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I couldn’t be prouder of the Stanford Cardiovascular Institute. Since its inception in 2004, the institute has established a legacy of groundbreaking research, outstanding education, and preeminent patient care. And its transformative work in 2019 only served to continue its excellence.

Led by Joseph C. Wu, MD, PhD, the Simon H. Stertzer, MD, Professor of Cardiovascular Medicine and of Radiology, and Robert Harrington, MD, the Arthur L. Bloomfield Professor of Medicine and Chair of the Department of Medicine, the Cardiovascular Institute is a collaborative force. Its members — a diverse and talented team of engineers, surgeons, physicians, scientists, fellows, and students — are committed to improving cardiovascular health and developing the leaders of tomorrow.

The far-reaching impact of their dedication is demonstrated in just a few of the many headlines the Cardiovascular Institute generated this past year:

- The landmark Apple Heart Study laid the foundation for future large-scale app-based clinical studies by showing that wearable technology can safely identify heart rate irregularities.
- The number of invasive procedures may soon decline thanks to a finding that stents and bypass surgery show no benefit over medication and lifestyle advice in treating patients with severe but stable heart disease.
- As e-cigarette use skyrockets, the institute found flavoring liquid used in electronic cigarettes may increase the risk of cardiovascular disease when inhaled.
- In a first-of-its-kind study, the institute took heart muscle cells derived from stem cells to the International Space Station to understand how microgravity affects the cells of the human heart.

At the same time, the institute continued to strengthen collaborative relationships and create innovative partnerships. The Stanford–Penn Symposium brought together more than 300 attendees to promote interinstitutional sharing, and more than 500 people from industry and academia met at the institute’s 4th Annual Drug Discovery Symposium.

Beyond these critical exchanges of knowledge, the future of cardiovascular health will be in good hands. The institute’s undergraduate summer program hosted 19 students for an intense 10 weeks to explore a future in cardiovascular research. The most important job we have at Stanford is to inspire and encourage young people.

I am excited to see what the Stanford Cardiovascular Institute accomplishes in 2020 as it continues to lead the field of cardiovascular medicine.

Llyod B. Minor, MD
Stanford Cardiovascular Institute (CVI) was established in 2004 to bring together trainees, scientists, engineers, and some of the brightest cardiologists and cardiac surgeons in the field. Together, the members of the Cardiovascular Institute embody valuable collaborative spirit and an open-minded philosophy that have driven innovation and yielded incredible biomedical advances, as evidenced by over 2,000 manuscripts published by our members in 2019 alone. In this report, we highlight the contributions from our members, which now number more than 260 Stanford faculty members and hundreds of the brightest fellows and students in the country.

The core strength of the CVI comes from our talented students and postdoctoral and clinical fellows. Their training and professional development are a top priority of the Institute to ensure continued success throughout their time at Stanford and thereafter. We are fortunate to support 16 fellows each year on NIH training grants and provide grant writing support for all fellows to pursue their own funding opportunities. We also aim to facilitate an active exchange of ideas across disciplines and training levels. To achieve this, we have a Frontiers of Cardiovascular Science seminar that features international leaders in the field, and we host an annual Stanford Drug Discovery Symposium that attracts diverse leaders in academia, industry, and government. We are very excited to announce our upcoming relocation to the new Biomedical Innovations Building, designed to be a hub for cardiovascular scientists to work side-by-side and actively collaborate. We are continuing to lead important conversations within and outside the cardiovascular community at Stanford to promote fruitful collaborations across all facets of science.

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

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

Joseph C. Wu, MD, PhD
Leadership

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

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

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

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

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

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

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

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

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

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

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

Marlene Rabinovitch, MD
Dwight and Vera Dunlevie Professor in Pediatric Cardiology, Director of BASE Program
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 research at Stanford. The committee is comprised of Stanford experts in different disciplines listed below.

**Basic Research**
- Ronglih Liao, PhD
- Mark Mercola, PhD
- Mark Nicolls, MD
- Marlene Rabinovitch, MD

**Cardiovascular Imaging**
- Dominik Fleischmann, MD
- Koen Nieman, MD, PhD

**Cardiovascular Medicine**
- Eldrin F. Lewis, MD, MPH
- Thomas Quertermous, MD
- Alan C. Yeung, MD

**Cardiothoracic Surgery**
- Y. Joseph Woo, MD

**Clinical Research**
- William Fearon, MD
- Kenneth W. Mahaffey, MD

**Education and Training**
- Daniel Bernstein, MD
- Mark Mercola, PhD

**Finance and Administration**
- Jason Irwin, MBA
- Stefan Pavlovic, MBA

**Innovation**
- Paul Yock, MD

**Junior Faculty Development**
- Patricia Nguyen, MD
- Edda Spierekoetter, 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
- Nicholas Leeper, 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.

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<thead>
<tr>
<th>Joseph C. Wu, MD, PhD</th>
<th>Ioannis Karakikes, PhD</th>
<th>Marlene Rabinovitch, MD</th>
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<td>Euan A. Ashley, MRCP, DPhil</td>
<td>Joshua W. Knowles, MD, PhD</td>
<td>Jayakumar Rajadas, PhD</td>
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<td>Daniel Bernstein, MD</td>
<td>Brian Kobilka, MD</td>
<td>James Spudich, PhD</td>
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<td>Alexander Dunn, PhD</td>
<td>Eldrin Lewis, MD, MPH</td>
<td>Jennifer A. Tremmel, MD, MS</td>
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<td>William Fearon, MD</td>
<td>Ronglih Liao, PhD</td>
<td>Philip S. Tsao, PhD</td>
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<td>Dominik Fleischmann, MD</td>
<td>Nicholas Leeper, MD</td>
<td>Minang  ‘Mintu’ Turakhia, MD, MAS</td>
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<td>Francois Haddad, MD</td>
<td>David Liang, MD, PhD</td>
<td>Paul J. Utz, MD</td>
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<td>Robert A. Harrington, MD</td>
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<td>Paul J. Wang, MD</td>
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<td>Sarah Heilshorn, PhD</td>
<td>Mark Mercola, PhD</td>
<td>Y. Joseph Woo, MD</td>
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<td>Paul A. Heidenreich, MD, MS</td>
<td>Daria Mochly-Rosen, PhD</td>
<td>Sean M. Wu, MD, PhD</td>
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<td>Mark Hlatky, MD</td>
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<td>Phillip C. Yang, MD</td>
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<td>Ngan F. Huang, PhD</td>
<td>Koen Nieman, MD, PhD</td>
<td>Alan C. Yeung, MD</td>
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<td>Michael Kapiloff, MD, PhD</td>
<td>Thomas Quertermous, MD</td>
<td>Paul Yock, MD</td>
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</table>
Education & Training Committee

The Cardiovascular Institute Education and Training Grant 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

Themistocles 'Tim' Assimes, MD, PhD
Associate Professor of Medicine (Cardiovascular Medicine) and, by courtesy, of Health Research and Policy (Epidemiology)

Daniel Bernstein, MD
Alfred Woodley Salter and Mabel Smith Salter Endowed Professor in Pediatrics

Amanda Chase, PhD
Project Coordinator and Grant Writer, Cardiovascular Institute

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

Vinicio A. de Jesus Perez, MD
Associate Professor of Medicine (Pulmonary and Critical Care Medicine)

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

Ngan Huang, PhD
Assistant Professor, Cardiothoracic Surgery

Ioannis Karakikes, PhD
Assistant Professor, Cardiothoracic Surgery

Nicholas Leeper, MD
Professor of Surgery (Vascular Surgery) and Medicine (Cardiovascular)

Mark Mercola, PhD
Professor (Research), Cardiovascular Medicine

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

Koen Nieman, MD, PhD
Associate Professor of Medicine (Cardiovascular) and of Radiology (CV Imaging)

David L. M. Preston, MA, MBA
Program Manager, Cardiovascular Institute

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

Sushma Reddy, MD
Assistant Professor of Pediatrics (Cardiology)

Marcia Stefanick, PhD
Professor of Medicine (Stanford Prevention Research Center) and of Obstetrics and Gynecology; Director and Co-founder, WSDM Program

Philip Tsao, PhD
Professor (Research) of Medicine (Cardiovascular)

PJ Utz, MD
Professor of Medicine (Immunology and Rheumatology)

