune disease associated with high cardiovascular risk. A molecular hallmark of the disease is the metabolic reprogramming of T cells and macrophages. We have assigned defects in bioenergetic regulation to mistrafficking of intracellular proteins, lysosomal dysfunction and insufficient mitochondrial DNA repair. We have described that loss-of-function of DNA repair molecules leads to telomeric instability, abnormal cell cycle progression and premature aging of the immune system. Immuno-aging results in the co-existence of immune failure with uncontrolled inflammation. Our current studies explore how defined tissue niches instruct tissue-dwelling immune cells to sustain inflammation, how the DNA repair machinery controls the immune aging process and how bioenergetic strategies determine cellular behavior.

The immune system is everywhere. All diseases have their roots in the immune system.

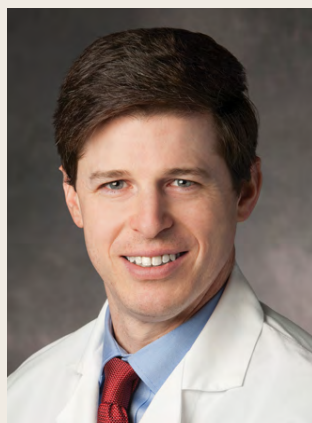
SELECTED PUBLICATIONS

N-myristoyltransferase Deficiency Impairs Activation of Kinase AMPK and Promotes Synovial Tissue Inflammation. Wen Z, Jin K, Shen Y, Yang Z, Li Y, Wu B, Tian L, Shoor S, Roche NE, Goronzy JJ, Weyand CM. *Nat Immunol* 20:313-325, 2019.

The DNA Repair Nuclease MRE11A Functions as a Mitochondrial Protector and Prevents T Cell Pyroptosis and Tissue Inflammation. Li Y, Shen Y, Jin K, Wen Z, Cao W, Wu B, Wen R, Tian L, Berry GJ, Goronzy JJ, Weyand CM. *Cell Metab* 30:477-492, 2019.

Inhibition of JAK-STAT Signaling Suppresses Pathogenic Immune Responses in Medium and Large Vessel Vasculitis. Zhang H, Watanabe R, Berry GJ, Tian L, Goronzy JJ, Weyand C. *Circulation*. 2017 Dec 18.

The Microvascular Niche Instructs T Cells in Large Vessel Vasculitis via the VEGF-Jagged1-Notch Pathway. Wen Z, Shen Y, Berry G, Shahram F, Li Y, Watanabe R, Liao YJ, Goronzy JJ, Weyand CM. *Sci Transl Med*. 2017 Jul 19;9(399).



Ronald Witteles, MD

Professor, Medicine - Cardiovascular Medicine
Co-Director, Stanford Amyloid Center
Program Director, Internal Medicine Residency Training Program
Co-Director, Stanford Multidisciplinary Sarcoidosis Program
Associate Editor, *JACC: CardioOncology*

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AMYLOID CENTER med.stanford.edu/amyloidcenter.html

SARCOIDOSIS PROGRAM med.stanford.edu/sarcoidosis.html

RESIDENCY PROGRAM medicine.stanford.edu/education/residency.html

EDUCATION/TRAINING

MD University of Chicago

MEDICINE RESIDENCY

Stanford University

CHIEF RESIDENT IN INTERNAL MEDICINE

Stanford University

CARDIOLOGY FELLOWSHIP

Stanford University

BOARD CERTIFICATION

Internal Medicine, ABIM
Cardiovascular Disease, ABIM
Advanced Heart Failure/Transplant
Cardiology, ABIM

CLINICAL FOCUS

Heart Failure
Amyloidosis
Cardiac complications of cancer
therapy ("Cardio-Oncology")
Sarcoidosis

HONORS & AWARDS

David Rytand Award for Excellence
in Clinical Teaching, Department of
Medicine (2009, 2010)
Heart Failure Society of America
National Research Fellowship Award
Timothy F. Beckett, Jr. Award for
Excelling in Clinical Teaching
Program Director of the Year Award for
Outstanding Contribution to Graduate
Medical Education (2020)

FELLOW

American College of Cardiology;
American College of Physicians

CURRENT RESEARCH

My research focuses on three primary areas: amyloidosis, cardiac complications of cancer therapy, and sarcoidosis. As Co-Director of one of the world's largest amyloid centers, I collaborate with partners throughout the campus on clinical trials, epidemiologic research, and laboratory-based research dedicated to a better understanding of and better treatments for cardiac amyloidosis. In the area of cardiac complications of cancer therapy ("Cardio-Oncology"), I collaborate with partners in Hematology and Medical Oncology to investigate optimal screening and treatment of cancer-therapy associated cardiac disease, and I serve as Associate Editor for the country's leading Cardio-Oncology journal, *JACC: CardioOncology*. In the area of sarcoidosis, I serve as Co-Director for and lead the cardiology program for the Stanford Multidisciplinary Sarcoidosis Program, investigating novel diagnostic and treatment options.

My career goal is to pursue excellence in and integration of the three cornerstones of academic medicine—clinical care, scholarship, and education.

SELECTED PUBLICATIONS

A Changing Landscape of Mortality for Systemic Light Chain Amyloidosis. Barrett CD, Dobos K, Liedtke M, Tuzovic M, Haddad F, Kobayashi Y, Lafayette R, Fowler MB, Arai S, Schrier S, Witteles RM. *JACC Heart Fail.* 2019 Nov;7(11): 958-966.

