

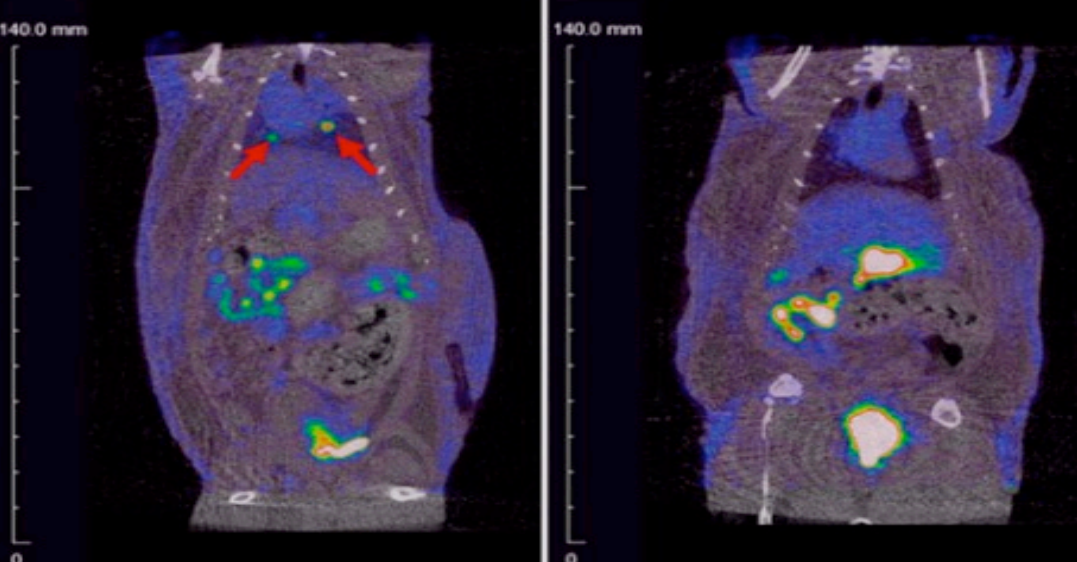
photo by Semnik CC BY-SA 4.0

*A billion beats in a lifetime...*

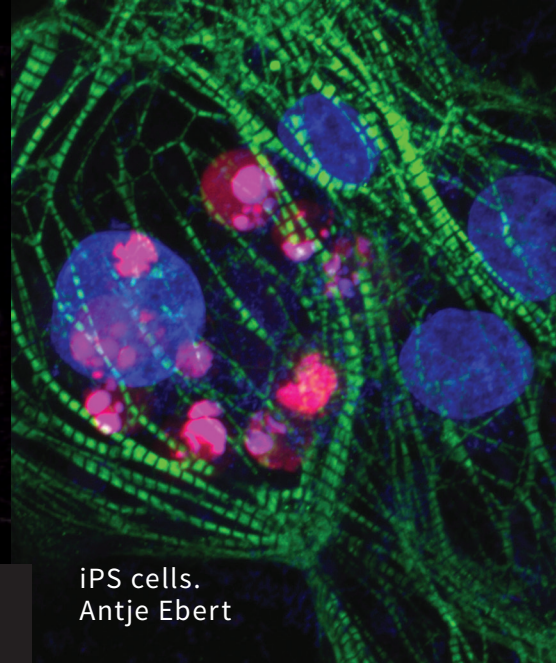
# Stanford Cardiovascular Institute

Annual Report





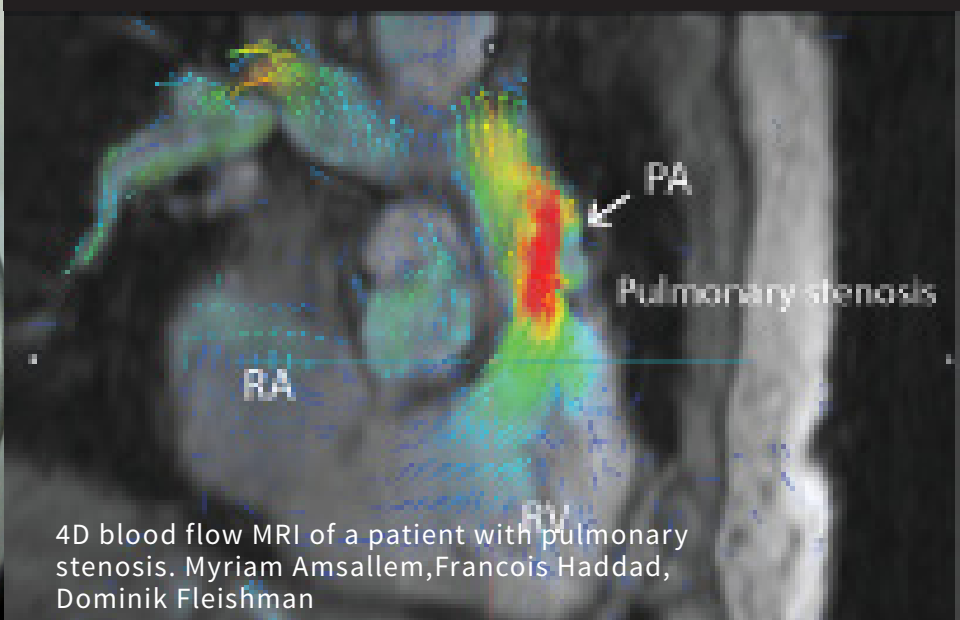
6F-18F-fluoromaltotriose PET/CT in a rat with an incidental Staph infection after cardiac surgery before and after antibiotic therapy. Mirwais Wardak



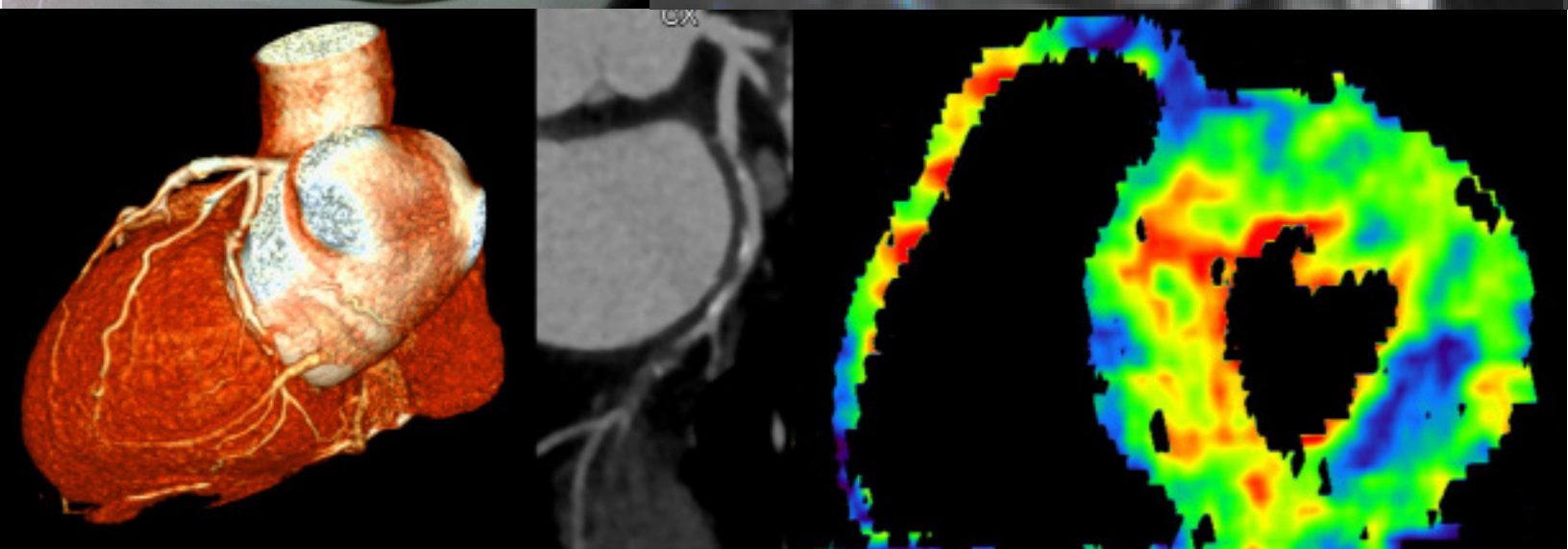
iPS cells.  
Antje Ebert



CVI Logo 3D printed in  
BioInk. Vahid Serpooshan



4D blood flow MRI of a patient with pulmonary stenosis. Myriam Amsallem, Francois Haddad, Dominik Fleishman



CT coronary angiogram showing a severe lesion in the distal left circumflex coronary artery. Dynamic myocardial perfusion CT demonstrated lower myocardial blood flow during pharmacological vasodilation in the corresponding inferolateral wall (blue). Koen Nieman



# Table of Contents

DEAN'S LETTER	4
DIRECTOR'S LETTER	5
Leadership	7
Executive Committee	8
Steering Committee	9
Education and Training Committee	10
Scientific Advisory Board	11
Staff	12
Research Disciplines	13
CVI Cores	15
Education & Training Programs	16-18
Multi-Disciplinary Training Program in Cardiovascular Imaging	
Research Training in Myocardial Biology	
Mechanisms & Innovation in Vascular Disease	
Philanthropy	19
Fresh Perspectives	20-25
Seed Grants	
iHeart Research Awards	
Manuscript Awards	
Frontiers in Cardiovascular Science	
Med 223	
Researcher Profiles	26-131



# Dean's Letter



**Lloyd B. Minor, MD**

The Carl and Elizabeth Naumann  
Dean of the School of Medicine and  
Professor of Otolaryngology - Head  
& Neck Surgery and, by courtesy, of  
Neurobiology and Bioengineering

Dear Friends,

Stanford Medicine is poised to lead the biomedical revolution in Precision Health by leveraging the art and science of medicine to predict and prevent disease before it strikes, and cure it decisively if it does. To achieve this bold vision, we must protect and promote high-risk, high-reward scientific discovery, give our students and trainees the skills they will need for a changing biomedical landscape, and deliver health care that helps individuals thrive based on all factors unique to them.

It is exciting to witness the growth and development of the Stanford Cardiovascular Institute under the leadership of Joseph C. Wu, MD, PhD, Simon H. Stertzer MD Professor of Cardiovascular Medicine and of Radiology. Stanford has a long, proud history of being at the forefront of cardiovascular research and patient care. Transformative innovations emerging from the Institute — from groundbreaking stem cell discoveries to novel methods and tools for disease detection and treatment — continue to revolutionize cardiovascular care. I am especially impressed by the Institute's commitment to education through its intensive training programs and many forums for trainees and faculty to exchange and build on new ideas. As an excellent example, the upcoming Stanford Drug Discovery Conference in April 2018 will bring some of world's most accomplished leaders in cardiovascular medicine, research, and pharmaceutical development to the Stanford Medicine community.

The Stanford Cardiovascular Institute is on the cutting edge of basic, applied, and clinical cardiovascular research. It provides state-of-the-art facilities and unique resources that enable brilliant scientists to open up new realms of scientific exploration in cardiovascular medicine. With valuable contributions from all its members, I am confident that the Stanford Cardiovascular Institute will remain an international leader in driving the transformation toward more proactive and personalized Precision Health Care.

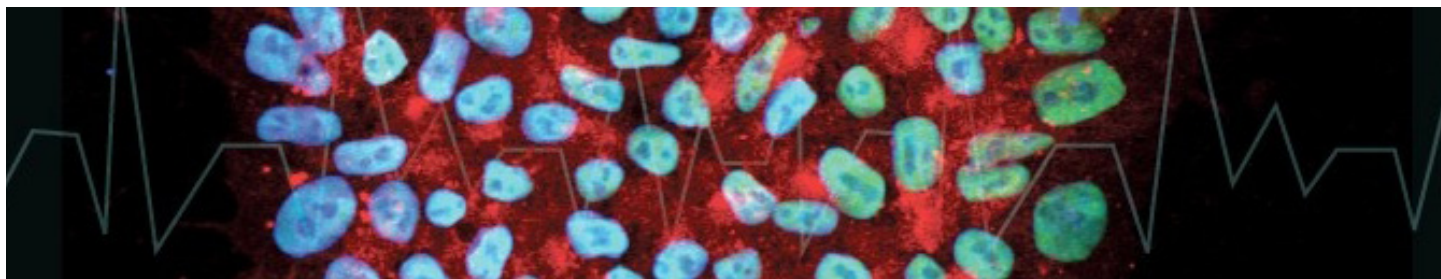
Sincerely,

A handwritten signature in black ink that reads "Lloyd B. Minor". The signature is written in a cursive, flowing style.

Lloyd B. Minor, MD



# Director's Letter



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

Stanford is recognized for realizing the unthinkable. Our ability to innovate is driven by a collaborative spirit and an open-minded philosophy in which disciplines have no boundaries. At the Stanford Cardiovascular Institute (CVI), this approach has yielded incredible biomedical advances, marked in part by the over 1,000 manuscripts published by our members in 2017. In this report, we highlight the some of the most significant research conducted by our Institute members, and how their work is changing the landscape of cardiovascular medicine.

Since its establishment in 2004, the CVI has grown to include over 100 Stanford faculty members and hundreds of the brightest fellows and students in the country. Members focus on diverse topics in cardiovascular biology and disease, including: utilizing endogenous repair systems to heal damaged heart tissue; elucidating the complexities of immunology to eliminate organ rejection; remodeling the heart and vasculature with novel surgical techniques; embracing personal genomes and exploring every detail of human genetics to utilize this coded information in clinical decisions; applying cell-based approaches to therapy; and promoting innovative methods of delivering factors that reverse the harmful consequences of aging. As the 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.

The strength of our Institute comes from our talented students and postdoctoral and clinical fellows. We make their training and professional development a top priority, ensuring that they pursue funding opportunities, offering grant writing support through courses like “Tackling your K” and “Rolling into your R,” and providing a junior faculty mentorship program. We are committed to providing the best infrastructure to promote the growth and curiosity of all of our trainees, and to that end we appreciate the generous endowment of the Dorothy Dee and Marjorie Helene Boring Trust, which supports Stanford students dedicated to cardiovascular research. The late Dr. Cohen has provided generous donations for the Lawrence H. and Roberta Cohen Lectureship, led by Y. Joseph Woo, MD, as a tribute to Dr. Norman Shumway's pioneering work in cardiovascular medicine. In partnership with the Child Health Research Institute and the Steven M. Gootter Foundation, the Institute awarded twelve seed awards this autumn to ignite inventive projects that are otherwise considered too risky by most funding agencies, but that are just right for Stanford's innovative spirit.



At the heart of our mission is the integration and communication of top-level research. We have invested great effort into the Frontiers of Cardiovascular Science seminar series, which facilitates the promulgation of groundbreaking cardiovascular biology from global leaders in the field. Our invited speakers for these seminars are extraordinary scientists who are transforming cardiovascular research and clinical practice. In 2017, we also hosted leaders from major Chinese hospitals and Dr. Victor Dzau, President of the National Academy of Medicine, to discuss the current advances in cardiovascular medicine and innovation in both continents during our two-day Stanford-China Cardiovascular Symposium in September. For 2018, we look forward to bringing our community together for two outstanding conferences. In April, we will host the 3rd Annual Stanford Drug Discovery Conference featuring presentations from leading academic researchers, titans of the pharmaceutical and biotechnology industries, and federal and foundation policy makers. Later in the year, we will partner with the Duke Cardiovascular Institute to explore the latest research in a joint Symposium. These events will generate unparalleled networking opportunities for our trainees, spur international collaborations, and accelerate scientific advances.

Much work remains ahead of us in these exciting times for ground-breaking research, and I am confident that the CVI will continue to play a vital and leading role in the advances to come.

A handwritten signature in black ink, appearing to read 'J. C. Wu', with a long horizontal line extending to the right.

Joseph C. Wu, MD, PhD





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



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



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



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



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



**Michael Snyder, PhD**  
Professor and Chair, Dept. of Genetics  
Director, Stanford Center for Genomics  
and Personalized Medicine



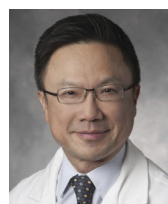
**Kenneth Mahaffey, MD**  
Professor, Dept. of Medicine  
Vice Chair of Medicine  
for Clinical Research



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



**Mark Nicolls, MD**  
Professor of Pulmonary and Critical Care  
Medicine, Dept. of Medicine, Chief, Pulmo-  
nary and Critical Care Medicine



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



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



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



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



# Executive Committee

The Stanford Cardiovascular Institute Executive Committee oversees Cardiovascular Institute operations. Its members represent cardiovascular research, education, and clinical care, ensuring that the Cardiovascular Institute remains the home for cardiovascular health at Stanford. The committee is comprised of the Director and Associate Directors in different disciplines as listed below.

Basic Research

**Marlene Rabinovitch, MD**  
**Mark Nicolls, MD**

Cardiothoracic Surgery

**Joseph Woo, MD**

Cardiovascular Imaging

**Dominik Fleischmann, MD**  
**Michael V. McConnell, MD, MSEE**

Clinical Research

**William Fearon, MD**  
**Kenneth W. Mahaffey, MD**

Cardiovascular Medicine

**Alan C. Yeung, MD**  
**Thomas Quertermous, MD**

Education and Training

**Daniel Bernstein, MD**

Finance and Administration

**Jason Irwin, MBA**

Innovation

**Paul Yock, MD**

Outcome & Prevention

**Mark Hlatky, MD**  
**Marcia Stefanick, PhD**  
**Paul A. Heidenreich, MD, MS**

Translational Research

**Philip S. Tsao, PhD**  
**Sean M. Wu, MD, PhD**

Vascular Surgery

**Ronald L. Dalman, MD**

Junior Faculty Development

**Edda Spiekerkoetter, MD**

# Steering Committee

The CVI Steering Committee is responsible for providing guidance on the overall strategic direction of the institute. This advisory committee, which includes representatives from the major areas of cardiovascular disease research and clinical care, provides support, guidance and oversight of progress on CVI objectives and initiatives.

**Joseph C. Wu, MD, PhD**

**Euan A. Ashley, MRCP, DPhil**

**Daniel Bernstein, MD**

**Michael D. Dake, MD**

**Ronald L. Dalman, MD**

**Alexander Dunn, PhD**

**William Fearon, MD**

**Dominik Fleischmann, MD**

**Francois Haddad, MD**

**Robert A. Harrington, MD**

**Sarah Heilshorn, PhD**

**Paul A. Heidenreich, MD, MS**

**Mark Hlatky, MD**

**Ngan F. Huang, PhD**

**Joshua W. Knowles, MD, PhD**

**Brian Kobilka, MD**

**Mark A. Krasnow, MD, PhD**

**Nicholas Leeper, MD**

**David Liang, MD, PhD**

**Kenneth W. Mahaffey, MD**

**Michael V. McConnell, MD, MSEE**

**Daria Mochly-Rosen, PhD**

**Philip E. Oyer, MD**

**Thomas Quertermous, MD**

**Marlene Rabinovitch, MD**

**Jayakumar Rajadas, PhD**

**James Spudich, PhD**

**Marcia Stefanick, PhD**

**Jennifer A. Tremmel, MD, MS**

**Philip S. Tsao, PhD**

**Minang ‘Mintu’ Turakhia, MD, MAS**

**Paul J. Utz, MD**

**Paul J. Wang, MD**

**Y. Joseph Woo, MD**

**Sean M. Wu, MD, PhD**

**Phillip C. Yang, MD**

**Alan C. Yeung, MD**

**Paul Yock, MD**



# Education & Training Committee

The Cardiovascular Institute Education and Training Committee oversees and defines the educational goals of the Cardiovascular Institute. The committee reflects multiple specialties of cardiovascular medicine and research, including surgery, pulmonary, development, genomics and engineering. The Institute strives to provide students and fellows with an atmosphere of growth and mentorship throughout their careers at Stanford.

**Euan A. Ashley, MCRP, DPhil**

Professor of Medicine (Cardiovascular), of Genetics and, by courtesy, of Pathology

**Daniel Bernstein, MD**

Alfred Woodley Salter and Mabel Smith Salter Endowed Professor in Pediatrics

**Crystal Botham, PhD**

Director of Strategic Research Development, Medicine - Med/Cardiovascular Medicine

**Terra Coakley**

Program Manager, Center for Inherited Cardiovascular Disease, Division of Cardiovascular Medicine

**Ronald Dalman, MD**

Walter Clifford Chidester and Elsa Rooney Chidester Professor of Surgery, Division of Vascular Surgery

**Alexander Dunn, PhD**

Associate Professor of Chemical Engineering

**Michael Fischbein, MD, PhD**

Associate Professor of Cardiothoracic Surgery (Adult Cardiac Surgery)

**Francois Haddad, MD**

Clinical Associate Professor, Medicine - Cardiovascular Medicine

**Nicholas Leeper, MD**

Associate Professor of Surgery (Vascular Surgery) and Medicine (Cardiovascular Medicine)

**Patricia Nguyen, MD**

Assistant Professor of Medicine (Cardiovascular Medicine) at the Palo Alto Veterans Affairs Health Care System

**Marlene Rabinovitch, MD**

Dwight and Vera Dunlevie Professor in Pediatric Cardiology

**Michal Bental Roof, PhD**

Academic and Research Program Officer, Pediatric Cardiology and Stanford Cardiovascular Institute

**Marcia Stefanick, PhD**

Professor (Research) of Medicine (Stanford Prevention Research Center) and of Obstetrics and Gynecology

**Philip Tsao, PhD**

Professor (Research) of Medicine (Cardiovascular Medicine)

**PJ Utz, MD**

Professor of Medicine (Immunology And Rheumatology)

**Paul J. Wang, MD**

Professor of Medicine (Cardiovascular Medicine) and, by Courtesy, of Bioengineering

**Joseph C. Wu, MD, PhD**

Simon H. Stertz, MD Professor of Medicine (Cardiovascular) and of Radiology

**Sean M. Wu, MD, PhD**

Associate Professor of Medicine (Cardiovascular Medicine) and, by Courtesy, of Pediatrics

# Scientific Advisory Board



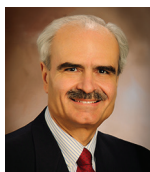
**C. Noel Bairey Merz, MD, FACC, FAHA**

Women's Guild Endowed Chair in Women's Health  
Director, Barbra Streisand Women's Heart Center  
Director, Preventive Cardiac Center  
Professor of Medicine  
Cedars-Sinai Medical Center



**Joseph Loscalzo, MD, PhD**

Chair, Department of Medicine  
Brigham and Women's Hospital  
Hersey Professor of the Theory and Practice  
of Medicine, Harvard Medical School



**Roberto Bolli MD, FAHA**

Professor of Medicine, Physiology and Biophysics  
Director, Institute of Molecular Cardiology  
Chief, Division of Cardiovascular Medicine  
Vice Chair for Research  
University of Louisville  
Editor-in-Chief, Circulation Research



**Eric Olson, PhD**

Annie and Willie Nelson Professor in Stem  
Cell Research, Pogue Distinguished Chair in  
Research on Cardiac Birth Defects, Robert A.  
Welch Distinguished Chair in Science  
UT Southwestern Medical Center



**Michael Bristow, MD, PhD**

Professor of Medicine, University of Colorado  
CEO, Arca Biopharma



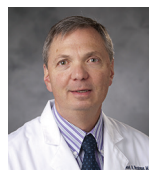
**Robert C. Robbins, MD**

President, University of Arizona



**Victor J. Dzau, MD**

President, National Academy of Medicine  
Chancellor Emeritus and James B. Duke Profes-  
sor of Medicine,  
Duke University



**Howard Rockman, MD**

Edward S. Orgain Professor of Cardiology  
Professor in Molecular Genetics, Microbiology,  
and Cell Biology  
Duke University School of Medicine  
Editor, JCI Insight



**Jonathan Epstein, MD**

William Wikoff Smith Professor of Medicine  
Executive Vice Dean and Chief Scientific Officer,  
Penn Medicine  
Scientific Director, Penn Cardiovascular Institute  
University of Pennsylvania



**Eric J. Topol, MD**

Director, Scripps Translational Science Institute  
Chief Academic Officer, Scripps Health  
Gary and Mary West Endowed Chair of Innovative  
Medicine  
The Scripps Research Institute



**Judith S. Hochman, MD**

Senior Associate Dean for Clinical Sciences  
Co-Director, NYU-HHC Clinical and Translation-  
al Science Institute  
Harold Snyder Family Professor and Associate  
Director of Cardiology  
New York University School of Medicine



**Clyde Yancy, MD**

Vice Dean for Diversity and Inclusion  
Magerstadt Professor of Medicine  
Chief, Division of Cardiology  
Northwestern University Feinberg School of Medicine  
Associate Director, Bluhm Cardiovascular Institute  
Northwestern Memorial Hospital



**Leslie Leinwand, PhD**

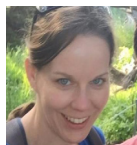
Chief Scientific Officer, BioFrontiers Institute  
Professor, Department of Molecular  
Cellular and Developmental Biology  
University of Colorado



# CVI Staff



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Director of Finance and Administration  
jason.irwin@stanford.edu



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Senior Researcher/Writer  
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**Aruna Krishnan, PhD**  
Senior Research Scientist  
akrish@stanford.edu



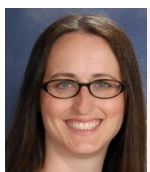
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Program Manager  
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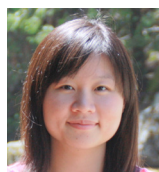
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Clinical Trials Manager  
efinn@stanford.edu



**Hoa Ly**  
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**Michal Bental Roof, PhD**  
Academic and Research Program Officer  
mroof@stanford.edu



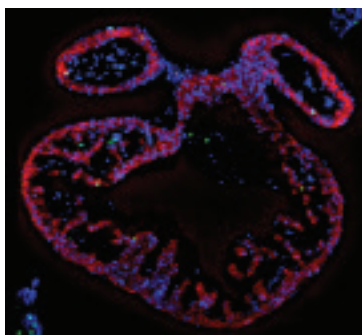
**Danielle deLeon**  
Web Manager  
ddeleon@stanford.edu

# Research Disciplines

The Stanford Cardiovascular Institute (CVI) provides a home for cardiovascular research across the Stanford campus. As a center of intellectual and scientific activity, the CVI provides resources to its members to stimulate discovery, translation, and implementation of new treatments, diagnostics, and preventive medicine.

## BIOENGINEERING:

Alexander Dunn, PhD  
Sarah Heilshorn, PhD  
Ngan F. Huang, PhD  
Ellen Kuhl, PhD  
Nick Melosh, PhD  
Ada Poon, PhD  
Beth Pruitt, PhD  
Stephen Quake, DPhil  
Fan Yang, PhD  
Peter Yang, PhD  
Richard Zare, PhD



## BIOMARKERS:

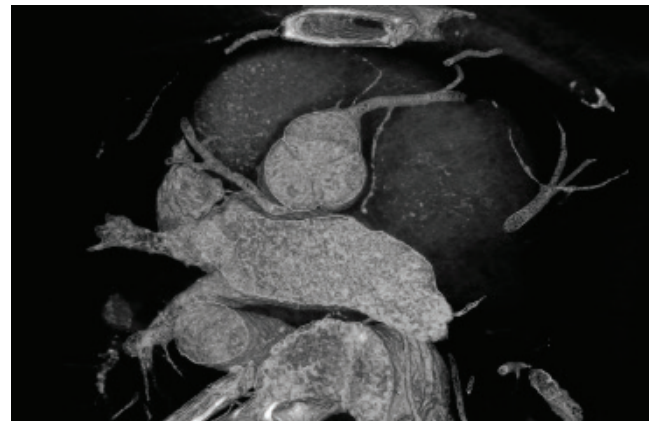
Themistocles Assimes, MD, PhD  
Mark M. Davis, PhD  
Francois Haddad, MD  
Holden Maecker, PhD  
Stanley G. Rockson, MD  
Paul J. Utz, MD  
Cornelia M. Weyand, MD, PhD

## CARDIOVASCULAR IMAGING:

Rajesh Dash, MD, PhD  
Dominik Fleischmann, MD  
Sanjiv 'Sam' Gambhir, MD, PhD  
Craig Levin, PhD  
Koen Nieman, MD, PhD  
Patricia K. Nguyen, MD  
Joseph C. Wu, MD, PhD  
Phillip C. Yang, MD

## CELLULAR & MOLECULAR BIOLOGY:

Alexander Dunn, PhD  
Michael Kapiloff, MD, PhD  
Brian Kobilka, MD  
Matthew Porteus, MD  
James Spudich, PhD



## CLINICAL (ADULT):

Michael D. Dake, MD  
William Fearon, MD  
Michael Fischbein, MD, PhD  
Robert A. Harrington, MD  
Sharon Hunt, MD  
Anson M. Lee, MD  
David Lee, MD  
George Lui, MD  
Kenneth W. Mahaffey, MD  
David J. Maron, MD  
Philip E. Oyer, MD  
Latha Palaniappan, MD, MS  
Stanley G. Rockson, MD  
Paul J. Wang, MD  
Ronald Witteles, MD  
Y. Joseph Woo, MD  
Alan C. Yeung, MD

## CLINICAL (PEDIATRICS):

Daniel Bernstein, MD  
Anne Dubin, MD  
Frank Hanley, MD  
David Rosenthal, MD  
Stephen J. Roth, MD, MPH



# Research Disciplines cont.

## **DEVELOPMENTAL BIOLOGY:**

---

Daniel Bernstein, MD  
Gerald R. Crabtree, MD  
Mark A. Krasnow, MD, PhD  
Mark Mercola, MD  
Sean M. Wu, MD, PhD

## **GENOMICS & BIOINFORMATICS:**

---

Russ B. Altman, MD, PhD  
Themistocles Assimes, MD, PhD  
Euan A. Ashley, MRCP, DPhil  
Carlos Bustamante, PhD  
Joshua W. Knowles, MD, PhD  
Thomas Quertermous, MD  
Michael Snyder, PhD

## **ION CHANNELS & ARRHYTHMIAS:**

---

Bianxiao Cui, PhD  
Merritt Maduke, PhD  
Paul J. Wang, MD  
Minang 'Mintu' Turakhia, MD, MAS

## **INNOVATION:**

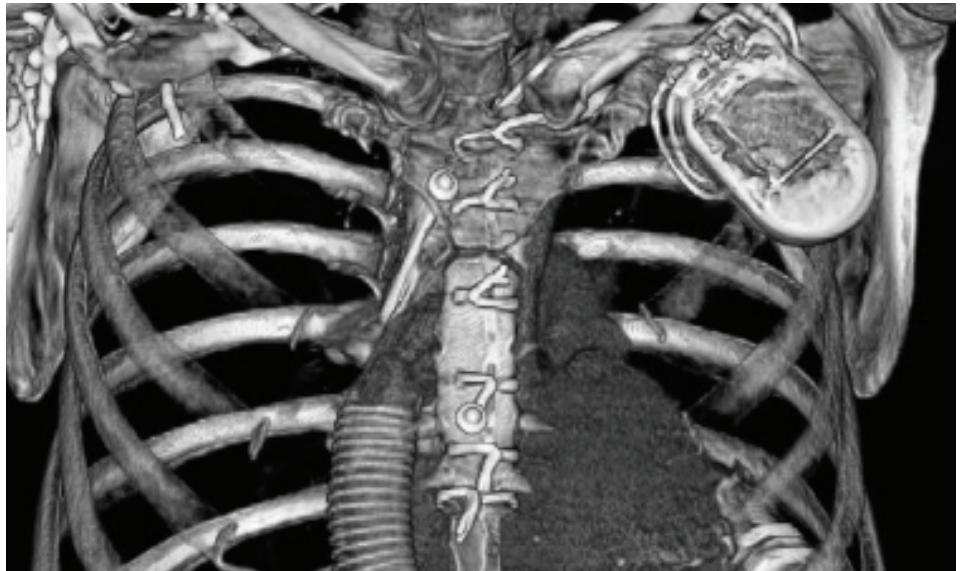
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Todd Brinton, MD  
Peter J. Fitzgerald, MD, PhD  
Yasuhiro Honda, MD  
Jayakumar Rajadas, PhD  
Daria Mochly-Rosen, PhD  
Paul Yock, MD

## **METABOLIC DISEASES:**

---

Brian Feldman, MD  
Fred Kraemer, MD  
Thomas Quertermous, MD  
Gerald Reaven, MD



## **OUTCOMES & PREVENTION:**

---

Themistocles Assimes, MD, PhD  
Glenn Chertow, MD, PhD  
Victor Froelicher, MD  
Christopher Gardner, PhD  
Robert A. Harrington, MD  
Paul Heidenrich, MD, MS  
Mark Hlatky, MD  
John P. A. Ioannidis, MD, DSc  
Kenneth W. Mahaffey, MD  
David J. Maron, MD  
Jonathan Myers, PhD  
Marcia L. Stefanick, PhD  
Minang 'Mintu' Turakhia, MD, MAS

## **PULMONARY BIOLOGY:**

---

Vinicio A. de Jesus Perez, MD  
Mark A. Krasnow, MD, PhD  
Mark R. Nicolls, MD  
Marlene Rabinovitch, MD

## **STEM CELL BIOLOGY:**

---

Helen M. Blau, PhD  
Michael Longaker, MD  
Mark Mercola, MD  
Irving Weissman, MD  
Y. Joseph Woo, MD  
Joseph C. Wu, MD, PhD  
Sean M. Wu, MD, PhD  
Phillip C. Yang, MD

## **VASCULAR BIOLOGY:**

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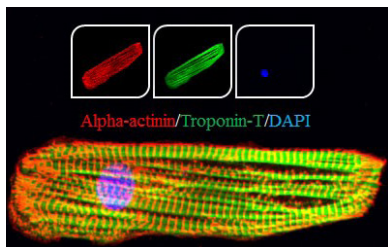
Ronald L. Dalman, MD  
Calvin Kuo, MD, PhD  
Jason T. Lee, MD  
Nicholas Leeper, MD  
Stanley G. Rockson, MD  
Philip S. Tsao, PhD

## **WOMEN'S HEALTH:**

---

Kiran Khush, MD  
Marcia L. Stefanick, PhD  
Jennifer A. Tremmel, MD, MS

## Stanford CVI Human iPSC Biobank Service



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

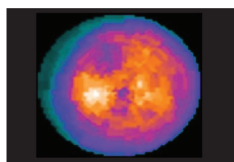
To facilitate research in a dish that allows screening of new compounds or characterization of human disease phenotypes using cardiomyocytes, the Institute created a service by which de-identified peripheral blood mononuclear cell (PBMC) samples from selected patients can be sent to Stanford CVI for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

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

Stanford iPSC Biobank was recently mentioned in Nature Methods news: [nature.com/nmeth/journal/v12/n2/full/nmeth.3263.html](http://nature.com/nmeth/journal/v12/n2/full/nmeth.3263.html).