Paul J. Wang, MD
Professor of Medicine (Cardiovascular) and, by Courtesy, of Bioengineering

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

Sean M. Wu, MD, PhD
Associate Professor of Medicine (Cardiovascular) 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

Michael R. Bristow, MD, PhD
Professor of Medicine, University of Colorado
CEO, Arca Biopharma

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

Victor J. Dzau, MD
President, National Academy of Medicine
Chancellor Emeritus and James B. Duke Professor of Medicine,
Duke University

Robert C. Robbins, MD
President, University of Arizona

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

Howard Rockman, MD
Edward S. Orgain Professor of Cardiology
Professor in Molecular Genetics, Microbiology, and Cell Biology
Duke University School of Medicine

Judith S. Hochman, MD
Senior Associate Dean for Clinical Sciences
Co-Director, NYU-HHC Clinical and Translational Science Institute
Harold Snyder Family Professor and Associate Director of Cardiology
New York University School of Medicine

Eric J. Topol, MD
Gary & Mary West Endowed Chair of Innovative Medicine, Professor of Molecular Medicine
Director & Founder, Executive VP
Scripps Research Translational Institute

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

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
Administration

Amanda Chase, PhD
Grant Writer and Project Coordinator
chaseama@stanford.edu

Kari Costa
Research Administrator
kcosta@stanford.edu

Andrea Dang
Faculty and Postdoctoral Affairs Administrator
adang@stanford.edu

Danielle deLeon
Web Manager
ddeleon@stanford.edu

Yamini Dwarkanath
Research Administrator
ydwaraka@stanford.edu

Edward Finn
Clinical Trials Manager
efinn@stanford.edu

Adrienne Mueller, PhD
Scientific Education and Outreach Program Coordinator
alm04@stanford.edu

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

Stefan Pavlovic, MBA
Finance Manager
zakp@stanford.edu

David L. M. Preston, MA, MBA
Business Operations and Program Manager
preston@stanford.edu

Chantanee Saejao
Accounting/Finance Associate
csaejao@stanford.edu

Francesca Mae G. Tongco
Administrative Associate
ftongco@stanford.edu

Ying Wong
Financial Analyst
yjwong@stanford.edu
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.
DEVELOPMENTAL BIOLOGY:
Daniel Bernstein, MD
Gerald R. Crabtree, MD
Mark A. Krasnow, MD, PhD
Mark Mercola, PhD
Hiromitsu ‘Hiro’ Nakauchi, MD, PhD
Kristy Red-Horse, PhD
Sean M. Wu, MD, PhD

GENOMICS & BIOINFORMATICS:
Russ B. Altman, MD, PhD
Themistocles ‘Tim’ Assimes, MD, PhD
Euan A. Ashley, MRCP, PhD
Carlos Bustamante, PhD
Joshua W. Knowles, MD, PhD
Ronglih Liao, PhD
Thomas Quertermous, MD
Michael Snyder, PhD

ION CHANNELS & ARRHYTHMIAS:
Bianxiao Cui, PhD
Merritt Maduke, PhD
Sanjiv Narayan, MD
Ada Poom, PhD
Paul J. Wang, MD
Minang ‘Mintu’ Turakhia, MD, MAS

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

METABOLIC DISEASES:
Joshua Knowles, MD, PhD
Fred Kraemer, MD
Ronglih Liao, PhD
Thomas Quertermous, MD

OUTCOMES & PREVENTION:
Themistocles ‘Tim’ 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
Philip Lavori, PhD
Kenneth W. Mahaffey, MD
David J. Maron, MD
Doff McElhinney, 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
Ioannis Karakikes, PhD
Ronglih Liao, PhD
Michael Longaker, MD
Mark Mercola, MD
Hiromitsu ‘Hiro’ Nakauchi, MD, PhD
Irving Weissman, MD
Y. Joseph Woo, MD
Joseph C. Wu, MD, PhD
Sean M. Wu, MD, PhD
Phillip C. Yang, MD

VASCULAR BIOLOGY:
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
Patricia Nguyen, 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).

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

Clinical Biomarker & Phenotyping Core Lab (BPCL)

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

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 at efin@stanford.edu

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

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
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.

Mechanisms and Innovation in Vascular Disease

PROGRAM DIRECTORS
Philip Tsao, PhD and Nicholas Leeper, MD

The Mechanisms & Innovation in Vascular Disease program (T32) 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.

ALEXANDER KAISER, PHD
Project: Personalized Virtual Surgery for Precision Treatment of Hypertrophic Cardiomyopathy

XIAOMING OUYANG, PHD
Project: Modeling Tyrosine Kinase Inhibitor-Induced Vascular Dysfunction Using Human iPSCs

STEPHANIE LINDSEY, PHD
Project: Quantification and Optimization of Tissue Engineered Vascular Graft Growth and Remodeling

KENNETH TRAN, MD
Project: Patient Specific Computational Hemodynamic Performance Modelling in Complex EVAR

MARCELLA MARTIN, PHD
Project: Defining the Role of Endothelial Cell Dysfunction in William’s Syndrome using iPSCs

IAN WILLIAMS, PHD
Project: Investigating the Role of Blood Flow in Coronary Vascular Remodeling

If interested in this postdoctoral training grant visit to apply: http://med.stanford.edu/cvi/education/mechanisms-and-innovations-t32.html
Multi-Disciplinary Program in Cardiovascular Imaging

PROGRAM DIRECTORS
Joseph C. Wu, MD, PhD, John Pauly, PhD, and Koen Nieman, MD, PhD

The Multi-Disciplinary Training Program in Cardiovascular Imaging (T32) 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, and 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 faculty mentors are a critical component of the program, with a balance of MD and PhD mentors across the core collaborative departments.

SANGKYUN 'SANG' CHO, PHD
Project: Reversal of Myofibroblast Differentiation and Cardiac Fibrosis by Cooperative Chemo-mechanical Signaling

GENNIFFER SMITH, PHD
Project: Risk Stratification of Atherosclerotic Plaques Through DNA Methylation Profiling

FATEMEH OSTADHOSSEIN, PHD
Project: Smart Nanoprobes for the Detection of Hypoxic Regions in Ischemia, Teratoma Formation, and Stem Cell Apoptosis

RAHEL A. WOLDEYES, PHD
Project: Visualizing the Structures and Subcellular Organization of Macromolecules Inside Cardiomyocytes Using Cryo-Electron Tomography

If you are interested in this postdoctoral training grant visit to apply: [http://med.stanford.edu/cvi/education/cardiovascular-imaging-t32.html](http://med.stanford.edu/cvi/education/cardiovascular-imaging-t32.html).
Research Training in Myocardial Biology

PROGRAM DIRECTORS
Daniel Bernstein, MD, Thomas Quertermous, MD, and Euan Ashley, MRCP, DPhil

Myocardial biologists at Stanford are found in diverse departments and divisions, providing a natural vehicle for multidisciplinary training. This T32 training grant 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.

PAUL PANG, PHD
Project: Single-cell Splicing Analysis of iPSC-CMs From Patients With Myotonic Dystrophy

DAVID STAUDT, MD, PHD
Project: Interrogating Diastolic Dysfunction Using A Novel Stem Cell Model of Restrictive Cardiomyopathy

JACK O'SULLIVAN, PHD
Projects: 1. A Polygenic Risk Score to Predict Stroke in Patients with AF; 2. The Accuracy of Smartphone Camera Apps to Detect AF: A Meta-analysis; 3. Predicting Reproducibility of GWAS

ALISON SCHROER, PHD
Project: Investigating Myosin and Myofibril Mechanobiology in Human Induced Pluripotent Stem Cell-derived Cardiomyocyte (Completed grant Dec. 31, 2019)

QIAN YU
Project: Mechanisms Underlying CIP4-CaNAβ Signaling in Myocytes

SARA RANJBARVAZIRI, PHD
Project: Hypertrophic Cardiomyopathy: A Disease of Altered Cardiac Energetics

If interested in this postdoctoral training grant email Terra R. Coakley at tcoakley@stanford.edu for more information on how to apply.
Promotions of CVI Affiliated Postdocs

Kevin Alexander, MD
Assistant Professor of Medicine, Cardiovascular Medicine

Myriam Amsallem, MD, PhD
Instructor of Medicine - Cardiovascular Medicine, Stanford

Tina Baykaner, MD, MPH
Instructor of Medicine - Cardiovascular Medicine, Stanford

Mark Chandy, MD, PhD
Instructor, Cardiovascular Institute

Abbygail Foster, PhD
Technical Development Scientist at Genentech

Mingxia Gu, PhD
Assistant Professor, Center for Stem Cell and Organoid Medicine, CuSTOM, Division of Dev. Biology, and Perinatal Institute, Cincinnati Children's Hospital Medical Center

Ilanit R. Itzhaki, PhD
Instructor, Cardiovascular Institute

Amy Kaufman, MD
Clinical Instructor of Surgery - Vascular Surgery, Stanford

Chun Liu, PhD
Instructor, Cardiovascular Institute

Edward Lau, PhD
Assistant Professor Department of Medicine (Cardiology) University of Colorado Anschutz Medical Center
Promotions of CVI Affiliated Postdocs cont.