Screening for Transthyretin Amyloid Cardiomyopathy in Everyday Practice. Witteles RM, Bokhari S, Damy T, Elliott PM, Falk RH, Fine NM, Gospodinova M, Obici L, Rapezzi C, Garcia-Pavia P. *JACC Heart Fail.* 2019 Aug;8(8):709-716.

Cardiac transplantation and mechanical circulatory support in amyloidosis. Witteles RM. *JACC CardioOncol.* 2021;3(4):516-521..

Avoiding catastrophe: Understanding free light chain testing in the evaluation of ATTR amyloidosis. Witteles RM, Liedtke M. *Circ Heart Fail.* 2021;14(4):e008225.3.

Outcomes in patients with cardiac amyloidosis undergoing heart transplantation. Barrett CD, Alexander KM, Zhao H, Haddad F, Cheng P, Liao R, Wheeler MT, Liedtke M, Schrier S, Arai S, Weisshaar D, Witteles RM. *JACC Heart Fail.* 2020;8(6):461-468.



Y. Joseph Woo, MD

Norman E. Shumway Professor and Chair, Department of Cardiothoracic Surgery
Professor, by courtesy, Department of Bioengineering

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CURRENT RESEARCH

My research focus is the development of novel genetic, molecular and cellular strategies for treating myocardial ischemia and heart failure. We are investigating new paths to myocardial repair through angiogenesis, stem cells and tissue engineering. We are conducting biomechanical engineering studies of heart valve operations. We are also exploring the newest techniques and devices for heart care: innovative approaches to mitral and aortic valve repair; smaller, more efficient mechanical heart pumps; and operations performed without stopping the heart.

Innovative pioneering cardiovascular surgeons Shumway, Reitz, and Robbins built and led the Stanford program to preeminence. It is truly a privilege to become a part of this amazingly prestigious, high-powered academic institution.

SELECTED PUBLICATIONS

The Stanford Experience of Heart Transplantation Over Five Decades. Zhu Y, Baiocchi M, Toro V, Williams K, Shudo Y, Oyer PE, Woo YJ. *European Heart J* 2021 Dec 21;42(48):4934-4943

Comprehensive Ex Vivo Biomechanical Engineering Comparison of Five Clinically Utilized Conduit Configurations for Valve-Sparing Aortic Root Replacement Using a 3D-Printed Heart Simulator. Paulsen MJ, Imbrie-Moore AM, Baiocchi M, Wang H, Hironaka CE, Lucian HJ, Farry JM, Thakore AD, Ma M, MacArthur JW, Woo YJ. *Circulation* 2020 Oct 6;142:1361-1373.

Use of a Supramolecular Polymeric Hydrogel as an Effective Post-Operative Pericardial Adhesion Barrier. Stapleton LM, Steele AN, Wang H, Hernandez HL, Yu AC, Paulsen MJ, Smith, AA, Agmon G, Thakore AD, Lucian HJ, Thetherow K, Baker SW, Tada Y, Farry JM, Eskandari A, Hironaka CE, Jaatinen KJ, Williams KM, Bergamasco H, Marschel C, Chadwick B, Ma M, Appel EA, Woo YJ. *Nature Biomedical Engineering*, 2019 Aug;3(8):611-620 [Cover Article]

A Unique Collateral Artery Development Program Promotes Neonatal Heart Regeneration. Das S, Goldstone AB, Wang HJ, Farry J, D'Amato G, Paulsen MJ, Eskandari A, Hironaka CE, Phansalkar R, Sharma B, Rhee S, Shamskhov EA, Agalliu D, de Jesus Perez V, Woo YJ, Red-Horse K. *Cell*, 2019 Feb 21;176(5):1128-1142.

Rapid Self-Assembly of Bioengineered Cardiovascular Bypass Grafts from Scaffold-Stabilized, Tubular Bilevel Cell Sheets. Von Bornstadt D, Wang H, Paulsen MJ, Goldstone AB, Eskandari A, Thakore A, Stapleton L, Steele AN, Truong VN, Jaatinen, Hironaka C, Woo YJ. *Circulation* 2018 Nov 6;138(19):2130-2144.

Mechanical or Biologic Prostheses for Aortic- and Mitral-Valve Replacement. Goldstone AB, Chiu PE, Baiocchi M, Lingala B, Patrick WL, Fischbein MP, Woo YJ. *New England Journal of Medicine* 2017 Nov 9;377(19):1847-1857.

EDUCATION/TRAINING

MD University of Pennsylvania

BS Massachusetts Institute of Technology

SURGERY RESIDENCY & INTERNSHIP
University of Pennsylvania

RESEARCH FELLOWSHIP
University of Pennsylvania

CARDIOTHORACIC SURGERY FELLOWSHIP
University of Pennsylvania

BOARD CERTIFICATION
Surgery, ABS
Thoracic Surgery, ABTS

CLINICAL FOCUS

Cardiothoracic Surgery

HONORS & AWARDS

American Heart Association Clinical Research Prize (2021)

AHA Mentoring Award (2019)

American Heart Association Surgery Mentoring Award

Clinical Research Forum, USA Top Ten Clinical Research Award Recipient (2018)

Top Doctor of Bay Area, San Francisco Magazine (2015, 2016, 2017, 2018, 2019)

Luigi Mastroianni Clinical Innovator Award, University of Pennsylvania (2012)

ASSOCIATE EDITOR

Journal of Thoracic and Cardiovascular Surgery

FELLOW American Heart Association, American College of Cardiology, American College of Surgeons