**Contact: Joseph Wu, MD, PhD** / [joewu@stanford.edu](mailto:joewu@stanford.edu)  
or Biobank manager, **Yan Zhuge** / [yanzhuge@stanford.edu](mailto:yanzhuge@stanford.edu) with any questions.

## Clinical Biomarker & Phenotyping Core Lab (BPCL)



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

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

**Contact: Francois Haddad, MD** / [fhaddad@stanford.edu](mailto:fhaddad@stanford.edu)

## CVI Clinical Trials Core

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

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

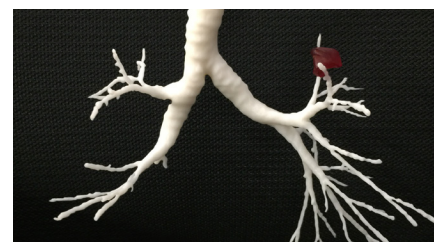
**Contact: Ed Finn**, Clinical Trials Manager or **Hoa Ly**, Clinical Research Coordinator at (650) 498-6279



## Cardiovascular Pharmacology (BioADD)

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

**Contact: Jayakumar Rajadas, PhD**  
[jayraja@stanford.edu](mailto:jayraja@stanford.edu)



## 3DQ Imaging Laboratory

Stanford's 3DQ Imaging Laboratory develops new approaches to exploration, analysis and quantitative assessments of diagnostic images that result in new and/or more cost-effective diagnostic approaches, and new techniques for the design and monitoring of therapy. The lab processes over 1,200 clinical cases to deliver relevant visualization and analysis of medical imaging data at Stanford.

The lab is co-directed by Dominik Fleischmann, MD; Roland Bammer, PhD ;and Sandy Napel, PhD.

**Contact: Dominik Fleischmann, MD**  
[d.fleischmann@stanford.edu](mailto:d.fleischmann@stanford.edu)



# Education & Training Programs

The Stanford Cardiovascular Institute offers a unique platform to train the next generation of basic and translational scientists by exposing them to cardiovascular imaging research, mechanisms and innovations in vascular disease and myocardial biology. Mentors for the programs are drawn from members of this collaborative Institute, including faculty in medicine, materials science, bioengineering, imaging, and health research and policy.

## Multi-Disciplinary Program in Cardiovascular Imaging

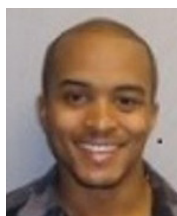
### PROGRAM DIRECTOR

Joseph C. Wu, MD, PhD

### CO-DIRECTORS

John Pauly, PhD and Koen Nieman, MD, PhD

The Multi-Disciplinary Training Program in Cardiovascular Imaging at Stanford is funded by the National Institute of Biomedical Imaging and Bioengineering of the National Institutes of Health. The program is designed to train the next generation of CV imaging investigators by exposing them to three complementary areas – clinical, engineering, and molecular imaging. The program trains a total of four fellows in three complementary areas: Clinical, Engineering, Molecular Imaging. With the impact of cardiovascular disease on US and world health and the rapid advances in imaging technologies and cardiovascular biology, it is critical that fellows be provided a broad, multi-disciplinary, and collaborative training program to foster their ability to translate CV imaging research into clinical applications. The twenty-one faculty mentors are a critical component of the program, with a balance of MD and PhD mentors across the core collaborative departments.



### ADAM BUSH, PHD

**Project:** Cardiovascular Blood Oxygenation and flow MRI in Congenital Heart Disease Detection



### DAVID T. PAIK, PHD

**Project:** To determine the effects of low-dose radiation on cellular responses in patients undergoing cardiac CTA; and determine novel gene expression signatures for radiosensitivity in response to low dose radiation.



### NICOLE DE JESUS, PHD

**Project:** Tools for mending broken hearts: non-invasive imaging assessing stemcell based therapy for treatment post myocardial infarction and heart failure.



### PRIYANKA GARG, PHD

**Project:** Elucidating Pathogenicity of a Novel Variant of Unknown Significance in LQTS Using-Genome-Editing and Patient-Specific iPSCs

# Education & Training Programs

## Mechanisms and Innovation in Vascular Disease

### PROGRAM DIRECTOR

Ronald Dalman, MD

### CO-DIRECTOR

Philip Tsao, PhD

The Mechanisms & Innovation in Vascular Disease program trains a total of six fellows over two years through an NIH training grant in the following areas of vascular medicine & research: Vascular Reactivity & Thrombosis, Vascular Regeneration & Development, Metabolic or Lifestyle Influences on Vascular Outcomes, Proteomic Markers & Genetic Determinants of Vascular Disease, Gender & Ethnicity Differences in Vascular Disease, and Vascular Bioengineering. Twenty-nine faculty mentors from eighteen different departments within the School of Medicine and the University provide a variety of angles from which to address fundamental questions about vascular disease.

*Courtesy of Daniel Bernstein, MD*



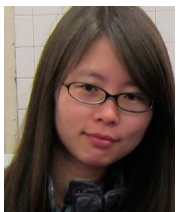
### DANIELLE NAGELBERG, PHD

**Project:** Role of Ino80 in coronary artery development through regulation of endothelial metabolic states.



### PATRICK THOMPSON, MD

**Project:** Innovation in medical devices and technology that address important unmet healthcare needs: developing health technology to transform patient care.



### JIN QIAN, MD, PHD

**Project:** Development of PAH by progressive infiltration of activated macrophages that secrete LTB4 in the lung and mediate vascular remodeling.



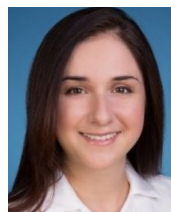
### ABBYGAIL FOSTER, PHD

**Project:** The use of biomaterials to probe cell interactions and modulate cell function with the goal of translating insights to clinically relevant regenerative cardiovascular therapies.



### AMBER SMITH, PHD

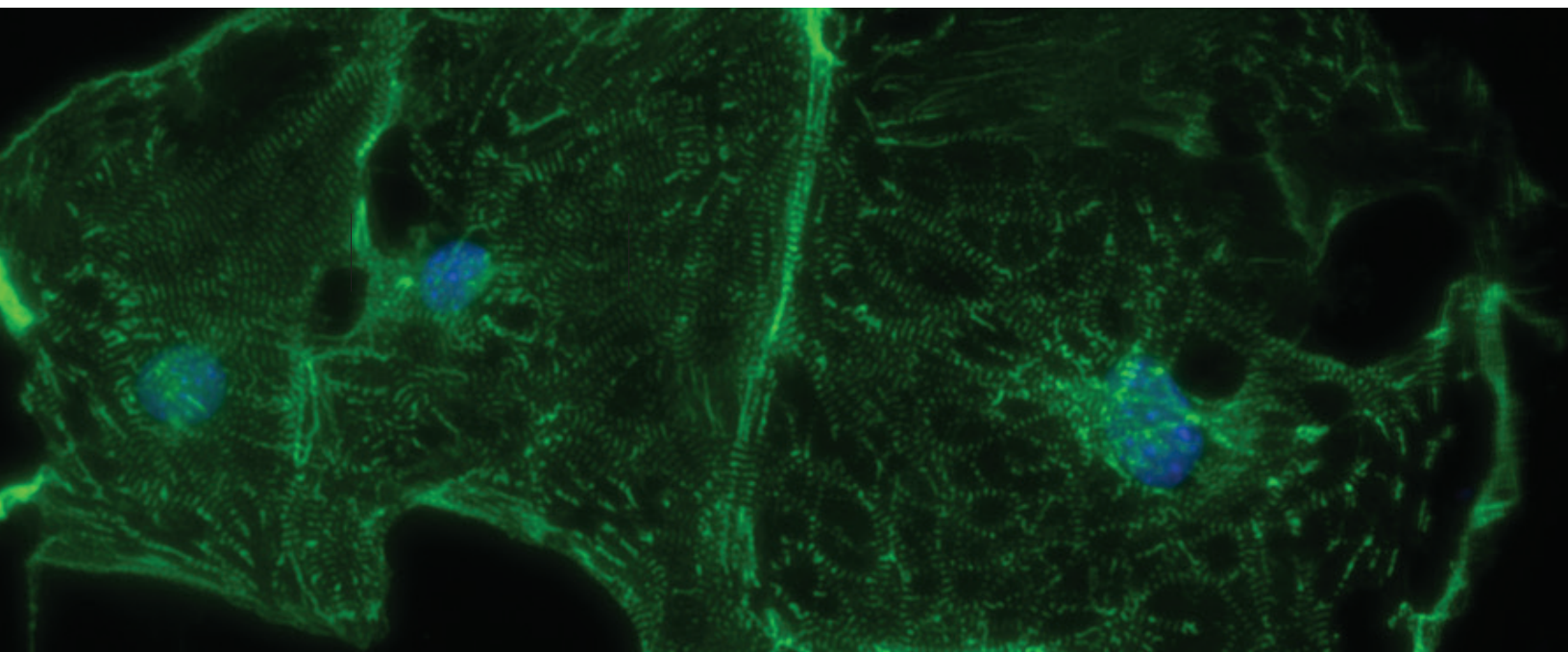
**Project:** Exploration of hysteresis during miR-126-mediated lymphangiogenesis; and exploration of miR-126 hysteresis in blood endothelial cells.



### SHEEVA RAJAEI, MD

**Project:** A mendelain randomization study of breast feeding duration and the risk of adverse cardiometabolic traits and outcomes.

# Education & Training Programs



## Research Training in Myocardial Biology

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### PROGRAM DIRECTOR

Daniel Bernstein, MD

### CO-DIRECTOR

Tom Quertermous, MD

### TRAINING COORDINATOR

Euan Ashley, MRCP, DPhil

Myocardial biologists at Stanford are found in diverse departments and divisions, providing a natural vehicle for multidisciplinary training. This program is funded by the National Institutes of Health to bring together post-doctoral fellows and faculty from six complementary areas – genetics and genomics, cellular signaling and molecular imaging, physiology and cardiac development and regeneration, outcomes research and population science.



### SHARON PAIGE, MD

**Project:** In vitro modeling of congenital heart disease using cardiac chamber specific reporters in patient-derived induced pluripotent stem cells



### WILLIAM GOODYER, MD

**Project:** Elucidation of the development and regenerative capacity of the cardiac conduction system



### ALISON SCHROER, PHD

**Project:** Enrichment of mature human induced pluripotent stem cell-derived cardiomyocytes



### CHI KEUNG LAM, PHD

**Project:** Dissecting the pathogenesis of pre-senilin-2 mutation in dilated cardiomyopathy and arrhythmia

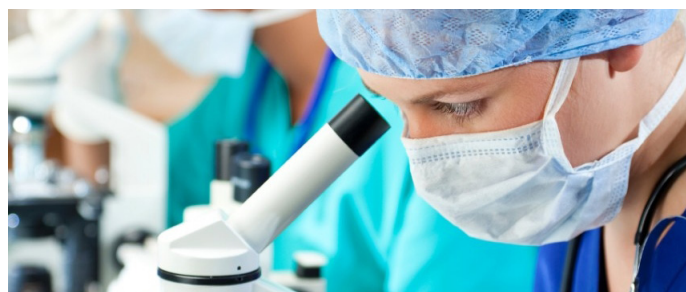
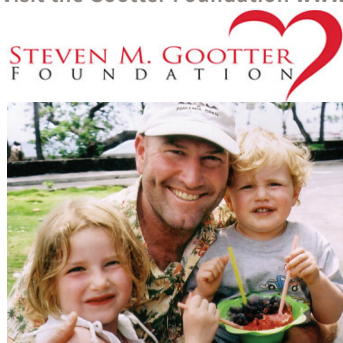


# The Impact of Philanthropy

## Sudden Cardiac Death

The support from the Steven M. Gootter Foundation upport allows seed funding of research projects that advance current knowledge of sudden cardiac death (SCD) such as development of molecular tests that can identify genetic mutations associated with SCD. Hypertrophic cardiomyopathy, in which a portion of the myocardium is thickened, is the most common cause of sudden death in the United States. The Foundation supported the 2016 Stanford Biodesign New Arrhythmia Technologies Conference and will fund research projects in the upcoming years.

Visit the Gootter Foundation [www.stevenmgootterfoundation.org](http://www.stevenmgootterfoundation.org)



## Education

Through a generous \$2.2 million gift from the Dorothy Dee and Marjorie Helene Boring family, the Stanford Cardiovascular Institute awards medical students with demonstrated excellence and dedication to cardiovascular medicine at Stanford.

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“We are very grateful for this generous endowment by the Boring Family Trust. Philanthropy enhances our educational mission and helps support the best and brightest young trainees within the Cardiovascular Institute.”

— Joseph C. Wu, MD, PhD, Stanford Cardiovascular Institute Director

## Lawrence H. and Roberta Cohn Lecture Series

Lawrence H. and Roberta Cohn endowed lectureship, held annually in the area of cardiovascular surgery, brings together physician-scientists from around the country to Stanford. Dr. Cohn graduated from Stanford School of Medicine in 1962 and trained under Dr. Norman Shumway. Dr. Cohn is a pioneer in the field of heart valve repair and replacement surgery and a passionate educator. David Adams, MD from Mount Sinai Hospital gave the first inaugural lecture.

**The support from our donors is critical for the Institute to provide a wide variety of programs to advance investigation of cardiovascular disease and development of innovative patient care programs. To learn more about how you can support the Stanford Cardiovascular Institute please contact:**

**Cathy Hutton, MBA**  
Senior Associate Director,  
Medical Center Development  
[cathy.hutton@stanford.edu](mailto:cathy.hutton@stanford.edu)

[cvi.stanford.edu/waystogive](http://cvi.stanford.edu/waystogive)

# CVI Seed Grants 2017-2018 (FY 2018)

The Stanford Cardiovascular Institute has provided over **\$2.7 million** in seed funding to support research in cardiovascular research and innovation since 2004. Our goal is to ignite and support new ideas that will change how we diagnosis and treat cardiovascular diseases. Together with Stanford Children's Health Institute (CHRI) and the Gootter Foundation, the CVI is excited to support research for the twelve outstanding investigators in 2017.

**JAMES PRIEST, MD**

Assistant Professor of Pediatrics (Cardiology)

Collaborator: Mads Melbye, MD, DMSc

**A Sensitized Genetic Association Study for Congenital Heart Disease** *Research Funded by CHRI*

**KIRAN KHUSH, MD**

Associate Professor of Medicine (Cardiovascular Medicine)

Collaborator: Ash Alizadeh, MD, PhD (Medicine/On-cology)

**A Genomic Approach for Early Noninvasive Detection of Post-Transplant Malignancies**

**CHRISTOPHER GARDNER, PHD**

Rehnborg Farquhar Professor of Medicine

Collaborators: Michael Snyder, PhD (Genetics) & Francois Haddad, MD (Medicine/Cardiology)

**Addressing the Obesity and Diabetes Epidemic Through Understanding Personalized Energy Expenditure** *Research Funded by CHRI*

**LAURA LAZZERONI, PHD**

Professor (Research) of Psychiatry and Behavioral Sciences and (by courtesy) of Biomedical Data Science  
Collaborator: Thomas Quertermous, MD (Medicine/Cardiology)

**Integrating MultiOmic Data in Coronary Heart Disease: A Pilot Study for New Statistical Methods**

**DOFF MCELHINNEY, MD**

Professor of Cardiothoracic Surgery (Pediatric Cardiac Surgery) and of Pediatrics (Cardiology)

**Psychosocial, Cognitive, and Quality of Life Outcomes in Children and Adults with Repaired Tetralogy of Fallot with Pulmonary Atresia and Major Aortopulmonary Collateral Arteries** *Research Funded by CHRI*

**KOEN NIEMAN, MD, PHD**

Associate Professor of Medicine (Cardiovascular Medicine) and Radiology (CV Imaging)

Collaborators: Jennifer Tremmel, MD (Medicine/Cardiology), Dominik Fleischmann, MD (Radiology)

**Computed Tomography Guided Revascularization of Chronic Coronary Occlusions**

**OSCAR ABILEZ, MD, PHD**

Instructor, Medicine (Cardiovascular Medicine)

Collaborators: Huaxiao Yang, PhD, Hung-Ta Wo, MD, Sanjiv Narayan, MD, PhD (Medicine/Cardiology)

**Early Detection of Arrhythmogenesis due to Cardiac Fibrosis via Correlation of In Vitro Modeling and Clinical Assessment** *Research Funded by the Gootter Foundation*

**JAYAKUMAR RAJADAS, PHD**

Director, BioADD, and Assistant Director of CV Pharmacology, Biomaterials & Advanced Drug Delivery

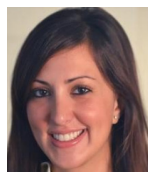
Collaborator: Rongliu Liao, PhD (Medicine/Cardiology)  
**Study of Aggregation Mechanism of Ig Light Chains from Light Chain Amyloidosis Patients**

**TARA CHANG, MD, MS**

Assistant Professor of Medicine (Nephrology)

Collaborators: Venita Chandra, MD (Surgery), Nicholas Leeper, MD (Surgery/Medicine), Maria Montez-Rath, PhD (Medicine)

**Harnessing Big Data to Reduce Peripheral Artery Disease-Related Leg Amputation in Chronic Kidney Disease**

**FATIMA RODRIGUEZ, MD, MPH**

Clinical Instructor, Medicine- Cardiovascular Medicine  
Collaborator: Rajesh Dash, MD, PhD (Medicine/Cardiology)

**Bridging the Gap: The Impact of a New Virtual Preventive Cardiology Clinic on Cardiovascular Risk Reduction in Two High Risk Ethnic Populations**

**SARAH HEILSHORN, PHD**

Associate Professor of Materials Science and Engineering and (by courtesy) of Chemical Engineering and Bioengineering

Collaborator: Joseph Woo, MD (CT Surgery)

**Stem Cell-derived Exosomes as Potential Therapy for Acute Myocardial Infarction**

**SEAN WU, MD, PHD**

Associate Professor of Medicine (Cardiovascular Medicine) and (by courtesy) of Pediatrics

Collaborator: Marlene Rabinovitch, MD (Pediatrics/Cardiology)

**A Perfusion Bioreactor for Understanding Endocardial-Myocardial Interactions in Hypoplastic Left Heart Syndrome**

## 2016-2017 (FY2017) Seed Grant Recipients

### **Wnt5A: A Master Regulator of Compensatory Angiogenesis in the Right Ventricle and Lung**

**Venicio de Jesus Perez, MD**, Assistant Professor of Medicine (Pulmonary and Critical Care Medicine)

### **Angiographic and Psychosocial Evaluation of Peripartum vs. Non-Peripartum Spontaneous Coronary Artery Dissection: A Collaborative Study**

**Katharine Edwards, MD**

**Jennifer Tremmel, MD**

Stanford Women's Heart Health

*This research was funded by CHRI*

### **Estimation of False- Lumen Pressure in Aortic Dissection using Patient- Specific Computational Fluid Dynamic Simulations**

**Dominik Fleischmann, MD**, Professor of Radiology. Collaborators: Kathrin Baeumler, PhD, Anna M. Karmann Sailer, BS, Alison L. Marsden, PhD

### **Generation of Endothelial Cells Resistant to Hyperglycemia-Induced Endothelial Cell Dysfunction**

**Eric Gross, MD**, Assistant Professor of Anesthesiology, Perioperative and Pain Medicine

### **Developing a Cardiovascular Simulator for the Cardiovascular Institute**

**Ellen Kuhl, MD**, Professor of Mechanical Engineering and, by courtesy, of Bioengineering

### **Assessing the Potential Health Risk of e-Cigarettes in Diabetes**

**Won Hee Lee, PhD**, Instructor, Cardiovascular Institute Collaborators: Kari Nadeau, PhD, Sang Ging Ong, PhD

### **Identification of Genetic Variation Determining Patient-Specific Responses to Anti-Diabetic Drugs**

**Elena Matsa, PhD**, Instructor, Cardiovascular Institute Collaborators: Kenneth Mahaffey, Michael P. Snyder, PhD

### **Predicting Cardiovascular Benefits of Anti-diabetic Drugs**

**Tracey McLaughlin, MD**, Associate Professor of Medicine (Endocrinology) Collaborators: Nazish Sayed, MD, PhD, Ian Chen, MD, PhD  
*This research was funded by CHRI*

### **Epigenetic Regulation of Cardiac Development**

**Ashby Morrison, PhD**, Assistant Professor of Biology Collaborators: Kristy Red-Horse, PhD and Will Greenleaf, PhD  
*This research was funded by CHRI*

### **Efficacy of Home-Based Cardiac Rehabilitation for Improving Clinical and Imaging Markers of Cardiovascular Health**

**Jonathan Myers, PhD**, Clinical Professor of Medicine, Palo Alto VA Collaborators: Victor Froelicher, MD, Dominik Fleischmann, MD

### **Computational Mapping to Guide Therapy In Atrial Fibrillation-**

**Sanjiv Narayan, MD**, Professor of Medicine (Cardiovascular Medicine)

### **Endothelial Dysfunction in Preeclampsia**

**Virginia Winn, MD** Associate Professor of Obstetrics and Gynecology  
*This research was funded by CHRI*

Seed grants are essential for opening doors to discovery. With this support, our investigators can pursue their boldest ideas and shift paradigms to create new treatments for cardiovascular disease. Stanford revolutionized heart treatment before, and we are poised to do it again. —Joseph Wu, MD, PhD



# iHeart Research Award

The iHeart Research award, supported by the Boring Family Trust, supports Stanford medical students excited about research solutions that impact how we treat and prevent cardiovascular diseases.



**JOETSAROOP BAGGA**  
**MD CANDIDATE**

The Role of Vascular Smooth Muscle Cell Phenotype in Coronary Artery Disease



**ANGELA ZHANG**  
**MD PHD CANDIDATE**

Using Nano Straws to Improve the Delivery of CRSIPR/CAS 9 System to Cardiomyocytes



**VERONICA TORO**  
**MD CANDIDATE**

Construction of Patient Specific Models from Angiography for CABG Surgery Planning

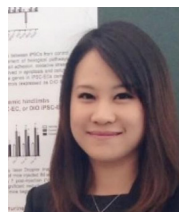


**XINYUAN LISA ZHANG**  
**MD CANDIDATE**

The Role of Epicardial-Endocardial Dissociation in Atrial Fibrillation Measured with a Novel Electrode Sensor Array with High Spatiotemporal Resolution

## Manuscript Awards 2017

Each winter, CVI recognizes the authors of outstanding publications.



Patient-Specific iPSC-Derived Endothelial Cells Uncover Pathways that Protect against Pulmonary Hypertension in BMPR2 Mutation Carriers.

**MINGXIA GU, PHD**

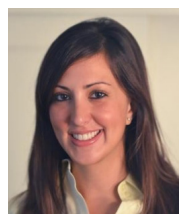
Gu M, Shao NY, Sa S, Li D, Termglinchan V, Ameen M, Karakikes I, Sosa G, Grubert F, Lee J, Cao A, Taylor S, Ma Y, Zhao Z, Chappell J, Hamid R, Austin ED, Gold JD, Wu JC, Snyder MP, Rabinovitch M. *Cell Stem Cell*. 2016 Dec 2.



Attenuated-Signal Plaque Progression Predicts Long-Term Mortality After Heart Transplantation: IVUS Assessment of Cardiac Allograft Vasculopathy.

**KOZO OKADA, MD**

Okada K, Fearon WF, Luikart H, Kitahara H, Otagiri K, Tanaka S, Kimura T, Yock PG, Fitzgerald PJ, Yeung AC, Valentine HA, Khush KK, Honda Y. *J Am Coll Cardiol*. 2016 Jul 26;68(4):382-92.



Association Between Intensity of Statin Therapy and Mortality in Patients With Atherosclerotic Cardiovascular Disease.

**FATIMA RODRIGUEZ, MD, MPH**

Rodriguez F, Maron DJ, Knowles JW, Virani SS, Lin S, Heidenreich PA. *JAMA Cardiol*. 2017 Jan 1;2(1):47-54.



Transcriptome Profiling of Patient-Specific Human iPSC-Cardiomyocytes Predicts Individual Drug Safety and Efficacy Responses In Vitro.

**ELENA MATSA, PHD**

Matsa E, Burrige PW, Yu KH, Ahrens JH, Termglinchan V, Wu H, Liu C, Shukla P, Sayed N, Churko JM, Shao N, Woo NA, Chao AS, Gold JD, Karakikes I, Snyder MP, Wu JC. *Cell Stem Cell*. 2016 Sep 1;19(3):311-25.

# Manuscript Awards 2015-16

## 2016

**Contractility of Single Cardiomyocytes Differentiated from Pluripotent Stem Cells Depends on Physiological Shape and Substrate Stiffness.**

**Alexandre J. S. Ribeiro, PhD**

Ribeiro AJ, Ang YS, Fu JD, Rivas RN, Mohamed TM, Higgs GC, Srivastava D, Pruitt BL. Proc Natl Acad Sci 2015 112(41).

**Epicardial FSTL1 Reconstitution Regenerates the Adult Mammalian Heart.**

**Ke Wei, PhD**

Wei K, Serpooshan V, Hurtado C, Diez-Cuñado M, Zhao M, Maruyama S, Zhu W, Fajardo G, Nosedá M, Nakamura K, Tian X, Liu Q, Wang A, Matsuura Y, Bushway P, Cai W, Savchenko A, Mahmoudi M, Schneider MD, van den Hoff MJ, Butte MJ, Yang PC, Walsh K, Zhou B, Bernstein D, Mercola M, Ruiz-Lozano P. Nature 525, 479–485.

**Epigenetic Regulation of Phosphodiesterases 2A and 3A Underlies Compromised Beta Adrenergic Signaling in an iPSC Model of Dilated Cardiomyopathy.**

**Haodi Wu, PhD**

Wu H, Lee J, Vincent LG, Wang Q, Gu M, Lan F, Churko JM, Sallam KI, Matsa E, Sharma A, Gold JD, Engler AJ, Xiang YK, Bers DM, Wu JC. Cell Stem Cell 17, 89–100.

**The Prognostic Value of Residual Coronary Stenoses After Functionally Complete Revascularization.**

**Yuhei Kobayashi MD**

Kobayashi Y, Nam CW, Tonino PA, Kimura T, De Bruyne B, Pijls NH, Fearon WF; FAME Study Investigators. J Am Coll Cardiol. 2016;67(14).

## 2015

**miR-24 Limits Aortic Vascular Inflammation and Murine Abdominal Aneurysm Development.**

**Joshua Spin, MD**

Maegdefessel L, Spin J, Raaz U, Eken SM, Toh R, Azuma J, Adam M, Nakagami F, Heymann HM, Chernogubova E, Jin H, Roy J, Hultgren R, Caidahl K, Schrepfer S, Hamsten A, Eriksson P, McConnell MV, Dalman RL, Tsao PS. Nat Commun 2014 Oct 31;5:5214.

**A Long Noncoding RNA Protects the Heart from Pathological Hypertrophy.**

**Pei Han, PhD**

Han P, Li W, Lin CH, Yang J, Shang C, Nurnberg ST, Jin KK, Xu W, Lin CY, Lin CJ, Xiong Y, Chien HC, Zhou B, Ashley E, Bernstein D, Chen PS, Chen HS, Quertermous T, Chang CP. Nature. 2014 Oct 2;514(7520):102-6.

**Human Induced Pluripotent Stem Cell-Derived Cardiomyocytes as an in vitro Model for Coxsackievirus B3-Induced Myocarditis and Antiviral Drug Screening Platform.**

**Arun Sharma, PhD**

Sharma A, Marceau C, Hamaguchi R, Burrridge PW, Rajarajan K, Churko JM, Wu H, Sallam KI, Matsa E, Sturzu AC, Che Y, Ebert A, Diecke S, Liang P, Red-Horse K, Carette JE, Wu SM, Wu JC. Circ Res. 2014 Aug 29;115(6):556-66.

**Characterization of the Molecular Mechanisms Underlying Increased Ischemic Damage in the Aldehyde Dehydrogenase 2 Genetic Polymorphism Using a Human Induced Pluripotent Stem Cell Model System.**

**Antje Ebert, PhD**

Ebert A, Kodo K, Liang P, Wu H, Huber BC, Riegler J, Churko J, Lee J, de Almeida P, Lan F, Diecke S, Burrridge PW, Gold JD, Mochly-Rosen D, Wu JC. Sci Transl Med. 2014 Sep 24;6(255):255ra130.

# Frontiers in Cardiovascular Science

The Frontiers in Cardiovascular Science lecture series is the flagship colloquium of the Stanford Cardiovascular Institute. Distinguished local, national and international scientists performing cutting-edge cardiovascular research (in both industry and academia) are invited to present their research and network with the CVI community. By convening thought leaders in cardiovascular science, this seminar series facilitates the initiation of new collaborations and accelerates science at Stanford.

**January 9, 2018**

**JENNIFER VAN EYK, PHD**

Director, Advanced Clinical Biosystems Institute in the Department of Biomedical Sciences; Director, Basic Science Research in the Women's Heart Center; Erika J. Glazer Chair in Women's Heart Health Cedars Sinai

**January 16, 2018**

**ERIK INGELSSON, MD**

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

**January 23, 2018**

**JAMES F. MARTIN, MD, PHD**

Professor, Vivian L. Smith Chair in Regenerative Medicine  
Baylor College of Medicine

**January 30, 2018**

**ALISON L. MARSDEN, PHD**

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

**February 6, 2018**

**(1:30 p.m., Munzer Auditorium)**

**BRIAN BLACK, PHD**

Professor, Cardiovascular Research Institute, Department of Biochemistry and Biophysics, UCSF

**February 13, 2018**

**WALTER J. KOCH, PHD**

William Wikoff Smith Endowed Chair in Cardiovascular Medicine; Professor and Chair, Pharmacology, Temple University

**February 20, 2018**

**KAJIMURA SHINGO, PHD**

Associate Professor, Department of Cell and Tissue Biology UCSF

**March 6, 2018**

**The Steven M Gootter Foundation Lecture**

**MARK E. ANDERSON, MD, PHD**

William Osler Professor of Medicine; Chair, Department of Medicine, Johns Hopkins University

**March 13, 2018**

**KAM W. LEONG, PHD**

Samuel Y. Sheng Professor; EiC, Biomaterials; Department of Biomedical Engineering, Columbia University

**March 20, 2018**

**RICHARD SCHELLER, PHD**

Chief Science Officer & Head of Therapeutics, 23andme

**March 27, 2018**

**SARAH C. HEILSHORN, PHD**

Associate Professor, Materials Science & Engineering, Stanford

**April 10, 2018**

**THOMAS M. VONDRISKA, PHD**

Professor of Anesthesiology, Medicine and Physiology, UCLA

**April 17, 2018**

**PEIPEI PING, PHD**

Professor, Physiology; Professor, Medicine/ Cardiology, and Bioinformatics, UCLA; Director, NIH BD2K Center of Excellence at UCLA; Director, NIH BD2K Centers-Coordination Center at UCLA

**May 1, 2018**

**GEOFFREY PITT, MD, PHD**

Director of the Cardiovascular Research Institute; The Ida and Theo Rossi Distinguished Professor of Medicine, Weill Cornell Medical College

**May 8, 2018**

**ROBERT J. GROPLER, MD**

Professor of Radiology, Medicine and Biomedical Engineering  
Senior Vice-Chair and Division Director Radiological Sciences &  
Chief, Cardiovascular Imaging Laboratory  
Washington University School of Medicine

**May 15, 2018**

**BRADFORD C. BERK, MD, PHD**

Distinguished University Professor in Medicine,  
Neurology, Pathology, and Pharmacology & Physiology  
Director, University of Rochester Neurorestoration Institute  
University of Rochester Medical Center

**May 22, 2018**

**PETER LIBBY, MD**

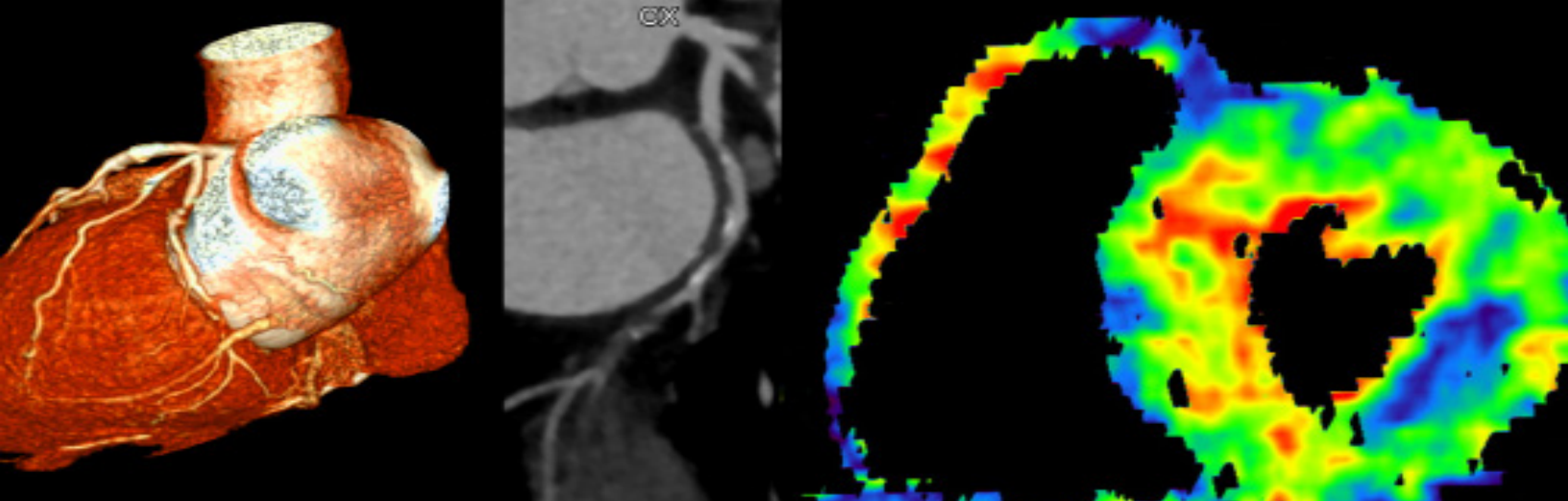
Mallinckrodt Professor of Medicine, Harvard Medical School  
Senior Physician, Brigham and Women's Hospital

**June 5, 2018**

**CHRISTINE MUMMERY, PHD**

Professor of Developmental Biology, Chair Dept. of Anatomy & Embryology, Leiden University Medical Center





# MED 223: Cardiovascular Research & Medicine

Winter 2018

The focus of MED223 is to fine tune critical thinking skills by analyzing original publications and understand the current complexities of the cardiovascular system.