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

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

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

Sharon Paige, MD
Instructor, Pediatric Cardiology, Stanford

David T. Paik, PhD
Instructor, Cardiovascular Institute, Stanford

Sheeva Rajaei, MD
Assistant Professor, University of Pennsylvania

June Rhee, MD
Instructor of Medicine - Cardiovascular Medicine Instructor, Cardiovascular Institute, Stanford

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

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

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

Mingtao Zhao, PhD
Assistant Professor at The Ohio State University & Principal Investigator at Nationwide Children's Hospital
The Stanford Cardiovascular Institute has been awarded an R38 StARR (Stimulating Access to Research in Residency) grant as of February 2020. This is its inaugural year!

Funded by the NHLBI, this multidisciplinary resident training grant is designed to recruit and train resident-investigators in cardiovascular and pulmonary research and to accelerate their development into independent clinician-investigators. This program is designed for individuals who have completed a significant portion of their clinical training (~2 years), and interested in becoming physician scientists, and have developed a clinical and research focus.

Residents will be selected from Internal Medicine, Radiology, Pediatrics, and Cardiothoracic Surgery residency programs here at Stanford School of Medicine.

Deadline for application is March 1, 2020. Start date of award is July 1, 2020.

To apply: [https://tinyurl.com/R38CVI](https://tinyurl.com/R38CVI).

R38 Directors
- Michael Fischbein, MD, PhD
  Associate Professor of Cardiothoracic Surgery, Adult Cardiac Surgery
- Marlene Rabinovitch, MD
  Dwight and Vera Dunlevie Professor in Pediatric Cardiology,
  Director of BASE Program
- Joseph C. Wu, MD, PhD
  Director, Stanford Cardiovascular Institute
  Simon H. Stertzer, MD, Professor of Medicine and Radiology

The 10-week-long program is designed to train rising sophomores, juniors, and seniors (enrolled in a 4-year undergraduate program in the U.S. and territories) that are majoring in a scientific discipline exposure to cardiovascular research in the laboratories of CVI-affiliated faculty members.

Each student receives a set stipend covering living costs. The program dates will be between June 8, 2020, and August 14, 2020. During their individual research mentorships, the program also hosts events fostering student interaction, including: a visit to local Silicon Valley biotech company, meeting with a panel of faculty mentors and peers discussing career opportunities in cardiovascular science, and to present their work with formal research presentations during an Undergrad Research event.

For its inaugural year (2018), this program hosted 7 students from around the country. Last year (2019), CVI hosted 19 undergraduate students; and we are recruiting for 20 spots this year.


The deadline for submission for this summer is March 15, 2020. Applications and additional information can be found here: [https://tinyurl.com/cviundergradinfo](https://tinyurl.com/cviundergradinfo).

Questions? Contact: preston@stanford.edu or chaseama@stanford.edu.

Education & Training Programs
CVI Residents Cardiovascular Research

CVI Undergraduate Summer Research Program

Our undergraduate summer research program is supported by the American Heart Association (AHA), the NHLBI R25 Diversity in Health-Related Research grant, and the Stanford CVI.

The 10-week-long program is designed to train rising sophomores, juniors, and seniors (enrolled in a 4-year undergraduate program in the U.S. and territories) that are majoring in a scientific discipline exposure to cardiovascular research in the laboratories of CVI-affiliated faculty members.

For its inaugural year (2018), this program hosted 7 students from around the country. Last year (2019), CVI hosted 19 undergraduate students; and we are recruiting for 20 spots this year.
The Impact of Philanthropy

Steven M. Gootter Foundation: Sudden Cardiac Death Research

The support from the Steven M. Gootter Foundation 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 supports an annual lecture on Sudden Cardiac Death and Electrophysiology, Seed Grant research projects (below), and other ongoing efforts.

Visit the Gootter Foundation at www.stevenmgootterfoundation.org

2017 Award: Oscar J. Abilez, MD, PhD
"Early Detection of Arrhythmogenesis due to Cardiac Fibrosis via Correlation of In Vitro Modeling and Clinical Assessment"

2018 Award: Kristy Red-Horse, PhD
"Does enhancing coronary artery development promote recovery from cardiac injury?"

2019 Award: Paul Wang, MD
"Experimental Heart Models of Ventricular Tachycardia: Porcine and Explanted Human Heart"

CVI Weill Research Scholars Endowment

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

Supporting CVI

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
http://med.stanford.edu/cvi/support-our-research.html

Lawrence H. and Roberta Cohn Endowed Lectureship

The Lawrence H. and Roberta Cohn endowed lectureship, held annually in the area of cardiothoracic surgery, brings together physician-scientists from around the country to Stanford. Dr. Cohn graduated from Stanford School of Medicine in 1962, training under Dr. Norman Shumway. Dr. Cohn was a pioneer in the field of heart valve repair and replacement surgery. Past keynote lecturers include: David Adams, MD (2015); Tomislav Mihaljevic, MD (2016); Joseph Coselli, MD (2017); Frederick Y. Chen, MD, PhD (2018); and Tirone E. David, MD (2019).
The Stanford Cardiovascular Institute has provided over $2.8 million in seed funding to support cardiovascular research and innovation. Our goal is to ignite and support new ideas that will change how we diagnosis and treat cardiovascular diseases. Together with Stanford Maternal and Children’s Health Research Institute (MCHRI) and the Gootter Foundation, the CVI is excited to support research for 11 outstanding projects in 2020.

**Research Funded by Maternal & Child Health Research Institute**

**PIs:** Sushma Reddy, MD  
**Co-Investigators:** Daniel Bernstein, MD; Jingjing Li, PhD  
**A Non-invasive Signature of Myocardial Signaling in Children with Single Ventricle Heart Failure**

**PIs:** Francois Haddad, MD; Myriam Amsallem, MD, PhD; Jeffrey Feinstein, MD, MPH  
**Co-Investigators:** Alison Marsden, PhD; Roham T. Zamanian, MD; David Ouyang, MD  
**Developing Novel Computational Methods for the Early Detection of Right Heart Failure and Pulmonary Hypertension in the Pediatric and Adult Populations**

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**Research Funded by Stanford Cardiovascular Institute**

**PIs:** Ioannis Karakikes, PhD; Kevin Wang, MD, PhD  
**CRISPR-mediated Therapy for Cardiac Laminopathies**

**PIs:** Nicholas Leeper, MD; Ying Wang, PhD  
**Identify 'Atherogenic' Somatic Mutations/Epigenetic Modifications in Vascular Smooth Muscle Cells**

**PIs:** Kari Nadeau, MD, PhD; David T. Paik, PhD  
**Co-Investigators:** Lei Tian, PhD  
**Single-cell Sequencing to Identify Air Pollution-Induced Cardiac Risks**
**Research Funded by the Steven M. Gootter Foundation**

**PI:** Paul Wang, MD  
**Co-Investigators:** Duy Nguyen, MD; Anson Lee, MD; Moham N. Viswanathan, MD; Nitish Badhwar, MD; Sanjiv Narayan, MD; Oscar J. Abilez, MD, PhD; Phillip Yang, MD; Meghedi Babakhanian, PhD; Terrance Pong, MD; Paul A. Chang, MD  
**Experimental Heart Models of Ventricular Tachycardia: Porcine and Explanted Human Heart**