Joseph C. Wu, MD, PhD

Director, Stanford Cardiovascular Institute

Simon H. Stertz, MD, Professor of Medicine & Radiology

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LAB wulab.stanford.edu

EDUCATION/TRAINING

MD Yale University

PHD UCLA

MEDICINE RESIDENCY

UCLA Medical Center

CARDIOLOGY FELLOWSHIP

UCLA Medical Center

BOARD CERTIFICATION

Cardiovascular Disease, ABIM

CLINICAL FOCUS

Adult Congenital Heart Disease

Cardiovascular Imaging

HONORS & AWARDS

Honorary Lifetime Member, Society of Toxicology

NIH Director's New Innovator Award

NIH Roadmap Transformative Award

Presidential Early Career Award for Scientists and Engineers, White House Office of Technology

American Heart Association (AHA)

Established Investigator Award

Academy of Radiology Research

Distinguished Investigator Award

Burroughs Wellcome Foundation

AHA Merit Award

AHA Distinguished Scientist Award

MEMBER

Am Society Clinical Investigators (ASCI)

Assoc University Cardiologists (AUC)

American Institute for Medical and Biological Engineering (AIMBE)

Association American Physicians (AAP)

Board of Directors, Keystone Symposia

FDA Cellular, Tissue, and Gene Advisory Committee

American Association for Advancement of Science (AAAS)

National Academy of Medicine (NAM)

CURRENT RESEARCH

My lab focuses on patient-specific and disease-specific induced pluripotent stem cells (iPSCs). The main goals are to (i) understand basic cardiovascular disease mechanisms, (ii) accelerate drug discovery and screening, (iii) develop the "clinical trial in a dish" concept, and (iv) implement precision cardiovascular medicine for disease prevention and treatment of patients. We use a combination of advanced genomics, stem cells, cellular & molecular biology, physiological testing, and molecular imaging technologies to better understand molecular and pathophysiological processes.

The missions of the Stanford CVI are to deliver excellence in clinical care, world-class education, and cutting-edge research that will improve the medical care and quality of life of our patients.

SELECTED PUBLICATIONS

Clinical trial in a dish using iPSCs shows lovastatin improves endothelial dysfunction and cellular crosstalk in LMNA cardiomyopathy. Sayed N, Liu C, Ameen M, Himmati F, Zhang JZ, Khanamiri S, Moonen JR, Wnorowski A, Cheng L, Rhee JW, Gaddam S, Wang KC, Sallam K, Boyd JH, Woo YJ, Rabinovitch M, Wu JC. *Science Transl Med* 2020;12(554):eaax9276.

Dysregulation of PDGFRB Contributes to the Pathogenesis of LMNA-related Dilated Cardiomyopathy. Lee J, Termglinchan V, Diecke S, Itzhaki I, Lam CK, Garg P, Lau E, Greenhaw M, Seeger T, Wu H, Zhang JZ, Chen X, Gil IP, Ameen M, Sallam K, Rhee JW, Churko J, Chaudhary R, Yi SA, Nam KH, Chour T, Wang PJ, Snyder MP, Chang HY, Karakikes I, Wu JC. *Nature* 2019;572(7769):335-340.

A Human iPSC Double-reporter System Enables Purification of Cardiac Lineage Subpopulations With Distinct Function and Drug Response Profiles. Zhang JZ, Termglinchan V, Shao NY, Itzhaki I, Liu C, Ma N, Tian L, Wang VY, Chang ACY, Guo H, Kitani T, Wu H, Lam CK, Kodo K, Sayed N, Blau HM, Wu JC. *Cell Stem Cell* 2019;24(5):802-811.

Autologous iPSC-based Vaccines Elicit Anti-tumor Responses In Vivo. Kooreman NG, Kim Y, de Almeida PE, Termglinchan V, Diecke S, Shao NY, Wei TT, Yi H, Dey D, Nelakanti R, Brouwer TP, Paik DT, Barfi I, Han A, Quax PHA, Hamming JF, Levy R, Davis MM, Wu JC. *Cell Stem Cell* 2018;22(4):501-537.

High-throughput Screening of Tyrosine Kinase Inhibitor-induced Cardiotoxicity Using Human Induced Pluripotent Stem Cells. Sharma A, Burrridge PW, McKeithan WL, Serrano R, Shukla P, Sayed N, Churko JM, Kitani T, Wu H, Holmstrom A, Matsa E, Zhang Y, Kumar A, Fan AC, del Alamo JC, Wu SM, Moslehi JJ, Mercola M, Wu JC. *Sci Transl Med* 2017;9(377).

Human Induced Pluripotent Stem-derived Cardiomyocytes Recapitulate the Predilection of Breast Cancer Patients to Doxorubicin-induced Cardiotoxicity. Burrridge PW, Li YF, Matsa E, Wu H, Ong SG, Sharma A, Chang AC, Coronado MJ, Ebert AD, Knowles JW, Tellis ML, Witteles RM, Blau HM, Bernstein D, Altman RB, Wu JC. *Nature Medicine* 2016;22(5):547-56.