*Directors: Patricia Ngyuen, MD; Themistocles L. Assimes, MD, PhD; Ioannis Karakikes, PhD; Ngan Huang, PhD*

## January 11, 2018

**KIRAN K. KHUSH, MD, MAS**

Associate Professor of Medicine, Cardiovascular Medicine

## January 18, 2018

**SIDDHARTHA JAISWAL, MD, PhD**

Assistant Professor of Pathology

## January 25, 2018

**OLIVER O. AALAMI, MD**

Clinical Associate Professor of Surgery, Vascular Surgery

## February 1, 2018

**JOSHUA W. KNOWLES, MD, PHD**

Assistant Professor of Medicine, Cardiovascular Medicine

## February 8, 2018

**ALEXANDER DUNN, PHD**

Associate Professor of Chemical Engineering

## February 15, 2018

**MICHAEL SNYDER, PHD**

Stanford W. Ascherman, MD, FACS, Professor in Genetics  
Chair, Department of Genetics

## February 22, 2018

**JAMES R. PRIEST, MD**

Assistant Professor of Pediatrics, Cardiology

## March 1, 2018

**SANJIV NARAYAN, MD**

Professor of Medicine, Cardiovascular Medicine

## March 8, 2018

**RONGLIH LIAO, PHD**

Professor of Medicine, Cardiovascular Medicine

## March 15, 2018

**NICHOLAS J. LEEPER, MD**

Associate Professor of Surgery, Vascular Surgery and  
Associate Professor of Medicine, Cardiovascular Medicine  
Chair, Department of Genetics



## RESEARCHER PROFILES



**Dr. Norman Shumway, a pioneering cardiothoracic surgeon at Stanford, performed the first successful heart transplant in the US in 1968.**

Credit: Jose Mercado / Stanford News Service





## Christopher Almond, MD

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

EMAIL [calmond@stanford.edu](mailto:calmond@stanford.edu)

PROFILE [med.stanford.edu/profiles/Christopher-Almond](http://med.stanford.edu/profiles/Christopher-Almond)

### EDUCATION/TRAINING

MD University of Connecticut

#### INTERNSHIP

Boston Children's Hospital (Combined  
Residency in Pediatrics) (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 multicenter 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 multicenter 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. pii: S1053-2498(17)31799-0.

Temporary Circulatory Support in U.S. Children Awaiting Heart Transplantation. Yarlaga 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. pii: S1053-2498(17)31728-X.

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. pii: S1053-2498(17)31801-6.





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

### EDUCATION/TRAINING

MD Stanford University

PhD University of Chicago

PhD Stanford University

BOARD CERTIFICATION Diplomate, ABIM

### RESEARCH FOCUS

Bioengineering, genetics, molecular level drug response

### HONORS & AWARDS

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

Advisor, Vanderbilt University Medical School (2014 - Present)

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

Member, FDA Commissioner Science Board (2011 - 2014)

Co-Organizer, Pacific Symposium on Biocomputing ([psb.stanford.edu](http://psb.stanford.edu)) (1995 - Present)

### CURRENT RESEARCH

I am interested in the application of computational technologies to problems in molecular biology of relevance to medicine. In particular, my laboratory focuses on drug response at the molecular level, working in three areas. First, we are building a comprehensive pharmacogenomics knowledge base (<http://www.pharmgkb.org/>) that provides access to information relating genotype to phenotype (in particular, how variation in genetics leads to variation in response to drugs). We are interested in collaboratively discovering and applying new pharmacogenomics knowledge. Second, we are interested in the analysis of three dimensional biological structures. We have methods for analyzing protein structures to recognize and annotate active sites and binding sites, particularly in the context of interactions with small molecule drugs. We are also interested in physics-based simulation of biological structures to understand how their dynamics impact their function (<http://simbios.stanford.edu/>). Finally, we are interested in computational methods for analyzing functional genomics information. We use natural language processing techniques for extracting and summarizing information in the literature, chemoinformatics methods for understanding small molecule function, and machine learning & data mining techniques to understand the molecular responses to drugs.

### SELECTED PUBLICATIONS

The Pharmacogenomics Research Network Translational Pharmacogenetics Program: Outcomes and Metrics of Pharmacogenetic Implementations Across Diverse Healthcare Systems. Luzum JA, Pakyz RE, Elsey AR, Haidar CE, Peterson JF, Whirl-Carrillo M, Handelman SK, Palmer K, Pulley JM, Beller M, Schildcrout JS, Field JR, Weitzel KW, Cooper-DeHoff RM, Cavallari LH, O'Donnell PH, Altman RB, Pereira N, Ratain MJ, Roden DM, Embi PJ, Sadee W, Klein TE, Johnson JA, Relling MV, Wang L, Weinshilboum RM, Shuldiner AR, Freimuth RR; Pharmacogenomics Research Network Translational Pharmacogenetics Program. Clin Pharmacol Ther. 2017 Jan 16.

Imputing gene expression to maximize platform compatibility. Zhou W, Han L, Altman RB. Bioinformatics. 2016 Oct 22.

Computing disease incidence, prevalence and comorbidity from electronic medical records. Bagley SC, Altman RB. J Biomed Inform. 2016 Oct;63:108-111.

Estimation of Maximum Recommended Therapeutic Dose Using Predicted Promiscuity and Potency. Liu T, Oprea T, Ursu O, Hasselgren C, Altman RB. Clin Transl Sci. 2016 Dec;9(6):311-320.

Predicting inpatient clinical order patterns with probabilistic topic models vs conventional order sets. Chen JH, Goldstein MK, Asch SM, Mackey L, Altman RB. J Am Med Inform Assoc. 2016 Sep 20.



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

Professor, Medicine - Cardiovascular Medicine

Professor, Genetics, Biomedical Data Science, and (by courtesy) Pathology

Director, Stanford Center for Inherited Cardiovascular Disease

Co-Director, Clinical Genomics Service

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CENTER [familyheart.stanford.edu](http://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

The Ashley lab is focused on the science of precision medicine. We study the human genome and apply computational approaches like machine learning to understand the integrated effects of genes and proteins on human health and disease. We are particularly interested in the extremes of human performance. We are fascinated by the heart - how it develops, adapts, contracts, and fails. In our wet lab, we explore cardiac biology, from the whole heart all the way down to single cells including induced pluripotent stem cells from our patients. We push them towards a cardiac myocyte fate and characterize them using a variety of bioengineering approaches. Developing new therapies 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. Our group is one of the most diverse on campus - from mathematicians to molecular biologists, undergrads to junior faculty, physicists to genetic counselors.

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

### SELECTED PUBLICATIONS

**MyHeart Counts, a Smartphone Cardiovascular Health Study.** McConnell MV, Shcherbina A, Pavlovic A, Homburger JR, Goldfeder RL, Waggott D, Cho MK, Rosenberger ME, Haskell WL, Myers J, Champagne MA, Mignot E, Landray M, Tarassenko L, Harrington RA, Yeung AC, Ashley EA. JAMA Cardiol. 2017;2(1):1-10.

**Multidimensional structure-function relationships in human beta-cardiac myosin from population-scale genetic variation.** Homburger JR, Green EM, Caleshu C, Sunitha MS, Taylor RE, Ruppel KM, Metpally RP, Colan SD, Michels M, Day SM, Olivetto I, Bustamante CD, Dewey FE, Ho CY, Spudis JA, Ashley EA. Proc Natl Acad Sci USA; 2016;113(24):6701-6.

**Early somatic mosaicism is a rare cause of long-QT syndrome.** Priest J. R., Gawad, C., Kahlig, K. M., Yu, J. K., O'Hara, T., Boyle, P. M., Rajamani, S., Clark, M. J., Garcia, S. T., Ceresnak, S., Harris, J., Boyle, S., Dewey, F. E., Malloy-Walton, L., Dunn, K., Grove, M., Perez, M. V., Neff, N. F., Chen, R., Maeda, K., Dubin, A., Belardinelli, L., West, J., Antolik, C., Macaya, D., Quertermous, T., Trayanova, N. A., Quake, S. R., Ashley, E. A. Proc Natl Acad Sci USA; 2016; 113 (41): 11555-11560



## Themistocles (Tim) Assimes, MD, PhD, FRCPC, FAHA

Associate Professor, Medicine - Cardiovascular Medicine  
Attending Cardiologist, Palo Alto VA Health Care System

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### EDUCATION/TRAINING

MD McGill University

PhD McGill University

MEDICINE RESIDENCY

McGill University

CARDIOLOGY FELLOWSHIP

Stanford University

BOARD CERTIFICATION

Cardiovascular Medicine, ABIM

### CLINICAL FOCUS

Echocardiography

General Cardiology

Primary and Secondary Prevention of  
Coronary Artery Disease

### APPOINTMENTS

STEERING COMMITTEE

Project Baseline

CARDIoGRAMplusC4D ([http://www.  
cardiogramplusc4d.org/](http://www.cardiogramplusc4d.org/))

LEADERSHIP COMMITTEE

Council of Functional Genomics and  
Translational Biology, American Heart  
Association

MEMBERSHIP AND COMMUNICATIONS  
COMMITTEE

Council of Epidemiology and Prevention,  
American Heart Organization

CO-CHAIR Women's Health Initiative  
Scientific Interest Group for Genetics,  
Proteomics & Biomarkers

MEMBER, Ancillary Studies Committee,  
Women's Health Initiative

FELLOW

Royal College of Physicians of Canada  
American Heart Association

### 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

Genetics: Implications for prevention and management of coronary artery disease. Assimes, T. L., Roberts, R. Journal of the American College of Cardiology; 2016; 68 (25): 2797-2818.

Associations between a genetic risk score for clinical CAD and early stage lesions in the coronary artery and the aorta. Salfati, E. L., Herrington, D. M., Assimes, T. L. PLoS One; 2016; 11 (11).

An epigenetic clock analysis of race/ethnicity, sex, and coronary heart disease. Horvath, S., Gurven, M., Levine, M. E., Trumble, B. C., Kaplan, H., Allayee, H., Ritz, B. R., Chen, B., Lu, A. T., Rickabaugh, T. M., Jamieson, B. D., Sun, D., Li, S., Chen, W., Quintana-Murci, L., Fagny, M., Kobor, M. S., Tsao, P. S., Reiner, A. P., Edlefsen, K. L., Absher, D., Assimes, T. L. Genome Biology. 2016; 17 (1): 171.

Susceptibility Loci for Clinical Coronary Artery Disease and Subclinical Coronary Atherosclerosis Throughout the Life-Course. Salfati, E., Nandkeolyar, S., Fortmann, S. P., Sidney, S., Hlatky, M. A., Quertermous, T., Go, A. S., Iribarren, C., Herrington, D. M., Goldstein, B. A., Assimes, T. L. Circulation Cardiovascular Genetics; 2015; 8 (6): 803-811

Study of exonic variation identifies incremental information regarding lipid-related and coronary heart disease genes. Assimes TL, Quertermous T. Circ Res.; 2014, Aug 15; 115 (5): 478-80.





## 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

#### CHAIR

Task Group, Lung Cancer in Women;  
National Lung Cancer Roundtable  
(American Cancer Society)

#### MEMBER

PCORI Advisory Panel on Health Delivery and Disparities Research  
ACGME Thoracic Surgery Resident Review Committee  
American Medical Association  
Western Thoracic Surgical Association  
Women in Thoracic Surgery  
Society of Thoracic Surgeons  
Harkins Surgical Society

#### FELLOW

American College of Surgeons

#### EXECUTIVE BOARD MEMBER

Artemis Medical Society

### 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 also involved in research with the Thoracic Surgical Health Services Research group, and has grant funding through the Veterans Affairs Administration. Her current research interests are in imaging surveillance following treatment for lung cancer and cancer survivorship. She is a member of the National Lung Cancer Roundtable of the American Cancer Society serving as Chair of the Task Group on Lung Cancer in Women. She also serves as a professional member of the Patient Centered Outcomes Research Institute (PCORI) Advisory Panel on Improving Healthcare Systems. As an educator, Dr. Backhus is the Associate Program Director for the Thoracic Track Residency and serves on the ACGME Residency Review Committee for Thoracic Surgery which is the accrediting body for all cardiothoracic surgery training programs in the US.

### SELECTED PUBLICATIONS

**Presence of Even a Small Ground-Glass Component in Lung Adenocarcinoma Predicts Better Survival.** Berry MF, Gao R, Kunder CA, Backhus L, Khuong A, Kadoch M, Leung A, Shrager J. *Clinical Lung Cancer*. 2017.

**Video-assisted thoracoscopic diaphragm plication using a running suture technique is durable and effective.** Demos DS, Berry MF, Backhus LM, Shrager JB. *The Journal of Thoracic and Cardiovascular Surgery*. 2017; 153(5):1182-1188.

**Assessment and Management of Symptoms for Outpatients Newly Diagnosed With Lung Cancer.** Reinke LF, Feemster LC, Backhus LM, Gyls-Colwell I, Au DH. *The American Journal of Hospice & Palliative Care*. 2016; 33(2):178-83.

**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. *The Journal of Surgical Research*. 2016; 200(1):171-6.

**Gaps in Guideline-Concordant Use of Diagnostic Tests Among Lung Cancer Patients.** Flanagan MR, Varghese TK Jr, Backhus LM, Wood DE, Mulligan MS, Cheng AM, Flum DR, Farjah F. *The Annals of Thoracic Surgery*. 2015; 100(6):2006-12.

**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. *The Journal of Thoracic and Cardiovascular Surgery*. 2015; 149(5):1365-71; discussion 1371-3.e3.

**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. *The Annals of Thoracic Surgery*. 2014; 98(6):1944-51; discussion 1951-2.



## Hans-Christoph Becker, MD

Professor of Radiology (General Radiology) at the Stanford University Medical Center

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### EDUCATION/TRAINING

MD Ludwig-Maximilians-University, Germany

Internship: Ludwig-Maximilians-University, Germany

Residency: Ludwig-Maximilians-University, Germany

### MEMBERSHIP

Radiological Society of North America

North American Society of Cardiovascular Imaging

Society of Computed Tomography & Magnetic Resonance

European Society of Radiology

### CURRENT RESEARCH

My current research focus in cardiovascular imaging is on myocardial and tumor perfusion imaging by multi-detector-row computed tomography, and comparison of intravascular ultrasound with computed tomography for the assessment of myocardial coronary artery bridges. 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 primary clinical focus is cardiovascular imaging, particularly cardiac CT as well as congenital cross-sectional 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.

### SELECTED PUBLICATIONS

Myocardial Bridges on Coronary Computed Tomography Angiography Correlation With Intravascular Ultrasound and Fractional Flow Reserve. Signe Helene Forsdahl, Ian S. Rogers, Ingela Schnittger, Shigemitsu Tanaka, Takumi Kimura, Vedant S. Pargaonkar, Frandics P. Chan, Dominik Fleischmann, Jennifer A. Tremmel, Hans-Christoph Becker. Circulation Journal, 2017 Nov 24;81(12):1894-1900.



## Daniel Bernstein, MD

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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### 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  
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

### CURRENT RESEARCH

Recent basic science work has been focused on: (1) on the role of alterations in mitochondrial function and dynamics (fission, fusion, mitophagy and biogenesis) in both normal cardiac physiology and in cardiac disease. (2) using human induced pluripotent stem cell derived cardiomyocytes (hiPSC-CMs) to determine the mechanism by which mutations in beta-myosin heavy chain (beta-MHC) cause hypertrophic cardiomyopathy (HCM). In collaboration with colleagues in Bioengineering (Beth Pruitt), Biochemistry (Jim Spudich), Medicine (Sean Wu) and Chemical Engineering (Alex Dunn), as well as an international team, we have developed a multi-scale platform to study the effect of HCM mutations on the crystal structure and biomechanical function of the myosin molecule, and contractile function of the individual myofibril, the whole cell, and bioengineered heart tissue. (3) using murine models of congenital heart disease affecting the right ventricle (RV), we are collaborating with Dr. Sushma Reddy to study the mechanisms by which the RV transitions from stable hypertrophy to overt heart failure, the role of micro-RNAs in this process, and potential biomarkers of early RV failure in children with congenital heart disease.

Recent clinical/translational work has focused on: (1) an NIH funded multi-center clinical study to evaluate two novel biomarkers for post-transplant lymphoproliferative disorder in pediatric solid organ transplant patient; (2) using immune profiling to determine risk factors for and mechanisms of serious complications (infection, thrombosis, death) in pediatric patients treated with a left ventricular assist device.

Success is the ability to go from failure to failure  
without loss of enthusiasm. — Winston Churchill

### SELECTED PUBLICATIONS

Physiological mitochondrial fragmentation is a cardiac adaptation to increased demand. Coronado M, Zhao M, Fajardo G, Jung G, Gottlieb R, Bernstein D. Circulation Research. 2018 Jan 19;122(2):282-295.

Mitochondrial Remodeling: Rearranging, recycling, and reprogramming. Gottlieb R, Bernstein D. Cell Calcium 60:88-101, 2016.

Time-dependent evolution of functional vs. remodeling signaling in induced pluripotent stem cell-derived cardiomyocytes and induced maturation with biomechanical stimulation. Jung G, Fajardo G, Ribeiro AJS, Bezold K, Coronado M, Zhao M, Hu, D-Q, Reddy S, Kodo K, Sriram K, Insel PA, Pruitt BL, Wu J, Bernstein D. FASEB J. 30:1464-79, 2016.





## Helen M. Blau, PhD

Donald E. and Delia B. Baxter Foundation Professor  
 Director, Baxter Laboratory for Stem Cell Biology  
 Director, Gene Therapy Technology, Stanford University School of Medicine

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### EDUCATION/TRAINING

PhD Harvard University

### HONORS & AWARDS

FASEB Excellence in Science Award  
 NIH MERIT AWARD  
 NIH Challenge Grant  
 NIH Transformative Research Award  
 Fullbright Senior Scholar Award  
 Yvette Mayent Rothschild Award  
 McKnight Technological Innovations for Neuroscience Award

Senior Career Women in Cell Biology Recognition Award  
 Glenn Award for Research in Biological Mechanisms of Aging  
 AACR-Irving Weinstein Award for Outstanding Innovations  
 Hall of Fame, Stanford Office of Technology Licensing

HONORARY DOCTORATE  
 University of Nijmegen, the Netherlands

ELECTED member of  
 National Academy of Sciences,  
 National Academy of Medicine,  
 Pontifical Academy of Sciences,  
 American Institute for Medical and Biological Engineering,  
 American Academy of Arts and Sciences,  
 Fellow of the American Association for the Advancement of Science.

PRESIDENT of  
 American Society for Developmental Biology  
 International Society of Differentiation

COUNCIL MEMBER  
 Institute of Medicine (National Academy of Medicine)  
 NIH National Institute on Aging

BOARD MEMBER  
 Harvard Board of Overseers  
 Ellison Medical Scientific Advisory Board  
 Pew Scholars Advisory Board

### CURRENT RESEARCH

Helen M. Blau, Ph.D., is the Donald E. and Delia B. Baxter Foundation Professor and Director of the Baxter laboratory for Stem Cell Biology at Stanford University. Blau's research area is regenerative medicine with a focus on stem cells. She is world-renowned for her work on nuclear reprogramming and the demonstration of the plasticity of cell fate using cell fusion. These studies provided the scientific underpinnings for mammalian cloning and induced pluripotent stem cells. Blau also led the field with novel approaches to treating muscle damaged due to disease, injury, or aging. She pioneered the design of biomaterials to mimic the in vivo microenvironment and direct stem cell fate. A major focus of her current work is the rejuvenation of muscle stem cell function to enhance skeletal muscle repair in the aged. In addition, her laboratory made the unexpected discovery that shortened telomeres are a hallmark of genetic cardiomyopathies. A major effort in her laboratory is directed at establishing the cause and effect of premature telomere shortening in cardiomyocytes in disease states, with a view toward novel therapeutic interventions.

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

Prostaglandin E2 is essential for efficacious skeletal muscle stem-cell function, augmenting regeneration and strength. Ho ATV, Palla AR, Blake MR, Yucel ND, Wang YX, Magnusson KEG, Holbrook CA, Kraft PE, Delp SL, Blau HM. Proc Natl Acad Sci U S A. 2017 Jun 27;114(26):6675-6684.

High-resolution myogenic lineage mapping by single-cell mass cytometry. Porpiglia E, Samusik N, Van Ho AT, Cosgrove BD, Mai T, Davis KL, Jager A, Nolan GP, Bendall SC, Fantl WJ, Blau HM. Nat Cell Biol. 2017 May;19(5):558-567.

Telomere shortening and metabolic compromise underlie dystrophic cardiomyopathy. Chang AC, Ong SG, LaGory EL, Kraft PE, Giaccia AJ, Wu JC, Blau HM. Proc Natl Acad Sci USA. 2016 Nov 15; 113 (46):13120-13125.

Human induced pluripotent stem cell-derived cardiomyocytes recapitulate the predilection of breast cancer patients to doxorubicin-induced cardiotoxicity. BurrIDGE PW, Li YF, Matsa E, Wu H, Ong SG, Sharma A, Holmström A, Chang AC, Coronado MJ, Ebert AD, Knowles JW, Tellis ML, Witteles RM, Blau HM, Bernstein D, Altman RB, Wu JC. Nat Med. 2016 May; 22(5): 547-56.

Rejuvenation of the muscle stem cell population restores strength to injured aged muscles. Cosgrove BD, Gilbert PM, Porpiglia E, Mourkioti F, Lee SP, Corbel SY, Llewellyn ME, Delp SL, Blau HM. Nat Med. 2014 Mar;20(3):255-64.



## Carlos Bustamante, PhD

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

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### EDUCATION/TRAINING

PHD Harvard University

### HONORS & AWARDS

Marshall Sherfield Fellow, Marshall Aid Commemoration Commission (2001-2)

Sloan Research Fellow in Molecular Biology, Sloan Foundation (2007-9)

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  
Associate Program Director, Pediatric Cardiology Fellowship Program  
Director, Non-Invasive Electrophysiology

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### 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 Med-  
icine (2005)

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

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

### HONORS & AWARDS

Alpha Omega Alpha (AOA) Medical Honor  
Society Member

Global Clinical Scholars Research  
Training Program  
Capstone Research Project  
Competition – 2nd Place

Resident Teaching Award New York  
Presbyterian Hospital – Cornell

Rutgers University Presidential Scholar

Bausch & Lomb Science Award Recipient

### 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 involves exploration of 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

Pediatric Cardiology Boot Camp: Description and Evaluation of a Novel Intensive Training Program for Pediatric Cardiology Trainees. Ceresnak, S. R., Axelrod, D. M., Motonaga, K. S., Johnson, E. R., Krawczeski, C. D. *Pediatric Cardiology*, 2016; 37 (5): 834-844.

Electrocardiographic repolarization abnormalities and increased risk of life-threatening arrhythmias in children with dilated cardiomyopathy. Chen, S., Motonaga, K. S., Hollander, S. A., Almond, C. S., Rosenthal, D. N., Kaufman, B. D., May, L. J., Avasarala, K., Dao, D. T., Dubin, A. M., Ceresnak, S. R. *Heart Rhythm*, 2016; 13 (6): 1289-1296.

50 is the new 70: Short ventriculoatrial times are common in children with atrioventricular reciprocating tachycardia. Ceresnak, S. R., Doan, L. N., Motonaga, K. S., Avasarala, K., Trela, A. V., Reddy, C. D., Dubin, A. M. *Heart Rhythm*, 2015; 12 (7): 1541-1547.

Success Rates in Pediatric WPW Ablation Are Improved with 3-Dimensional Mapping Systems Compared with Fluoroscopy Alone: A Multicenter Study. Ceresnak, S. R., Dubin, A. M., Kim, J. J., Valdes, S. O., Fishberger, S. B., Shetty, I., Zimmerman, F., Tanel, R. E., Epstein, M. R., Motonaga, K. S., Capone, C. A., Nappo, L., Gates, G. J., Pass, R. H. *Journal of Cardiovascular Electrophysiology*, 2015; 26 (4): 412-416.

Novel method of signal analysis for ablation of Wolff-Parkinson-White syndrome. Ceresnak, S. R., Gates, G. J., Nappo, L., Cohen, H. W., Pass, R. H. *Heart Rhythm*, 2012; 9 (1): 2-7.

Wolff-Parkinson-White syndrome (WPW) and athletes: Darwin at play? Ceresnak, S. R., Dubin, A. M. *Journal of Cardiovascular Electrophysiology*, 2015; 48 (3): 356-361.





## 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

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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, Burrridge 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).





## Michael D. Dake, MD

Thelma and Henry Doelger Professor of Cardiothoracic Surgery  
Medical Director, Cath/Angio Laboratories

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### EDUCATION/TRAINING

MD Baylor College of Medicine

INTERNAL MEDICINE RESIDENCY Baylor  
College of Medicine

PULMONARY DISEASES FELLOWSHIP  
UCSF

RADIOLOGY RESIDENCY  
UCSF

INTERVENTIONAL RADIOLOGY  
FELLOWSHIP UCSF

BOARD CERTIFICATION  
Diagnostic Radiology, ABR

Internal Medicine, ABIM

Pulmonary Disease, ABIM

### CLINICAL FOCUS

Diagnostic Radiology

Interventional Radiology

Endovascular Surgery

### HONORS & AWARDS

SIR Foundation Leaders in Innovation  
Award

Docteur Honoris Causa (Honorary  
Doctorate), Republique Francaise  
Universite del a Mediterranee

#### FELLOW

American College of Chest Physicians;  
American College of Physicians;  
American Heart Association; Society  
of Interventional Radiology

#### MEMBER

American College of Radiology;  
American Thoracic Society; Radiological  
Society of North America

### CURRENT RESEARCH

Improved endovascular procedures and devices to treat aortic lesions, peripheral arterial disease and venous abnormalities. Focused interest in drug-eluting stents and balloons, endovascular stent-grafts, including branched aortic devices and techniques for the endovascular management of aortic dissection. Current clinical research projects include drug-eluting stents for superficial femoral arterial disease and multiple device trials to evaluate stent-grafts for the treatment of aortic lesions.

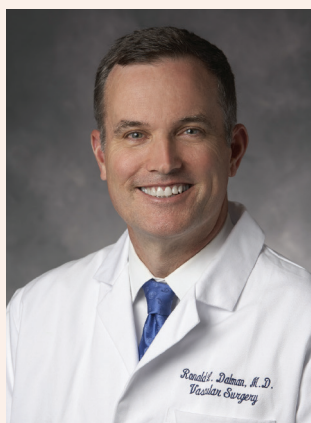
I have a broad background in working with young investigators to collaboratively develop opportunities with medical devices that address unmet clinical needs or limitations of current therapeutic approaches.

### SELECTED PUBLICATIONS

Midterm survival after thoracic endovascular aortic repair in more than 10,000 Medicare patients Schaffer JM, Lingala B, Miller DC, Woo YJ, Mitchell RS, Dake MD. J Thorac Cardiovasc Surg. 2014 Oct 18

A novel, catheter-based approach to left ventricular assist device deactivation after myocardial recovery Zeigler SM, Sheikh AY, Lee PH, Desai J, Banerjee D, Oyer P, Dake MD, Ha RV. Ann Thorac Surg. 2014 Aug;98(2):710-3

Five-year results of thoracic endovascular aortic repair with the Zenith TX2 Matsumura JS, Melissano G, Cambria RP, Dake MD, Mehta S, Svensson LG, Moore RD; Zenith TX2 Clinical Trial Investigators. J Vasc Surg. 2014 Jul;60(1):1-10



## Ronald L. Dalman, MD

Dr. Walter C. Chidester Professor of Surgery  
Chief, Division of Vascular Surgery

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DIVISION [vascular.stanford.edu](http://vascular.stanford.edu)

### EDUCATION/TRAINING

MD University of Michigan

GENERAL SURGERY RESIDENCY

University of Washington

VASCULAR SURGERY FELLOWSHIP

Oregon Health Sciences University

ENDOVASCULAR FELLOWSHIP

Texas Tech University

BOARD CERTIFICATION

General Vascular Surgery, American

Board of Surgery

Surgery, American Board of Surgery

### CLINICAL FOCUS

Abdominal Aortic Aneurysm Disease

### HONORS & AWARDS

ASSOCIATE DIRECTOR of Cardiovascular Health (CVH) for Quality and Outcome Assessment

CO-DIRECTOR, CVI T32: Mechanisms and Innovation in Vascular Disease

FELLOW

American College of Surgeons, American Heart Association

Immediate Past Chair 2014-2017, Program Committee Vascular Annual Meeting, Society for Vascular Surgery

MEMBER

American Surgical Association; Society of University Surgeons; Western Vascular Society (Past President)

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

Board of Governors, American College of Surgeons

### 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

CCR2 inhibition sequesters multiple subsets of leukocytes in the bone marrow. Fujimura N, Xu B, Dalman J, Deng H, Aoyama K, Dalman RL. Sci Rep; 2015; 5: 11664.

Comparative geometric analysis of renal artery anatomy before and after fenestrated or snorkel/chimney endovascular aneurysm repair. Ullery BW, Suh GY, Lee JT, Liu B, Stineman R, Dalman RL, Cheng CP. J Vasc Surg; 2016; 63:922-9.

Metformin treatment status and abdominal aortic aneurysm disease progression. Fujimura N, Xiong J, Kettler EB, Xuan H, Glover KJ, Mell MW, Xu B, Dalman RL. J Vasc Surg; 2016; 64: 46-54.

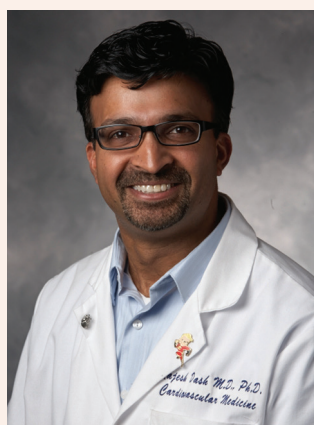
Challenges and opportunities in limiting abdominal aortic aneurysm growth. Golledge J, Norman PE, Murphy MP, Dalman RL. J Vasc Surg; 2017; 65: 225-233.

Angiotensin Receptor Blockers and Abdominal Aortic Aneurysm Management: Evidence Supporting the TEDY Trial. Dalman RL, Xuan H, Wang W, Tanaka H, Fujimura N, Xu B. J Vasc Surg; 2016: 64:539.

Inhibition or deletion of angiotensin II type I receptor suppresses elastase-induced abdominal aortic aneurysms. Xuan H, Xu B, Wang W, Tanaka H, Fujimura N, Miyata M, Michie SA, Dalman RL. J Vasc Surg. 2017 Apr 20.

Hypoxia-inducible factor 1 in clinical and experimental aortic aneurysm disease. Wang W, Xu B, Xuan H, Ge Y, Wang Y, Wang L, Huang J, Fu W, Michie SA, Dalman RL. J Vasc Surg. 2017 Dec 11.

The Society for Vascular Surgery practice guidelines on the care of patients with an abdominal aortic aneurysm. Chaikof EL, Dalman RL, Eskandari MK, Jackson BM, Lee WA, Mansour MA, Mastracci TM, Mell M, Murad MH. J Vasc Surg. 2018 Jan. 2-77.e2



## 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 techniques. I am Medical and Scientific Director of the Stanford South Asian Translational Heart Initiative, and 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 we validate our local discoveries and hypotheses in population studies we are doing with clinical partners in India. I also study cell signaling in the heart and develop 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 Director of the Falk Cardiovascular MRI Facility. I am applying some of these imaging strategies in select high-risk patients, such as chemotherapy patients.

There is nothing like returning to a place that remains unchanged to find the ways in which you yourself have altered. — Nelson Mandela, 'A Long Walk to Freedom'

### 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.

Manganese-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 and Positron Emission Tomography Approaches to Imaging Vascular and Cardiac Inflammation. Amsallem 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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### EDUCATION/TRAINING

BA Johns Hopkins

PhD Caltech

POSTDOC NIH

### HONORS & AWARDS

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

Behring-Heidelberger Prize, American Association of Immunologists

Novartis Prize for Basic Immunology

King Faisal Prize

Gairdner Award

General Motors Cancer Prize

### ELECTED MEMBER

National Academy of Sciences, USA

National Academy of Medicine, USA

Royal Society of London, UK

### SCIENTIFIC ADVISORY BOARDS

Ragon Institute of Harvard and MIT, USA

Tsinghua Institute of Immunology, Beijing, China

Weatherall Institute of Molecular Medicine, Oxford, UK

### CURRENT RESEARCH

My laboratory is interested in the molecular basis of T and B lymphocyte recognition, as well as the control of differentiation and functional responses in these cells. These studies have ranged from analyzing the inherent diversity of these highly diverse molecules and relating it to their function and specificity, to basic aspects of TCR biochemistry and cell biology. We also developed peptide-MHC tetramers which are useful for staining and isolating specific T cells in both basic science and clinical applications. We also try to relate what we have learned in basic immunology using mouse models to understanding the human immune system. Here we 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. Investigator, Howard Hughes Medical Institute; Director, Stanford Institute for Immunity, Transplantation and Infection (ITI).

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

Expression of specific inflammasome gene modules stratifies older individuals into two extreme clinical and immunological states. Furman, D., Chang, J., Lartigue, L., Bolen, C.R., Haddad, F., Gaudilliere, B., Fragiadakis, G.K., Spitzer, M.H., Douchet, I., Daburon, S., Moreau, J.F., Nolan, G.P., Blanco, P., Dechanet-Merville, J., Dekker, C.L., Jojic, V., Kuo, C.J., Davis, M.M., and Faustin, B. *Nature Med.* 23(2): 174-184, 2017.

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.



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

Assistant Professor, Medicine - Pulmonary and Critical Care Medicine  
Co-Director, Stanford Translational Investigator Program (TIP)  
Staff Physician, Stanford Adult Pulmonary Hypertension Clinic

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### 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

Pulmonary Hypertension Association  
Award for Outstanding K08

ASCI Young Physician Scientist Award

ATS Early Career Research Achievement  
Award

IM Rosenzweig Award, Pulmonary  
Fibrosis Foundation

Cournand and Comroe 3CPR Award  
(Mentor)

Parker B. Francis Awards (Mentor)

CVI Boring Trust Award (Mentor)

FELLOW

American College of Chest Physicians

American Heart Association

Pulmonary Vascular Research Institute

EDITORIAL BOARD

American Journal of Respiratory

and Critical Care Medicine

Pulmonary Circulation

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.