**Research Funded by Stanford Cardiovascular Institute**

**PI:** Marlene Rabinovitch, MD  
**Co-Investigators:** Michael Snyder, PhD; David Marciano, PhD; Jan-Renier Moonen, MD, PhD  
**Exploring Genomic Mosaicism in Pulmonary Arterial Hypertension Patient Lungs**

**PI:** Phillip Yang, MD  
**Co-Investigator:** Utkan Demirci, PhD; Katrin Svensson, PhD  
**Proteomic Analysis of iPSC-derived Extracellular Vesicles for Mitochondrial Biogenesis**

**PI:** Elsie G. Ross, MD  
**Co-Investigators:** Nigam Shah, MBBS, PhD; Nicholas J. Leeper, MD; Erik Ingelsson, MD, PhD; Philip Tsao, PhD  
**Development of a Precision Screening Platform for Peripheral Artery Disease Using Electronic Health Records and Polygenic Risk Scores**

**PIs:** Jennifer Tremmel, MD; Patricia Ngyuen, MD  
**Co-Investigators:** Vedant Pargaonkar, MD; Thomas Quertermous, MD  
**Whole Exome Sequencing Study of Coronary Microvascular Dysfunction in Patients with Angina in the Absence of Obstructive Coronary Artery Disease**

**PIs:** Ronald Witteles, MD; Euan A. Ashley, MRCP, PhD; Kevin Alexander, MD  
**Co-Investigator:** Francois Haddad, MD; Paul Cheng, MD, PhD; David Ouyang, MD  
**Precision Approach to Ventricular Mass: Image-Based Differentiation of Hypertrophic Cardiomyopathy, Amyloidosis, and Phenocopies**
Past Seed Grant Awardees: 2018-2019

**Multiparametric Imaging to Study Cellular Dynamics in Duchenne Muscular Dystrophy-associated Dilated Cardiomyopathy**

Helen Blau, PhD, The Donald E. and Delia B. Baxter Foundation Professor and Director, Baxter Laboratory for Stem Cell Biology

Yu Xin Wang, PhD, Postdoctoral Research Fellow, Microbiology and Immunology

Collaborators: Mingxia Gu, MD, PhD; Marlene Rabinovitch, MD

*This research was funded by MCHRI*

**Identification of Metabolic Markers During Early Pregnancy Associated With the Risk of Congenital Heart Defects in the Offspring**

Michael Snyder, PhD, Stanford W. Ascherman, MD, Professor in Genetics

Mads Melbye, MD, Visiting Professor, Medicine - Primary Care and Population Health

Collaborator: Liang Liang, PhD, Postdoctoral Research Fellow, Genetics

*This research was funded by MCHRI*

**Functional Characterization of Distinct Bone Marrow Sub-Fractions for Treatment of Myocardial Infarction**

Charles K. F. Chan, MD, Assistant Professor of Surgery (Plastic and Reconstructive Surgery)

Irving Weissman, MD, Director, Stanford Institute for Stem Cell Biology and Regenerative Medicine, Virginia & D. K. Ludwig Professor for Clinical Investigation in Cancer Research, Professor of Developmental Biology

Patrici K. Nguyen, MD, Assistant Professor of Medicine (Cardiovascular Medicine) at the Palo Alto Veterans Affairs Health Care System

Collaborator: Andrew Lee

**Novel Intravascular Ultrasound Array Catheter for Quantitative Imaging of Vulnerable Plaque**

Jeremy Dahl, PhD, Associate Professor of Radiology (Pediatric Radiology)

Matthew Lungren, MD, MPH, Assistant professor of Radiology (Pediatric Radiology)

Collaborator: Arsenii Telichko, PhD, Postdoctoral Research Fellow, Radiology; Carl Herickhoff, PhD, Research Engineer, Radiology (Pediatric Radiology)

**Anesthetics Induced Myocardial Depression Through TRPA1 Signaling Pathway**

Detlef Obal, MD, PhD, Clinical Assistant Professor, Anesthesiology, Perioperative and Pain Medicine

Collaborator: Ian Ying-Li Chen, MD, PhD, Staff, Cardiovascular Institute Operations, Resident, HS-Medicine-SHC

**Genome-scale CRISPR Interference Approach to Investigate Statin-induced Myotoxicity**

June-Wha Rhee, MD, Clinical Instructor of Medicine (Cardiovascular Medicine)

Stanley Qi, MD, Assistant Professor of Bioengineering

Collaborator: Masataka Nishiga, MD, PhD, Postdoctoral Research Fellow, Cardiovascular Institute

**Influence of E-cigarette Vapor on Experimental Aortic Aneurysm**

Phil Tsao, PhD, Professor (Research) of Medicine (Cardiovascular Medicine)

Collaborators: Joshua M. Spin, MD, PhD, Clinical Assistant Professor, Medicine (Cardiovascular Medicine); Ronglih Liao, PhD, Professor of Medicine (Cardiovascular Medicine); Nicholas J. Leeper, MD, Professor of Surgery (Vascular Surgery) and Medicine (Cardiovascular Medicine); Juyong Brian Kim, MD, Instructor of Medicine (Cardiovascular Medicine)

**Characterization of the Gut Microbiome-Host Metabolome Interactions in Heart Failure-Related Insulin Resistance**

Michael Fowler, MB, FRCP, Professor of Medicine (Cardiovascular)

Petra Mamic, MD, Fellow in Medicine, Cardiovascular Medicine

Collaborators: Michael Snyder, PhD, Stanford W. Ascherman, MD, Professor in Genetics; Thomas Quertermous, MD, William G. Irwin Professor in Cardiovascular Medicine

**A Bioabsorbable External Mesh to Prevent Vein Graft Failure After Coronary Artery Bypass Graft Surgery**

Alison Marsden, PhD, Associate Professor of Bioengineering, Pediatrics (Cardiology), and by courtesy, of Mechanical Engineering

Jack Boyd, MD, Clinical Associate Professor, Cardiothoracic Surgery

Collaborators: Michael Snyder, PhD, Stanford W. Ascherman, MD, Professor in Genetics; Francois Haddad, MD (Medicine/Cardiology)

**Does Enhancing Coronary Artery Development Promote Recovery From Cardiac Injury?**

Kristy Red-Horse, PhD, Assistant Professor of Biology

Collaborators: Daniel Bernstein, MD, Alfred Woodley Salter and Mabel Smith Salter Endowed Professor in Pediatrics

**Evaluation of Orphan G-protein-coupled Receptor GPR151 as a Novel Obesity Drug Target**

Erik Ingelsson, MD, PhD, Professor of Medicine (Cardiovascular Medicine) and, by courtesy, of Health Research and Policy

Collaborators: Mark Mercola, PhD, Professor of Medicine, Cardiovascular Medicine

**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 C. Wu, MD, PhD
Dorothy Dee & Marjorie Helen Boring Trust  
Medical School Student Research Award

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.

**NICOLAS QUACH**  
MS2 / Cardiothoracic Surgery  
**Project:** Engineering a Supra-therapeutic C-X-C Chemokine Receptor Type 4 (CXCR4) Agonist to Prevent Ischemic Heart Failure  
Mentor: William Hiesinger, MD

**TING HSUAN WU**  
MS2 / Pulmonary and Critical Care Medicine  
**Project:** Single-cell Analysis of Inflammation-induced Pulmonary Hypertension in Bmpr2 Dysfunction  
Mentors: Mark Nicolls, MD and Peter Kao, MD, PhD

**SAAD SYED**  
MS3 / Pediatric Cardiology  
**Project:** A Non-invasive Signature of Myocardial Signaling in Children with Single Ventricle Heart Failure  
Mentor: Sushma Reddy, MD

**PAST Awardees**

- **2018 Recipients:** Kevin Cyr, Yuhao "Danny" Huang, and Annika Dries
- **2017 Recipients:** Joetsaroop Bagga, Veronica Toro, Angela Zhang, and Xinyan "Lisa" Zhang
- **2016 Recipients:** Aditya J. Ullal, Francisco Xavier Galdos, Andrew Lee, and Raheel Ata
- **2015 Recipients:** Charlotte Rajasingh, and Christopher Jensen