Sean M. Wu, MD, PhD

Joan and Sanford I. Weill Scholar
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Associate Professor (by courtesy), Pediatrics

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EDUCATION/TRAINING

MD Duke University

PHD Duke University

MEDICINE RESIDENCY

Duke University Hospital

CARDIOLOGY FELLOWSHIP

Massachusetts General Hospital

RESEARCH FELLOWSHIP

Boston Children's Hospital

BOARD CERTIFICATION

Internal Medicine, ABIM

Cardiovascular Medicine, ABIM

CLINICAL FOCUS

General Cardiology

HONORS & AWARDS

Kenneth D. Bloch Memorial Lecturer,
American Heart Association Scientific
Sessions (2018)

Established Investigator Award,
American Heart Association (2016)

Elected Member, American Society for
Clinical Investigation (2016)

Department of Medicine Teaching Award,
Stanford University School of Medicine
(2015)

NIH Director's Pioneer Award, NIH Office
of the Director (2014)

David Lawrence Stein Award, American
Heart Association-Western Affiliate
(2014)

Fellow, American College of Cardiology
(2009)

NIH Director's New Innovator Award, NIH
Office of the Director (2008)

CURRENT RESEARCH

My research laboratory seeks to identify mechanisms responsible for human congenital heart disease, the most common cause of still-births in the U.S. and one of the major contributors to morbidity and mortality in infants and toddlers. We believe that by understanding the mechanisms regulating growth and differentiation of heart precursor cells during early embryonic development we can then apply these principles to understand the pathogenesis of adult onset heart diseases such as heart failure and arrhythmia where re-activation of early embryonic developmental program plays a central role. We currently use both genetically-modified mice as our living model to understand the biology of heart development as well as human iPS cells as a test-tube model to study the process of heart cell formation. In addition, we have actively published studies using single cell multi-omic strategies such as single cell RNAseq to address the mechanism of disease onset and develop new treatments using engineered 3D tissues.

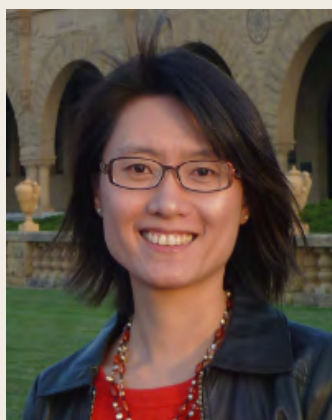
SELECTED PUBLICATIONS

Patient-Specific Induced Pluripotent Stem Cells Implicate Intrinsic Impaired Contractility in Hypoplastic Left Heart Syndrome. Paige SL, Galdos FX, Lee S, Chin ET, Ranjbarvaziri S, Feyen DA, Darsha AK, Xu S, Ryan JA, Beck AL, Qureshi MY, Miao Y, Gu M, Bernstein D, Nelson TJ, Mercola M, Rabinovitch M, Ashley EA, Parikh VN, Wu SM. *Circulation*, 2020; 142:1605–1608.

Wnt Activation and Reduced Cell-Cell Contact Synergistically Induce Massive Expansion of Functional Human iPSC-derived Cardiomyocytes. Buikema JW, Lee S, Goodyer WR, Chirikian O, Serpooshan V, Li G, Paige SL, Wu H, Paik D, Rhee S, Beck A, Venkatraman S, Hu J, Kort E, Hesse M, Galdos FX, Puluca N, Beyersdorf B, van Mil A, Red-Horse K, Wu JY, Doevendans PA, Fleischmann B, Jovinge S, Garcia KC, Wu JC, Sluiter JPG, Wu SM. *Cell Stem Cell*, 2020. 27:50-63.

Single-cell Transcriptomics of 20 Mouse Organs Creates a Tabula Muris. Schaum N, Karkanias J, Neff NF, ... (260 authors) ... Wu SM, Quake SR, Wyss-Coray T. *Nature*, 2018. 562(7727):367-372.

Transcriptomic Profiling Maps Anatomically Patterned Subpopulations Among Single Embryonic Cardiac Cell. Li G, Xu A, Sim S, Priest JR, Tian X, Khan T, Zhou B, Quertermous T, Tsao PS, Quake SR, Wu SM. *Dev Cell*, 2016. 39(4):491-507.



Fan Yang, PhD

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EDUCATION/TRAINING

PHD Johns Hopkins University,
Biomedical Engineering

HONORS & AWARDS

American Institute for Medical and
Biological Engineering Fellow induction
(2021)

Ellen Weaver Award by the Association
for Women in Science (2017)

Society for Biomaterials Young
Investigator Award (2016)

Biomaterials Science Lectureship Award
(2016)

California Institute of Technology Tools
and Technologies Award (2015-2018)

NSF Faculty Early Career Development
(CAREER) award, National Science
Foundation (2014-2019)

2011 Technology Review TR35 Global List
(2011)

3M Nontenured Faculty Grant Award, 3M
(2012-2015)

Stanford Asian American Faculty Award,
Stanford University (2013)

Mission for Learning Faculty Scholar
Award in Pediatric Translational
Medicine, Child Health Research
Institute (2013-2015)

Young Investigator Award, Alliance for
Cancer and Gene Therapy, Alliance for
Cancer and Gene Therapy (2013)

Basil O' Connor Starter Scholar Research
Award, March of Dimes Foundation
(2012-2014)

McCormick Faculty Award (2011)

Faulty Scholar of the Donal E. and Delia
B. Baxter Foundation (2010)

CURRENT RESEARCH

A bioengineer by training, I work at the interface of biomaterials, stem cell biology, engineering, and medicine. Using an interdisciplinary approach, my research seeks: (1) to decipher how interactive microenvironmental cues (cell-matrix or cell-cell interactions) regulate cell fate during normal tissue development and during disease progression (cancer), and (2) to develop novel biomaterials and stem cell-based therapeutics to improve tissue regeneration. Using biomaterials-mediated approaches, my lab employs two strategies to engineer stem cells: from the "outside in" via novel scaffold design and from the "inside out" via non-viral gene delivery. In the first strategy, we engineer injectable hydrogels using a "lego-building" approach in order to independently tune cell-niche properties including biochemical, mechanical, and topographical cues. These biomaterials are useful for elucidating the mechanisms of multifactorial cell-niche interactions, and for enabling desirable cell fates and tissue regeneration with particular functions. In the second strategy, we harness the ability of stem cells to home to diseases sites and their ability to enhance tissue regeneration via paracrine signaling. We further modulate the paracrine signaling of stem cells using biodegradable polymeric nanoparticle-mediated non-viral gene delivery, which is safer than conventional viral vectors. Using relevant animal models, we have demonstrated the potential applications of such stem cell- and biomaterials-based strategies for treating musculoskeletal diseases, cardiovascular diseases, and cancer.