First things first, but not in that particular order.

### SELECTED PUBLICATIONS

Whole Exome Sequencing identifies TopBP1 as a novel gene in pulmonary arterial hypertension. VA de Jesus Perez, K. Yuan, M.A. Lyuksyutova, F. Dewey, ME Orcholski, L. Yancy, V. Rojas BS, K. Cimprich, A. Butte, E. Ashley and RT. Zamanian. Am J Respir Crit Care Med. 2014, May 15; 189 (10): 1260-72.

Activation of the Wnt/planar cell polarity pathway is required for pericyte recruitment during pulmonary angiogenesis. K Yuan, ME Orcholski, C Panaroni, EM Shuffle, NF Huang, Jiang X, W Tian, VEK Vladar, L Wang, MR Nicolls, JY Wu, VA de Jesus Perez. Am J Pathol. 2015, Jan; 185 (1): 69-84.

Features and Outcomes of methamphetamine associated pulmonary arterial hypertension. RT Zamanian, H Hedlin, P Gruenwald, DM Wilson, JI Segal, M Jorden, K Kudelko, J Liu, A His, A Rupp, AJ Sweatt, R Tuder, GJ Berry, M Rabinovitch, RL Doyle, VA de Jesus Perez\* and S Kawut\*. Am J Respir Crit Care Med. 2017 Sep 21. (\*Equal contribution).

Health Disparities in Pulmonary Hypertension: A Blueprint for Action. A Talwar, JG Garcia, H Tsai, M Moreno, T Lahm, RT Zamanian, R Machado, SM Kawut, M Selej, S Mathai, L D'Anna, S Sahni, EJ Rodriguez, R Channick, K Fagan, M Gray, J Armstrong, JR Lopez, V McLaughlin and VA de Jesus Perez. Am J Respir Crit Care Med. 2017 Oct 15;196(8):e32-e47.

Reduced carboxylesterase 1 is associated with endothelial injury in methamphetamine-induced pulmonary arterial hypertension. ME Orcholski, A Khurshudyan, EA Shamskhov, K Yuan, IY Chen, SD Kodani, C Morisseau, BD Hammock, EM Hong, L Alexandrova, TP Alastalo, G Berry, RT Zamanian, VA de Jesus Perez. Am J Physiol Lung Cell Mol Physiol. 2017 Aug 1;313(2):L252-L266.



## Anne Dubin, MD

Professor of Pediatrics (Pediatric Cardiology) at the Lucile Salter Packard Children's Hospital  
Director, Pediatric Arrhythmia Service

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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)

Fellowship: 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 have been 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

The precise timing of tachycardia entrainment is determined by the postpacing interval, the tachycardia cycle length, and the pacing rate: Theoretical insights and practical applications. Kaiser, D. W., Hsia, H. H., Dubin, A. M., Liem, L. B., Viswanathan, M. N., Zei, P. C., Wang, P. J., Narayan, S. M., Turakhia, M. P. Heart Rhythm; 2016; 13 (3): 695-703.

Ventricular Pacing in Single Ventricles - A Bad Combination. Bulic A, Zimmerman FJ, Ceresnak SR, Shetty I, Motonaga KS, Freter A, Trela AV, Hanisch D, Russo L, Avasarala K, Dubin AM. Heart Rhythm 2017;14:853-7.

A Pilot Study Assessing ECG versus ECHO Ventriculoventricular Optimization in Pediatric Resynchronization Patients. Pun, R., Hanisch, D., Motonaga, K. S., Rosenthal, D. N., Ceresnak, S. R., Dubin, AM. Journal of Cardiovascular Electrophysiology; 2016; 27 (2): 210-216.

A Bridge to Success: A Better Method of Cryoablation for Atrioventricular Nodal Reentrant Tachycardia in Children. Reddy CD, Ceresnak SR, Motonaga KS, Avasarala K, Feller C, Trela A, Hanisch D, Dubin AM. Heart Rhythm 2017; 14:1649-54.

Screening ECGs for young competitive athletes: it is complicated. Dubin, A. M. Current Opinion in Pediatrics; 2015; 27 (5): 604-608.

Task Force 4: Pediatric Cardiology Fellowship Training in Electrophysiology. Dubin, A. M., Walsh, E. P., Franklin, W., Kanter, R. J., Saul, J. P., Shah, M. J., Van Hare, G. F., Vincent, J. A. Journal of the American College of Cardiology; 2015; 66 (6): 706-711.





## Alexander Dunn, PhD

Associate Professor, Chemical Engineering

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LAB [dunngroup.stanford.edu](http://dunngroup.stanford.edu)

### 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

Observers have noted the central importance of tissue mechanics in health and disease since ancient times. We now know that intrinsically mechanical stimuli such as fluid flow, mechanical stretch, and tissue stiffness play central roles in cardiovascular development, homeostasis, and disease. However, the molecular mechanisms by which cells sense mechanical cues remain poorly understood, due largely to a lack of tools that measure forces inside living cells and tissues. Our laboratory uses genetically encoded molecular sensors to directly visualize mechanical tension in living cells, with the goal of uncovering how mechanical cues regulate stem cell differentiation and self-renewal. In addition, we study how the endothelial cells that line the vascular system sense fluid flow, a fundamental and unsolved question in vascular biology.

The hard and stiff will be broken. The soft and supple will prevail. — Tao Te Ching (trans. Stephen Mitchell)

### SELECTED PUBLICATIONS

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.

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.

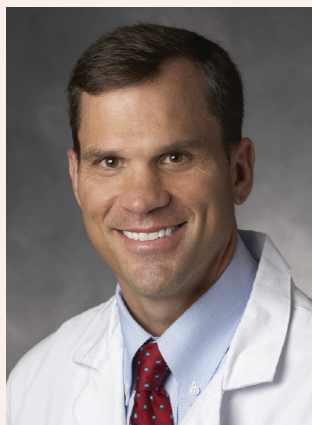
Energetics and forces in living cells. Dunn, A. R., Price, A. Physics Today; 2015; 68 (2): 27-32.

Cell adhesion. The minimal cadherin-catenin complex binds to actin filaments under force. Buckley, C. D., Tan, J., Anderson, K. L., Hanein, D., Volkmann, N., Weis, W. I., Nelson, W. J., Dunn, A. R. Science; 2014; 346 (6209).

Mechanical control of the sense of touch by  $\beta$ -spectrin. Krieg, M., Dunn, A. R., Goodman, M. B. Nature Cell Biology; 2014; 16 (3): 224-233

Molecular tension sensors report forces generated by single integrin molecules in living cells. Morimatsu M, Mekhdjian AH, Adhikari AS, Dunn AR. Nano Lett.; 2013; 13(9): 3985-9.

E-cadherin is under constitutive actomyosin-generated tension that is increased at cell-cell contacts upon externally applied stretch. Borghi N, Sorokina M, Shcherbakova OG, Weis WI, Pruitt BL, Nelson WJ, & Dunn AR. Proc Natl Acad Sci USA. 2012; 109: 12568-73.



## William Fearon, MD

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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

American Heart Association,  
Scientific Sessions Poster  
Competition, Best Science Award  
(2009)  
E. William Hancock, MD,  
Cardiovascular Medicine Teaching  
Award (2004, 2009)  
Division of Cardiovascular Medicine  
Mentoring Award (2008)  
Division of Cardiovascular Medicine  
Teaching Award (2004)  
Elected to American Society for  
Clinical Investigation (2015)

### FELLOW

American College of Cardiology;  
Society of Cardiac Angiography and  
Interventions

### 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. 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

Clinical Outcomes and Cost-Effectiveness of Fractional Flow Reserve-Guided Percutaneous Coronary Intervention in Patients With Stable Coronary Artery Disease: Three-Year Follow-Up of the FAME 2 Trial (Fractional Flow Reserve Versus Angiography for Multivessel Evaluation). Fearon WF, Nishi T, De Bruyne B, Boothroyd DB, Barbato E, Tonino P, Jüni P, Pijls NHJ, Hlatky MA; FAME 2 Trial Investigators. Circulation. 2017 Nov 2.

Fractional flow reserve-guided PCI for stable coronary artery disease. De Bruyne B, Fearon WF, Pijls NH, Barbato E, Tonino P, Piroth Z, Jagic N, Mobius-Winckler S, Rioufol G, Witt N, Kala P, MacCarthy P, Engström T, Oldroyd K, Mavromatis K, Manoharan G, Verlee P, Frobert O, Curzen N, Johnson JB, Limacher A, Nüesch E, Jüni P; FAME 2 Trial Investigators. N Engl J Med.; 2014; Sep 25; 371 (13): 1208-17.

PARTNER 2 Investigators. Transcatheter or Surgical Aortic-Valve Replacement in Intermediate-Risk Patients. Leon MB, Smith CR, Mack MJ, Makkar RR, Svensson LG, Kodali SK, Thourani VH, Tuzcu EM, Miller DC, Herrmann HC, Doshi D, Cohen DJ, Pichard AD, Kapadia S, Dewey T, Babaliaros V, Szeto WY, Williams MR, Kereiakes D, Zajarias A, Greason KL, Whisenant BK, Hodson RW, Moses JW, Trento A, Brown DL, Fearon WF, Pibarot P, Hahn RT, Jaber WA, Anderson WN, Alu MC, Webb JG; N Engl J Med.; 2016 Apr 28; 374 (17): 1609-20.



## Brian Feldman, MD, PhD

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Bechtel Endowed Faculty Scholar

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### EDUCATION/TRAINING

MD Stanford University School of Medicine

RESIDENCY Children's Hospital Boston, Harvard University

FELLOWSHIP University of California San Francisco

### HONORS & AWARDS

Clinical Scientist Research Career Development Award, NIH/ NIDDK (2006-2011)

Clinical Scholar Award, Pediatric Endocrinology Society (2007)

Young Investigator Award, Society for Pediatric Research (2008)

NIH Director's New Innovator Award, NIH (2010-2015)

Bechtel Endowed Faculty Scholar, The Bechtel Faculty Scholar Fund (2012-Current)

Early Investigator Award, The Endocrine Society (2013)

Basic Science Research Award of Excellence, Stanford University (2016)

Elected, American Society for Clinical Investigation, ASCI (2017)

### CURRENT RESEARCH

The overall goal of our research is to understand on both a molecular and systemic level how hormones regulate stem cell fate decisions and the role these pathways play in both physiology and disease. We use molecular biology and in vivo models to elucidate mechanisms of regulating cell fate determination by the endocrine system. Understanding these processes has profound and broad implications for both science and health.

In the middle of difficulty lies opportunity – Albert Einstein

### SELECTED PUBLICATIONS

Cell Autonomous Regulation of Brown Fat Identity Gene UCP1 by Unliganded Vitamin D Receptor. Malloy PJ, Feldman BJ. *Molecular Endocrinology*, 27(10): 1632-1642. 2013.

A Plasmonic Chip for Biomarker Discovery and Diagnosis of Type-1 Diabetes. Zhang B, Kumar RB, Dai H, Feldman BJ. *Nature Medicine*, 20(8): 948-953, 2014.

Vitamin D Regulates Fatty Acid Composition in Subcutaneous Adipose Tissue Through Elovl3. Ji L, Gupta M, Feldman BJ. *Endocrinology*, 157(1): 91-97, 2016.

A Glucocorticoid and Diet-responsive Pathway Toggles Adipocyte Precursor Cell Activity In Vivo. Wong JC, Krueger KC, Costa MJ, Aggarwal A, Du H, McLaughlin TL, Feldman BJ. *Science Signaling*, 451(9), 2016.

Macrophage Secreted ADAMTS1 Promotes Muscle Stem Cell Activation. Du H, Shih C-H, Wosczyzna MN, Mueller AA, Cho J, Aggarwal A, Rando TA, Feldman BJ. *Nature Communications*, 8(1) 669, 2017.

The Circadian Clock Regulates Adipogenesis by a Per3 Crosstalk Pathway to Klf15. Aggarwal A, Costa MJ, Ji L, Morgan SL, Feldman BJ. *Cell Reports*, 21(9), 2017.





## 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 Association Society of  
Thoracic Surgeons  
San Francisco Surgical Society  
Western Thoracic Surgical Society  
Association 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

**miR-29b Participates in Early Aneurysm Development in Marfan Syndrome.** Merk D, Chin JT, Dake BA, Maegdefessel L, Miller MO, Kimura N, Tsao PS, Josef 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.

**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.

**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.

**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). pii: e13257.



## Peter J. Fitzgerald, MD, PhD, FACC

Professor of Medicine (Cardiovascular Medicine) Emeritus  
Director, Center for Cardiovascular Technology

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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

Assessment of bioresorbable scaffold with a novel high-definition 60 MHz IVUS imaging system: Comparison with 40-MHz IVUS referenced to optical coherence tomography. Okada K, Kitahara H, Mitsutake Y, Tanaka S, Kimura T, Yock PG, Fitzgerald PJ, Ikeno F and Honda Y. Catheter Cardiovasc Interv. 2017.

Bioresorbable scaffold for treatment of coronary artery lesions: Intravascular ultrasound results from ABSORB Japan trial. Okada K, Honda Y, Kitahara H, Otagiri K, Tanaka S, Yock PG, Popma JJ, Kusano H, Cheong W-F, Sudhir K, Fitzgerald PJ and Kimura T. J Am Coll Cardiol Interv. 2017. (in press)

Impact of stent diameter on vascular response after self-expanding paclitaxel-eluting stent implantation in the superficial femoral artery. Miki K, Fujii K, Shibuya M, Fukunaga M, Imanaka T, Kawai K, Tamaru H, Sumiyoshi A, Nishimura M, Horimatsu T, Saita T, Yoshihara N, Kimura T, Honda Y, Fitzgerald PJ, Masuyama T and Ishihara M. J Cardiol. 2017;70:346-352.

Impact of analysis interval size on the quality of optical frequency domain imaging assessments of stent implantation for lesions of the superficial femoral artery. Miki K, Fujii K, Kawasaki D, Shibuya M, Fukunaga M, Imanaka T, Tamaru H, Sumiyoshi A, Nishimura M, Horimatsu T, Saita T, Kobayashi Y, Honda Y, Fitzgerald PJ, Masuyama T and Ishihara M. Catheter Cardiovasc Interv. 2017;89:735-745.

Impact of attenuated-signal plaque observed by intravascular ultrasound on vessel response after drug-eluting stent implantation. Kitahara H, Waseda K, Sakamoto K, Yamada R, Huang CC, Nakatani D, Sakata K, Kawarada O, Yock PG, Matsuyama Y, Yokoi H, Nakamura M, Muramatsu T, Nanto S, Fitzgerald PJ and Honda Y. Atherosclerosis. 2017;259:68-74.

Impact of stent size selection on acute and long-term outcomes after drug-eluting stent implantation in de novo coronary lesions. Kitahara H, Okada K, Kimura T, Yock PG, Lansky AJ, Popma JJ, Yeung AC, Fitzgerald PJ and Honda Y. Circ Cardiovasc Interv. 2017;10.



## Dominik Fleischmann, MD

Professor, Radiology  
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Medical Director, Stanford 3DQ Lab

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[radiology.stanford.edu/patient/clinical\\_sections/computedtomography](http://radiology.stanford.edu/patient/clinical_sections/computedtomography)  
[3dradiology.stanford.edu](http://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

American Heart Association (AHA)  
Society of Computed Body Tomography  
and MR (SCBT/MR)

MEMBER

North American Society for  
Cardiovascular Imaging; RSNA Scientific  
Program Committee

ASSOCIATE EDITOR

Radiology (Cardiac Imaging)

EXECUTIVE & STEERING COMMITTEE

MEMBER

Stanford Cardiovascular Institute

### CURRENT RESEARCH

My technical research focuses on how to generate the best images to provide clinically important anatomic and functional information for cardiac and vascular diseases. This includes evaluation of new CT technology with improved temporal and spatial resolution, to enable and improve surgical and endovascular treatment planning of cardiac, valvular, and aortic diseases, and developing and optimizing clinical cardiac and vascular imaging strategies, and sophisticated 3D and 4D image post-processing. My clinical research focuses on acute aortic diseases, including aortic dissection. We are developing new stratification models for patients with uncomplicated type B aortic dissection based on imaging features and quantitation available in high-resolution CT datasets. I am the Director of CT, Stanford Hospital and Clinics and Medical Director at Stanford 3DQ Lab.

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

### SELECTED PUBLICATIONS

Computed tomography imaging features in acute uncomplicated stanford type-b aortic dissection predict late adverse events. Sailer AM, van Kuijk SM, Nelemans PJ, Chin AS, Kino A, Huininga M, Schmidt J, Mistelbauer G, Baumler K, Chiu P, Fischbein MP, Dake MD, Miller DC, Schurink GW, Fleischmann D. Circulation. Cardiovascular Imaging. 2017;10:e005709

Prognostic significance of early aortic remodeling in acute uncomplicated type b aortic dissection and intramural hematoma. Sailer AM, Nelemans PJ, Hastie TJ, Chin AS, Huininga M, Chiu P, Fischbein MP, Dake MD, Miller DC, Schurink GW, Fleischmann D. J Thorac Cardio-vasc Surg. 2017

Lower extremity computed tomography angiography can help predict technical success of endovascular revascularization in the superficial femoral and popliteal artery. Itoga NK, Kim T, Sailer AM, Fleischmann D, Mell MW. J Vasc Surg. 2017

Aortic dissection maps: Comprehensive visualization of aortic dissections for risk assessment. Mistelbauer G, Schmidt J, Sailer AM, Baeumler K, Fleischmann D. Eurographics Workshop on Visual Computing for Biology and Medicine. 2016:143-152

Pre- and postoperative imaging of the aortic root. Hanneman K, Chan FP, Mitchell RS, Miller DC, Fleischmann D. Radiographics. 2016;36:19-37

Computed tomography angiography: A review and technical update. Fleischmann D, Chin AS, Molvin L, Wang J, Hallett R. Radiol Clin North Am. 2016;54:1-12



## Victor Froelicher, MD

Professor Emeritus, Medicine - Cardiovascular Medicine  
Professor (by courtesy), Orthopedics  
Director, 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

SESSION CHAIR

ACC Scientific Session 2013; Sudden  
Cardiac Death In Athletes Symposium  
2012

### CURRENT RESEARCH

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

### SELECTED PUBLICATIONS

Comparison of three ECG criteria for athlete pre-participation screening. Pickham D, Zarafshar S, Sani D, Kumar N, Froelicher V. J Electrocardiol. 2014 Nov-Dec;47(6):769-74.

International criteria for electrocardiographic interpretation in athletes. Drezner JA, Sharma S, Baggish A, Papadakis M, Wilson MG, Prutkin JM, La Gerche A, Ackerman MJ, Borjesson M, Salerno JC, Froelicher VF, Ashley E, Asif IM et al. Br J Sports Med. 2017 Mar 1:bjsports-2016.

QT Corrections for Long QT Risk Assessment: Implications for the Preparticipation Examination. Hadley D, Hsu D, Pickham D, Drezner JA, Froelicher VF. Clinical Journal of Sport Medicine. 2017 Oct 5.

Limited Relationship of Voltage Criteria for Electrocardiogram Left Ventricular Hypertrophy to Cardiovascular Mortality. Le H, Elbadawi A, Froelicher VF. The American Journal of Medicine. 2017 Aug 10.





## Sanjiv Sam Gambhir, MD, PhD

Virginia and DK Ludwig Professor for Clinical Investigation in Cancer Research  
Chair, Department of Radiology  
Professor (by courtesy), Bioengineering and Materials Science and Engineering  
Director, Canary Center for Cancer Early Detection at Stanford  
Director, Molecular Imaging Program at Stanford (MIPS)

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### EDUCATION/TRAINING

MD UCLA

PhD UCLA

MEDICINE RESIDENCY & INTERNSHIP  
UCLA

FELLOWSHIP  
UCLA

BOARD CERTIFICATION  
Nuclear Medicine, ABNM

### CLINICAL FOCUS

Nuclear Medicine  
Radiology  
Positron Emission Tomography (PET)  
Imaging

### HONORS & AWARDS

J. Allyn Taylor International Prize in  
Medicine  
Georg Charles de Hevesy Nuclear  
Pioneer Award, Society of Nuclear  
Medicine (SNM)  
Radiology Society of Northern America  
(RSNA) Outstanding Researcher of the  
Year Award  
Paul C. Abersold Award, Society of  
Nuclear Medicine  
Parmley Prize, American College of  
Cardiology Foundations  
Tesla Medal, United Kingdom Royal  
College of Radiologists  
Hounsfield Medal, Imperial College of  
London

### ELECTED MEMBER

National Academy of Medicine  
National Academy of Inventors  
American Association for the  
Advancement of Science

### CURRENT RESEARCH

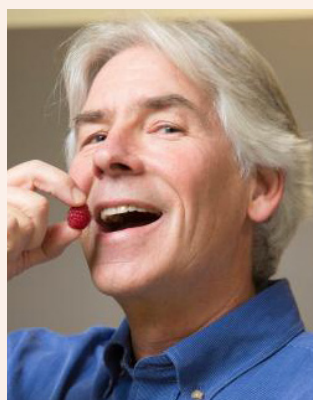
My laboratory is developing imaging assays to monitor fundamental cellular/molecular events in living subjects including patients. Technologies such as micro positron emission tomography (microPET), bioluminescence optical imaging, fluorescence optical imaging, micro computerized axial tomography (microCAT), ultrasound, photoacoustics, and Raman imaging are all being actively investigated in small animal models. Our goals are to marry fundamental advances in molecular/cell biology with those in biomedical imaging to advance the field of molecular imaging. We have a particular interest in cancer biology and early cancer detection. Research in early cancer detection and pharmacological therapy assessment is also being performed. Assays to interrogate cells for mRNA levels, cell surface antigens, intracellular proteins and protein-protein interactions are under active development. We are also extending many of these approaches for human clinical applications using optical and PET-CT technologies.

### SELECTED PUBLICATIONS

Multimodality Molecular Imaging of Cardiac Cell Transplantation: Part I. Reporter Gene Design, Characterization, and Optical in Vivo Imaging of Bone Marrow Stromal Cells after Myocardial Infarction. N. Parashurama, B.C. Ahn, K. Ito, R. Paulmurugan, J.K. Willmann, J. Chung, F. Ikeno, J.C. Swanson, D.R. Merk, J.K. Lyons, D. Yerushalmi, T. Teramoto, H. Kosuge, C.N. Dao, P. Ray, M. Patel, Y.F. Chang, M. Mahmoudi, J.E. Cohen, A.B. Goldstone, F. Habte, S. Bhaumik, S. Yaghoubi, R.C. Robbins, R. Dash, P.C. Yang, T.J. Brinton, P.G. Yock, M.V. McConnell, S.S. Gambhir. *Radiology*, 280(3): 815-25, 2016.

Multimodality Molecular Imaging of Cardiac Cell Transplantation: Part II. In Vivo Imaging of Bone Marrow Stromal Cells in Swine with PET/CT and MR Imaging. N. Parashurama, B.C. Ahn, K. Ito, R. Paulmurugan, J.K. Willmann, J. Chung, F. Ikeno, J.C. Swanson, D.R. Merk, J.K. Lyons, D. Yerushalmi, T. Teramoto, H. Kosuge, C.N. Dao, P. Ray, M. Patel, Y.F. Chang, M. Mahmoudi, J.E. Cohen, A.B. Goldstone, F. Habte, S. Bhaumik, S. Yaghoubi, R.C. Robbins, R. Dash, P.C. Yang, T.J. Brinton, P.G. Yock, M.V. McConnell, S.S. Gambhir. *Radiology*, 280(3): 826-36, 2016.

Reporter Gene Imaging of Targeted T Cell Immunotherapy in Recurrent Glioma. K.V. Keu, T.H. Witney, S. Yaghoubi, J. Rosenberg, A. Kurien, R. Magnusson, J. Williams, F. Habte, J.R. Wagner, S. Forman, C. Brown, M. Allen-Auerbach, J. Czernin, W. Tang, M.C. Jensen, B. Badie, S.S. Gambhir. *Science Translational Medicine*, 9(373): eaag2196, 2017.



## Christopher Gardner, PhD

Rehnborg Farquhar Professor

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### EDUCATION/TRAINING

PhD University of California, Berkeley

### HONORS & AWARDS

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

Over the past 20 years I have been involved in more than a dozen human intervention trials involving more than 2,000 volunteer participants. These studies have examined the potential health benefits of garlic, soy, antioxidants, fish oil, ginkgo biloba, vegetarian diets, and weight loss diets. In the past few years my long-term research interests have shifted to include a second 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 for changing and improving human food behaviors can drastically limit the potential impact for change. This realization led me to seek out colleagues across all seven of Stanford's schools, including those in the fields of business, law, education, earth sciences, and medicine, as well as many disciplines from the school of humanities and sciences. My long-term vision in this area is to create a world-class Stanford Food Systems Initiative and build on the idea that Stanford is uniquely positioned geographically, culturally, and academically, to address national and global crises in the areas of obesity and diabetes that are directly related to our broken food systems. The target of my current nutrition and food research involves institutional food settings such as universities, worksites, hospitals, schools, and retirement communities. I serve on the Scientific Advisory board of the Culinary Institute of America and have many new colleagues that are chefs who are striving to elevate the unapologetic deliciousness of food, while at the same time including human health and the health of the environment. The long-term goal of my research 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

Low-Carbohydrate Diet on 12-Month Weight Loss in Overweight Adults and the Association with Genotype Pattern or Insulin Secretion: A Randomized Clinical Trial. Gardner CD, Trepanowski JF, Del Gobbo LC, Hauser ME, Rigdon J, Ioannidis JPA, Desai M, King AC, Effect of Low-Fat vs. JAMA (In Press)

Food and beverage environment and procurement policies for healthier work environments. Gardner CD, Whitsel LP, Thorndike AN, Marrow MW, Otten JJ, Foster GD, Carson JA, Johnson RK. Nutr Rev. 2014;72:390-410.

Non nutritive sweeteners: current use and health perspectives. A scientific statement from the American Heart Association. Gardner CD, Wylie-Rosett J, Gidding SS, Steffen L, Johnson R, Reading D, Lichtenstein A. Circulation 2012;126:509-19.

Incorporating prototyping and iteration into intervention development: A case study of a dining hall-based intervention. McClain AD, Hekler EB, Gardner CD. J Amer College Health 2013;61(2):122-31.



## François 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 core 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

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 U S A. 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.

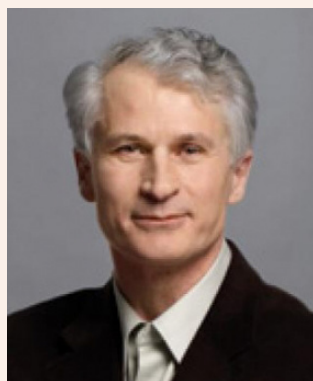
Biventricular VAD versus LVAD for right heart failure. Boulate D, Marques MA, Ha R, Banerjee D, Haddad F. Ann Cardiothorac Surg.; 2014; Nov; 3 (6): 585-8.

Right ventricular reserve in a piglet model of chronic pulmonary hypertension. Guihaire J, Haddad F, Noly PE, Boulate D, Decante B, Darteville P, Humbert M, Verhoye JP, Mercier O, Fadel E. Eur Respir J.; 2014, Dec 10.

Intracoronary Transplantation of CD34 Cells is Associated with Improved Myocardial Perfusion in Patients with Non-ischemic Dilated Cardiomyopathy. Lezaic L, Socan A, Poglajen G, Peitl PK, Sever M, Cukjati M, Cernelc P, Wu JC, Haddad F, Vrtovec B. J Card Fail; 2014, Nov 18.

Pulmonary hypertension in patients with advanced heart failure is associated with increased levels of interleukin-6. Dolenc J, Šebešljen M, Vrtovec B, Koželj M, Haddad F. Biomarkers; 2014, Aug; 19 (5): 385-90.

Right ventricular function in cardiovascular disease, part I - Anatomy, physiology, aging, and functional assessment of the right ventricle. Haddad, F., Hunt, S. A., Rosenthal, D. N., Murphy, D. J. Circulation. 2008; 117 (11): 1436-1448



## 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

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### EDUCATION/TRAINING

MD Tufts University  
MEDICINE RESIDENCY  
University of Massachusetts  
INTERVENTIONAL  
CARDIOLOGY FELLOWSHIP  
Duke University

BOARD CERTIFICATION  
ABIM Internal Medicine, ABIM  
Cardiovascular Disease, ABIM  
Interventional Cardiology

### CLINICAL FOCUS

Cardiovascular Disease

### HONORS & AWARDS

CHAIR  
American Heart Association Committee  
on Scientific Sessions Program (2013-  
2014)  
FDA Cardiovascular and Renal Drugs  
Advisory Committee  
MEMBER  
American College of Cardiology  
Board of Trustees  
American Heart Association National  
Board of Directors

MEMBER (Elected)  
Association of American Physicians  
Association of University Cardiologists  
National Academy of Medicine/Institute  
of Medicine

AWARDED  
Master of the American College of  
Cardiology (2016)  
Clinical Research Prize, American Heart  
Association (2017)

### 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 health care while also advancing science and educating the next generation of clinical leaders.

### SELECTED PUBLICATIONS

Extended Thromboprophylaxis with Betrixaban in Acutely Ill Medical Patients. Cohen, A. T., Harrington, R. A., Goldhaber, S. Z., Hull, R. D., Wiens, B. L., Gold, A., Hernandez, A. F., Gibson, C. M.; New England Journal of Medicine; 2016; 375 (6): 534-544.

Safety and Tolerability of CSL112, a Reconstituted, Infusible, Plasma-Derived Apolipoprotein A-I, After Acute Myocardial Infarction: The AEGIS-I Trial (ApoA-I Event Reducing in Ischemic Syndromes I). Michael Gibson C, Korjian S, Tricoci P, Daaboul Y, Yee M, Jain P, Alexander JH, Steg PG, Lincoff AM, Kastelein JJ, Mehran R, D'Andrea DM, Deckelbaum LI, Merkely B, Zarebinski M, Ophuis TO, Harrington RA. Circulation. 2016;134(24):1918-1930.

Sharing Data from Cardiovascular Clinical Trials - A Proposal. Academic Research Organization Consortium for Continuing Evaluation of Scientific Studies - Cardiovascular (ACCESS CV). Patel MR, Armstrong PW, Bhatt DL, Braunwald E, Camm AJ, Fox KA, Harrington RA, Hiatt WR, James SK, Kirtane AJ, Leon MB, Lincoff AM, Mahaffey KW, Mauri L, Mehran R, Mehta SR, Montalescot G, Nicholls SJ, Perkovic V, Peterson ED, Pocock SJ, Roe MT, Sabatine MS, Sekeres M, Solomon SD, Steg G, Stone GW, Van de Werf F, Wallentin L, White HD, Gibson M. N Engl J Med. 2016;375(5):407-9.

Cholesterol, Cardiovascular Risk, Statins, PCSK9 Inhibitors, and the Future of LDL-C Lowering. Rodriguez F, Harrington RA. JAMA. 2016;316(19):1967-1968.

The Academic Medical System: Reinvention to Survive the Revolution in Health Care. Konstam MA, Hill JA, Kovacs RJ, Harrington RA, Arrighi JA, Khara A for Academic Cardiology Section Leadership Council of the American College of Cardiology. J Am Coll Cardiol. 2017; 69(10):1305-1312.

Disaggregation of Cause-Specific Cardiovascular Disease Mortality Among Hispanic Subgroups. Rodriguez F, Hastings KG, Boothroyd DB, Echeverria S, Lopez L, Cullen M, Harrington RA, Palaniappan LP. JAMA Cardiol. 2017;2(3):240-247.

Targeting Inflammation in Coronary Artery Disease. Harrington RA. N Engl J Med 2017; 377:1197-1198.



## Paul A. Heidenreich, MD, MS

Professor and Vice-Chair for Quality, Medicine - Cardiovascular Medicine  
 Professor (by courtesy), Health Research and Policy  
 Director of Echocardiography, 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

Simon Dack Award for Outstanding  
Scholarship, American College of  
Cardiology Foundation

Anna and Harry Borun Visiting Professor,  
UCLA (2011)

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

Association Between Intensity of Statin Therapy and Mortality in Patients With Atherosclerotic Cardiovascular Disease. Rodriguez F, Maron DJ, Knowles JW, Virani SS, Lin S, Heidenreich PA. JAMA Cardiol. 2017 Jan 1;2(1):47-54.

Cost-Effectiveness of Sacubitril-Valsartan in Patients With Heart Failure With Reduced Ejection Fraction. Sandhu AT, Ollendorf DA, Chapman RH, Pearson SD, Heidenreich PA. Ann Intern Med. 2016 Nov 15;165(10):681-689.

Forecasting the impact of heart failure in the United States: a policy statement from the American Heart Association. Heidenreich PA, Albert NM, Allen LA, Bluemke DA, Butler J, Fonarow GC, Ikonidis JS, Khavjou O, Konstam MA, Maddox TM, Nichol G, Pham M, Piña IL, Trogon JG; American Heart Association Advocacy Coordinating Committee; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Cardiovascular Radiology and Intervention; Council on Clinical Cardiology; Council on Epidemiology and Prevention; Stroke Council. Circ Heart Fail. 2013 May;6(3):606-19.



## Sarah Heilshorn, PhD

William R. and Gretchen B. Kimball University Fellow in Undergraduate  
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

Postdoctoral Research UC Berkeley

### HONORS & AWARDS

Elected Fellow, Royal Society of Chemistry

Elected Fellow, American Institute for Medical and Biological Engineering

NIH Director's New Innovator Award

National Science Foundation Career Award

UK-US Stem Cell Collaboration Development Award

Colburn Lectureship, University of Delaware

EDITORIAL BOARD  
Biomaterials Science; APL  
Bioengineering

ASSOCIATE EDITOR  
Science Advances

MEMBER  
American Chemical Society; American Institute of Chemical Engineers; Materials Research Society; Society for Biomaterials; Tissue Engineering and Regenerative Medicine International Society

### 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.

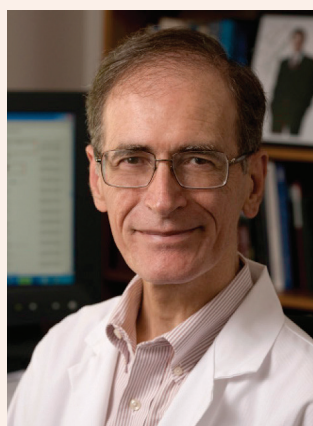
I have advised PhD students from six different academic programs at Stanford: chemistry, chemical engineering, bio engineering, materials science, mechanical engineering, and MD/PhD.