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, Director, Stanford Cardiovascular Institute
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 7, 2020
JAVID J. MOSLEHI, MD
Associate Professor of Medicine, Director of Cardio-Oncology, Vanderbilt University Medical Center

January 14, 2020
YIBIN WANG, PHD
Professor of Molecular Medicine; Chair of Cardiovascular Theme, UCLA David Geffen School of Medicine

January 21, 2020
ANTHONY ROSENZWEIG, MD
Chief, Cardiology Division, Massachusetts General Hospital; Paul Dudley White Professor of Medicine, Harvard Medical School; Co-Director, Corrigan Minehan Heart Center

January 28, 2020
SHARLENE M. DAY, MD
Clinical Associate Professor of Medicine, U-Penn

February 4, 2020
MARTIN PERA, PHD
Professor, Jackson Lab, Bar Harbor, ME

February 11, 2020
GEOFFREY S. GINSBURG, MD, PHD
Professor of Medicine; Director, Duke Center for Applied Genomics & Precision Medicine; Professor Pathology, Duke University

February 18, 2020
MANUELA ZACCOLO, MD, PHD
Deputy Head, Department of Physiology, Anatomy and Genetics; and Professor, Cell Biology, Oxford

February 25, 2020
JAYAKUMAR RAJADAS, PHD
Assistant Professor, Division of Pulmonary, Allergy, and Critical Care; Founding Director, Biomaterials and Advanced Drug Delivery Laboratory (BioADD)

March 3, 2020
MARIA I. KONTARIDIS, PHD
Gordon K. Moe Professor and Chair of Biomedical Research and Translational Medicine; Director of Research, Masonic Medical Research Institute

March 10, 2020
MARK MERCOLA, PHD
Professor of Medicine (Cardiovascular Medicine), Stanford

March 17, 2020
NAOMI CHESLER, PHD
Professor, Department of Biomedical Engineering, University of Wisconsin-Madison

March 24, 2020
KATHERINE YUTZEY, PHD
Professor, Department of Pediatrics, Cincinnati Children’s Hospital, University of Cincinnati

March 31, 2020
YOUNG-SUP YOON, MD, PHD
Director of Stem Cell Biology; Professor of Medicine, Division of Cardiology; Department of Medicine, Emory University School of Medicine

April 7, 2020
GLENN DILLON, PHD
Director of Research Operations, American Heart Association

April 14, 2020
CORNELIA WEYAND, MD, PHD
Professor of Medicine (Immunology and Rheumatology), Stanford University

April 28, 2020
BUDDHADEB DAWN, MD
Professor and Chairman, Department of Internal Medicine; Chief, Division of Cardiovascular Medicine, University of Nevada, Las Vegas School of Medicine

May 5, 2020
ÅSA GUSTAFSSON, PHD
Professor, Skaggs School of Pharmacy and Pharmaceutical Sciences, Department of Pharmacology, School of Medicine, UCSD

May 12, 2020
MICHAEL KAPILOFF, MD, PHD
Associate Professor (Research) of Ophthalmology and, by courtesy, of Medicine (Cardiovascular Medicine), Stanford

May 19, 2020
DAVID J. MILAN, MD
Chief Science Officer, Leducq Foundation

May 26, 2020
GIANLUIGI CONDORELLI, MD, PHD
Professor of Cardiology, and Director, Post-Graduate School of Cardiology; Head, Dept. of Cardiovascular Medicine, Humanitas Research Hospital

June 9, 2020
SUMANTH PRABHU, MD
Professor of Medicine, Cardiovascular Disease; Chair, Department of Medicine, University of Alabama, Birmingham

June 16, 2020
BIN ZHOU, MD, PHD
Professor, Institute of Biochemistry and Cell Biology, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences
MED223: Cardiovascular Research and Medicine

The focus of the MED223 class, in conjunction with the Cardiovascular and Pulmonary Medicine Scholarly Concentration, is to fine tune critical thinking skills by: analyzing original publications, engaging small group lectures with Stanford faculty, and exposing medical students to the variety of current complexities of the cardiovascular and pulmonary systems.

For more information: http://med.stanford.edu/cvi/education/cvi-courses/med223.html
Who We Are
An international leader in the field of pulmonary vascular disease with an established tradition of innovative research, exceptional teaching, and outstanding patient care. A pioneer of new and novel clinical therapies, the Vera Moulton Wall Center is uniquely positioned to lead the field translating research into effective pulmonary hypertension (PH) therapies.

Our Mission
To eradicate pulmonary vascular disease by discovering fundamental causes, developing innovative therapies, disseminating crucial knowledge, and delivering transformative care.

Our Vision
To transform the way pulmonary vascular disease is understood and treated, both locally and globally.

What We Do
Discover Develop Disseminate Deliver

Steering Committee

Mark Krasnow, MD, PhD
Endowed Chair, The Paul and Mildred Berg Professorship Investigator, Howard Hughes Medical Institute Executive Director, Wall Center for Pulmonary Vascular Disease

Jeffrey Feinstein, MD, MPH
Endowed Chair, The Dunlevie Family Professorship in Pulmonary Vascular Disease and Professor, by courtesy, of Bioengineering at Lucile Packard Children’s Hospital Director, Vera Moulton Wall Center

Mark Nicolls, MD
Endowed Chair, The Stanford Professor of Pulmonary and Critical Care Medicine; Professor, Immunology and Rheumatology; Chief, Division of Pulmonary, Allergy and Critical Care Medicine; Director, Lung Immunology

Roham Zamanian, MD, FCCP
Associate Professor, Pulmonary & Critical Care Medicine Director, Adult Pulmonary Hypertension (PH) Program

Contact Us
Phone: 800.640.9255
Email: wallcenter@stanford.edu
Web: wallcenter.stanford.edu
Dr. Norman Shumway (1923-2006), former cardiothoracic surgeon at Stanford, performed the first adult heart transplant in the U.S. in 1968.
Kevin Alexander, MD
Assistant Professor of Medicine - Cardiovascular Medicine

EMAIL kevalex@stanford.edu
EMAIL med.stanford.edu/profiles/kevin-alexander

CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


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

EMAIL calmond@stanford.edu
PROFILE med.stanford.edu/profiles/Christopher-Almond

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


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

EMAIL russ.altman@stanford.edu
PROFILE https://rbaltman.people.stanford.edu
HELIX GROUP http://helix.stanford.edu/

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

SELECTED PUBLICATIONS


Shipra Arya, MD
Associate Professor of Surgery (Vascular Surgery)

EMAIL: sarya1@stanford.edu
PROFILE: profiles.stanford.edu/shipra-arya

CURRENT RESEARCH
Dr Arya’s research is focused on improving quality of care and outcomes in older and high-risk vulnerable patients undergoing surgery. Her health services research lab focuses on how novel risk predictors can be used to guide improvements in patient centered outcomes and healthcare value in this population. She has been funded by the American Heart Association (AHA) grant to develop risk prediction models for cardiovascular outcomes and limb loss in Peripheral Arterial Disease (PAD) patients. She is also funded by the NIH/ NIA GEMSSTAR grant studying the impact of frailty on quality of surgical care in PAD and aortic aneurysm patients. Her work addressing the importance of home-time in older adults undergoing surgery is funded by the Center for Innovation and Implementation (Ci2i) at VA Palo Alto. Her accumulated research points to frailty as a versatile tool that can guide surgical decision making, inform patient consent and design quality improvement initiatives at the patient and hospital level.

If you don't measure it, you can't improve it.

SELECTED PUBLICATIONS


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

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

EMAIL euan@stanford.edu
PROFILE med.stanford.edu/profiles/Euan_Ashley
LAB ashleylab.stanford.edu
CENTER familyheart.stanford.edu

CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


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


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

CURRENT RESEARCH
Leah Backhus trained in general surgery at the University of Southern California and cardiothoracic surgery at the University of California Los Angeles. She practices at Stanford Hospital and is Chief of Thoracic Surgery at the VA Palo Alto. Her surgical practice consists of general thoracic surgery with special emphasis on thoracic oncology and minimally invasive surgical techniques. She is Co-Director of the Thoracic Surgery Clinical Research Program and has independent grant funding with a VA Merit Award through the Veterans Affairs Administration Health Services Research & Development. She also has grant funding as a co-PI on an R01 clinical trial titled, "A Mechanistic Clinical Trial of JAK Inhibition to Prevent Ventilator-induced Diaphragm Dysfunction." Her current research interests are in imaging surveillance following treatment for lung cancer and cancer survivorship. Outside of Stanford, she is also a member of the National Lung Cancer Roundtable in conjunction with the American Cancer Society; serves as the Chair of the Women and Lung Cancer Task Group; and serves as Chair of the Thoracic Surgery Review Committee for the ACGME.