SELECTED PUBLICATIONS

Contractile Force Generation by 3D hiPSC-derived Cardiac Tissue is Enhanced by Rapid Establishment of Cellular Interconnection in Matrix With Muscle-mimicking Stiffness. Lee S, Serpooshan V, Tong X, Venkatraman S, Lee M, Wu SM, Yang F. *Biomaterials*. 2017 Jul;131:111-120.

Polymer-DNA Nanoparticle Induced CXCR4 Overexpression Improves Stem Cell Engraftment and Tissue Regeneration in a Mouse Hindlimb Ischemia Model. Deveza L, Choi J, Lee J, Huang N, Cooke J, Yang F. *Theranostics*, 2016 May 23;6(8):1176-89.

Adipose Derived Stromal Cells Overexpressing Vascular Endothelial Growth Factor Accelerate Wound Closure in a Mouse Excisional Wound Healing Model. Nauta A, Seidel C, Deveza L, Montoro D, Grova M, Ko SH, Hyun J, Gurtner G, Longaker MT, Yang F. *Molecular Therapy*, 2013 Feb;21(2):445-55.

Nanoparticle Engineered TRAIL-overexpressing Adipose-derived Stem Cells Target and Eradicate Glioblastoma via Intracranial Delivery. Jiang X, Fitch S, Wang C, Wilson C, Li JF, Song B, Grant G, Yang F. *Proc Natl Acad Sci USA*, 2016 Nov 29;113(48):13857-13862. Epub 2016 Nov 14.

Sliding Hydrogels With Mobile Molecular Ligands and Crosslinks as 3D Stem Cell Niche. Tong X, Yang F. *Advanced Materials*, 2016 Sep;28(33):7257-63.



Phillip C. Yang, MD

Professor, Medicine - Cardiovascular Medicine
 Director, Cardiovascular Stem Cell Laboratory
 Director, Cardiothoracic MRI Program

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CURRENT RESEARCH

Our research interest focuses on the fundamental molecular and cellular processes of myocardial regeneration and restoration. We employ novel in vivo multi-modality molecular and cellular imaging technology to translate basic discovery in stem cell biology. Autologous iPSCs are considered a potential landmark solution. Translational effort of this revolutionary biology is investigated through the secretomes generated from patient- and disease-specific iPSC-cardiovascular cells and their molecular cargo to implement precision medicine. Through AHA, CIRM, NIH, and Stanford-sponsored research grants, the translational potential and clinical implementation of this innovative therapeutic approach are investigated

Success consists of going from failure to failure without loss of enthusiasm. — Winston Churchill

SELECTED PUBLICATIONS

Mitochondria-rich extracellular vesicles rescue patient-specific cardiomyocytes from doxorubicin injury. O'Brien CG, Ozen MO, Ikeda G, Vaskova E, Jung JH, Bayardo N, Santoso MR, Shi L, Wahlquist C, Jiang Z, Jung Y, Zeng Y, Egan E, Sinclair R, Gee A, Witteles R, Mercola M, Svensson KJ, Demirci U, Yang PC. *JACC:CardioOnc.* 2021.

Mitochondria containing extracellular vesicles from autologous induced pluripotent stem cell-derived cardiomyocytes restore bioenergetics in ischemic myocardium. Ikeda G, Santoso M, Tada Y, Vaskova E, O'Brien C, Jung J, Yang PC. *J Am Coll Cardiol* 2021 Mar 2;77(8):1073-1088. doi: 10.1016/j.jacc.2020.12.060.

miR-106a-363 cluster in extracellular vesicles promotes endogenous myocardial repair via Notch3 pathway in ischemic heart injury. Jung J, Ikeda G, Tada Y, von Bornstädt D, Santoso M, Wahlquist C, Rhee S, Jeon YJ, Yu AC, O'Brien C, Red-Horse K, Appel EA, Mercola M, Woo J, Yang PC. *Basic Res Cardiol.* 2021;11(1).

Sacubitril/Valsartan improves cardiac function and decreases myocardial fibrosis via downregulation of exosomal mir-181a in rodent chronic myocardial infarction model. Vaskova E, Ikeda G, Tada Y, Wahlquist C, Mercola M, Yang PC. *J Am Heart Assoc.* 2020.

Exosomes from induced pluripotent stem cell-derived cardiomyocytes promote autophagy for myocardial repair. Santoso MR, Ikeda G, Tada Y, Jung JH, Vaskova E, Sierra RG, Gati C, Goldstone AB, von Bornstaedt D, Shukla P, Wu JC, Wakatsuki S, Woo YJ, Yang PC. *J Am Heart Assoc.* 2020 Mar 17;9(6):e014345.