### SELECTED PUBLICATIONS

Maintenance of neural progenitor cell stemness in 3D hydrogels requires matrix remodelling. Madl CM, LeSavage B, Dewi R, Dinh C, Stowers R, Khariton M, Lampe K, Nguyen D, Chaudhuri O, Enejder A, Heilshorn SC. Nature Materials, 2017; 16: 1233–1242

Dual-stage crosslinking of a gel-phase bioink improves cell viability and homogeneity for 3D bioprinting. Dubbin K., Hori Y., Lewis K., Heilshorn SC. Advanced Healthcare Materials, 2016, 5(19): 2488-2492

Regulating stem cell secretome using injectable hydrogels with in situ network formation. Cai L., Dewi R., Goldstone A., Cohen J., Steele A., Woo J., Heilshorn SC. Advanced Healthcare Materials, 2016, 5(21):2758-2764



## Mark Hlatky, MD

Professor, Health Research and Policy

Professor, Medicine - Cardiovascular Medicine

Director, Health Services Research Masters Degree Program

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### 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). I am the Director of Stanford's Health Policy Masters Degree Program.

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

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

Clinical Associate 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 410 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

Assessment of bioresorbable scaffold with a novel high-definition 60 MHz IVUS imaging system: Comparison with 40-MHz IVUS referenced to optical coherence tomography. Okada K, Kitahara H, Mitsutake Y, Tanaka S, Kimura T, Yock PG, Fitzgerald PJ, Ikeno F and Honda Y. Catheter Cardiovasc Interv. 2017.

Bioresorbable Scaffold for Treatment of Coronary Artery Lesions: Intravascular Ultrasound Results from ABSORB Japan Trial. Okada K, Honda Y, Kitahara H, Otagiri K, Tanaka S, Yock PG, Popma JJ, Kusano H, Cheong W-F, Sudhir K, Fitzgerald PJ and Kimura T. J Am Coll Cardiol Interv. 2017. (in press)

Impact of attenuated-signal plaque observed by intravascular ultrasound on vessel response after drug-eluting stent implantation. Kitahara H, Waseda K, Sakamoto K, Yamada R, Huang CC, Nakatani D, Sakata K, Kwarada O, Yock PG, Matsuyama Y, Yokoi H, Nakamura M, Muramatsu T, Nanto S, Fitzgerald PJ and Honda Y. Atherosclerosis. 2017;259:68-74.

Impact of stent size selection on acute and long-term outcomes after drug-eluting stent implantation in de novo coronary lesions. Kitahara H, Okada K, Kimura T, Yock PG, Lansky AJ, Popma JJ, Yeung AC, Fitzgerald PJ and Honda Y. Circ Cardiovasc Interv. 2017;10.

Functional versus anatomic assessment of myocardial bridging by intravascular ultrasound: impact of arterial compression on proximal atherosclerotic plaque. Yamada R, Tremmel JA, Tanaka S, Lin S, Kobayashi Y, Hollak MB, Yock PG, Fitzgerald PJ, Schnitger I and Honda Y. J Am Heart Assoc. 2016;5:e001735.

Attenuated-signal plaque progression predicts long-term mortality after heart transplantation: IVUS assessment of cardiac allograft vasculopathy. Okada K, Fearon WF, Luikart H, Kitahara H, Otagiri K, Tanaka S, Kimura T, Yock PG, Fitzgerald PJ, Yeung AC, Valentine HA, Khush KK and Honda Y. J Am Coll

### 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  
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## Ngan F. Huang, PhD

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Biomedical Engineer, VA Palo Alto Health Care System

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### EDUCATION/TRAINING

PhD UC Berkeley and UCSF

MS UC Berkeley and UCSF

### HONORS & AWARDS

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

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

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

American Heart Association (FAHA)

STEERING COMMITTEE MEMBER, Stanford Cardiovascular Institute

### MEMBER

Bio-X; Child Health Research Institute

### FACULTY FELLOW

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 cardiovascular tissues. We are also collaborating with industry partners to develop bioengineered devices that improve lymphangiogenesis and angiogenesis in preclinical studies.

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

### SELECTED PUBLICATIONS

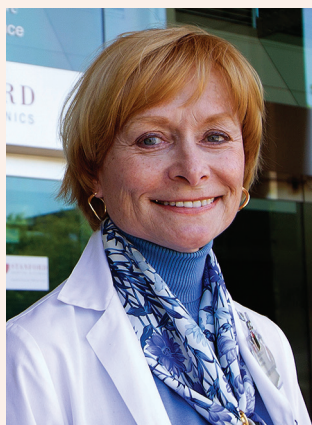
Anisotropic microfibrillar scaffolds enhance the organization and function of cardiomyocytes derived from induced pluripotent stem cells. Wanjare M, Hou L, Nakayama KH, Kim JJ, Mezak NP, Abilez OJ, Tzatzalos E, Wu JC, Huang NF. *Biomater Sci*. 5: 1567–1578, 2017.

Combinatorial Extracellular Matrix Microenvironments for Probing Endothelial Differentiation of Human Pluripotent Stem Cells. Hou L, Kim JJ, Wanjare M, Patlolla B, Collier J, Natsu V, Hastie TJ, Huang NF. *Sci Rep* 7, 6551, 2017.

Microfibrillar Scaffolds Enhance Endothelial Differentiation and Organization of Induced Pluripotent Stem Cells. Kim JJ, Hou L, Yang G, Mezak NP, Wanjare M, Joubert LM, Huang NF. *Cell Mol Bioeng*, 10:417–432, 2017.

Boosting the down-shifting luminescence of rare-earth nanocrystals for biological imaging beyond 1500 nm. Zhong Y, Ma Z, Zhu S, Yue J, Zhang M, Antaris AL, Yuan J, Cui R, Wan H, Zhou Y, Wang W, Huang NF, Luo J, Hu Z, Dai H. *Nat Commun*. 2017 8:737.

iPSC-derived endothelial cells in insulin resistance and metabolic syndrome. Carcamo-Orive I, Huang NF, Quertermous T, Knowles JW. *Arterioscler Thromb Vasc Biol* 37:2038–2042, 2017.



## Sharon Hunt, MD

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

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### EDUCATION/TRAINING

MD Stanford University

MEDICINE RESIDENCY & INTERNSHIP  
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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

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, Weisshaar D, Zhou J, Nam CW, Vu TA, Gomari FA, Skhiri M, Simos A, Schnittger I, Vrtovc B, Hunt SA, Fearon WF. Circ Heart Fail 5:759-768, 2012.



## John P. A. Ioannidis, MD, DSc

C.F. Rehnberg Professor in Disease Prevention  
 Professor, Medicine - Stanford Prevention Research Center and Health Research and Policy  
 Professor (by courtesy), Statistics  
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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

European Award for Excellence in Clinical Science  
 Chanchlani Award for Global Health  
 Medal for Distinguished Service, Teachers College, Columbia University  
 Honorary PhD, Erasmus University Rotterdam  
 Honorary PhD (health sciences), University of Athens

### ELECTED MEMBER

European Academy of Sciences and Arts  
 Association of American Physicians (also elected Councilor)  
 European Academy of Cancer Sciences  
 American Epidemiological Society

### FORMER PRESIDENT

Society for Research Synthesis Methodology

### AFFILIATED FACULTY

Woods Institute for the Environment, Bio-X, Stanford Cancer Institute

### EDITOR-IN-CHIEF

European Journal of Clinical Investigation

### EDITORIAL BOARD MEMBER

26 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

Meta-assessment of bias in science. Fanelli, D., Costas, R., Ioannidis, J. P. *Proc Natl Acad Sci*; 2017;114 (14): 3714-3719.

What does research reproducibility mean? Goodman, S. N., Fanelli, D., Ioannidis, J. P. *Sci Transl Med* 2016; 8 (341).

Evidence-based medicine has been hijacked: a report to David Sackett. Ioannidis, J.P. *J Clin Epidemiol* 2016; 73: 82-86.

Evolution of Reporting P Values in the Biomedical Literature, 1990-2015. Chavalarias, D., Wallach, J. D., Li, A. H., Ioannidis, J. P. *J Am Med Assoc*. 2016; 315 (11): 1141-1148.

Reproducible Research Practices and Transparency across the Biomedical Literature. Iqbal, S. A., Wallach, J. D., Khoury, M. J., Schully, S. D., Ioannidis, J. P. *PLoS Biology* 2016;14(1).





## Michael Kapiloff, MD, PhD

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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

The Protein Kinase A Anchoring Protein mAKAP Coordinates Two Integrated cAMP Effector Pathways. Dodge-Kafka, K.L., Souhayer, J., Pare, G.C., Michel, J.J.C., Langeberg, L.K., Kapiloff, M.S., and Scott, J.D. Nature, 437: 574-578, 2005.

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., Danial, 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.

The Scaffold Protein Muscle A-Kinase Anchoring Protein Beta Orchestrates Cardiac Myocyte Hypertrophic Signaling Required for the Development of Heart Failure. Kritzer, M.D., Li, J., Passariello, C.L., Gayanilo, M., Thakur, H., Dayan, J., Dodge-Kafka, K.L., and Kapiloff, M.S. Circulation: Heart Failure, 7 (4):663-672, 2014.



## Ioannis Karakikes, PhD

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### EDUCATION/TRAINING

PhD University of Essex, UK

POSTDOCTORAL TRAINING

Icham School of Medicine, NY

### HONORS & AWARDS

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

BEST MANUSCRIPT AWARD  
Circulation Research 2017

### CURRENT RESEARCH

Dr Karakike's research focuses on delineating the molecular mechanisms underlying the pathogenesis of cardiomyopathies toward improving future treatment strategies. His group uses human induced pluripotent stem cells and genome editing technologies to attain a better understanding of the biological function of genes and the functional significance of genetic variants in human cardiovascular diseases.

### SELECTED PUBLICATIONS

Correction Of Human Phospholamban R14del Mutation Associated With Cardiomyopathy Using Targeted Nucleases And Combination Therapy. Karakikes, I., Stillitano, F., Nonnenmacher, M., Tzimas, C., Sanoudou, D., Termglinchan, V., Kong, C., Rushing, S., Hansen, J., Ceholski, D., Kolokathis, F., Kremastinos, D., Katoulis, A., Ren, L., Cohen, N., Gho, J. M., Tsiapras, D., Vink, A., Wu, J. C., Asselbergs, F. W., Li, R. A., Hulot, J., Kranias, E. G., Hajjar, R. J.; Nature Communications; 2015: 6.

A Comprehensive TALEN-Based Knockout Library for Generating Human Induced Pluripotent Stem Cell-Based Models for Cardiovascular Diseases. Karakikes, I., Termglinchan, V., Cepeda, D. A., Lee, J., Diecke, S., Hendel, A., Itzhaki, I., Ameen, M., Shrestha, R., Wu, H., Ma, N., Shao, N., Seeger, T., Woo, N. A., Wilson, K. D., Matsa, E., Porteus, M. H., Sebastiano, V., Wu, J. C. Circulation research; 2017; 120(10): 1561-1571.

Human Induced Pluripotent Stem Cell-Derived Cardiomyocytes Insights Into Molecular, Cellular, and Functional Phenotypes. Karakikes, I., Ameen, M., Termglinchan, V., Wu, J. C.; Circulation Research; 2015; 117 (1): 80-88.

Efficient Genome Editing in Induced Pluripotent Stem Cells with Engineered Nucleases In Vitro. Termglinchan, V., Seeger, T., Chen, C., Wu, J. C., Karakikes, I.; Methods in Molecular Biology; 2017; 1521: 55-68.

iPSC-Derived Cardiomyocytes Reveal Abnormal TGF- $\beta$  Signalling In Left Ventricular Non-Compaction Cardiomyopathy. Kodo, K., Ong, S., Jahanbani, F., Termglinchan, V., Hirano, K., Inanloorahatloo, K., Ebert, A. D., Shukla, P., Abilez, O. J., Churko, J. M., Karakikes, I., Jung, G., Ichida, F., Wu, S. M., Snyder, M. P., Bernstein, D., Wu, J. C.; Nature Cell Biology; 2016; 18 (10): 1031-1042.

Transcriptome Profiling of Patient-Specific Human iPSC-Cardiomyocytes Predicts Individual Drug Safety and Efficacy Responses In Vitro. Matsa, E., Burridge, P. W., Yu, K., Ahrens, J. H., Termglinchan, V., Wu, H., Liu, C., Shukla, P., Sayed, N., Churko, J. M., Shao, N., Woo, N. A., Chao, A. S., Gold, J. D., Karakikes, I., Snyder, M. P., Wu, J. C.; Cell Stem Cell; 2016; 19 (3): 311-325.

Genomic Correction Of Familial Cardiomyopathy In Human Engineered Cardiac Tissues. Stillitano, F., Turnbull, I. C., Karakikes, I., Nonnenmacher, M., Backeris, P., Hulot, J., Kranias, E. G., Hajjar, R. J., Costa, K. D.; European Heart Journal; 2016.



## Kiran Kaur Khush, MD

Associate Professor, Medicine - Cardiovascular Medicine

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### EDUCATION/TRAINING

MD Harvard University,

MEDICINE RESIDENCY

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, American Board  
of Internal Medicine

### HONORS & AWARDS

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

Campaign for Stanford Medicine Award

Cardiovascular Institute Seed Grant

### CURRENT RESEARCH

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 am the Associate Director of the International Society for Heart and Lung Transplantation Adult Heart Transplant Registry, and I serve 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.

I aim to use innovative research tools to achieve scientific advances in heart transplantation, with the ultimate goal of improving the quality and length of life of our heart transplant recipients.

### SELECTED PUBLICATIONS

Temporal response of the human virome to immunosuppression and antiviral therapy. De Vlaminc I, Khush KK, Strehl C, Kohli B, Luikart H, Neff NF, Okamoto J, Snyder TM, Cornfield DN, Nicolls MR, Weill D, Bernstein D, Valantine HA, Quake SR. Cell. 2013 Nov 21;155(5):1178-87.

Circulating cell-free DNA enables noninvasive diagnosis of heart transplant rejection. De Vlaminc I, Valantine HA, Snyder TM, Strehl C, Cohen G, Luikart H, Neff NF, Okamoto J, Bernstein D, Weisshaar D, Quake SR, Khush KK. Sci Transl Med. 2014 Jun 18;6(241):241ra7.

National Decline in Donor Heart Utilization with Regional Variability: 1995-2010. Khush K, Zaroff J, Nguyen J, Menza R, Goldstein B. American Journal of Transplantation, 2015 Mar 15(3) 642-9.

Non-invasive monitoring of infection and rejection after lung transplantation. De Vlaminc I, Martin L, Kertesz M, Patel K, Kowarsky M, Strehl C, Cohen G, Luikart H, Neff N, Okamoto J, Nicolls M, Cornfield D, Weill D, Valantine H, Khush K, Quake S. Proceedings of the National Academy of Sciences, 2015 Oct; 112 (43) 13336-41.

Angiotensin-Converting Enzyme Inhibition Early After Heart Transplantation. Fearon WF, Okada K, Kobashigawa J, Kobayashi Y, Luikart H, Sana S, Daun T, Chmura SA, Sinha S, Cohen G, Honda Y, Pham M, Lewis DB, Bernstein D, Yeung AC, Valantine HA, Khush K. Journal of the American College of Cardiology, 2017 June 13; 69(23)2832-2841.



## Joshua W. Knowles, MD, PhD

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### 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  
The Familial Hypercholesterolemia (FH)  
Foundation

American Heart Association National  
Fellow to Faculty Transition Award

Future Leaders in CV Medicine  
Fellowship Award

Doris Duke Foundation Clinical  
Researcher

FELLOW  
American College of Cardiology;  
American Heart Association

DIPLOMATE  
American Board of Clinical Lipidology

INTERNATIONAL ADVISORY BOARD  
Canadian FH registry

STEERING COMMITTEE  
Stanford Cardiovascular Institute

### CURRENT RESEARCH

The theme of Dr. Knowles' research 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 to the clinic, and most recently to the Public Health aspect of genetics. He completed his MD-PhD at UNC with Prof. Nobuyo Maeda and Nobel Laureate Oliver Smithies. He did Internal Medicine residency and Cardiology fellowship training at Stanford working with Dr. Tom Quertermous. Currently his discovery and basic translational efforts center on understanding the genetic basis of insulin resistance using GWAS studies coupled with exploration in model systems. His clinical translational focus is on Familial Hypercholesterolemia (FH) and he is the volunteer Chief Medical 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) and apply for an ICD10 code for FH, and he is now using cutting-edge "big-data" approaches to identify previously undiagnosed FH patients in electronic medical records (FIND FH). He has published over 70 papers with research projects currently funded by the National Institutes of Health, the American Heart 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

Cascade Screening for Familial Hypercholesterolemia And the Use of Genetic Testing. Knowles JW, Rader DJ, Khoury MJ. JAMA. 2017 July 25. 318(4):381-382.

Access to Non-Statins Lipid Lowering Therapies in Patients at High-Risk of Atherosclerotic Cardiovascular Disease. Knowles JW, Howard WB, Karayan L, Baum SJ, Wilemon KA, Ballantyne CM, Myers KD. Circulation. 2017 May 30;135(22):2204-2206.

Identification and validation of N-acetyltransferase 2 as an insulin sensitivity gene. Knowles JW, Xie W, Zhang Z, Chennamsetty I, Assimes TL, Paananen J, Hansson O, Pankow J, Goodarzi MO, Carcamo-Orive I, Morris AP, Chen YD, Mäkinen VP, Ganna A, Mahajan A, Guo X, Abbasi F, Greenawald DM, Lum P, Molony C, Lind L, Lindgren C, Raffel LJ, Tsao PS, Schadt EE, Rotter JI, Sinaiko A, Reaven G, Yang X, Hsiung CA, Groop L, Cordell HJ, Laakso M, Hao K, Ingelsson E, Frayling TM, Weedon MN, Walker M, Quertermous T. J Clin Invest. 2016 Jan 4;126(1):403.

Nat1 Deficiency Is Associated with Mitochondrial Dysfunction and Exercise Intolerance in Mice. Chennamsetty I, Coronado M, Contrepas K, Keller MP, Carcamo-Orive I, Sandin J, Fajardo G, Whittle AJ, Fathzadeh M, Snyder M, Reaven G, Attie AD, Bernstein D, Quertermous T, Knowles JW. Cell Rep. 2016 Oct 4;17(2):527-540.





## 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 research in my lab is to characterize the structure and mechanism of activation of G protein coupled receptors (GPCRs). GPCRs represent the largest group of cellular receptors for hormones and neurotransmitters in the human 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 a spectrum of 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 new approaches for the more efficient and economical development of safer and more effective therapeutics targeting these receptors.

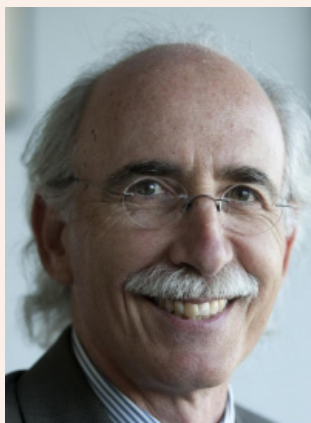
It has been a great privilege to be part of the Stanford community, which provides a unique environment for interdisciplinary collaborations, and attracts the most talented and innovative students and fellows.

### SELECTED PUBLICATIONS

**Crystal structure of the beta 2-adrenergic receptor-Gs protein complex.** Rasmussen, S. G., Devree, B. T., Zou, Y., Kruse, A. C., Chung, K. Y., Kobilka, T. S., Thian, F. S., Chae, P. S., Pardon, E., Calinski, D., Mathiesen, J. M., Shah, S. T., Lyons, J. A., Caffrey, M., Gellman, S. H., Steyaert, J., Skiniotis, G., Weis, W. I., Sunahara, R. K. & Kobilka, B. K. *Nature*, 477, 549-555 (2011).

**Structural insights into the dynamic process of beta2-adrenergic receptor signaling.** Manglik, A., Kim, T. H., Masureel, M., Altenbach, C., Yang, Z., Hilger, D., Lerch, M. T., Kobilka, T. S., Thian, F. S., Hubbell, W. L., Prosser, R. S., and Kobilka, B. K. *Cell* 161(5), 1101-1111 (2015).

**Single-molecule analysis of ligand efficacy in beta2AR-G-protein activation.** Gregorio, G.G., Masureel, M., Hilger, D., Terry, D.S., Juette, M., Zhao, H., Zhou, Z., Perez-Aguilar, J.M., Hauge, M., Mathiasen, S., Javitch, J.A., Weinstein, H., Kobilka, B.K.\* and Blanchard, S.C.\* *Nature* 547: 68-73 (2017).



## Fredric Kraemer, MD

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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

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.

Hormone-sensitive lipase knockout mice maintain high bone density during aging. Shen W.-J., Liu L.-F., Patel S., Kraemer F.B. FASEB J 25:2722-2730, 2011.

Resistance to high fat diet-induced obesity with altered expression of adipose specific genes in hormone-sensitive lipase deficient mice. Harada K., Shen W.-J., Patel S., Natu V., Wang J., Osuga J.-i., Ishibashi S., Kraemer F.B. Am. J. Physiol. Endocrinol. Metab. 285:E1182-1195, 2003.



## Mark A. Krasnow, MD, PhD

Professor, Biochemistry  
Investigator, Howard Hughes Medical Institute  
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.

Mesenchymal cells. Defining a mesenchymal progenitor niche at single-cell resolution. Kumar ME, Bogard PE, Espinoza FH, Menke DB, Kingsley DM, Krasnow MA. Science; 2014; Nov 14; 346( 6211): 1258810.

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.



## 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.

Non-equivalence of Wnt and R-spondin ligands during Lgr5+ intestinal stem-cell self-renewal. Yan KS, Janda CY, Chang J, Zheng GXY, Larkin KA, Luca VC, Chia LA, Mah AT, Han A, Terry JM, Ootani A, Roelf K, Lee M, Yuan J, Li X, Bolen CR, ..., Belgrader P, Ziraldo SB, Ordóñez H, Henning SJ, Wong MH, Snyder MP, Weissman IL, Hsueh AJ, Mikkelsen TS, Garcia KC, Kuo CJ. *Nature* (2017) May 11;545(7653):238-242.





## Anson Lee, MD

Assistant Professor of Cardiothoracic Surgery (Adult Cardiac Surgery)

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### 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

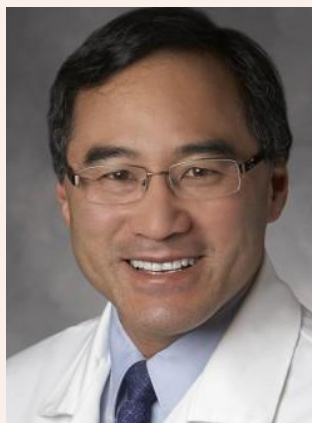
### CURRENT RESEARCH

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

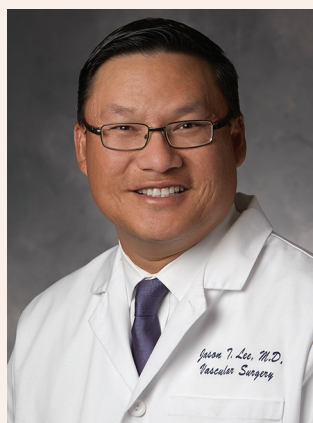
My current research is largely focused on developing new technology for interventional cardiology. I helped develop catheter-based renal denervation as a treatment for hypertension, and my current studies have focused on RDN as primary therapy alone or in combination with medications. My other projects 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

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

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### 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  
Surgical Simulation and Education  
Thoracic Outlet Syndrome

### HONORS & AWARDS

Society for Vascular Surgery  
Distinguished Fellow  
CVI Seed Grant (2013)  
Henry J. Kaiser Family Foundation  
Teaching Award  
Society for Vascular Surgery E.J. Wyllie  
Traveling Fellowship  
Stanford Program in Biodesign,  
Mentorship Award

### PRESIDENT

Northern California Vascular Surgery  
Society (2013-16)

### PROGRAM CHAIR

Western Vascular Society (2014)

### PROGRAM COMMITTEE

Vascular Annual Meeting (2013-15)

### SECRETARY-TREASURER

Association for Program Directors in  
Vascular Surgery (APDVS) (2016-current)

SIMULATION COMMITTEE CHAIR APDVS  
(2008-11)

### SECRETARY

Peripheral Vascular Surgery Society  
(2016-current)

### 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. I am the Director of Endovascular Surgery and Program Director of our top-notch Vascular Surgery Residency/Fellowship.

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

Prospective, multicenter study of endovascular repair of aortoiliac and iliac aneurysms using the Gore IBE. Schneider DB, Matsumura J, Lee JT, Peterson B, Chaer R, Oderich G. J Vasc Surg. 2017 Sep;66(3):775-785.

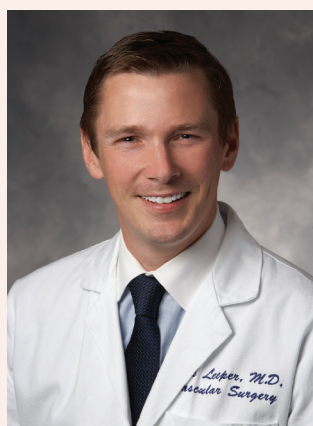
Natural history of gutter-related Type Ia endoleaks after snorkel/chimney EVAR. Ullery BW, Itoga NK, Tran K, Fleischmann D, Dalman RL, Lee JT. J Vasc Surg 2017; 65:981-90.

Renal function changes after fenestrated endovascular aneurysm repair. Tran, K., Fajardo, A., Ullery, B. W., Goltz, C., Lee, J. T.; Journal of Vascular Surgery; 2016; 64 (2): 273-280.

Comparative geometric analysis of renal artery anatomy before and after fenestrated or snorkel/chimney endovascular aneurysm repair. Ullery, B. W., Suh, G., Lee, J. T., Liu, B., Stineman, R., Daman, R. L., Cheng, C. P. ; Journal of Vascular Surgery ; 2016; 63 (4): 922-929.

Debate: Whether branched/fenestrated endovascular aneurysm repair procedures are better than snorkels, chimneys, or periscopes in the treatment of most thoracoabdominal and juxtarenal aneurysms. Hertault, A., Haulon, S., Lee, J. T.; Journal of Vascular Surgery; 2015; 62 (5): 1357-1365.

Collected world experience about the performance of the snorkel/chimney endovascular technique in the treatment of complex aortic pathologies: The PERICLES registry. Lee JT, Donas KP, Lachat M, Torsello G, Veith FJ. Ann Surg 2015;262:546-53.



## Nicholas Leeper, MD

Associate Professor, Surgery - Vascular Surgery  
Associate 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  
Internal Medicine, ABIM  
Cardiovascular Disease, ABIM  
Vascular Medicine, ABVM

### CLINICAL FOCUS

Vascular Medicine

### HONORS & AWARDS

PRESIDENT  
American Heart Association, Silicon  
Valley Board

Jeremiah Stamler Distinguished  
Young Investigator Research Award,  
Northwestern Cardiovascular Young  
Investigators' Forum (2013)

Jay D. Coffman Young Investigator  
Award, Society for Vascular Medicine

CHAIR  
ATVB Early Career Committee

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" (Greek: 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.

*A man is as old as his arteries. — Thomas Sydenham,  
17th Century*

### SELECTED PUBLICATIONS

CD47-blocking antibodies restore phagocytosis and prevent atherosclerosis. *Nature*. Kojima, Y., Volkmer, J., McKenna, K., Civelek, M., Lusic, 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. 2016; 536 (7614): 86-90.

The Role of Efferocytosis in Atherosclerosis. *Circulation*. Kojima, Y., Weissman, I. L., Leeper, N. J. 2017; 135 (5): 476-489.

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

Pro-efferocytic therapy promotes TGFbeta signaling and prevents aneurysm formation. *Circulation*. Kojima, Y., Werner, N., Ye, J., Nanda, V., Tsao, N., Wang, Y., Flores, A.M., Miller C., Weissman, Deng H., I.L., Xu, B., Dalman, RL, Eken, S.M., Pelisek, J., Li, Y., Maegdefessel, L., Leeper, N.J. In Press, 2018.





## Lawrence Leung, MD

Maureen Lyles D'Ambrogio Professor of Medicine, Hematology  
Senior Associate Dean for Veterans Affairs  
Chief of Staff, VA Palo Alto Health Care System

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DIVISION [hematology.stanford.edu](http://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. I am Chief of Staff, VA Palo Alto Health Care System.

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 activation in human obesity. Chang SS, Eisenberg D, Zhao L, Adams C, Leib R, Morser J, Leung L.; Obesity; 2016; Jul; 24 (7): 1522-9.

Carboxypeptidase B2 deficiency reveals opposite effects of complement C3a and C5a in a murine polymicrobial sepsis model. Shao Z, Nishimura T, Leung LL, Morser J. J. Thromb. Haemost. 2015, 13:1090-1102.

Thrombin cleavage of osteopontin disrupts a pro-chemotactic sequence for dendritic cells, which is compensated by the release of its pro-chemotactic C-terminal fragment. Shao Z, Morser J, Leung LL. J Biol Chem.; 2014; Sep 26; 289 (39): 27146-58.

Open aortic valve replacement in a patient with Glanzmann's thrombasthenia: a multidisciplinary strategy to minimize perioperative bleeding. Sheikh, A. Y., Hill, C. C., Goodnough, L. T., Leung, L. L., Fischbein, M. P.; Transfusion; 2014; 54 (2): 300-305.



## 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

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

Low Eddy Current RF Shielding Enclosure Designs for 3T MR Applications. B.J. Lee, R.D. Watkins, C.M. Chang, C.S. Levin. Magnetic Resonance in Medicine. June 2017.

Studies of a Next Generation Silicon-Photomultiplier-Based Time-of-Flight PET/CT System. D.F.C. Hsu, E. Ilan, W.T. Peterson, J. Uribe, M. Lubberink, C.S. Levin. Journal of Nuclear Medicine, 58(9), pp. 1511-1518, SEPT 2017

An Expectation Maximization Method for Joint Estimation of Emission Activity Distribution and Photon Attenuation Map in PET. Mihlin, Alexander; Levin, Craig S. IEEE Transactions on Medical Imaging, 36(1), pp. 214-224, JAN 2017.

Simultaneous PET/MR imaging with a radio frequency-penetrable PET insert. Grant, AM, Lee, BJ, Chang, CM, Levin, C.S. Medical Physics, Vol. 44, Issue 1, Pages 112-120, JAN 2017.

A promising new mechanism of ionizing radiation detection for positron emission tomography: modulation of optical properties. Tao, L; Daghighian, HM; Levin, CS. Physics in Medicine and Biology, 61(21), pp. 7600-7622, NOV 2016.



## Ronglih Liao, PhD

Professor of Medicine, Cardiovascular Medicine

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### EDUCATION/TRAINING

PhD University of Alabama at Birmingham

POSTDOCTORAL TRAINING  
Harvard Medical School/Beth Israel Hospital and Brigham and Women's Hospital

### HONORS & AWARDS

CHAIR, Basic Cardiovascular Sciences Council, American Heart Association

AD HOC CONSULTANT, NHLBI Review Committee Study Section

FELLOW  
American Heart Association  
American Physiological Society

### CURRENT RESEARCH

Following tissue injury or genetic alteration, the heart undergoes a process of molecular and structural remodeling, ultimately resulting in cardiac dysfunction. The central focus of our laboratory's research is to understand the molecular mechanisms that mediate the transition from a normal to failing heart. Our research approaches attempt to bridge the growing span between basic bench research and patient care, with a goal towards identifying novel therapeutic targets for rapid translation into clinical medicine. We tackle these scientific interests by utilizing an integrated approach combining molecular studies with intensive investigation of cardiovascular physiology from single cells, isolated hearts to intact animals and patients bio-specimen. Current ongoing projects are (1) to elucidate the molecular mechanisms regulating the development and progression of primary amyloid cardiomyopathy and (2) to reveal the mechanisms, metabolic regulation, and therapeutic potential of cardiac regeneration using stem/progenitor cells from extra-cardiac sources, such as bone marrow, iPS and resident cardiac stem cells

### SELECTED PUBLICATIONS

Amyloidogenic light chains induce cardiomyocyte contractile dysfunction and apoptosis via a non-canonical p38alpha MAPK pathway. Shi J, Guan J, Jiang B, Brenner DA, Del Monte F, Ward JE, Connors LH, Sawyer DB, Semigran MJ, Macgillivray TE, Seldin DC, Falk R, Liao R. Proc Natl Acad Sci U S A. 107(9):4188-93.

Lysosomal dysfunction and impaired autophagy underlie the pathogenesis of amyloidogenic light chain-mediated cardiotoxicity. Guan J, Mishra S, Qiu Y, Shi J, Trudeau K, Las G, Liesa M, Shirihai OS, Connors LH, Seldin DC, Falk RH, MacRae CA, Liao R. EMBO Mol Med. 2014 (11):1493-507.

MicroRNA-34a Plays a Key Role in Cardiac Repair and Regeneration Following Myocardial Infarction. Yang Y, Cheng HW, Qiu Y, Dupee D, Noonan M, Lin YD, Fisch S, Unno K, Sereti KI, Liao R. Circ Res. 2015;117 (5):450-9.

Amyloid Cardiomyopathy- Disease on the Rise. Liao R, Ward JE. View Point, Circulation Research. Circ Res. 2017;120 (12):1865-1867.



## 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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### EDUCATION/TRAINING

MD Harvard Medical School

General Surgery

INTERNSHIP UCSF Medical Center

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)

FLANCE-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)

### 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

Identification and specification of the mouse skeletal stem cell. Chan CK, Seo EY, Chen JY, Lo D, McArdle A, Sinha R, Tevlin R, Seita J, Vincent-Thompkins J, Wearda T, Lu WJ, Senartha-Yapa K, Chung MT, Marcic O, Tran M, Yan KS, Upton R, Walmsley GG, Lee AS, Sahoo D, Kuo C, Weissman L, Longaker MT. Cell 2015; 160: 285-298.