SELECTED PUBLICATIONS


CURRENT RESEARCH

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

SELECTED PUBLICATIONS


Daniel Bernstein, MD

Associate Dean for Curriculum and Scholarship
Stanford University School of Medicine
Alfred Woodley Salter and Mabel G. Salter Endowed Professor of Pediatrics (Cardiology) Stanford University
Former Division Chief, Pediatric Cardiology
Former Director, Children’s Heart Center, Lucile Packard Children’s Hospital at Stanford

EMAIL danb@stanford.edu
PROFILE med.stanford.edu/profiles/Daniel-Bernstein
LAB murinecvcore.stanford.edu

CURRENT RESEARCH

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

SELECTED PUBLICATIONS


Helen M. Blau, PhD

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

EMAIL hblau@stanford.edu
PROFILE med.stanford.edu/profiles/helen-blau
LAB stanford.edu/group/blau
WEB baxterlab.stanford.edu

CURRENT RESEARCH

Dr. Blau’s research area is stem cell biology, aging, and regenerative medicine. She is world renowned for her work on nuclear reprogramming and demonstration of the plasticity of cell fate using cell fusion. Her lab made the unexpected finding that short telomeres are a hallmark of genetic dilated cardiomyopathies and constitute premature aging disorders. Blau’s lab identified biomaterials and molecular regulators that synergize to rejuvenate aged muscle stem cell function, augmenting strength. From these studies, new therapeutic paradigms have emerged for cardiac and skeletal muscle disorders.

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


EDUCATION/TRAINING

PHD Harvard University

ELECTED MEMBER

National Academy of Sciences
National Academy of Medicine
National Academy of Inventors
Pontifical Academy of Sciences
American Institute for Medical & Biological Engineering
American Academy of Arts & Sciences
American Association for the Advancement of Science
American Heart Association
Harvard Board of Overseers

HONORS & AWARDS

Ellison Medical Foundation, Senior Scholar Award
AACR-Irving Weinstein Award
NIH MERIT Award
NIH Challenge Grant
NIH EUREKA Grant
NIH Director's Transformative Research Award
FASEB Excellence in Science Award
HONORARY DOCTORATE
University of Nijmegen, Holland
University of York, England

PRESIDENT
International Society of Differentiation
Society for Developmental Biology

COUNCIL MEMBER
National Academy of Medicine
NIH National Institute on Aging
American Academy of Arts and Sciences

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

EMAIL hblau@stanford.edu
PROFILE med.stanford.edu/profiles/helen-blau
LAB stanford.edu/group/blau
WEB baxterlab.stanford.edu

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


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

EMAIL cdbustam@stanford.edu
PROFILE med.stanford.edu/profiles/Carlos-Bustamante

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


Scott Ceresnak, MD
Associate Professor of Pediatric Cardiology
Program Director, Pediatric Cardiology Fellowship Program Director, Non-Invasive Electrophysiology

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

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

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

SELECTED PUBLICATIONS


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

EMAIL: gchertow@stanford.edu
PROFILE: med.stanford.edu/profiles/Glenn-Chertow

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


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 (2008-2011)
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)
Gerald Crabtree, MD
Department of Pathology Professor in Experimental Pathology and Professor of Developmental Biology

EMAIL crabtree@stanford.edu
PROFILE med.stanford.edu/profiles/Gerald-Crabtree
LAB crablab.stanford.edu/

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


ReSEARCHER PROFILES

Bianxiao Cui, PhD
Associate Professor of Chemistry

EMAIL bcui@stanford.edu
PROFILE med.stanford.edu/profiles/Bianxiao-Cui
LAB cuilab.stanford.edu

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 electrically active 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


Ronald L. Dalman, MD
Walter C. and Elsa R. Chidester Professor and Chief, Division of Vascular Surgery
Stanford Medicine Associate Dean for Market Development

EMAIL rld@stanford.edu
PROFILE med.stanford.edu/profiles/ronald-dalman
DIVISION vascular.stanford.edu

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


CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


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)

EMAIL mmdavis@stanford.edu
PROFILE med.stanford.edu/profiles/mark-davis
LAB stanford.edu/group/davislab/cgi-bin/drpl
INSTITUTE iti.stanford.edu

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

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

SELECTED PUBLICATIONS


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

Associate Professor of Medicine with Tenure - Division of Pulmonary, Allergy and Critical Care Medicine
Co-Director, Stanford Translational Investigator Program
Co-Chair, DOM Diversity and Inclusion Committee
Chair, PHA PH Care for All Committee
Chair, International Pulmonary Vascular Diseases Consortium (iPVD)
Vice-chair, 3CPR Scientific & Clinical Education Lifelong Learning Committee

EDUCATION/TRAINING
MD University of Puerto Rico
MEDICINE RESIDENCY
Massachusetts General Hospital
PULMONARY DISEASES FELLOWSHIP
University of Colorado
Stanford University
PULMONARY VASCULAR FELLOWSHIP
Stanford University
BOARD CERTIFICATION
Internal Medicine, ABIM
Pulmonary Diseases, ABIM
Critical Care Medicine, ABIM

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

HONORS & AWARDS
American Society of Clinical Investigation (ASC1) membership
Pulmonary Hypertension Association Award for Outstanding K08
Be Heard Rare Challenge Disease International Award
FELLOW, American College of Chest Physicians
FELLOW, American Heart Association
FELLOW, American Thoracic Society Keystone Symposia Fellowship
American Society of Clinical Invest.
Young Physician Scientist Award
ATS Pulmonary Circulation Assembly Early Career award

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

CURRENT RESEARCH

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

Life is too unpredictable to plan ahead: You should be prepared to be surprised every step of the way.

SELECTED PUBLICATIONS


Anne Dubin, MD
Professor of Pediatrics (Pediatric Cardiology) at the Lucile Salter Packard Children’s Hospital
Director, Pediatric Arrhythmia

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

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

SELECTED PUBLICATIONS
What have we learned in the last 20 years? A Comparison of a Modern Era Pediatric and Congenital Catheter Ablation Registry to Prior Pediatric Ablation Registries. Dubin AM, Jorgensen NW, Radbill AE, Bradley DJ, Silva JN, Tsao S, Kanter RJ, Tanel RE, Trivedi B, Young ML, Pflaummer A, McCormack J, Seslar SP. Heart Rhythm 2018


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)
Daniel B. Ennis, PhD
Associate Professor, Department of Radiology, Stanford University
Director, Radiology Research, VA Palo Alto Health Care System

EMAIL dbe@stanford.edu
PROFILE profiles.stanford.edu/daniel-ennis
LAB stanford.edu/cmrgroup.html

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

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

SELECTED PUBLICATIONS


RESEARCHER PROFILES

William Fearon, MD
Professor of Medicine - Cardiovascular Medicine
Director, Interventional Cardiology

EMAIL wfearon@stanford.edu
PROFILE med.stanford.edu/profiles/william-fearon
WEB stanfordhospital.org/cardiovascularhealth/interventionalCardiology

CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


Jeffrey A. Feinstein, MD, MPH
Dunlevie Family Professor of Pulmonary Vascular Disease, and Professor, by courtesy, of Bioengineering
Director, Vera Moulton Wall Center

EMAIL jeff.feinstein@stanford.edu
PROFILE profiles.stanford.edu/jeffrey-feinstein

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

SELECTED PUBLICATIONS

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


Michael Fischbein, MD, PhD

Associate Professor of Cardiothoracic Surgery (Adult Cardiac Surgery)
Director of Thoracic Aortic Surgery
Program Director, Department of Cardiothoracic Surgery

EMAIL mfischbe@stanford.edu
PROFILE med.stanford.edu/profiles/Michael-Fischbein

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

HONORS & AWARDS
Donald Morton Research Award,
Department of Surgery - UCLA School of Medicine (2003)
Ronald K. Tompkins Golden Apple
Teaching Award, UCLA School of Medicine (2003)
Golden Scalpel Award for Teaching Excellence, Division of General Surgery -
UCLA School of Medicine (2003)