Epicardial FSTL1 Reconstitution Regenerates the Adult Mammalian Heart. Wei K, Serpooshan V, Hurtado C, Diez-Cunado M, Zhao M, Maruyama S, Zhu W, Fajaro G, Nosedo M, Nakamura K, Tian X, Liu Q, Wang A, Matsuura Y, Bushway P, Cai W, Savchenko A, Mahmoudi M, Schneider MD, van den Hoff M, Butte MJ, Yang PC, Walsh K, Zhou B, Bernstein D, Mercola M, Ruiz-Lozano P. *Nature* 2015 Sep 24;525(7570):479-85.

EDUCATION/TRAINING

MD Yale University

MEDICINE RESIDENCY & INTERNSHIP
 UCLA

CARDIOLOGY FELLOWSHIP
 Stanford University

ADVANCED CARDIOLOGY IMAGING
 FELLOWSHIP Stanford University

BOARD CERTIFICATION
 Cardiovascular Disease, ABIM
 Echocardiography, Level III, ASE
 Cardiac MRI, Level III, SCMR

CLINICAL FOCUS

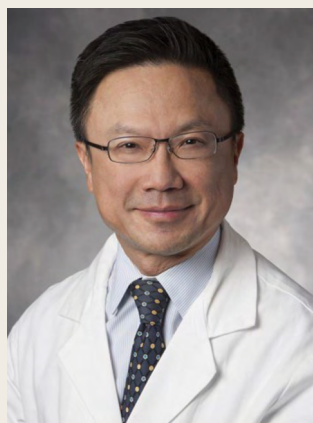
General Cardiology
 Cardiovascular Imaging
 Cardiovascular Molecular and Cellular
 Therapy
 Cardiovascular Regeneration

HONORS & AWARDS

Young Investigator Award, American
 College of Cardiology (ACC)
 Burroughs Wellcome Scholar
 NIH Career Development Award
 NIH Career Enhancement Award in Stem
 Cell Research
 Young Investigator Award, American
 Melvin Judkins YIA, AHA (Senior author,
 2009, 2010, 2012, 2014, 2016, 2018)
 Co-Chair, AHA Cardiovascular Stem Cell
 Writing Group

PRINCIPAL INVESTIGATOR

AHA Collaborative Sciences Award;
 CIRM Discovery Research Grant; NIH
 Patient-Oriented Research in Cell
 Therapy; Stanford Innovative Medicine
 Accelerator Grant; Stanford SPARK
 Grant; BioCardia CardiAmp Trial and
 Department of Defense DCM-II Trial



Alan C. Yeung, MD

Li Ka Shing Professor of Medicine (Cardiology)
Medical Director, Cardiovascular Health, Stanford Medicine

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EDUCATION/TRAINING

MD Harvard Medical School

MEDICINE RESIDENCY & INTERNSHIP
Massachusetts General Hospital

CLINICAL CARDIOLOGY FELLOWSHIP
Brigham and Women's Hospital

RESEARCH CARDIOLOGY FELLOWSHIP
Harvard Medical School

BOARD CERTIFICATION
Internal Medicine, ABIM
Cardiovascular Disease, ABIM
Interventional Cardiology, ABIM

CLINICAL FOCUS

Interventional Cardiology

HONORS & AWARDS

BOARD OF TRUSTEES
Li Ka Shing Foundation and Shantou
University, Hong Kong

BOARD OF DIRECTORS
Cardiology Research Foundation, South
Korea; Chien Foundation, Hong Kong

EDITORIAL BOARD
Journal of the American College
of Cardiology (JACC)

REVIEW BOARD
Circulation

FORMER CHAIR
ABIM Interventional Cardiology
Examination Board Chair

CURRENT RESEARCH

My current research extends beyond stents and devices, focusing on interventions that could lead to long term health in all our cardiac patients. We are exploring this through mobile health as well as big data. I remain interested in device development such as percutaneous valves, new bioabsorbable stents and new ways to treat hypertension using renal denervation techniques. I am the Medical Director of Cardiovascular Health at Stanford Medicine and Chief (Clinical), of Division of Cardiovascular Medicine and Former Director of Interventional Cardiology.

Imagine a day when the interests of patients, physicians and the health care system are all aligned: to enhance the health of our patients physically and mentally.

SELECTED PUBLICATIONS

Efficacy and Safety of Novel Multi-lumen Catheter for Chronic Total Occlusions: From Preclinical Study to First-in-man Experience. Mitsutake Y, Ebner A, Yeung AC, Taber MD, Davidson CJ, Ikeno F. *Catheter Cardiovasc Interv.* 2014 Oct 20.

Continuous Flow Left Ventricular Assist Device Placement Complicated by Aortic Valve Thrombus and Myocardial Infarction. Kim JB, Rhee JW, Brenner DA, Ha R, Banerjee D, Yeung AC, Tremmel JA. *Int J Cardiol.* 2014 Oct 20;176(3):e102-3.

Dichloroacetate Prevents Restenosis in Preclinical Animal Models of Vessel Injury. Deuse T, Hua X, Wang D, Maegdefessel L, Heeren J, Scheja L, Bolaños JP, Rakovic A, Spin JM, Stubbendorff M, Ikeno F, Länger F, Zeller T, Schulte-Uentrop L, Stoeck A, Itagaki R, Haddad F, Eschenhagen T, Blankenberg S, Kieffmann R, Reichenspurner H, Velden J, Klein C, Yeung A, Robbins RC, Tsao PS, Schrepfer S. *Nature.* 2014 May 29;509(7502):641-4.