Identification and targeted inhibition of a fibroblast lineage responsible for skin scarring and cancer stroma. Yuval Rinkevich, Graham G. Walmsley, Michael S. Hu, Zeshaan N. Maan, Aaron M. Newman, Micha Drukker, Michael Januszyk, Geoffrey C. Gurtner, Peter H. Lorenz, Irving L. Weissman, Michael T. Longaker. Science. 2015;348(6232):aaa2151.

Chemical rescue of cleft palate and midline defects in conditional GSK-3beta mice. Liu KJ, Arron JR, Stankunas K, Crabtree GR, Longaker MT. Nature. 2007;446(7131):79-82.

Pharmacological rescue of diabetic skeletal stem cell niches. Tevlin R, Seo EY, Marcic O, McArdle A, T Xinming, Zimdahl B, Malkovskly A, Sinha R, Gulati G, Li X, Wearda T, Morganti R, Lopez M, Ransom RC, Duldulao CR, Rodrigues M, Nguyen A, Januszyk M, Maan Z, Paik K, Yapa KS, Rajadas J, Wan DC, Gurtner GC, Snyder M, Beachy PA, Yang F, Goodman SB, Weissman IL, Chan CK, Longaker MT. Science Translational Medicine. 2017; 9(372).





## 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

My research interests include the longterm outcome and prevalence of adolescents and adults with congenital heart disease. I am currently working with the Centers for Disease Control and Prevention on the Surveillance of Congenital Heart Defects Across the Lifespan. The goal of this project is to build on existing infrastructure for population-based CHDs surveillance to (i) link additional years of surveillance data for both adolescents and adults identified having a CHD, (ii) identify factors associated with optimal healthcare and improved outcomes, (iii) evaluate factors that impede appropriate transition from pediatric to adult care, (iv) expand surveillance activities to include the lifespan, and (v) develop pilot projects to translate public health best practices into action.

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

Diagnosis and Management of Noncardiac Complications in Adults with Congenital Heart Disease: A Scientific Statement from the American Heart Association. Lui GK, Saidi A, Bhatt AB, Burchill LJ, Deen JF, Earing MG, Gewitz M, Ginns J, Kay JD, Kim YY, Kovacs AH, Krieger EV, Wu FM, Yoo SJ; American Heart Association Adult Congenital Heart Disease Committee of the Council on Clinical Cardiology and Council on Cardiovascular Disease in the Young; Council on Cardiovascular Radiology and Intervention; and Council on Quality of Care and Outcomes Research. *Circulation* 2017; Oct 9.

Proximity to pediatric cardiac surgical care among adolescents with congenital heart defects in eleven New York counties. Sommerhalter K, Insaf T, Akkaya-Hocagil T, McGarry C, Farr S, Downing K, Lui GK, Zaidi A, Van Zutphen A. *Birth Defects Research (Part A)* 2017; 109: 1494-1503.

Risk Estimates for Atherosclerotic Cardiovascular Disease in Adults with Congenital Heart Disease. Lui GK, Rogers IS, Ding YV, Hedlin HK, MacMillen K, Maron D, Sillman C, Romfh A, Dade TC, Haeffele C, Grady SR, Murphy DJ, McElhinney D, Fernandes SM. *Am J Card* 2017; 119: 112-118.

Management of Cardiovascular Risk Factors in Adults with Congenital Heart Disease. Lui GK, Fernandes S, McElhinney DB. *Journal of the American Heart Association* 2014; 3.



## Merritt Maduke, PhD

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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)

### CURRENT RESEARCH

Ion transport across the hydrophobic barrier of the cell membrane is a primary challenge faced by all cells. Such transport sets up and exploits ion gradients, thus providing the basic energy and signaling events that are the foundation of life. My laboratory studies the molecular mechanisms of ion channels and transporters, the proteins that catalyze this transport. We use a combination of biophysical methods to investigate membrane-protein structure and dynamics together with electrophysiological analyses to directly measure function. We also collaborate with the Du Bois laboratory (Chemistry) to develop small-molecule tools for studying physiological functions of channels and transporters. Finally, we apply expertise in ion channels towards understanding the mechanism by which ultrasound modulates neural activity. These projects have many potential therapeutic applications in cardiovascular health and disease.

Nothing will work if you don't. — Maya Angelou.

### SELECTED PUBLICATIONS

The CLC-0 chloride channel is a "broken" Cl<sup>-</sup>/H<sup>+</sup> antiporter. Lisal, J. and Maduke, M. *Nature Struct. Mol. Biol.* 15, 805-810, 2008.

A designed inhibitor of a CLC antiporter blocks function through a unique binding mode. Howery, A.E., Elvington, S.M., Abraham, D.J., Choi, K.H., Dworschak-Simpson, S., Phillips, S., Ryan, C.M., Sanford, R.L., Almqvist, J., Tran, K., Chew, T.A., Zachariae, U., Andersen, O.S., Whitelegge, J.P., Matulef, K., Du Bois, J. & Maduke, M. *Chem. Biol.*, 19(11), 1460-1470., 2012.

Revealing an outward-facing open conformational state in a CLC Cl<sup>-</sup>/H<sup>+</sup> exchange transporter. Khantwal, C.M., Abraham, S.J., Han, W., Jiang, T., Chavan, T.S., Cheng, R.C., Elvington, S.M., Liu, C.W., Mathews, I.I., Stein, R.A., Mchaourab, H.S., Tajkhorshid, E., and Maduke, M. *Elife* Jan 22;5. pii: e11189.

Activation of Piezo1 but not Nav1.2 Channels by Ultrasound at 43 MHz. Prieto, M.L., Firouzi, K., Khuri-Yakub, B.T., Maduke, M. . *Ultrasound in Medicine and Biology*, accepted, Available at *BioRxiv* 136994, 2017.

<sup>13</sup>C NMR detects conformational change in the 100-kD membrane transporter CLC-ec1. Abraham, S.J., Cheng, R.C., Chew, T.A., Khantwal, C.M., Liu, C.W., Gong, S., Nakamoto, R.K., and Maduke, M. *J Biomol NMR*, 61(3-4), 209-26, 2015.



## Kenneth W. Mahaffey, MD

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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

ADVISORY BOARD MEMBER

Brazilian Clinical Research Institute

CONTRIBUTOR

European Society of Cardiology, Task Force of Guidelines for the Management of Acute Myocardial Infarction in Patients with Persistent ST-segment Elevation

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 focuses on the study of anticoagulant and antiplatelet agents for the treatment of acute coronary syndromes, stable atherosclerotic vascular disease and atrial fibrillation, the study of agents targeted to protect the myocardium during reperfusion therapy for acute myocardial infarction, and the evaluation of cardiovascular safety of diabetic therapies. A key focus is also the rigorous study of mobile and digital technologies to improve patient care and the conduct research. I am also interested in the methodology of clinical trials. Current research activities include standardization of the definition of myocardial infarction used in clinical trials, the adjudication of suspected clinical endpoint events, and evaluation of evidence-based operations in the conduct of large multinational clinical trials. I am the Vice Chair of Clinical Research in the department of Medicine and Director of the Stanford Center for Clinical Research.

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

### SELECTED PUBLICATIONS

*Canagliflozin and Cardiovascular and Renal Events in Type 2 Diabetes.* Neal B, Perkovic V, Mahaffey KW, de Zeeuw D, Fulcher G, Erond N, Shaw W, Law G, Desai M, Matthews DR; CANVAS Program Collaborative Group. *N Engl J Med.* 2017 Aug 17;377(7):644-657

*Ticagrelor versus Clopidogrel in Symptomatic Peripheral Artery Disease.* Hiatt WR, Fowkes FG, Heizer G, Berger JS, Baumgartner I, Held P, Katona BG, Mahaffey KW, Norgren L, Jones WS, Blomster J, Millegård M, Reist C, Patel MR; EUCLID Trial Steering Committee and Investigators. *N Engl J Med.* 2017 Jan 5;376(1):32-40.



## David J. Maron, MD

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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

Alpha Omega Alpha  
Vanderbilt Emergency Department  
Patient Advocate Award  
Vanderbilt Five Star Award for patient  
satisfaction (2010, 2013)

#### FELLOW

American College of Cardiology  
American Heart Association  
National Lipid Association

#### FORMER DIRECTOR

(VANDERBILT UNIVERSITY)  
Dayani Center for Health and Wellness;  
Emergency Cardiology; Vanderbilt Chest  
Pain Unit

### CURRENT RESEARCH

My research is devoted to the application of evidence-based medicine for the prevention and treatment of coronary artery disease. As a follow-up to my work on the COURAGE trial, I am Co-Chair of the ISCHEMIA trial, a large international NIH/NHLBI-funded trial that compares the effectiveness of conservative versus invasive management of patients with stable coronary disease and at least moderate ischemia on stress testing. In the Preventive Cardiology Clinic we are testing an antisense oligonucleotide for the treatment of high levels of lipoprotein (a) and chelation therapy for patients with diabetes and a history of heart attack. I am working on Project Baseline to find new signals that indicate the onset or progression of coronary artery disease.

### SELECTED PUBLICATIONS

Association Between Intensity of Statin Therapy and Mortality in Patients With Atherosclerotic Cardiovascular Disease. Rodriguez F, Maron DJ, Knowles JW, Virani SS, Lin S, Heidenreich PA. JAMA Cardiol; 2017; Jan 1; 2 (1): 47-54.

AHA/ASE/ASNC/SCAI/SCCT/STS 2017 Appropriate use criteria for coronary revascularization in patients with stable ischemic heart disease: a report of the American College of Cardiology Appropriate Use Criteria Task Force, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, and the Society of Thoracic Surgeons. Patel MR, Calhoun JH, Dehmer GJ, Grantham JA, Maddox TM, Maron DJ, Smith PK. ACC/AATS/J Am Coll Cardiol 2017;69:2212-2241.

ACC/AATS/AHA/ASE/ASNC/SCAI/SCCT/STS 2016 Appropriate use criteria for coronary revascularization in patients with acute coronary syndromes: a report of the American College of Cardiology Appropriate Use Criteria Task Force, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, and the Society of Thoracic Surgeons. Patel MR, Calhoun JH, Dehmer GJ, Grantham JA, Maddox TM, Maron DJ, Smith PK. J Am Coll Cardiol 2017;69:570-591.

Relationship between simple markers of insulin resistance and coronary artery calcification. Reaven GM, Knowles JW, Leonard D, Barlow CE, Willis BL, Haskell WL, Maron DJ. J Clin Lipidol. 2017;11:1007-1012.

Dietary patterns and long-term survival: a retrospective study of healthy primary care patients. Shah NS, Leonard D, Finley CE, Rodriguez F, Sarraju A, Barlow CE, DeFina LF, Willis BL, Haskell WL, Maron DJ. Am J Med. 2017 Aug 30. pii: S0002-9343(17)30840-9.





## Alison Marsden, PhD

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

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### CURRENT RESEARCH

Alison Marsden is an Associate 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 working with Prof. Parviz Moin. She was a postdoctoral fellow at Stanford University in Bioengineering and Pediatric Cardiology from 2005-07 working with Charles Taylor and Jeffrey Feinstein. She was the recipient of a Burroughs Wellcome Fund Career Award at the Scientific Interface in 2007, an NSF CAREER award in 2011, and is a member of an international Leducq Foundation Network of Excellence. She received the UCSD graduate student association faculty mentor award in 2014 and MAE department teaching award at UCSD in 2015. She has published over 90 peer reviewed journal papers, and has received funding from the NSF, NIH, and several private foundations. She serves on the editorial boards of PLOS Computational Biology, the Journal of Biomechanical Engineering and Cardiovascular Engineering and Technology, and on the advisory board for the Burroughs Wellcome Fund. Her work focuses on the development of numerical methods for cardiovascular blood flow stimulation, medical device design, application of 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

Assessment of Coronary Artery Aneurysms Caused by Kawasaki Disease Using Transluminal Attenuation Gradient Analysis of Computerized Tomography Angiograms. Grande Gutierrez, N., Shirinsky, O., Gagarina, N.V., Lyskina, G.A., Fukazawa, R., Ogawa, S., Burns, J.C., Marsden, A.L., Kahn, A.M., American Journal of Cardiology, Vol. 120 (4), pp. 556-562, (2017).

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.

A Method to Quantify Mechanobiologic Forces during Zebrafish Cardiac Development using 4-D Light Sheet Imaging and Computational Modeling. Vedula, V., Lee, J., Xu, H., Kuo, J.C.-C., Hsiai, T.K., Marsden, A.L.. PLOS Computational Biology, in press.

Patient specific simulations reveal significant differences in mechanical stimuli in venous and arterial coronary grafts. Ramachandra, A. B., Kahn, A. M., Marsden, A.L., Journal of Cardiovascular Translational Research, Vol. 9 (4), pp 279-290, (2016).

Flow Simulations and Validation for the First Cohort of Y-graft Fontan Patients. Yang, W., Chan, F.P., Reddy, V.M., Marsden, A.L., Feinstein, J.A. Journal of Thoracic and Cardiovascular Surgery, Vol. 149(1), pp. 247-255, (2015).

### 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, American Institute of Medical and Biological Engineering

### Advisory Boards

Burroughs Wellcome Fund Career Awards at the Scientific Interface



## 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

### 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

**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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### 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

#### ASSOCIATE EDITOR

Catheterization and Cardiovascular Interventions

Circulation: Cardiovascular Interventions

#### GUEST EDITOR

Circulation

#### EXECUTIVE COMMITTEE

Lucile Packard Children's Heart Center

#### CO-CHAIR

Medtronic Global Melody TPV Publication Committee

### CURRENT RESEARCH

My interests are in transcatheter device therapy for congenital heart disease, predictive analytics, outcomes research for congenital heart surgery and transcatheter interventions, and collaborative translational investigation related to the pathophysiology, evaluation, and management of pediatric and adult congenital heart disease. In the Lucile Packard Children's Hospital Stanford Heart Center, I am Director of the Program for Clinical and Translational Research and Medical Director of the Pulmonary Artery Reconstruction Program.

### SELECTED PUBLICATIONS

Transcatheter tricuspid valve-in-valve implantation for the treatment of dysfunctional surgical bioprosthetic valves: an international multicenter registry study. McElhinney DB, Cabalka AK, Aboulhosn JA, Eicken A, Boudjemline Y, Schubert S, Himbert D, Asnes JD, Salizzoni S, Bocks ML, Cheatham JP, Momenah TS, Kim DW, Schranz D, Meadows J, Thomson JD, Goldstein BH, Crittendon I 3rd, Fagan TE, Webb JG, Horlick E, Delaney JW, Jones TK, Shahanavaz S, Moretti C, Hainstock MR, Kenny DP, Berger F, Rihal CS, Dvir D; VIVID Registry. *Circulation* 2016;133:1582-93.

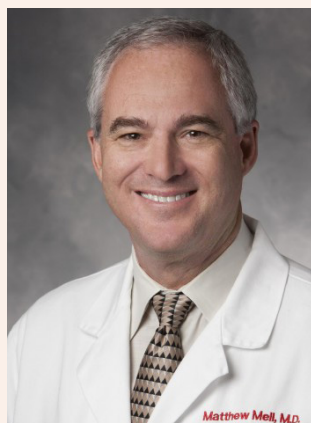
Relative risk factors for cardiac erosion following transcatheter closure of atrial septal defects: a case-control study. McElhinney DB, Quartermain MD, Kenny D, Alboliras E, Amin Z. *Circulation* 2016;133:1738-46.

Progressive intermediate-term improvement in ventricular and atrioventricular interaction after transcatheter pulmonary valve replacement in patients with right ventricular outflow tract obstruction. Lunze FI, Hasan BS, Gauvreau K, Brown DW, Colan SD, McElhinney DB. *Am Heart J* 2016;179:87-98.

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.

Web-based real-time case finding for the population health management of patients with diabetes mellitus: a prospective validation of the natural language processing-based algorithm with statewide electronic medical records. Zheng L, Wang Y, Hao S, Shin AY, Jin B, Ngo AD, Jackson-Browne MS, Feller DJ, Fu T, Zhang K, Zhou X, Zhu C, Dai D, Yu Y, Zheng G, Li YM, McElhinney DB, Culver DS, Alfreds ST, Stearns F, Sylvester KG, Widen E, Ling XB. *JMIR Med Inform* 2016;4(4):e37.

Unique molecular patterns uncovered in Kawasaki disease patients with elevated serum gamma glutamyl transferase levels: implications for intravenous immunoglobulin responsiveness. Wang Y, Li Z, Hu G, Hao S, Deng X, Huang M, Ren M, Jiang X, Kanegaye JT, Ha KS, Lee J, Li X, Jiang X, Yu Y, Tremoulet AH, Burns JC, Whitin JC, Shin AY, Sylvester KG, McElhinney DB, Cohen HJ, Ling XB; Pediatric Emergency Medicine Kawasaki Disease Research Group. *PLoS One* 2016 Dec 21;11(12):e0167434.



## Matthew Mell, MD

Associate Professor of Surgery (Vascular Surgery)

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### EDUCATION/TRAINING

MD Harvard University, Medicine (1987)

RESIDENCY Stanford Hospital and Clinics - Dept of Surgery (1992)

FELLOWSHIP University of Wisconsin (2006)

#### BOARD CERTIFICATION

General Surgery, American Board of Surgery

Vascular Surgery, American Board of Surgery

### CURRENT RESEARCH

Dr. Mell's research interest focus on comparative effectiveness of health care delivery for complex surgical diseases, including optimizing outcomes and cost effectiveness.

Dr. Mell's clinical interests include all aspects of vascular surgery, with a special emphasis on surgery for complex aortic disease, including endovascular repair of abdominal aortic aneurysm.

### SELECTED PUBLICATIONS

The Society for Vascular Surgery practice guidelines on the care of patients with an abdominal aortic aneurysm. Chaikof EL, Dalman RL, Eskandari MK, Jackson BM, Lee WA, Mansour MA, Mastracci TM, Mell M, Murad MH, Nguyen LL, Oderich GS, Patel MS, Schermerhorn ML, Starnes BW. J Vasc Surg 2018; 67(1):2-77

Opportunities for Improving Population-Based Management of Abdominal Aortic Aneurysms. Mell MW. Circulation 2017 Oct 31;136(18):1735-1736

Management of Symptomatic Unruptured Aortic Aneurysms Over the Past 20 years. Chandra V, Trang K, Harris EJ, Dalman RL, Lee JT, Mell MW. J Vasc Surg 2017; 66(6):1679-1685

Under-utilization of Ultrasound for Routine Surveillance after EVAR. Mell MW, Garg T, Baker LC. Ann Vasc Surg 2017; Oct;44:54-58

Western Vascular Society Guidelines for Transfer of Patients with Ruptured Abdominal Aortic Aneurysm. Mell MW, Starnes BW, Kraiss LW, Schneider PA, Pevcec WC. J Vasc Surg 2017, Mar;65(3):603-608.

Unplanned reoperations after vascular surgery. Kazaure, H. S., Chandra, V., Mell, M. W. J Vasc Surg 2016; 63 (3): 731-737

Postoperative Surveillance and Long-term Outcomes After Endovascular Aneurysm Repair Among Medicare Beneficiaries. Garg, T., Baker, L. C., Mell, M. W. JAMA Surgery 2015; 150 (10): 957-963.

Adherence to postoperative surveillance guidelines after endovascular aortic aneurysm repair among Medicare beneficiaries. Garg, T., Baker, L. C., Mell, M. W. J Vasc Surg 2015; 61 (1): 23-27.

Transposition of the Left Renal Vein for the Treatment of Nutcracker Syndrome in Children: A Short-term Experience. Ullery, B.W., Itoga, N.K., Mell, M.W. ANN Vasc Surg 2014; 28 (8).





## Mark Mercola, PhD

Professor of Medicine (Cardiovascular)

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### EDUCATION/TRAINING

PhD UCLA

BA UCLA

### HONORS & AWARDS

National Institutes of Health MERIT Award

Basil O'Connor Award, March of Dimes Birth Defects Foundation

Established Investigator Award, American Heart Association

Grant support from the National Institutes of Health, California Institute for Regenerative Medicine, and the Fondation Leducq

### SCIENTIFIC/NATIONAL ADVISORY BOARDS

Vala Sciences, Inc. (San Diego)

Human Biomolecular Research Institute (San Diego)

Ted Rogers Centre for Heart Research (Toronto)

### CURRENT RESEARCH

Our research is dedicated to discovering disease mechanisms that can be turned into therapeutic strategies. We use high throughput screening technology combined with stem cell based models of heart disease to discover therapeutic targets and evaluate small molecules and other potential drugs, with emphasis on maintaining contractility and preventing arrhythmia. Ultimately, our goal is to develop new drugs that will preserve or restore cardiac function, ameliorating the quality of life for patients with heart disease.

I am motivated to improve people's lives by translating our lab research into therapies.

### SELECTED PUBLICATIONS

Wnt antagonism initiates cardiogenesis in *Xenopus laevis*. Schneider, V. and Mercola, M. *Genes and Development*, 2011; 15: 304-315.

Small-molecule inhibitors of the Wnt pathway potentially promote cardiomyocytes from human embryonic stem cell-derived mesoderm. Willems E, Spiering S, Davidovics H, Lanier M, Xia Z, Dawson M, Cashman J, Mercola M. *Circulation Research*. 2011;109(4):360-4.

High throughput measurement of Ca(2)(+) dynamics for drug risk assessment in human stem cell-derived cardiomyocytes by kinetic image cytometry. Cerignoli F, Charlot D, Whittaker R, Ingemannson R, Gehalot P, Savchenko A, Gallacher DJ, Towart R, Price JH, McDonough PM, Mercola M. *Journal of Pharmacological and Toxicological Methods*. 2012;66(3):246-56.

Small molecule-mediated TGF-beta type II receptor degradation promotes cardiomyogenesis in embryonic stem cells. Willems E, Cabral-Teixeira J, Schade D, Cai W, Reeves P, Bushway PJ, Lanier M, Walsh C, Kirchhausen T, Izpisua Belmonte JC, Cashman J, Mercola M. *Cell Stem Cell*. 2012;11(2):242-52.

APJ acts as a dual receptor in cardiac hypertrophy. Scimia MC, Hurtado C, Ray S, Metzler S, Wei K, Wang J, Woods CE, Purcell NH, Catalucci D, Akasaka T, Bueno OF, Vlasuk GP, Kaliman P, Bodmer R, Smith LH, Ashley E, Mercola M, Brown JH, Ruiz-Lozano P. *Nature*. 2012;488(7411):394-8.

Inhibition of miR-25 improves cardiac contractility in the failing heart. Wahlquist C, Jeong D, Rojas-Munoz A, Kho C, Lee A, Mitsuyama S, van Mil A, Jin Park W, Sluijter JP, Doevendans PA, Hajjar RJ, Mercola M. *Nature*. 2014;508(7497):531-5.

Epicardial FSTL1 reconstitution regenerates the adult mammalian heart. Wei, K., Serpooshan, V., Hurtado, C., Diez-Cunado, M., Zhao, M., Maruyama, S., Zhu, W., Fajardo, G., Nosedá, M., Nakamura, K., Tian, X., Liu, Q., Wang, A., Matsuura, Y., Bushway, P., Cai, W., Savchenko, A., Mahmoudi, M., Schneider, M.D., van den Hoff, M.J., Butte, M.J., Yang, P.C., Walsh, K., Zhou, B., Bernstein, D., Mercola, M., and Ruiz-Lozano, P. *Nature*. 2015; 525, 479-485.



## D. Craig Miller, MD

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Department of Cardiothoracic Surgery

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### EDUCATION/TRAINING

MD Stanford University School of Medicine CA

RESIDENCY Stanford University School of Medicine CA

BOARD CERTIFICATION  
Thoracic Surgery, American Board of Thoracic Surgery

### HONORS & AWARDS

David J. Dugan Distinguished Service Award (Western Thoracic Surgical Association) 2016

Eugene Braunwald Mentorship Award, American Heart Association (2009)

Distinguished Achievement Award, American Heart Association Cardiovascular Surgery and Anesthesia Council (2008)

President, American Association for Thoracic Surgery (2007-2008)

Outstanding Achievement in Medicine Award, Santa Clara County Medical Society (2004)

William W. L. Glenn lecturer, American Heart Association (AHA) (2002)

Wilfred Bigelow Award, Wilfred Bigelow Award, Canadian Cardiovascular Society (2000)

Distinguished Alumni Award, Stanford University Medical School (1997)

R. T. Hall Lectureship, Cardiac Society of Australia and New Zealand (1990)

Presidente, Sociedad de Cardiocirujanos (España) (1988)

### 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.

### SELECTED PUBLICATIONS

5-year outcomes of transcatheter aortic valve replacement compared with standard treatment for patients with inoperable aortic stenosis (PARTNER 1): a randomised controlled trial *Lancet*. Kapadia, S. R., Leon, M. B., Makkar, R. R., Tuzcu, E. M., Svensson, L. G., Kodali, S., Webb, J. G., Mack, M. J., Douglas, P. S., Thourani, V. H., Babaliaros, V. C., Herrmann, H. C., Szeto, W. Y., Pichard, A. D., Williams, M. R., Fontana, G. P., Miller, D. C., Anderson, W. N., Akin, J. J., Davidson, M. J., Smith, C. R. 2015; 385 (9986): 2485-2491.

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 *Lancet*. 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. 2015; 385 (9986): 2477-2484.

Rationale and results of the Stanford modification of the David V reimplantation technique for valve-sparing aortic root replacement *Journal of Thoracic and Cardiovascular Surgery* Miller, D. C. 2015; 149 (1): 112-114.

Defining "Severe" Secondary Mitral Regurgitation Emphasizing an Integrated Approach *Journal of the American College of Cardiology* Grayburn, P. A., Carabello, B., Hung, J., Gil- lam, L. D., Liang, D., Mack, M. J., McCarthy, P. M., Miller, D. C., Trento, A., Siegel, R. J. 2014; 64 (25): 2792-2801.



## Daria Mochly-Rosen, PhD

George D. Smith Professor of Translational Medicine  
Professor, Chemical and Systems Biology  
Professor (by courtesy), Neurosurgery  
Co-director, SPARK - Stanford's Translational Research Program

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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

Stanford University Office of Technology Licensing

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 Biochemistry and Molecular Biology; Council on Stroke, AHA; Heart Failure Society of America; ISHR; Society for Neuroscience

### 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 Co-director of SPARK - Stanford's Translational Research Program.

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

Coupling between protein stability and catalytic activity determines pathogenicity of G6PD Variants. Cunningham AD, Colavin A, Huang KC, Mochly-Rosen D. Cell Rep. 2017; 18:2592-2599.

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.

New therapeutics to modulate mitochondrial dynamics and mitophagy in cardiac diseases. Disatnik MH, Hwang S, Ferreira JC, Mochly-Rosen D. J Mol Med 2015; 93:279-87.

Protein kinase C, an elusive therapeutic target? Mochly-Rosen D, Das K, Grimes KV. Nature Rev Drug Discovery. 2012; 11:937-57.



## 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.

Reference standards for cardiorespiratory fitness measured with cardiopulmonary exercise testing: Data from the fitness registry and the importance of exercise national database (FRIEND Registry). Kaminsky L, Myers J, Arena R. Mayo Clinic Proceedings. 2015; 90:1515-1523.

### 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



## Sanjiv Narayan, MD, MSc

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### 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)

### CURRENT RESEARCH

I direct a bedside-to-bench-to-bedside translational program using bioengineering to understand and treat complex heart rhythm disorders. My laboratory reported for the first time that chaotic and disorganized patterns of human AF are typically sustained by small rotational or focal sources, where direct ablation (Focal Impulse and Rotor Modulation, FIRM) may yield successful outcomes, as now validated in multiple laboratories. The finding of localized drivers for cardiac fibrillation was unexpected, and has been extended to ventricular arrhythmias. Our exceptional interdisciplinary team uses a variety of analytic techniques, computational models and supervised and unsupervised machine learning to redefine clinical arrhythmia syndromes. A major focus of the laboratory is to share our raw data, code and other results using novel online and mobile platforms to accelerate collaboration and discussion.

Our laboratory principle is bedside-to-bench-to-bedside research integrating bioengineering and computational methods with sound physiological understanding.

### SELECTED PUBLICATIONS

Animated Visualization Of A High Resolution Color Three Dimensional Digital Computer Model Of The Whole Human Head. Narayan S, Sensharma D, Santori E, Lee A, Sabherwal A, Toga AW. International Journal of Biomedical Computing 1993; 32:7-17.

Mapping Functional Activity In Rodent Cortex Using Optical Intrinsic Signals. Narayan SM, Santori EM, Toga AW. Cerebral Cortex 1994a; 4(2): 194-204 and 1993; 3(6) cover article.

Imaging Optical Reflectance In Rodent Barrel And Forelimb Sensory Cortex. Narayan SM, Santori EM, Blood AJ, Burton JS, Toga AW. Neuroimage 1994b; 1: 181-190.

Atrial Fibrillation. Narayan SM, Cain ME, Smith, JM. Lancet 1997; 350: 943-950.

Spectral Analysis of Periodic Fluctuations in Electrocardiographic Repolarization. Narayan SM, Smith JM. IEEE Transactions in Biomedical Engineering 1999b; 46(2): 203-212.

Demonstration of the Proarrhythmic Preconditioning of Single Premature Extrastimuli by Use of the Magnitude, Phase and Distribution of Repolarization Alternans. Narayan SM, Lindsay BD, Smith JM. Circulation 1999; 100: 1887-1893.





## Patricia K. Nguyen, MD

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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

My research applies imaging technology to translate promising basic science findings into clinical application and to better understand the pathophysiology of coronary artery disease in men and women.

[Humans] love to wonder, and that is the seed of science... — Ralph Waldo Emerson

### SELECTED PUBLICATIONS

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 Aug;35(8):1994-2000.

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 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. Accepted. Jan 2018.



## Mark R. Nicolls, MD

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Immunology and Rheumatology  
Chief, Division of Pulmonary and Critical Care Medicine  
Director, Lung Immunology

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### 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

### 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 more than 18 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, and lymphedema.

### SELECTED PUBLICATIONS

**Leukotriene B-4 antagonism ameliorates experimental lymphedema.** Tian, W., Rockson, S. G., Jiang, X., Kim, J., Begaye, A., Shuffle, E. M., Tu, A. B., Cribb, M., Nepiyushchikh, Z., Feroze, A. H., Zamanian, R. T., Dhillon, G. S., Voelkel, N. F., Peters-Golden, M., Kitajewski, J., Dixon, J. B., Nicolls, M. R. *Science Translational Medicine* 2017; 9 (389)

**Models of Lung Transplant Research: a consensus statement from the National Heart, Lung, and Blood Institute workshop.** Lama VN, Belperio JA, Christie JD, El-Chemaly S, Fishbein MC, Gelman AE, Hancock WW, Keshavjee S, Kreise D, Laubach VE, Looney MR, McDyer JF, Mohanakumar T, Shilling RA, Panoskaltsis-Mortari A, Wilkes DS, Eu JP, Nicolls MR. *JCI Insight*. 2017 May 4;2(9). pii: 93121. doi: 10.1172/jci.insight.93121

**Lymphatic Dysfunction, Leukotrienes, and Lymphedema.** Jiang X,\* Nicolls MR\*, Tian W, Rockson SG. *Annu Rev Physiol*. 2017 Oct 13 \*(Co-First Author).

**Microhemorrhage-associated tissue iron enhances the risk for *Aspergillus fumigatus* invasion in murine tracheal transplantation.** Hsu JL, Manouvakova 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 (in press)



## Koen Nieman, MD, PhD

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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

Eindhoven dissertation prize, Dutch  
Cardiologists Association (2004)  
  
ESC Fellowship, European Society of  
Cardiology (2009)  
  
Paludan award for best clinical  
innovations: fast-track chest pain clinic  
(2009)  
  
Established Clinical Investigator award  
by Dutch Heart Foundation (2014).  
  
Chair WG Cardiac CT, MRI and Nuclear  
Imaging (Dutch Cardiac Society) (2012-  
2015)  
  
Secretary ESC/EACVI section cardiac CT  
and nuclear imaging (2010-2016)  
  
Board International Society of  
Computed Tomography (2014-present)  
  
Board and Executive Committee Society  
of Cardiovascular CT (2015-present)

### EDITORIAL BOARDS

Associate editor, Journal of  
Cardiovascular CT (2015-present)  
Associate editor, JACC cardiovascular  
imaging (2017-present)

### CURRENT RESEARCH

Dr Nieman is a cardiologist and associate professor in the departments of cardiovascular medicine and radiology. He came to Stanford in September 2016. He investigates advanced cardiac imaging techniques, and current projects include the development and technical validation of functional CT applications for ischemic heart disease, and the clinical validation of cardiac CT in the form of clinical effectiveness trials.

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 joined the staff of the department of cardiology and radiology at the Erasmus University Medical Center in 2008, where he was scientific director of the cardiac CT and MRI group and supervised the intensive cardiac care unit until he joined the staff at Stanford University.

### SELECTED PUBLICATIONS

Comprehensive Cardiac CT With Myocardial Perfusion Imaging Versus Functional Testing in Suspected Coronary Artery Disease: The Multicenter, Randomized CRESCENT-II Trial. Lubbers M, Coenen A, Kofflard M, Bruning T, Kietselaer B, Galema T, Kock M, Niezen A, Das M, van Gent M, van den Bos EJ, van Woerkens L, Musters P, Kooij S, Nous F, Budde R, Hunink M, Nieman K. JACC Cardiovasc Imaging. 2017 Dec 8.

Integrating CT Myocardial Perfusion and CT-FFR in the Work-Up of Coronary Artery Disease. JACC Cardiovasc Imaging. Coenen A, Rossi A, Lubbers MM, Kurata A, Kono AK, Chelu RG, Segreto S, Dijkshoorn ML, Wragg A, van Geuns RM, Pugliese F, Nieman K. 2017 Jul;10(7):760-770.

Coronary CT Angiography for Suspected ACS in the Era of High-Sensitivity Troponins: Randomized Multicenter Study. Dedic A, Lubbers MM, Schaap J, Lammers J, Lamfers EJ, Rensing BJ, Braam RL, Nathoe HM, Post JC, Nielen T, Beelen D, le Cocq d'Armandville MC, Rood PP, Schultz CJ, Moelker A, Ouhlous M, Boersma E, Nieman K. J Am Coll Cardiol. 2016 Jan 5;67(1):16-26.

Calcium imaging and selective computed tomography angiography in comparison to functional testing for suspected coronary artery disease: the multicentre, randomized CRESCENT trial. Lubbers M, Dedic A, Coenen A, Galema T, Akkerhuis J, Bruning T, Krenning B, Musters P, Ouhlous M, Liem A, Niezen A, Hunink M, de Feijter P, Nieman K. Eur Heart J. 2016 Apr 14;37(15):1232-43.