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

CURRENT RESEARCH

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

SELECTED PUBLICATIONS


Peter J. Fitzgerald, MD, PhD, FACC
Professor of Medicine (Cardiovascular Medicine) Emeritus

EMAIL pfitz@stanford.edu
PROFILE med.stanford.edu/profiles/peter-fitzgerald

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

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

EMAIL d.fleischmann@stanford.edu
PROFILE https://med.stanford.edu/profiles/dominik-fleischmann
WEB radiology.stanford.edu/patient/clinical_sections/cardiovascular
radiology.stanford.edu/patient/clinical_sections/computedtomography
3dradiology.stanford.edu

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

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

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

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

SELECTED PUBLICATIONS


RESEARCHER PROFILES

Victor Froelicher, MD
Professor Emeritus, Medicine - Cardiovascular Medicine
Professor (by courtesy), Orthopedics
Consultant, Stanford Sports Cardiology Clinic
VAPAHSC Cardiologist Consultant

EMAIL victorf@stanford.edu
PROFILE med.stanford.edu/profiles/victor-froelicher

CURRENT RESEARCH

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

SELECTED PUBLICATIONS


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
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 Division Chief, Canary Center for Cancer Early Detection at Stanford Division Chief, Molecular Imaging Program at Stanford (MIPS)
Director, Precision Health and Integrated Diagnostics Center (PHIND)

EMAIL sgambhir@stanford.edu
PROFILE med.stanford.edu/profiles/Sanjiv-Gambhir
DEPARTMENT radiology.stanford.edu
PROGRAM mips.stanford.edu

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


Christopher Gardner, PhD
Rehnborg Farquhar Professor

EMAIL cgardner@stanford.edu
PROFILE med.stanford.edu/profiles/Christopher-Gardner
WEB nutrition.stanford.edu

CURRENT RESEARCH
I have been involved in more than a dozen human intervention trials involving more than 2,000 participants. These have examined the potential health benefits of garlic, soy, antioxidants, fish oil, ginkgo biloba, vegetarian diets, and weight loss diets. 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 can drastically limit the potential impact for change. This 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 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 obesity and diabetes that are directly related to our broken food systems. 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 and environmental health. My long-term goal is to contribute to and accelerate positive changes in the food environment and social norms.

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

SELECTED PUBLICATIONS


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

EMAIL fhaddad@stanford.edu
PROFILE med.stanford.edu/profiles/Francois-Haddad

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

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

SELECTED PUBLICATIONS


RESEARCHER PROFILES

Frank Hanley MD
Lawrence Crowley, MD Endowed Professor in Child Health Cardiothoracic Surgery

EMAIL  fhanley@stanford.edu
PROFILE med.stanford.edu/profiles/Frank-Hanley

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

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)
Robert A. Harrington, MD
Arthur L. Bloomfield Professor of Medicine
Chair, Department of Medicine, Stanford University School of Medicine

EMAIL robert.harrington@stanford.edu
PROFILE med.stanford.edu/profiles/robert-harrington
DEPARTMENT medicine.stanford.edu

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


Paul A. Heidenreich, MD, MS
Professor, Medicine - Cardiovascular Medicine
Professor (by courtesy), Health Research and Policy
Vice-Chair for Quality, Department of Medicine
Director of Echocardiography, VA Palo Alto Health Care System

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


Sarah Heilshorn, PhD

Lee Otterson Faculty Scholar
Associate Professor, Materials Science and Engineering
Associate Professor (by courtesy), Chemical Engineering
Associate Professor (by courtesy), Bioengineering

EMAIL heilshorn@stanford.edu
PROFILE med.stanford.edu/profiles/sarah-heilshorn
LAB stanford.edu/group/heilshorn

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


RESEARCHER PROFILES

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

EMAIL willhies@stanford.edu
PROFILE med.stanford.edu/profiles/william-hiesinger
DEPARTMENT ctsurgery.stanford.edu

CURRENT RESEARCH

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

SELECTED PUBLICATIONS


Mark Hlatky, MD
Professor, Medicine - Primary Care and Outcomes Research
Professor, Medicine - Cardiovascular Medicine

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

CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


RESEARCHER PROFILES

Yasuhiro Honda, MD, FACC, FAHA

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

CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


EDUCATION/TRAINING

MD Kyoto University
MEDICINE RESIDENCY Kobe General Hospital
CARDIOLOGY FELLOWSHIP Kobe General Hospital
RESEARCH FELLOWSHIP Stanford University

CLINICAL FOCUS

Advanced Cardiovascular Imaging
Interventional Cardiology
Intravascular Diagnostics

HONORS & AWARDS

INTERNATIONAL COMMITTEE & TASK FORCE
International Working Group for Intravascular Optical Coherence Tomography Standardization and Validation
STEERING COMMITTEE MEMBER
Stanford Trans-Pacific Cardiovascular Research Scholarship Program
FELLOW
American College of Cardiology; American Heart Association
EDITORIAL BOARD
Cardiovascular Intervention and Therapeutics

EMAIL yshonda@stanford.edu
PROFILE med.stanford.edu/profiles/yasuhiro-honda
WEB med.stanford.edu/ccvt
Current Research

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

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

Selected Publications


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

EMAIL: hunts@stanford.edu
PROFILE: med.stanford.edu/profiles/sharon-hunt

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


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


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


Michael S. Kapiloff, MD, PhD
Associate Professor (Research) of Ophthalmology and, by courtesy, of Medicine (Cardiovascular Medicine)

EMAIL kapiloff@stanford.edu
PROFILE med.stanford.edu/profiles/michael-kapiloff

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


CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


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

SELECTED PUBLICATIONS


Joshua W. Knowles, MD, PhD, FAHA, FACC
Assistant Professor, Medicine - Cardiovascular Medicine

EMAIL knowlej@stanford.edu
PROFILE med.stanford.edu/profiles/joshua-knowles
FOUNDATION thefhfoundation.org
LAB med.stanford.edu/knowleslab.html

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

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

SELECTED PUBLICATIONS


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

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

SELECTED PUBLICATIONS


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**

Mark A. Krasnow, MD, PhD
Endowed Chair, The Paul and Mildred Berg Professorship in Biochemistry
Investigator, Howard Hughes Medical Institute
Executive Director, Wall Center for Pulmonary Vascular Diseases

EMAIL krasnow@stanford.edu
PROFILE med.stanford.edu/profiles/mark-krasnow
LAB cmgm.stanford.edu/krasnow

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


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

EMAIL cjkuo@stanford.edu
PROFILE med.stanford.edu/profiles/calvin-kuo
LAB kuolab.stanford.edu

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/Egf17 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


Anson Lee, MD
Assistant Professor of Cardiothoracic Surgery (Adult Cardiac Surgery)

EMAIL ansonlee@stanford.edu
PROFILE med.stanford.edu/profiles/anson-lee
LAB med.stanford.edu/ctsurgery/research/leelab.html

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
David Lee, MD
Associate Professor of Medicine (Cardiovascular Medicine)

EMAIL dplee@stanford.edu
PROFILE med.stanford.edu/profiles/david-lee

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


Jason T. Lee, MD
Professor, Surgery
Director, Endovascular Surgery
Program Director, Vascular Surgery Residency/Fellowship

EMAIL jtlee@stanford.edu
PROFILE med.stanford.edu/profiles/jason-lee
WEB vascular.stanford.edu

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


Nicholas Leeper, MD
Professor, Surgery - Vascular Surgery
Professor, Medicine - Cardiovascular Medicine
Chief, Vascular Medicine
Director, Vascular Research

EMAIL nleeper@stanford.edu
PROFILE med.stanford.edu/profiles/nicholas-leeper
LAB med.stanford.edu/leeperlab.html

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

A man is as old as his arteries.
— Thomas Sydenham (17th Century)

SELECTED PUBLICATIONS


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.
Craig Levin, PhD
Professor of Radiology and, by courtesy, of Physics, of Electrical Engineering, and of Bioengineering

EMAIL cslevin@stanford.edu
PROFILE med.stanford.edu/profiles/craig-levin
WEB miil.stanford.edu/