Clinical Interpretation and Implications of Whole-genome Sequencing. Dewey FE, Grove ME, Pan C, Goldstein BA, Bernstein JA, Chaib H, Merker JD, Goldfeder RL, Enns GM, David SP, Pakdaman N, Ormond KE, Caleshu C, Kingham K, Klein TE, Whirl-Carrillo M, Sakamoto K, Wheeler MT, Butte AJ, Ford JM, Boxer L, Ioannidis JP, Yeung AC, Altman RB, Assimes TL, Snyder M, Ashley EA, Quertermous T. *JAMA.* 2014 Mar 12;311(10):1035-45.



Paul Yock, MD

Martha Meier Weiland Professor of Medicine, Emeritus
Professor, Bioengineering
Professor, Medicine - Cardiovascular Medicine
Acting Faculty Director, Stanford Byers Center for Biodesign

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EDUCATION/TRAINING

MD Harvard University

MEDICINE RESIDENCY & INTERNSHIP

UCSF

CARDIOLOGY FELLOWSHIP

Stanford University

CORONARY ANGIOPLASTY FELLOWSHIP

Sequoia Hospital

BOARD CERTIFICATION

Internal Medicine, ABIM

Cardiovascular Disease, ABIM

CLINICAL FOCUS

Cardiovascular Disease

HONORS & AWARDS

Transcatheter Therapeutics (TCT) Career Achievement Award

Distinguished Scientist Award, American College of Cardiology

Bernard M. Gordon Prize for Innovation, National Academy of Engineering

Fritz and Delores Russ Prize, National Academy of Engineering

DOCTOR OF SCIENCE (HONORIS CAUSA)

Amherst College

FOUNDING CO-CHAIR

Bioengineering, Stanford University

ADVISORY BOARD

Stanford Technology Ventures Programs

LEADERSHIP GROUP

Stanford CTSA application and program

FELLOW

American College of Cardiology;
American Institute for Medical and Biological Engineering
National Academy of Inventors

MEMBER

Association of American Physicians
National Academic of Engineering
Stanford Cardiovascular Institute

CURRENT RESEARCH

I am the founder and director emeritus of the Byers Center for Biodesign, a multidisciplinary training and support program for physicians and engineers with the ambition and talent to become health technology innovators. The Center has educational/training programs at multiple levels including a postgraduate fellowship, multiple graduate and undergraduate classes and a faculty training program. In addition, Biodesign administers seed grant programs and a mentoring system for faculty and students who seek to translate health technology innovations into patient care.

SELECTED PUBLICATIONS

Noninvasive Estimation of Right Ventricular Systolic Pressure by Doppler Ultrasound in Patients With Tricuspid Regurgitation. Yock PG, Popp RL. *Circulation*, 70: 657-662, 1984.

The Safety of Intracoronary Ultrasound: A Multi-center Survey of 2207 Examinations. Hausmann D, Erbel R, Alibelli-Chemarin MJ, Boks W, Yock PG. *Circulation*, 91(3): 623-30, 1995.

Angioplasty Method. Yock P. Issued August 20, 1991; US patent no. 5,040,548.

Biodesign: The Process of Innovating Medical Technologies. Yock, P, Zenios S, Makower J, senior editors: New York: Cambridge University Press, 2015. 839 pp.

Outcomes From a Postgraduate Biomedical Technology Innovation Training Program: The First 12 Years of Stanford Biodesign. Brinton TJ, Kurihara CQ, Camarillo DB, Pietzsch JB, Gorodsky J, Zenios SA, Doshi R, Shen C, Kumar U, Mairal A, Watkins J, Popp RL, Wang PJ, Makower J, Krummel TM, Yock PG. *Annals of Biomedical Engineering*, 41(9): 1803-1810, 2013.



Roham Zamanian, MD, FCCP

Associate Professor - Med Center Line, Medicine - Pulmonary & Critical Care Medicine
 Director, Stanford Adult Pulmonary Hypertension Program
 Vera Moulton Wall Center for Pulmonary Vascular Disease

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<http://med.stanford.edu/wallcenter.html>

EDUCATION/TRAINING

MD University of California Irvine

RESIDENCY and INTERNSHIP
 University of Irvine Medical Center

FELLOWSHIP
 Stanford University

SUPER-FELLOWSHIP (2004-2006)
 eBay Pulmonary Vascular Fellow, Vera Moulton Wall Center for Pulmonary Vascular Disease

BOARD CERTIFICATION
 Pulmonary Disease, ABIM (2006)

HONORS & AWARDS

Junior Faculty Scholar Award, Vera Moulton Wall Center (2013-2018)

Fellow of the American College of Chest Physicians, American College of Chest Physicians (2008)

Faculty Teaching Award, Dept of Medicine, Stanford (2007)

Young Investigator Career Development Award, Entelligence Actelion Young

Investigators Program (2006-2007)

Fellow of the Year, Univ of California, Irvine Medical Center (2002-2003)

Resident Research Presentation Award, Univ of Calif, Irvine Medical Center -

Dept of Medicine (2001)

Case Presentation Award, ACCP - Chest 2000 (2000)

CURRENT RESEARCH

My research is focused on the development of risk prediction and leading-edge phenotyping strategies for patients with pulmonary arterial hypertension (PAH), as well as the translation of basic laboratory discoveries into clinical therapeutics at bedside. Over the past 5 years, I have been involved in the design, implementation, analysis, and reporting of phase 1 and phase 2 proof of concept PAH clinical trials.

My heroes are the ones who survived doing it wrong,
 who made mistakes, but recovered from them.

— Bono, U2.