## 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 Doctor: Top Internist in California

Stanford University: Asian American Faculty Award

"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

Dr. Palaniappan's research has focused on the study of diverse populations, chronic disease and prevention. She 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). During her time at Palo Alto Medical Foundation (PAMF), she led the organization-wide initiative to collect patient race/ethnicity and language information, enabling PAMF researchers to conduct disparities research using electronic health records. She was the co-founder of PRANA (along with Dr. Ronesh Sinha), a South Asian Wellness program. Her 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). She is currently working on implementation of evidence based genetic and pharmacogenetic testing in Primary Care Clinics as the Scientific Director of Precision Genomics and Pharmacogenomics in Primary Care (with Dr. Megan Mahoney). She also co-leads the Stanford GenePool (founded by Dr. Thomas Quertermous in 2014) at Stanford, a population based biobank designed to accelerate genetic and other -omics discovery.

### SELECTED PUBLICATIONS

**Dyslipidemia in Special Ethnic Populations.** Pu, J., Romanelli, R., Zhao, B., Azar, K. M., Hastings, K. G., Nimbal, V., Fortmann, S. P., Palaniappan, L. P. *Endocrinology and metabolism clinics of North America*. 2016; 45 (1): 205-216.

**Executive Summary: Heart Disease and Stroke Statistics-2016 Update A Report From the American Heart Association.** Mozaffarian, D., Benjamin, E. J., Go, A. S., Arnett, D. K., Blaha, M. J., Cushman, M., Das, S. R., de Ferranti, S., Despres, J., Fullerton, H. J., Howard, V. J., Huffman, M. D., Isasi, C. R., Jimenez, M. C., Judd, S. E., Kissela, B. M., Lichtman, J. H., Lisabeth, L. D., Liu, S., Mackey, R. H., Magid, D. J., McGuire, D. K., Mohler, E. R., Moy, C. S., Muntner, P., Mussolino, M. E., Nasir, K., Neumar, R. W., Nichol, G., Palaniappan, L., Pandey, D. K., Reeves, M. J., Rodriguez, C. J., Rosamond, W., Sorlie, P. D., Stein, J., Towfighi, A., Turan, T. N., Virani, S. S., Woo, D., Yeh, R. W., Turner, M. B., American Heart Association Statistics Committee, Stroke Statistics Subcommittee; *Circulation*; 2016; 133 (4): 447-454.

**Dyslipidemia in special ethnic populations.** Pu, J., Romanelli, R., Zhao, B., Azar, K. M., Hastings, K. G., Nimbal, V., Fortmann, S. P., Palaniappan, L. P.; *Cardiology Clinics*; 2015; 33 (2): 325-333.

**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

Assistant Professor, Medicine - Cardiovascular Medicine

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### 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 studies using new technology to detect 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. Dr. Perez receives funding from NIH/NHLBI (R01), the Weston Havens Foundation, Apple Inc., The Stanford Cardiovascular Division and the Stanford SPARK program.

### SELECTED PUBLICATIONS

**Lean body mass and risk of incident atrial fibrillation in post-menopausal women** Eur Heart J Azarbal, F., Stefanick, M. L., Assimes, T. L., Manson, J. E., Bea, J. W., Li, W., Hlatky, M. A., Larson, J. C., LeBlanc, E. S., Albert, C. M., Nassir, R., Martin, L. W., Perez, M. V.2016; 37 (20): 1606-1613

**Systems Genomics Identifies a Key Role for Hypocretin/Orexin Receptor-2 in Human Heart Failure** J Am Coll Cardiol Perez, M. V., Pavlovic, A., Shang, C., Wheeler, M. T., Miller, C. L., Liu, J., Dewey, F. E., Pan, S., Thanaporn, P. K., Absher, D., Brandimarto, J., Salisbury, H., Chan, K., Mukherjee, R., Konadhode, R. P., Myers, R. M., Sedehi, D., Scammell, T. E., Quertermous, T., Cappola, T., Ashley, E. A.2015; 66 (22): 2522-2533

**Systematic Comparison of Digital Electrocardiograms From Healthy Athletes and Patients With Hypertrophic Cardiomyopathy.** Journal of the American College of Cardiology Bent, R. E., Wheeler, M. T., Hadley, D., Knowles, J. W., Pavlovic, A., Finocchiaro, G., Haddad, F., Salisbury, H., Race, S., Shmargad, Y., Matheson, G. O., Kumar, N., Saini, D., Froelicher, V., Ashley, E., Perez, M. V.2015; 65 (22): 2462-2463

**Molecular diagnosis of long QT syndrome at 10 days of life by rapid whole genome sequencing.** Heart rhythm. Priest, J. R., Ceresnak, S. R., Dewey, F. E., Malloy-Walton, L. E., Dunn, K., Grove, M. E., Perez, M. V., Maeda, K., Dubin, A. M., Ashley, E. A.2014; 11 (10): 1707-1713

**The prognostic value of early repolarization with ST-segment elevation in African Americans** Heart Rhythm. Perez, M. V., Uberoi, A., Jain, N. A., Ashley, E., Turakhia, M. P., Froelicher, V.2012; 9 (4): 558-565

### EDUCATION/TRAINING

#### FELLOWSHIP

Stanford University

#### RESIDENCY & INTERNSHIP

Massachusetts General Hospital

MD Harvard University

#### BOARD CERTIFICATION

American Board of Internal Medicine (ABIM), Cardiovascular Disease,

### HONORS & AWARDS

Harold Amos Faculty Development Award, Robert Wood Johnson Foundation (2012-2016)

Fellow to Faculty Award, American Heart Association (2011-2016)

Loan Repayment Program Award, NIH (2010-2014)





## Ada Poon, PhD

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### EDUCATION/TRAINING

PhD UC Berkeley

### HONORS & AWARDS

National Science Foundation Career Award (2014)

Okawa Foundation Research Grant recipient (2010)

Terman Fellow, Stanford University

### 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.



## Beth L. Pruitt, PhD

Professor of Mechanical Engineering  
and (by courtesy) of Molecular and Cellular Physiology

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### CURRENT RESEARCH

My lab works on custom measurements and analysis systems for small-scale biomechanics and mechanotransduction. We are interested in the molecular biophysics and mechanisms of mechanobiology, i.e., the role of mechanical force in the evolution of structure and function in human pluripotent stem cell derived cardiomyocytes (hPSC-CMs) including related topics of cell adhesion, downstream signaling and mechanoresponse. My research interests have evolved from the development of improved microtechnologies for small-scale mechanical measurements to questions of how mechanics mediate biological signaling. Normal force sensing, remodeling and load bearing by cells are essential for basic life processes. My training and experience as an engineer have provided me with the skills and knowledge to perform quantitative mechanobiology research. When I started my laboratory, there was a dearth of portable force measurement techniques, which limited the integration of biophysical assays with direct analysis of neural networks (e.g., patch clamp electrophysiology) or simultaneous imaging of cellular processes (e.g., cardiomyocyte cytoskeleton dynamics). We have now bridged these technology gaps and enabled new bioengineering strategies to address complex mechanobiology problems in novel ways across large scales of force and anatomical size. Notably, we have integrated live cell mechanical and functional analyses (Ribeiro 2015 and Ribeiro 2017) to show a critical role for tension in developing more physiological hiPSC-CMs. Collectively, these studies have laid the foundation for ongoing work to combine tools for the study of mechanobiology of the cytoskeleton and cell adhesions under different mechanical states. I have enjoyed active collaborations for almost a decade with leading cardiac stem cell and myopathy researchers to study a range of mutations, including the labs of Euan Ashley, Sean Wu, Sean Palecek, Jim Spudich, Bruce Conklin, Deepak Srivastava, Helen Blau, and Joe Wu. These collaborative activities have advanced knowledge and propagated methods across our labs, facilitated the open exchange of materials and information and have resulted in several joint publications.

### SELECTED PUBLICATIONS

Contractility of single cardiomyocytes differentiated from pluripotent stem cells depends on physiological shape and substrate stiffness. A.J.S. Ribeiro, Y.-S. Ang, J.-D. Fu, R. Rivas, T. Mohamed, G. Higgs, D. Srivastava, B.L. Pruitt. PNAS, 112, 12705-12710 (2015).

Multi-Imaging Method to Assay the Contractile Mechanical Output of Micropatterned Human iPSC-Derived Cardiac Myocytes. A. J. Ribeiro, O. Schwab, M. A. Mandegar, Y.-S. Ang, B. R. Conklin, D. Srivastava, and B. L. Pruitt. Circ Res, Apr. 2017.

Sacrificial layer technique for axial force post assay of immature cardiomyocytes. R. Taylor, K. Kim, N. Sun, S.-j. Park, J.Y. Sim, G. Fajardo, D. Bernstein, J.C. Wu and B. L. Pruitt. Biomedical Microdevices, Feb 2013, Vol 15, Issue 1, pp 171-181.

### EDUCATION/TRAINING

PhD Stanford University

MSc Stanford University

BS MIT

### HONORS & AWARDS

FELLOW

AIMBE, ASME

Silas H. Palmer Faculty Scholar in Mechanical Engineering, Stanford University

Denice Denton Emerging Leader Award, Anita Borg Institute

Navy Commendation Medal for teaching and performance excellence, U.S. Naval Academy

CAREER Award, NSF



## 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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DIVISION [cvmedicine.stanford.edu](http://cvmedicine.stanford.edu)

LAB [quakelab.stanford.edu](http://quakelab.stanford.edu)

### EDUCATION/TRAINING

PhD University of Oxford

### HONORS & AWARDS

R29 "FIRST" Award, NIH (1997)

Career Award, NSF (1997)

Packard Fellow, Packard Foundation (1999)

Participant, NAS Symposium for Frontiers in Science (1999, 2000)

100 Young Innovators that will create the future, MIT Tech Review Magazine (2002)

### 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 U S A. 2017 Nov 14. pii: 201713863.

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. pii: clinchem.2017.278101.

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  
Chief (Research), Division of Cardiovascular Medicine

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### EDUCATION/TRAINING

MD University of Chicago

MS 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

ANALYSIS COMMITTEE CHAIR  
Stanford Asia Pacific Program in  
Hypertension and insulin resistance  
(SAPPHIRE)

MEMBER  
American Society for Clinical  
Investigation (Young Turks); Association  
of University Cardiologists

### 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.

### SELECTED PUBLICATIONS

Enhancer connectome in primary human cells identifies target genes of disease-associated DNA elements. Mumbach MR, Satpathy AT, Boyle EA, Dai C, Gowen BG, Cho SW, Nguyen ML, Rubin AJ, Granja JM, Kazane KR, Wei Y, Nguyen T, Greenside PG, Corces MR, Tycko J, Simeonov DR, Suliman N, Li R, Xu J, Flynn RA, Kundaje A, Khavari PA, Marson A, Corn JE, Quertermous T, Greenleaf WJ, Chang HY. Nat Genet. 2017; 49:1602-1612.

Integrative functional genomics identifies regulatory mechanisms at coronary artery disease loci. Miller CL, Milos Pjanic M, Wang T, Nguyen T, Cohain A, Lee JD, Perisic L, Hedin U, Kundu RK, Majmudar D, Kim JB, Wang O, Betsholtz C, Ruusalepp A, Franzén O, Assimes TL, Montgomery SB, Schadt EE, Björkegren JLM, Quertermous T. Nat Commun. 2016;7:12092.

TCF21 and the environmental sensor aryl-hydrocarbon receptor cooperate to activate a pro-inflammatory gene expression program in coronary artery smooth muscle cells. Kim JB, Pjanic M, Nguyen T, Miller CL, Iyer D, Liu B, Wang T, Sazonova O, Carcamo-Orive I, Perisic-Matic L, Maegdefessel L, Hedin U, Quertermous T. PLOS Genetics. 201713:e1006750.



## Marlene Rabinovitch, MD

Dwight and Vera Dunlevie Professor of Pediatric Cardiology  
Professor (by courtesy), Developmental Biology

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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

### HONORS & AWARDS

American Heart Association (AHA) Basic  
Research Prize

AHA Distinguished Scientist Award

AHA Distinguished Scientist Lecture

ATS, Recognition Award for Scientific  
Accomplishment

ATS Amberson Lecturer  
Louis and Artur Lucian Award for  
Research in Circulatory Diseases

Gill Award for Research in  
Cardiovascular Diseases

Grover Prize for Pulmonary Circulation  
Research

SCIENTIFIC ADVISORY BOARD  
Children's Discovery Institute,  
Washington University; NHLBI Lung  
Repair and Regeneration Consortium;  
Max Planck Institute for Heart and Lung  
Research  
DZL Centers for Excellence in Lung  
Disease

### 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 $\gamma$  mediated gene regulation. We relate mutant BMPR2 to heightened GM-CSF mediated macrophage recruitment, and PPAR $\gamma$  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

Patient-Specific iPSC-Derived Endothelial Cells Uncover Pathways that Protect against Pulmonary Hypertension in BMPR2 Mutation Carriers. Gu M, Shao NY, 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.

Upregulation of Human Endogenous Retrovirus-K Is Linked to Immunity and Inflammation in Pulmonary Arterial Hypertension. Saito T, Miyagawa K, Chen SY, Tamosiuniene R, Wang L, Sharpe O, Samayoa E, Harada D, Moonen JAJ, Cao A, Chen PI, Hennigs JK, Gu M, Li CG, Leib RD, Li D, Adams CM, Del Rosario PA, Bill M, Haddad F, Montoya JG, Robinson WH, Fantl WJ, Nolan GP, Zamanian RT, Nicolls MR, Chiu CY, Ariza ME, Rabinovitch M. Circulation. 2017 Nov 14;136(20):1920-1935.

BMPR2 preserves mitochondrial function and DNA during reoxygenation to promote endothelial cell survival and reverse pulmonary hypertension. Diebold I, Hennigs JK, Miyagawa K, Li CG, Nickel NP, Kaschwich M, Cao A, Wang L, Reddy S, Chen PI, Nakahira K, Alcazar MA, Hopper RK, Ji L, Feldman BJ, Rabinovitch M. Cell Metab. 2015 Apr 7;21(4):596-608.

Elafin Reverses Pulmonary Hypertension via Caveolin-1-Dependent Bone Morphogenetic Protein Signaling. Nickel NP, Spiekerkoetter E, Gu M, Li CG, Li H, Kaschwich M, Diebold I, Hennigs JK, Kim KY, Miyagawa K, Wang L, Cao A, Sa S, Jiang X, Stockstill RW, Nicolls MR, Zamanian RT, Bland RD, Rabinovitch M. Am J Respir Crit Care Med. 2015 Jun 1;191(11):1273-86.





## Jayakumar Rajadas, PhD

Founding Director, Biomaterials and Advanced Drug Delivery Laboratory  
Assistant Director, Cardiovascular Pharmacology, Stanford CVI  
Adjunct Full Professor, UCSF

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### 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

### CURRENT RESEARCH

My research oversees the application of various technologies in a research domain aimed at the development of novel formulations and therapeutics and inventing targeted drug delivery systems. For the past 20 years, 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. Recently, I discovered that the misfolding stress is initiated by phospho-Tau in the brain could affect the heart function with compromised brain perfusion. We have shown apelin therapy could recover the heart function significantly using the mutant human tau-expressing PS19 mouse model. In addition, I have used biophysical and pharmacological approaches to identify optimal microenvironments in which implanted cardiomyocytes to repair injured hearts.

Somewhere, something incredible is waiting to be known — Blaise Pascal

### 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 U S A. 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 (In press ).

**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).



## Kristen Red-Horse, PhD

Assistant Professor, Department of Biology

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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 uses cardiovascular development as a model to study the signals that instruct cell fate and guide morphogenesis during organ formation in the mammalian embryo. Our current focus is to fate-map the different cellular sources that give rise to the coronary arteries of the heart and to identify the molecules that direct their migration and differentiation. Their long-term goal is to use this information to better understand and treat cardiovascular diseases.

### SELECTED PUBLICATIONS

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.

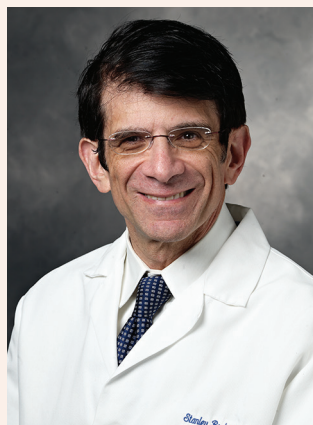
Cellular Plasticity in cardiovascular development and disease. Das S, Red-Horse K. (2017) *Dev Dyn*. Jan 18

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, Kivela 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.

VEGF-C and aortic cardiomyocytes guide coronary artery stem development. Chen HI, Poduri A, Numi H, Kivela R, Saharinen P, McKay AS, Raftrey B, Churko J, Tian X, Zhou B, Wu JC, Alitalo K, Red-Horse K. *J Clin Invest*. 2014 Nov 3;124(11):4899-914.



## 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

FACULTY MEMBER  
Faculty of 1000 Medicine

### 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 Vascular Disorders, a specialized center for the diagnostic evaluation and focused therapy of lymphedema and allied diseases. I am Director of Stanford Center for Lymphatic and Venous Disorders.

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

Leukotriene B4 antagonism ameliorates experimental lymphedema. Tian W, Rockson SG, Jiang X, et al. Sci Transl Med 2017;9.

Lymphatic Medicine: Paradoxically and Unnecessarily Ignored. Rockson SG. Lymphat Res Biol 2017;15:315-6.

Lymphatic Dysfunction, Leukotrienes, and Lymphedema. Jiang X, Nicolls MR, Tian W, Rockson SG. Annu Rev Physiol 2017.

Aligned nanofibrillar collagen scaffolds - Guiding lymphangiogenesis for treatment of acquired lymphedema. Hadamitzky C, Zaitseva TS, Bazalova-Carter M, et al. Biomaterials 2016;102:259-67.



## 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).



## Stephen J. Roth, MD, MPH

Professor, Pediatrics

Chief, Division of Pediatric Cardiology, Lucile Packard Children's Hospital

Interim Chief, Pediatric Critical Care, Lucile Packard Children's Hospital

Director, The Children's Heart Center, Lucile Packard Children's Hospital

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### 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

MEMBER  
Cardiovascular Development Clinical  
and Translational Committee, American  
Heart Association

### 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

A Double-Blinded, Randomized, Placebo-Controlled Clinical Trial of Aminophylline to Prevent Acute Kidney Injury in Children Following Congenital Heart Surgery With Cardiopulmonary Bypass. Axelrod DM, Sutherland SM, Anglemeyer A, Grimm PC, Roth SJ; *Pediatr Crit Care Med*; 2016; Feb; 17 (2): 135-43.

Association of presence and timing of invasive airway placement with outcomes after pediatric in-hospital cardiac arrest. Gupta P, Rettiganti M, Gossett JM, Kuo K, Chow V, Dao DT, Roth SJ; *Resuscitation*; 2015; Jul; 92: 53-8.

Task Force 5: Pediatric Cardiology Fellowship Training in Critical Care Cardiology. Feltes TF, Roth SJ, Almodovar MC, Andropoulos DB, Bohn DJ, Costello JM, Gajarski RJ, Mott AR, Koenig P; Society of Pediatric Cardiology Training Program Directors.; American College of Cardiology.; American Academy of Pediatrics; American Heart Association; *Circulation*; 2015; Aug 11; 132 (6): e81-90.

Utility of clinical biomarkers to predict central line-associated bloodstream infections after congenital heart surgery. Shin AY, Jin B, Hao S, Hu Z, Sutherland S, McCammond A, Axelrod D, Sharek P, Roth SJ, Ling XB. *Pediatr Infect Dis J.*; 2015; Mar; 34 (3): 251-4.





## Ingela Schnittger, MD

Professor, Medicine - Cardiovascular Medicine  
Medical Director, Stanford Echocardiography Laboratory  
Chief of Academic Affairs & Associate Chief, Division of Cardiovascular Medicine

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### 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 (2009 - present)

### CLINICAL FOCUS

Cardiovascular disease

Coronary artery myocardial bridge

Echocardiography

### 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

Myocardial Bridges on Coronary Computed Tomography Angiography- Correlation With Intravascular Ultrasound and Fractional Flow Reserve. Forsdahl, S. H., Rogers, I. S., Schnittger, I., et al. Circulation Journal

Myocardial bridging is associated with exercise-induced ventricular arrhythmia and increases in QT dispersion. Nishikii-Tachibana, M., Pargaonkar, V. S., Schnittger, I., Haddad, F., Rogers, I. S., Tremmel, J. A., Wang, P. J. Annals of Noninvasive Electrocardiology. 2017

Myocardial bridges: Overview of diagnosis and management. Rogers, I. S., Tremmel, J. A., Schnittger, I. Congenital Heart Disease 2017.

Surgical Unroofing of Hemodynamically Significant Left Anterior Descending Myocardial Bridges. Boyd, J. H., Pargaonkar, V. S., Scoville, D. H., Rogers, I. S., Kimura, T., Tanaka, S., Yamada, R., Fischbein, M. P., Tremmel, J. A., Mitchell, R. S., Schnittger, I; Annals of Thoracic Surgery; 2016; Oct. 1.

Myocardial Bridge and Acute Plaque Rupture. Perl, L., Daniels, D., Schwartz, J., Tanaka, S., Yeung, A., Tremmel, J. A., Schnittger, I. Journal of investigative medicine high impact case report 2016; 4 (4).

Functional Versus Anatomic Assessment of Myocardial Bridging by Intravascular Ultrasound: Impact of Arterial Compression on Proximal Atherosclerotic Plaque. Yamada, R., Tremmel, J., Tanaka, S., Lin, S., Kobayashi, Y., Hollak, M., Yock, P., Fitzgerald, P., Schnittger, I., Honda, Y.; Journal of the American Heart Association; 2016; 20 (5(4)).

Exercise Strain Echocardiography in Patients With a Hemodynamically Significant Myocardial Bridge. Assessed by Physiological Study. Kobayashi, Y., Tremmel, J. A., Kobayashi, Y., Amsallem, M., Tanaka, S., Yamada, R., Rogers, I. S., Haddad, F., Schnittger, I; Journal of the American Heart Association; 2015; 4 (11).

Invasive physiologic and anatomic multimodality assessment of myocardial bridging. Schwartz, J., Tanaka, S., Schnittger, I., Tremmel, J., et al; Coronary Artery Disease; 2015: 38-40.



## 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, HUPO

Connecticut Medal of Science

Burroughs Wellcome Scholar Award

Lewis B. Cullman Professor of MCDB

EXECUTIVE COMMITTEE

HUPO

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

We are presently in an omics revolution in which genomes and other omes can be readily characterized. My laboratory has both used and developed a variety of approaches to analyze genomes, proteomes and regulatory networks. Our research focuses on yeast, an ideal model organism ideally suited to genetic analysis, and humans. We discovered that much more of the human genome is transcribed and contains regulatory information that was previously appreciated, and a high diversity of transcription factor binding occurs both between and within species. We have also combined different state-of-the-art omics technologies to perform the first longitudinal detailed integrative personal omics profile (iPOP) of person and used this to assess disease risk and monitor disease states for personalized medicine. I am the Director of the Center for Genomics and Personalized Medicine and Chair Department of Genetics.

I'm a believer in the future—genomics will move medicine from 'diagnose and treat' to 'predict and prevent'.

### SELECTED PUBLICATIONS

Identification of significantly mutated regions across cancer types highlights a rich landscape of functional molecular alterations. Araya, C. L., Cenik, C., Reuters, J. A., Kiss, G., Pande, V. S., Snyder, M. P., Greenleaf, W. J.; *Nature Genetics*; 2016; 48 (2): 117-125.

Synthetic long-read sequencing reveals intraspecies diversity in the human microbiome. Kuleshov, V., Jiang, C., Zhou, W., Jahanbani, F., Batzoglou, S., Snyder, M.; *Nature Biotechnology*; 2016; 34 (1): 64-69.

Predicting non-small cell lung cancer prognosis by fully automated microscopic pathology image features. Yu, K., Zhang, C., Berry, G. J., Altman, R. B., Ré, C., Rubin, D. L., Snyder, M.; *Nature Communications*; 2016; 7: 12474.

Genetic Control of Chromatin States in Humans Involves Local and Distal Chromosomal Interactions. Grubert, F., Zaugg, J. B., Kasowski, M., Ursu, O., Spacek, D. V., Martin, A. R., Greenside, P., Srivas, R., Phanstiel, D. H., Pekowska, A., Heidari, N., Euskirchen, G., Huber, W., Pritchard, J. K., Bustamante, C. D., Steinmetz, L. M., Kundaje, A., Snyder, M.; *Cell*; 2015; 162 (5): 1051-1065.



## Edda Spiekerkoetter, MD

Assistant Professor of Medicine, Pulmonary and Critical Care Medicine

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### 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  
BMP2 modifiers in Pulmonary  
Hypertension with Repurposed Drugs

DoD Grant PR161256: Targeting BMP2  
Signaling to Improve Right Ventricular  
Function in Congenital Heart Disease

### CURRENT RESEARCH

My research focuses on the importance of the Bone Morphogenetic Protein Receptor 2 (BMP2) signaling pathway in pulmonary, pulmonary-vascular as well as cardiac disease. In 2000, two independent groups discovered mutations in the BMP2 pathway as the genetic basis for pulmonary arterial hypertension (PAH). Over the past years, more mutations either directly involved in the BMP2 pathway (Endoglin, ALK1, Smad9) or indirectly linked to the BMP2 pathway (Caveolin-1), have been discovered, emphasizing the central role of BMP2 signaling in familial PAH. It was subsequently found that reduced BMP2 expression and signaling seems to be a feature of other sporadic or idiopathic forms of PAH.

Hypothesizing that increasing BMP2 signaling might improve PAH, we have performed a High-Throughput Screen of FDA approved drugs to find BMP2 activators and have identified the immuno-suppressive drug FK506 (Tacrolimus) as the main activator. We have subsequently shown that FK506 can rescue endothelial dysfunction in PAH, and prevent and reverse PAH in rodent models of experimental PAH (JCI 2013). This discovery has led to the compassionate use of the compound in end-stage PAH patients (AJRCCM 2015) and a phase II clinical trial to test the safety, tolerability and efficacy of low-dose FK506 in PAH at Stanford (ERJ 2017).

The most current research in the lab focuses on the role of BMP2 signaling in RV failure, using different mouse models with cell specific deficient BMP2 signaling, deep tissue imaging as well as patient derived iPSC- Cardiomyocytes.

Ever tried. Ever failed. No matter. Try again. Fail again. Fail better. — Samuel Beckett

### SELECTED PUBLICATIONS

FK506 activates BMP2 Signaling, rescues endothelial dysfunction, reverses pulmonary hypertension. Spiekerkoetter E, Tian X, Cai J, Hopper K, Sudheendra D, Li CG, El-Bizri N, Sawada H, Haghighat R, Chan R, Haghighat L, De Jesus Perez V, Wang L, Reddy S, Zhao M, Bernstein D, Solow-Cordero, DE, Beachy PA, Wandless TJ, ten Dijke P Rabinovitch M. J Clin Invest. 2013 Aug 1;123(8):3600-13.

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 and Zamanian RT. Am J Respir Crit Care Med. 2015, Jul 15;192(2):254-7.

Randomized 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 Resp J 2017, Sept 11;50 (3)1602449.



## James Spudich, PhD

Douglass M. and Nola Leishman Professor of Cardiovascular Disease  
Professor, Biochemistry

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### EDUCATION/TRAINING

PhD Stanford University

### HONORS & AWARDS

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

SCIENTIFIC ADVISORY BOARD

Curie Institute, Paris; Mechanobiology

Institute, Singapore

ADJUNCT PROFESSOR

National Center for Biological Sciences,

TFIR, Bangalore, India

### CURRENT RESEARCH

Our long-term goal is to understand how enzymes use specific structural elements to carry out their exquisite roles. We have focused on the myosin family of enzymes, which do much more than simply catalyze the conversion of a substrate to a product. The ATPase activity of myosin molecular motors must be precisely coupled with binding to and release from the actin filaments along which they move, as well as to a conformational change that provides force and directionality for movement. Understanding these structure-function relationships is a prerequisite to uncovering the effects of disease causing mutations in the genes encoding these molecular motors. My current research focuses on hypertrophic and dilated cardiomyopathies. These diseases, which affect 1 in 500 people, are debilitating and can lead to sudden death. Our focus is on the contractile machinery, studied at the molecular and single cardiomyocyte levels.

### SELECTED PUBLICATIONS

Hypertrophic and Dilated Cardiomyopathy: Four Decades of Basic Research on Muscle Lead to Potential Therapeutic Approaches to These Devastating Genetic Diseases. Spudich, J.A. (2014). *Biophys J.* 106:1236-1249.

The Myosin Mesa and a Possible Unifying Hypothesis for the Molecular Basis of Human Hypertrophic Cardiomyopathy. Spudich, J.A. (2015). *Biochem Soc Trans.* 43:64-72.

Early Onset HCM Mutations H251N and D239N Significantly Increase the Velocity, Force, and Actin-activated ATPase activity of human beta-cardiac Myosin. Adhikari, A.S., Kooiker, K.B., Sarkar, S.S., Liu, C., Bernstein, D., Spudich, J.A. and Ruppel, K.M. (2016). *Cell Rep.* 17:2857-2864. doi: 10.1016/j.celrep.2016.11.040.

Biophysical Properties of Human beta-cardiac Myosin with Converter Mutations that Cause Hypertrophic Cardiomyopathy. Kawana, M. Sarkar, S.S., Sutton, S., Ruppel, K.M. and Spudich, J.A. (2017). *Sci. Adv.* 3, e1601959.

The myosin mesa and the basis of hypercontractility caused by hypertrophic cardiomyopathy mutations. Nag, S., Trivedi, D.V., Sarkar, S.S., Adhikari, A.S., Sunitha, M.S., Sutton, S., Ruppel, K.M. and Spudich, J.A. *Nat. Struct. Mol. Biol.*, (2017) 24:525-533.

Hypertrophic cardiomyopathy and the myosin mesa: Viewing an old disease in a new light. Trivedi, D.V., Adhikari, A.S., Sarkar, S.S., Ruppel, K.M. and Spudich, J.A. *Biophys Rev.* 2017 Jul 17.



## Marcia L. Stefanick, PhD

Professor, Medicine - Stanford Prevention Research Center  
Professor, Obstetrics and Gynecology

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**CENTER** [wsdm.stanford.edu](http://wsdm.stanford.edu)

### EDUCATION/TRAINING

PhD Stanford University

### HONORS & AWARDS

Iris F. Litt Faculty Fellowship, Clayman Institute of Gender Research (2009-2010)

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)

CO-DIRECTOR  
Stanford Center for Health Research on Women and Sex Differences in Medicine (WSDM)

COUNCILOR  
Organization for the Study of Sex Differences (OSSD)

FELLOW  
American College of Sports Medicine; American Heart Association (AHA); AHA Council on Arteriosclerosis, Thrombosis and Vascular Biology

CO-DIRECTOR  
Women's Cardiovascular Disease Strategic Planning Group

STEERING, EXECUTIVE & EDUCATION COMMITTEE MEMBER  
Stanford Cardiovascular Institute

FORMER CHAIR  
Steering and Executive Committees, Women's Health Initiative (1998-2011)

### CURRENT RESEARCH

My research focuses on chronic disease prevention—particularly, heart disease, breast cancer, and osteoporosis—and aging, in both women and men. As the principal investigator (PI) of the Women's Health Initiative (WHI), I have conducted large randomized controlled studies of diet, menopausal hormone therapy, and calcium and vitamin D supplementation as population-based strategies to prevent heart disease, stroke, cancer, fractures and dementia and plan to conduct a large physical activity trial in the WHI cohort. I mentor several junior and senior faculty and fellows on WHI analyses from across the School of Medicine. I am also PI of the multi-center Osteoporotic Fractures in Men (MrOS) Study, which is determining risk factors for bone and muscle loss (sarcopenia) and reduced physical function in older men, and the MrOS Sleep Study, which is focusing on cardiovascular outcomes.

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, Bavry 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, Aragaki AK, Rossouw JE, Prentice RL, Anderson G, Howard BV, Thomson CA, LaCroix AZ, Wactawski-Wende J, Jackson RD, Limacher M, Margolis KL, Wassertheil-Smoller S, 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.

Changes in physical activity and body composition in postmenopausal women over time. Sims ST, Kubo J, Desai M, Bea J, Beasley JM, Manson JM, Allison M, Sequin RA, Chen Z, Michael YL, Sullivan SD, Beresford S, Stefanick ML. *Med Sci Sports Exerc*. 2013; 45(8): 1486-92.





## Elif Seda Selamet Tierney, MD

Associate Professor of Pediatrics (Cardiology)  
 Director of Pediatric Vascular Research Laboratory, Lucile Packard Children's Hospital at Stanford University.  
 Director of Research, Non-Invasive Imaging, Lucile Packard Children's Hospital at Stanford University.

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LAB [med.stanford.edu/pediatricvascularlab.html](https://med.stanford.edu/pediatricvascularlab.html)

### 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

### HONORS & AWARDS

Resident Research Award, Suffolk County Pediatric Society, NY

Wyeth Women in Cardiology Travel Grant, American Heart Association, Scientific Sessions in Orlando, FL

#### FELLOW

American Society of Echocardiography Fellow, American College of Cardiology

National Scientist Development Award, American Heart Association

Outstanding Research Award, American Heart Association, International Kawasaki Disease,

Symposium, Kyoto, Japan

Spectrum Child Health Research Institute Grant Support Award

Cardiovascular Institute Grant Support Award

Grant in Aid, American Heart Association- Western States Affiliate

National Marfan Foundation Faculty Grant

### CURRENT RESEARCH

My research focus is an amalgam of pediatric echocardiography, vascular health in children, and use of Internet to deliver care to children with acquired and congenital heart disease. In our vascular research laboratory, we have various noninvasive modalities to easily acquire vascular health measures in children. Recently, we have focused on delivering tele-health interventions to pediatric heart transplant patients to improve their vascular health. We discovered that lifestyle interventions delivered via live-video conferencing is a feasible and maintainable method to manage long-term care in this patient population. Branching off on the idea of using tele-health as a tool, we have also piloted a home tele-echo study where we taught parents of pediatric heart transplant patients to acquire echo images of their children's hearts. This study proved to be effective and showed that parents are able to acquire reliable images for evaluation by an experienced echocardiographer. We are now expanding this concept to tele-clinic visits in pediatric Marfan patients. Using the same idea of a home-echo, and incorporating other home acquisition of key clinical data such as height, weight, digital cardiac auscultation, and medical history, we hope to show that home tele-clinic visits delivered via live-video conferencing is reliable and clinically comparable to regular clinic visits. Emerging new tools makes the landscape for innovative long-term surveillance care exciting. It is a field with which we hope to explore further to be able to incorporate cost-effective, maintainable, accessible, and specialized care nationwide.

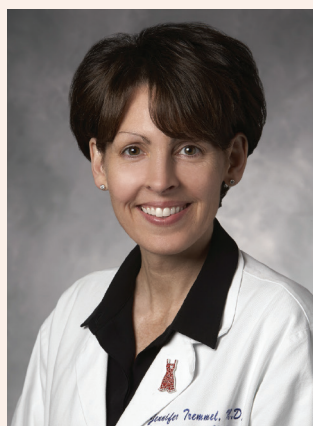
Healthy hearts for life.

### SELECTED PUBLICATIONS

**Vascular health in Kawasaki disease.** Selamet Tierney ES, Gal D, Gauvreau K, Baker A, Trevey S, O' Neill SR, Jaff MR, De Ferranti S, Fulton DR, Colan SD, Newburger JW. J Am Coll Card. 2013;62:1114-21.

**Atenolol versus losartan in children and young adults with Marfan's syndrome.** Lacro RV, Dietz HC, Sleeper LA, Yetman AT, Bradley TJ, Colan SD, Pearson GD, Selamet Tierney ES, Levine JC, Atz AM, Benson DW, Braverman AC, Chen S, De Backer J, Gelb BD, Grossfeld PD, Klein GL, Lai WW, Liou A, Loeys BL, Markham LW, Olson AK, Paridon SM, Pemberton VL, Pierpont ME, Pyeritz RE, Radojewski E, Roman MJ, Sharkey AM, Stylianou MP, Wechsler SB, Young LT, Mahony L; Pediatric Heart Network Investigators. N Engl J Med. 2014;371:2061-71.

**Live Video Diet and Exercise Intervention in Overweight Adolescents and Vascular Health.** Nourse SE, Olson I, Popat RA, Stauffer KJ, Vu C, Berry S, Kazmucha J, Ogareva O, Couch SC, Urbina EM, Selamet Tierney ES. J Pediatr. 2015;167:533-9.



## Jennifer A. Tremmel, MD, MS

Assistant Professor, Medicine - Cardiovascular Medicine  
Clinical Director, Women's Heart Health at Stanford

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CLINIC [stanfordhospital.org/cardiovascularh-alth/womenHeartHealth](http://stanfordhospital.org/cardiovascularh-alth/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 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.

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

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General Medical Disciplines 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

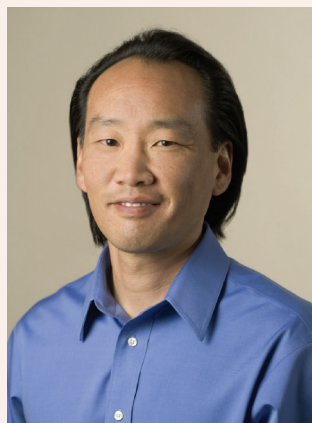
### CURRENT RESEARCH

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 are collaborating with the Stanford Department of Obstetrics to develop mobile health programs for women who either start pregnancy obese or gain too much weight during pregnancy. The aim of this study was to evaluate recent trends and the adoption of practice recommendations for menopausal hormone therapy (MHT) by formulation, dose, woman's age, and characteristics of physicians reporting MHT visits. The IMS Health (Plymouth Meeting PA) National Disease and Therapeutic Index physician survey data from 2001 to 2009 were analyzed for visits in which MHT use was reported by US office-based physicians.

### SELECTED PUBLICATIONS

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.



## Philip S. Tsao, PhD

Professor, Medicine - Cardiovascular Medicine  
Associate Chief of Staff for Research and Development, VAPAHCS  
Director, VA Epidemiology Research and Information Center for Genomics at VAPAHCS

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### 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

BOARD OF DIRECTORS  
Sarnoff Cardiovascular Research Foundation

MEMBER,  
Committee on Scientific Sessions Program, American Heart Association

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

### CURRENT RESEARCH

The primary interests of our basic science laboratory 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; elucidating the impact of insulin resistance and obesity in vascular disease; and identification of biomarkers for risk assessment. In addition, we are interested in the genetic underpinnings of cardiovascular disease and are involved with various studies with the VA's Million Veterans Program.

The Stanford Cardiovascular Institute is a place where clinicians and basic scientists can seamlessly collaborate on important clinical issues.

### SELECTED PUBLICATIONS

miR-24 limits aortic vascular inflammation and murine abdominal aneurysm development. Maegdefessel L, Spin JM, 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. Nat Commun. 2014 Oct 31;5:5214.

New ways to dismantle a ticking time bomb: microRNA 712/205 and abdominal aortic aneurysm development. Maegdefessel L, Spin JM, Tsao PS. Arterioscler Thromb Vasc Biol. 2014 Jul;34(7):1339-40.

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 May 29;509(7502):641-4.



## Minang 'Mintu' Turakhia, MD, MAS

Associate Professor, Medicine - Cardiovascular Medicine

Executive Director, Stanford Center for Digital Health

Director, Cardiac Electrophysiology at the VA Palo Alto Health Care System

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TWITTER [@leftbundle](https://twitter.com/leftbundle)

### EDUCATION/TRAINING

MD UCSF

MAS UCSF

MEDICINE RESIDENCY & INTERNSHIP  
Brigham and Women's Hospital

CARDIOLOGY & CARDIAC  
ELECTROPHYSIOLOGY FELLOWSHIP UCSF

Stanford Biodesign Faculty Fellow

### CLINICAL FOCUS

Catheter ablation  
Atrial Fibrillation  
Ventricular Tachycardia  
Sudden Cardiac Death  
Pacemakers  
Implantable Defibrillators

### HONORS & AWARDS

VA Career Development Award

American Heart Association (AHA)  
National Scientist Development Award

American College of Cardiology (ACC)  
Foundation Emerging Faculty Fellow

E. William Hancock Stanford  
Cardiovascular Medicine Faculty  
Teaching Award

AHA Top Ten Scientific Advances in  
Cardiology

FELLOW  
ACC; AHA; Heart Rhythm Society

Associate Editor JAMA Cardiology

American Society of Clinical  
Investigation

Cardiology Today Next Gen Innovator  
Award

Awardee, American Thrombosis  
Investigator Initiated Research Program

### CURRENT RESEARCH

I am a practicing cardiac electrophysiologist, outcomes researcher, and clinical trialist. The goals of my research are to improve the outcomes of the treatment of heart rhythm disorders, with a focus on atrial fibrillation (AF), and to design, test, and implement digital health solutions to improve health outcomes and value. I have developed a multidisciplinary research program that draws upon technical knowledge, principals, and methods from computer science, biostatistics, economics, health services research, epidemiology, behavior science, and cardiac electrophysiology. 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.

As the Executive Director of Stanford's new Center for Digital Health, I lead a great team to help foster research collaborations with the tech world and develop resources and education programs for the Stanford community. I am the principal investigator of several multi-center trials to test digital health tools and wearable devices to screen and manage heart rhythm disorders. I am co-Principal Investigator, with Dr. Marco Perez, of the Apple Heart Study, launched in 2017. In my clinical role, I performs invasive procedures such as catheter ablation and device implantation to treat heart rhythm disorders.

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.

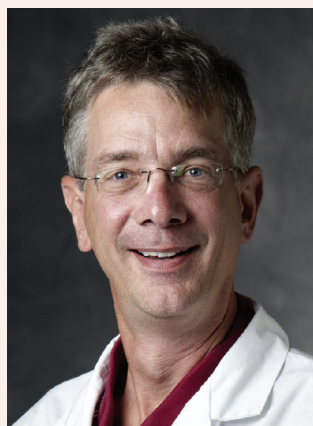
### SELECTED PUBLICATIONS

Site-level variation in adherence to dabigatran: Insights from the Veterans Health Administration. Shore SS, Ho PM, Lambert-Kerzner A, Glorioso T, Carey EP, Cunningham F, McCarren M, Longo L, Jackevicius C, Baron AE, Rose AJ, Turakhia MP. JAMA. 2015 Apr 14;313(14):1443-50.

Association of Treating Specialty to Outcomes in Newly-Diagnosed Atrial Fibrillation: Findings from the TREAT-AF Study. Perino AC, Fun J, Schmitt S, Askari M, Kaiser DW, Deshmukh A, Heidenreich PA, Swan C, Narayan S, Wang PJ, Turakhia MP. J Am Coll Cardiol. 2017 Jul 4;70(1):78-86. 108.

The Outlook of Digital Health for Cardiovascular Medicine: Challenges but Also Extraordinary Opportunities. Turakhia MP, Desai SA, Harrington RA. JAMA Cardiol. 2016 Oct 1;1(7):743-744.





## Paul J. Utz, MD

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Program Director, Medical Scientist Training Program (MSTP)

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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

FOUNDER AND DIRECTOR  
STANFORD INSTITUTES OF MEDICINE  
RESEARCH (SIMR) SUMMER STUDENTS  
PROGRAM

PROGRAM DIRECTOR  
EXPLORE SUMMER STUDENTS PROGRAM;  
RHEUMATOLOGY FELLOWSHIP PROGRAM

ASSOCIATE DIRECTOR OF EDUCATION  
IMMUNITY, TRANSPLANTATION AND  
INFECTION INSTITUTE (ITI)

ELECTED MEMBER  
SOCIETY FOR CLINICAL INVESTIGATION;  
THE KUNKEL SOCIETY  
DEPARTMENT OF MEDICINE TEACHING  
AWARD, STANFORD UNIVERSITY (2009)

FORMER FACULTY FELLOW  
STANFORD UNIVERSITY OFFICE OF  
DIVERSITY AND LEADERSHIP

### CURRENT RESEARCH

While earning my MD degree at Stanford, I co-discovered the transcription factor Nuclear Factor of Activated T Cells (NFAT) with JP Shaw in Dr. Gerald Crabtree's laboratory. I am an expert in the study of human and murine autoantibodies and autoantigens, apoptosis signaling pathways, animal models of autoimmunity, proteomics and multiplexed assay development for biomarker discovery. Members of my laboratory are developing several cutting-edge proteomics technologies for immunological applications, including multiplex planar-based autoantigen microarrays for studying lupus, multiple sclerosis, and other diseases such as diabetes. I am Program Director of Medical Scientist Training Program (MSTP).

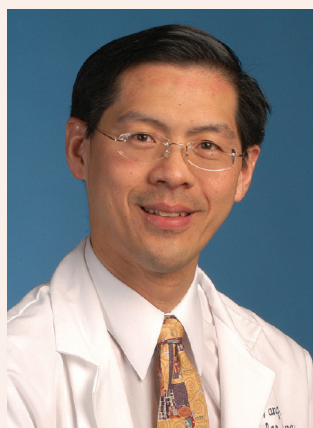
We are working to develop antigen-specific tolerizing therapies for common autoimmune diseases.

### SELECTED PUBLICATIONS

Integrated, multi-cohort analysis of systemic sclerosis identifies robust transcriptional signature of disease severity. Lofgren S, Hinchcliff M, Carns M, Wood T, Aren K, Arroyo E, Cheung P, Kuo A, Valenzuela A, Haemel A, Wolters PJ, Gordon J, Spiera R, Assassi S, Boin F, Chung L, Fiorentino D, Utz PJ, Whitfield M, Khatri P. 2016. JCI Insight 1(21):e89073.

Clonal evolution of autoreactive Germinal Centers. Degn SE, van der Poel CE, Firl DJ, Utz PJ, Victora GD, Carroll MC. 2017. Cell, 170:913-926.

Severe toxoplasma gondii infection in a member of the NFKB2-deficient family with T and B cell dysfunction. Maccari ME, Scarselli A, DiCesare S, Floris M, Angius A, Deodati A, Chiriaco M, Cambiaso P, Corrente S, Colafati GS, Utz PJ, Angelini F, Fierabracci A, Aiuti A, Carsetti R, Rosenberg JM, Cappa M, Rossi P, Bacchetta R, Cancrini C. In Press, Clin Immunol., 2017.



## Paul J. Wang, MD

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### 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  
Hypertrophic Cardiomyopathy

### HONORS & AWARDS

American Heart Association Clinical Cardiology Distinguished Achievement Award  
EDITOR-IN-CHIEF, Circulation: Arrhythmia and Electrophysiology  
DIRECTOR Arrhythmia Advanced Treatment Center, Stanford Cardiovascular Health  
Cardiac Electrophysiology Fellowship  
Stanford Center for Arrhythmia Research  
FORMER CHAIR American Heart Association Committee on Electrocardiography/Arrhythmias  
FACULTY LIAISON Biodesign  
CO-DIRECTOR, Bioengineering Scholarly Concentration, Stanford School of Medicine  
CO-DIRECTOR 2018 Stanford Biodesign New Arrhythmia Technologies Retreat  
MEMBER American Heart Association National Science and Clinical Education Life Long Learning Committee  
American Heart Association Clinical Cardiology

### CURRENT RESEARCH

My research centers on the development of innovative approaches to the treatment of arrhythmias, including more effective catheter ablation techniques, more reliable implantable devices, and less invasive treatments. My clinical research interests include atrial fibrillation, ventricular tachycardia, supraventricular arrhythmias and implantable devices. I have active collaborations with Bioengineering, Mechanical Engineering, and Electrical Engineering Departments at Stanford. Some of the goals of my research program are: 1) to create a more effective methods of catheter ablation, 2) to create implantable pacemakers and leads that are more reliable, 3) to create a combined surgical-catheter approach to ablation, 4) to create noninvasive methods of ablation, 5) to make defibrillation painless. I am the Director of Cardiac Arrhythmia Service and Cardiac Electrophysiology Laboratory.

Advances of the past 2 decades in engineering, biology and genetics, computer science, material science, chemistry and physics will result in major new developments in arrhythmia therapy and device innovation. We are poised to make significant contributions in this area.

### SELECTED PUBLICATIONS

Bipolar left ventricular pacing is associated with significant reduction in heart failure or death in CRT-D patients with LBBB. Jame, S., Kutyla, V., Aktas, M. K., McNitt, S., Polonsky, B., Al-Ahmad, A., Zareba, W., Moss, A., Wang, P. J. 2016. Heart Rhythm; 13 (7): 1468-1474.

Cost-Effectiveness of Percutaneous Closure of the Left Atrial Appendage in Atrial Fibrillation Based on Results From PROTECT AF Versus PREVAIL. Freeman, J. V., Hutton, D. W., Barnes, G. D., Zhu, R. P., Owens, D. K., Garber, A. M., Go, A. S., Hlatky, M. A., Heidenreich, P. A., Wang, P. J., Al-Ahmad, A., Turakhia, M. P. 2016. Circulation Arrhythmia and Electrophysiology 9 (6).

Brain natriuretic peptide and the risk of ventricular tachyarrhythmias in mildly symptomatic heart failure patients enrolled in MADIT-CRT. Medina, A., Moss, A. J., McNitt, S., Zareba, W., Wang, P. J., Goldenberg, I. 2016. Heart Rhythm 13 (4): 852-859.



## 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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### 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 U S A*. 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 Direnzo, 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 Oct 19;370(1680):20140364.



## Cornelia M. Weyand, MD, PhD

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Chief, Division of Immunology and Rheumatology

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### 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 research program is focused on defining and characterizing pathogenic immune responses in humans with emphasis on two disease models; inflammatory blood vessel disease and rheumatoid arthritis. In large vessel vasculitis, we have defined disease-relevant T cells, discerned mechanisms of T cell-antigen recognition, connected different T cell lineages to early and late disease and discovered microenvironmental signals that shape pathogenic immunity in the walls of human arteries. We were the first to describe the role of arterial wall dendritic cells in sensing danger-associated molecular patterns and initiating vasculitis and have implicated NOTCH-NOTCH ligand interactions in directing the tissue tropism of large vessel vasculitis. We build patient-relevant experimental models by engrafting human blood vessels, human atherosclerotic plaque and human immune cells into mice. Work in rheumatoid arthritis has identified premature immune aging as a typifying defect in this autoimmune syndrome. We are examining the contribution of DNA instability, telomeric damage and metabolic abnormalities in accelerated immune cell aging and inflammatory disease.

The immune system is everywhere. All diseases have their roots in the immune system.

### SELECTED PUBLICATIONS

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.

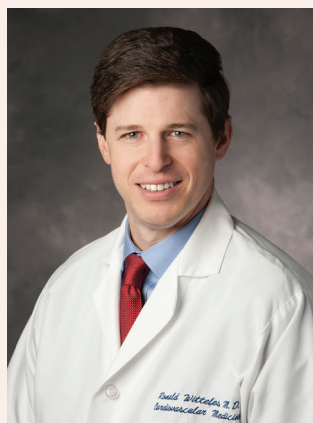
The microvascular niche instructs T cells in large vessel vasculitis via the VEGF-Jagged1-Notch pathway. Wen Z, Shen Y, Berry G, Shahram F, Li Y, Watanabe R, Liao YJ, Goronzy JJ, Weyand CM. *Sci Transl Med*. 2017 Jul 19;9(399).

Pyruvate controls the checkpoint inhibitor PD-L1 and suppresses T cell immunity. Watanabe R, Shirai T, Namkoong H, Zhang H, Berry GJ, Wallis BB, Schaefer B, Harrison DG, Tremmel JA, Giacomini JC, Goronzy JJ, Weyand CM. *J Clin Invest*. 2017 Jun 30;127(7):2725-2738.

Immunoinhibitory checkpoint deficiency in medium and large vessel vasculitis. Zhang H, Watanabe R, Berry GJ, Vaglio A, Liao YJ, Warrington KJ, Goronzy JJ, Weyand CM. *Proc Natl Acad Sci U S A*. 2017 Feb 7;114(6):E970-E979.

Metabolic control of the scaffold protein TKS5 in tissue-invasive, proinflammatory T cells. Shen Y, Wen Z, Li Y, Matteson EL, Hong J, Goronzy JJ, Weyand CM. *Nat Immunol*. 2017 Sep;18(9):1025-1034.

Deficient Activity of the Nuclease MRE11A Induces T Cell Aging and Promotes Arthritogenic Effector Functions in Patients with Rheumatoid Arthritis. Li Y, Shen Y, Hohensinner P, Ju J, Wen Z, Goodman SB, Zhang H, Goronzy JJ, Weyand CM. *Immunity*. 2016 Oct 18;45(4):903-916.



## Ronald Witteles, MD

Associate Professor, Medicine - Cardiovascular Medicine  
Co-Director, Stanford Amyloid Center  
Program Director, Internal Medicine Residency Training Program

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RESIDENCY PROGRAM [medicine.stanford.edu/education/residency.html](http://medicine.stanford.edu/education/residency.html)

### EDUCATION/TRAINING

MD University of Chicago

MEDICINE RESIDENCY  
Stanford University

CHEIF RESIDENT IN INTERNAL MEDICINE  
Stanford University

CARDIOLOGY FELLOWSHIP  
Stanford University

BOARD CERTIFICATION  
Internal Medicine, ABIM  
Cardiovascular Disease, ABIM  
Nuclear Cardiology, CBNC  
Advanced Heart Failure/Transplant  
Cardiology, ABIM

### CLINICAL FOCUS

Heart Failure  
Amyloidosis  
Cardiac complications of cancer  
therapy ("Cardio-Oncology")  
Sarcoidosis

### HONORS & AWARDS

David Ryland 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

FELLOW  
American College of Cardiology;  
American College of Physicians

### CURRENT RESEARCH

My research focuses on two primary areas: amyloidosis and cardiac complications of cancer therapy. As Co-Director of one of the nation'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 the Divisions of Hematology and Medical Oncology to investigate optimal screening and treatment of cancer-therapy associated cardiac disease.

My career goal is to pursue excellence in and  
integration of the three cornerstones of academic  
medicine—clinical care, scholarship, and education.

### SELECTED PUBLICATIONS

The state of medical school performance evaluations: Improved transparency or continued obfuscation? Hom J, Richman I, Hall P, Ahuja N, Harman S, Harrington R, Witteles R. Academic Medicine. 2016 Nov;91(11):1534-39.

Myocardial protection during cardiotoxic chemotherapy. Witteles RM, Bosch X. Circulation. 2015 Nov;132(19):1835-45.

Changing outcomes after heart transplantation in patients with amyloid cardiomyopathy. Davis MK, Lee PH, Witteles RM. J Heart Lung Transplant. 2015 Sep;34(5):685-66.

Radiation-induced heart disease: an under-recognized entity? Davis M, Witteles RM. Curr Treat Options Cardiovasc Med. 2014 Jun;16(6):317.

Cancer therapy-induced left ventricular dysfunction: interventions and prognosis. Thakur A, Witteles RM. J Card Fail. 2014 Mar;20(3):155-8.





## Y. Joseph Woo, MD

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Professor, Cardiothoracic Surgery

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DEPARTMENT [ctsurgery.stanford.edu](http://ctsurgery.stanford.edu)

### 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

Top Doctor of Bay Area, San Francisco Magazine (2015, 2016, 2017)

President, American Heart Association  
Silicon Valley Board of Directors

Surgical Mentorship Teaching Award,  
University of Pennsylvania (2013)

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

### 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 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

**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.

**A Novel Protein-Engineered Hepatocyte Growth Factor Analog Released via a Shear-Thinning Injectable Hydrogel Enhances Post-Infarction Ventricular Function.** Steele AN, Cai L, Truong VN, Edwards BE, Goldstone AB, Eskandari An Mitchell AC, Hopkins MS, Stapleton LM, Marquardt LM, Foster AA, Kawamura M, Cochran JR, Heilshorn SC, Woo YJ. *Biotechnology and Bioengineering* 2017 Oct;114(10):2379-2389.

**An Innovative Biologic System for Photo-Powered Myocardium in the Ischemic Heart.** Cohen JE, Goldstone AB, Paulsen MJ, Shudo Y, Steele AN, Edwards BB, Patel JB, MacArthur JW, Hopkins MS, Burnett CE, Jaatinen KJ, Thakore AD, Farry JM, Truong VN, Bourdillon AT, Stapleton LM, Eskandari A, Fairman AS, Hiesinger W, Esipova TV, Patrick WL, Ji K, Shizuru JA, Woo YJ. *Science Advances* 2017 Jun 14;3(6):e1603078

**A "Repair All" Strategy for All Degenerative Mitral Valve Disease Safely Minimizes Unnecessary Replacement.** Goldstone AB, Cohen JE, Howard JL, Edwards BB, Acker AL, Hiesinger W, MacArthur JW, Cohen JE, Atluri P, Woo YJ. *Annals of Thoracic Surgery* 2015 Jun;99(6):1983-1991.

**One Hundred Years at Stanford University: Thoracic and Cardiovascular Surgery.** Woo YJ and Reitz BR. *Semin Thorac and Cardiovasc Surg* 2015 Winter;27(4):388-397.

**Transdifferentiation of Mesenchymal Stem Cell into Smooth Muscle Cell Lineage; Utility for Clinical Application From Isolation to Creation of Cell-Sheet.** Shudo Y, Cohen JE, Goldstone AB, MacArthur JW, Patel J, Edwards BE, Hopkins MS, Steele AN, Joubert MM, Miyagawa S, Sawa Y, Woo YJ. *Cytotherapy* 2016 Apr;18(4):510-517. [Cover Article]



## Joseph C. Wu, MD, PhD

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Simon H. Stertz Professor of Cardiovascular Medicine & Radiology

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### 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

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 Established Investigator Award

Academy of Radiology Research

Distinguished Investigator Award

Burroughs Wellcome Foundation

Innovation in Regulatory Science Award

American Heart Association Merit Award

### MEMBER

American Society for Clinical

Investigation

Association of University Cardiologists

Scientific Advisory Board, Keystone

Symposia

Association of American Physicians

AHA National Board of Directors (2017-

2019)

FDA Cellular, Tissue, and Gene Advisory

Committee (2017-2020)

### CURRENT RESEARCH

My lab works on biological mechanisms of 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 "clinical trial in a dish" concept, and (iv) implement precision cardiovascular medicine for prevention and treatment of patients. His lab uses a combination of 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 lead to better care for our patients.

### SELECTED PUBLICATIONS

Chemically defined generation of human cardiomyocytes. Burrridge PW, Matsa E, Shukla P, Lin ZC, Churko JM, Ebert AD, Lan F, Diecke S, Huber B, Mordwinkin NM, Plews JR, Abilez OJ, Cui B, Gold JD, Wu JC. *Nature Methods* 2014;11(8):855-860.

Epigenetic regulation of phosphodiesterases 2A and 3A underlies compromised beta-adrenergic signaling in iPSC model of dilated cardiomyopathy. Wu H, Lee J, Vincent JG, Wang Q, Gu W, Lan F, Churko J, Sallam K, Matsa E, Sharma A, Gold JD, Engler AJ, Xiang YK, Bers DM, Wu JC. *Cell Stem Cell* 2015;17(1):89-100.

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.

Abnormal activation of TGFbeta signaling as a pathogenesis of left ventricular non-compaction cardiomyopathy. Kodo K, Ong SG, Jahanbani F, Termglinchan V, Hirono K, Inanloo Rahatloo K, Ebert AD, Shukla P, Abilez OJ, Churko JM, Karakikes I, Jung G, Ichida F, Wu SM, Snyder MP, Bernstein D, Wu JC. *Nature Cell Biology* 2016;18(10):1031-42.

Transcriptome profiling of patient-specific human iPSC-cardiomyocytes predicts individual drug safety and efficacy responses in vitro. Matsa E, Burrridge PW, Yu KH, Ahrens JH, Termglinchan V, Wu H, Liu H, Shukla P, Sayed N, Churko JM, Shao N, Woo NA, Chao AS, Gold JD, Karakikes I, Snyder MP, Wu JC. *Cell Stem Cell* 2016;19:311-325.

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).



## Sean M. Wu, MD, PhD

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Associate Professor (by courtesy), Pediatrics  
Endowed Faculty Scholar, Child Health Research Institute

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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

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 embryonic stem cells as a test-tube model to study the process of heart cell formation.

Given the difficult research funding climate,  
I hope in 20 years we can be proud of our efforts  
today to train the next generation of cardiovascular  
physician scientists.

### SELECTED PUBLICATIONS

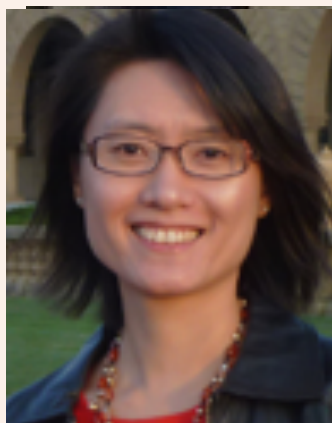
Bioacoustic-enabled assembly of human iPSC-derived cardiomyocytes into 3D cardiac tissues. Serpooshan V, Chen P, Wu H, Lee S, Sharma A, Hu DA, Venkatraman S, Ganesan AV, Yarmush M, Yang F, Wu JC, Demirci U, Wu SM. (2017) Biomaterials. 131:47-57.

YY1 expression is sufficient for the maintenance of cardiac progenitor cell state. Gregoire S, Li G, Sturzu A, Schwartz RJ, Wu SM. (2017) Stem Cells. 35(8):1913-1923

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. (2016) Dev Cell. 39(4):491-507.

The fetal mammalian heart generates a robust compensatory response to cardiac cell loss. Sturzu, A.C., Kuppusamy, R., Passer, D., Plonowska, K., Riley, A., Tan, T.C., Sharma, A., Xu, A.F., Engels, M.C., Feistritz, R., Li, G., Selig, M.K., Geissler, R., Robertson, K.D., Sherrer-Crosbie, M., Domian, I.J., Wu, S.M. (2015) Circulation. 132(2):109-21.

Identification of cardiovascular lineage descendants at single cell resolution. Li, G., Plonowska, K., Kuppusamy, R., Sturzu, A., Wu, S.M. (2015) Development. 142(5):846-57.



## Fan Yang, PhD

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### EDUCATION/TRAINING

PHD Johns Hopkins University,  
Biomedical Engineering

### HONORS & AWARDS

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#. (\*:co-first authors, # : co-corresponding author). *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. Devezza 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, Devezza 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

Associate Professor, Medicine - Cardiovascular Medicine  
 Director, Cardiovascular Stem Cell Laboratory  
 Director, Cardiothoracic MRI Program

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### 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

### CLINICAL FOCUS

General Cardiology  
 Cardiovascular Imaging  
 Cardiovascular and Molecular Therapy

### 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  
 Heart Association (AHA) and American  
 College of Cardiology (ACC), Senior  
 Author (2009, 2010, 2012, 2015)  
 Co-Chair, AHA Cardiovascular Stem Cell  
 Writing Group

PRINCIPAL INVESTIGATOR  
 NIH Patient-Oriented Research in  
 Cardiovascular Regeneration  
 NIH Cardiovascular Cell Therapy  
 Research Network  
 Novartis, Investigator Initiated Research  
 Intervallien Foundation Research Award

### 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 exosomes generated from patient- and disease-specific iPSC-cardiovascular cells and their molecular cargo to implement precision medicine. Through NIH/NHLBI-sponsored Cardiovascular Cell Therapy Research Network, the feasibility of a pilot clinical trial of this innovative therapeutic approach is investigated.

Success consists of going from failure to failure  
 without loss of enthusiasm. — Winston Churchill

### SELECTED PUBLICATIONS

Direct Evaluation of Myocardial Viability and Stem Cell Engraftment Demonstrates Salvage of the Injured Myocardium. Kim PJ, Mahmoudi M, Ge X, Matsuura Y, Toma I, Metzler S, Kooreman N, Ramunas J, Holbrook C, McConnell MV, Blau H, Harnish P, Rulifson E, Yang PC. *Circulation Res* 2015;116:e40-e50.

Engineered Cell-free Epicardium Activates the Endogenous Regeneration Program in the Adult Mammalian Heart. Wei K, Serpooshan V, Diez-Cuñado M, Zhao M, Nosedá M, Maruyama S, Nakamura K, Tian X, Metzler SA, Liu Q, Kim PJ, Matsuura Y, Cai W, Savtchenko A, ZhuW, Mahmoudi M, Schneider MD, vandenHoff M, Butte MJ, Walsh K, Zhou B, Yang PC, Bernstein D, Mercola M, Lozano PR. *Nature* 2015;525:479-485.

Novel MRI Contrast Agent from Magnetotactic Bacteria Enables In Vivo Tracking of iPSC-derived Cardiomyocytes. Mahmoudi M, Tachibana A, Gladstone AB, Woo YJ, Chakraborty P, Muth K, Foote C, Pieciewicz S, Barrozo J, Wakeel A, Rice B, Bell III C, Yang PC. *Nature Sci Rep* 2016 Jun 6;6:26960.

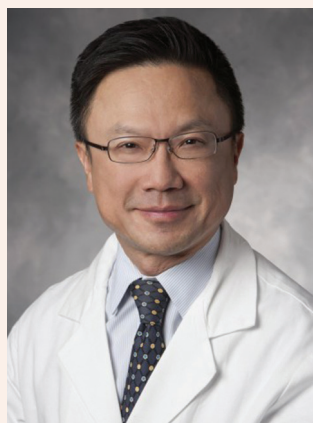
The Promise and Challenge of Induced Pluripotent Stem Cells (iPSCs) for Cardiovascular Applications. Youssef AA, Ross EG, Bolli R, Pepine CJ, Leeper NJ, Yang PC. *JACC: Basic to Translational Science* 31 October 2016.

Exosomes generated from iPSC-derivatives: new direction for stem cell therapy in human heart diseases. Jung J, Fu X, Yang PC. *Circulation Res* 2017 Jan 20;120(2):407-417

Circulating Biomarkers to Identify Responders in Cardiac Cell therapy. Jokerst J, Cauwenberghs N, Kouznetsova T, Haddad F, Sweeney T, Hou J, Rosenberg-Hasson Y, Zhao E, Schutt R, Bolli R, Traverse J, Henry J, Pepine C, Schulman I, Moye L, Taylor D, Yang, PC. *Nature Sci Rep*. 2017 Jun 30;7(1):4419.

Myocardial Edema on T2-Weighted MRI: New Marker of Ischemia Reperfusion Injury and Adverse Myocardial Remodeling. Tada Y, Yang PC. *Circ Res*. 2017 Aug 4;121(4):326-328.





## Alan C. Yeung, MD

Li Ka Shing Professor of Medicine (Cardiology)  
Medical Director, Cardiovascular Health, Stanford Medicine  
Chief (Clinical), Division of Cardiovascular Medicine  
Former Director, Interventional Cardiology

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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, 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.

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  
Professor, Bioengineering  
Professor, Medicine - Cardiovascular Medicine  
Professor (by courtesy), Mechanical Engineering and Graduate School of Business  
Director, Stanford Byers Center for Biodesign

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### EDUCATION/TRAINING

MD Harvard University

MEDICINE RESIDENCY & INTERNSHIP  
USCF

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  
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

MEMBER  
Association of American Physicians  
National Academic of Engineering  
Stanford Cardiovascular Institute

### CURRENT RESEARCH

I direct the Byers Center in Biodesign, a unit of Stanford's Bio-X initiative that focuses on invention and technology transfer related to biomedical engineering. The Bio-design program includes courses, training, mentoring and seed grant programs for faculty and postdoctoral, graduate and undergraduate students.

A well-characterized need is the DNA of a good invention.

### 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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### 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 (2013-2018), Vera Moulton Wall Center

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

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, Tuder 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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### 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)

### 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 extra-terrestrial 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

Diagnosis of Prostate Cancer by Desorption Electrospray Ionization Mass Spectrometric Imaging of Small Metabolites and Lipids. S. Banerjee, R. N. Zare, R. J. Tibshirani, C. A. Kunder, R. Nolley, R. Fan, J. D. Brooks, and G. A. Sonn. *Proc. Natl. Acad. Sci. USA* 114, 3334-3339 (2017).

Abiotic Production of Sugar Phosphates and Uridine Ribonucleoside in Aqueous Microdroplets. I. Nam, J. K. Lee, H. G. Nam, and R. N. Zare. *Proc. Nat. Acad. Sci. (USA)* 114, 12396-12400 (2017).

"On-Droplet" Chemistry: The Cycloaddition of Diethyl Azodicarboxylate and Quadricyclane. R. M. Bain, S. Sathyamoorthi, and R. N. Zare, *Angew. Chemie Int. Ed.* 56, 15083-15087 (2017).