SELECTED PUBLICATIONS

Discovery of Distinct Immune Phenotypes Using Machine Learning in Pulmonary Arterial Hypertension. Sweatt AJ, Hedlin HK, Balasubramanian V, Hsi A, Blum LK, Robinson WH, Haddad F, Hickey PM, Condliffe R, Lawrie A, Nicolls MR, Rabinovitch M, Khatri P, Zamanian RT. *Circ Res*. 2019 Mar 15;124(6):904-919.

Features and Outcomes of Methamphetamine Associated Pulmonary Arterial Hypertension. Zamanian RT, Hedlin H, Greuenwald P, Wilson DM, Segal JI, Jorden M, Kudelko K, Liu J, Hsi A, Rupp A, Sweatt AJ, Tudor R, Berry GJ, Rabinovitch M, Doyle RL, De Jesus Perez V, Kawut SM. *Am J Respir Crit Care Med*. 2017 Sep 21.

Randomised Placebo-controlled Safety and Tolerability Trial of FK506 (Tacrolimus) for Pulmonary Arterial Hypertension. Spiekerkoetter E, Sung YK, Sudheendra D, Scott V, Del Rosario P, Bill M, Haddad F, Long-Boyle J, Hedlin H, Zamanian RT. *Eur Respir J*. 2017 Sep 11;50(3).

Low-Dose FK506 (Tacrolimus) in End-Stage Pulmonary Arterial Hypertension. Spiekerkoetter E, Sung YK, Sudheendra D, Bill M, Aldred MA, van de Veerdonk MC, Vonk Noordegraaf A, Long-Boyle J, Dash R, Yang PC, Lawrie A, Swift AJ, Rabinovitch M, Zamanian RT. *Am J Respir Crit Care Med*. 2015 Jul 15;192(2):254-7.

Single- vs Double-lung Transplantation in Patients With Chronic Obstructive Pulmonary Disease and Idiopathic Pulmonary Fibrosis Since the Implementation of Lung Allocation Based on Medical Need. Schaffer JM, Singh SK, Reitz BA, Zamanian RT, Mallidi HR. *JAMA*. 2015 Mar 3;313(9):936-48.



Richard Zare, PhD

Marguerite Blake Wilbur Professor in Natural Science and Professor (by courtesy) of Physics

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LAB web.stanford.edu/group/Zarelab/

EDUCATION/TRAINING

PHD Harvard University

HONORS & AWARDS

National Medal of Science, National Science Foundation (1983)

Wolf Prize in Chemistry (2005)

Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM), U.S. Office of Science and Technology Policy (2009)

Priestley Medal of the American Chemical Society (2010)

BBVA Foundation Frontiers of Knowledge Award in the Basic Sciences category (2010)

King Faisal International Prize in Science, King Faisal Foundation (2011)

Othmer Gold Medal from the Chemical Heritage Foundation (2017)

National Hero's Medal, 70th Anniversary of the Founding of the People's Republic of China (2019)

Yusuf Hamied Visiting Professorship (2019)

CURRENT RESEARCH

Current research in the Zare lab explores wide-ranging questions in physical and analytical chemistry, from the study of elementary chemical reactions to chemical analysis of extraterrestrial materials. The major focus of these efforts is chemical analysis on the nanoscale. The team has devised tools and techniques to examine molecules in extremely tiny volumes – the volumes characteristic of what is found in heterogeneous structures in mineral samples or in the contents of cells and subcellular compartments. Group members have also made contributions to understanding chemical reactions in microdroplets.

SELECTED PUBLICATIONS

Spontaneous Generation of Hydrogen Peroxide From Aqueous Microdroplets. Lee JK, Walker KL, Han HS, Kang J, Prinz FB, Waymouth RM, Nam HG, Zare RN. *Proc Natl Acad Sci USA*. 2019 Sep 24;116(39):19294-19298.

Influence of Inlet Capillary Temperature on the Microdroplet Chemistry Studied by Mass Spectrometry. Banerjee S, Zare RN. *J Phys Chem A*. 2019 Sep 12;123(36):7704-7709.

Stark-induced Adiabatic Raman Passage Examined Through the Preparation of D(2) ($v=2, j=0$) and D(2) ($v=2, j=2, m=0$). Perreault WE, Mukherjee N, Zare RN. *J Chem Phys*. 2019 Jun 21;150(23):234201.

Nonresonant Photons Catalyze Photodissociation of Phenol. Hilsabeck KI, Meiser JL, Sneha M, Harrison JA, Zare RN. *J Am Chem Soc*. 2019 Jan 16;141(2):1067-1073.

Photon Catalysis of Deuterium Iodide Photodissociation. Hilsabeck KI, Meiser JL, Sneha M, Balakrishnan N, Zare RN. *Phys Chem Chem Phys*. 2019 Jul 14;21(26):14195-14204.

Selective Synthesis in Microdroplets of 2-Phenyl-2,3-dihydrophthalazine-1,4-dione From Phenyl Hydrazine With Phthalic Anhydride or Phthalic Acid. Gao D, Jin F, Yan X, Zare RN. *Chemistry*. 2019 Jan 28;25(6):1466-1471.

Combining Desorption Electrospray Ionization Mass Spectrometry Imaging and Machine Learning for Molecular Recognition of Myocardial Infarction. Margulis K, Zhou Z, Fang Q, Sievers RE, Lee RJ, Zare RN. *Anal Chem*. 2018 Oct 16;90(20):12198-12206.

Enhancement of Reaction Rate in Small-sized Droplets: A Combined Analytical and Simulation Study. Mondal S, Acharya S, Biswas R, Bagchi B, Zare RN. *J Chem Phys*. 2018 Jun 28;148(24):244704.