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


Eldrin F. Lewis, MD, MPH
Incoming Professor of Medicine and Division Chief, Cardiovascular Medicine, Department of Medicine (March 1, 2020)

EDUCATION/TRAINING
MD University of Pennsylvania
MPH Havard School of Public Health

RESIDENCIES / FELLOWSHIPS
Internal Medicine Residency - Brigham and Women’s Hospital
Cardiovascular Medicine Fellowship - Brigham and Women’s Hospital
Advanced Heart Failure and Transplant Cardiology - Brigham and Women’s Hospital

CLINICAL FOCUS
Heart Failure
Managing Advanced Stages of Heart Disease
Improvement of Patients' Quality of Life

MEMBERSHIPS
Massachuesetts Medical Society (1995 - present)
Association of Black Cardiologists (2018 - present)
American College of Cardiology (2000 - present)
American Heart Association (2004 - present)
Heart Failure Society of America (2004 - present)

CURRENT RESEARCH
Dr. Lewis is an internationally recognized clinical expert in the field of advanced heart failure and transplant management. He has been involved in several clinical trials across the spectrum of cardiovascular diseases that aim to improve patient quality of life. These include several innovative approaches to prevent the progression of disease, reduce the rate of readmission following heart failure hospitalization, improve patient understanding prior to surgical interventions, and improve the clinical usefulness of Quality of Life assessments. Dr. Lewis is also working to leverage novel stem cell interventions for advanced heart failure patients. Over a decade ago, Dr. Lewis initiated a patient questionnaire on symptoms and concerns that became a routine part of care. Later, Dr. Lewis performed a clinical trial with Drs. Eric Velazquez and Robert Califf that examined the effect of nonfatal cardiovascular events on changes in health-related quality of life (JACC: Heart Failure, 2014). This study showed that subsequent nonfatal cardiovascular events resulted in significant worsening of patients’ health-related quality of life. These findings have had profound implications for the design of clinical trials to assess patient-reported outcomes. Dr. Lewis’s subsequent work built of these findings, seeking to improve quality of life assessments and their utility in routine care.

SELECTED PUBLICATIONS


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

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

SELECTED PUBLICATIONS


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

EMAIL longaker@stanford.edu
PROFILE med.stanford.edu/profiles/michael-longaker
WEB longakerlab.com

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.

— Thomas Jefferson

SELECTED PUBLICATIONS


My research interests include the long-term 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


Michael Ma, MD
Assistant Professor
Department of Cardiothoracic Surgery
Department of Pediatric Cardiac Surgery

EMAIL mma@stanford.edu
PROFILE profiles.stanford.edu/michael-ma
LAB cve.stanford.edu

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

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

SELECTED PUBLICATIONS


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

**SELECTED PUBLICATIONS**


RESEARCHER PROFILES

Merritt Maduke, PhD
Associate Professor of Molecular and Cellular Physiology

EMAIL maduke@stanford.edu
PROFILE med.stanford.edu/profiles/merritt-maduke
WEB maduke.stanford.edu

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


Kenneth W. Mahaffey, MD
Professor, Medicine – Cardiovascular Medicine
Vice Chair of Clinical Research, Medicine

EMAIL kenneth.mahaffey@stanford.edu
PROFILE med.stanford.edu/profiles/kenneth-mahaffey

CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


David J. Maron, MD
Clinical Professor, Medicine - Cardiovascular Medicine
Director, Preventive Cardiology
Chief, Stanford Prevention Research Center

EMAIL david.maron@stanford.edu
PROFILE med.stanford.edu/profiles/david-maron
WEB stanfordhealthcare.org/medical-clinics/preventive-cardiology.html

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. I am working on Project Baseline to find new signals that indicate the onset or progression of coronary artery disease.

SELECTED PUBLICATIONS


Planning and Conducting the ISCHEMIA Trial: Setting the Record Straight. Maron DJ, Harrington RA, Hochman JS. Circulation 2018;138:1384–1386.


Alison Marsden, PhD
Associate Professor of Pediatrics (Cardiology) and of Bioengineering and (by courtesy) of Mechanical Engineering

EMAIL amarsden@stanford.edu
PROFILE med.stanford.edu/profiles/alison-marsden
LAB cbcl.stanford.edu

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. She was a postdoctoral fellow at Stanford University in Bioengineering and Pediatric Cardiology from 2005-07. She was the recipient of a Burroughs Wellcome Fund Career Award at the Scientific Interface (2007), an NSF CAREER award (2011), received the UCSD graduate student association faculty mentor award (2014) and MAE department teaching award (2015). She is a fellow of two major scientific societies, the American Institute for Medical and Biological Engineering and the Society for Industrial and Applied Mathematics. She has published over 100 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, Current Opinion in Biomedical 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 simulation, medical device design, optimization to large-scale fluid mechanics simulations, and application of engineering tools to impact patient care in cardiovascular surgery and congenital heart disease.

 Failure is closer to success than inaction.  
— Earl Bakken

SELECTED PUBLICATIONS


RESEARCHER PROFILES

Nicholas Melosh, PhD
Associate Professor of Material Science and Engineering and of Photon Science

EMAIL nmelosh@stanford.edu
PROFILE med.stanford.edu/profiles/nicholas-melosh

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


Doff McElhinney, MD
Professor of Cardiothoracic Surgery (Pediatric Cardiac Surgery) and of Pediatrics (Cardiology)

EMAIL: doff@stanford.edu
PROFILE: med.stanford.edu/profiles/doff-mcelhinney

CURRENT RESEARCH

My interests are in outcomes research, transcatheter device therapy for congenital heart disease, and collaborative translational investigation related to the pathophysiology, evaluation, and management of pediatric and adult congenital heart disease. I am Director of the Lucile Packard Children’s Hospital Stanford Heart Center, Program for Clinical and Translational Research.

SELECTED PUBLICATIONS


Our goal is to discover new therapeutic targets and therapeutics for heart failure, and to remove the adverse cardiac effects of oncology drugs. Over the past two decades, our studies laid the groundwork for the efficient production of heart cells from pluripotent stem cells, and for automated, high throughput screening of genes, proteins and small molecules for the ability to ameliorate disease symptoms. Our current pipeline starts with cardiomyopathy and arrhythmia models generated using patient and genome edited iPSCs and uses them in screens to find new therapeutic targets and develop novel therapeutic strategies. The most advanced projects are now in preclinical, large animal testing.

There is so much we can do now to understand the human condition that would have been unimaginable only a few years ago—in many ways we live in the best of times.

SELECTED PUBLICATIONS


D. Craig Miller, MD
Thelma and Henry Doelger Professor in Cardiovascular Surgery
Department of Cardiothoracic Surgery

EMAIL dcm@stanford.edu
PROFILE med.stanford.edu/profiles/d-miller

EDUCATION/TRAINING
MD Stanford University School of Medicine CA
BA Stanford University, Basic Medical Sciences (1969)
Dartmouth College, Chemistry/Mathematics (1968)

RESIDENCY Stanford University School of Medicine CA (1975, 1977)

BOARD CERTIFICATION

HONORS & AWARDS
President, American Association for Thoracic Surgery, 2007-2008
President, Western Thoracic Surgical Association, 1994-1995
Eugene Braunwald Mentorship Award, American Heart Association, 2009
Distinguished Scientist of the American Heart Association, 2003
Antoine Marfan Award, National Marfan’s Foundation, 2001
Wilfred Bigelow Award, Canadian Cardiovascular Society, 2000
Distinguished Achievement Award, American Heart Assoc. Cardiovascular Surgery & Anesthesia Council, 2008
William W. L. Glenn Lecturer, American Heart Association, 2002
David J. Dugan Distinguished Service Award (Western Thoracic Surgical Association) 2016

CURRENT RESEARCH
Cardiac and heart valve disease with experimental laboratory large animal projects focused on the investigation of left ventricular and cardiac mechanics, bioenergetics, and LV and mitral valve physiology and pathophysiology. Current thrust is aimed at understanding the mitral valve and subvalvular mitral apparatus and transmural LV wall strains, thickening, and myolaminar fiber-sheet mechanics.

Clinical research interests include thoracic aortic diseases (aortic dissection, aneurysm) and cardiac valvular disease, including surgical treatment, endovascular thoracic aortic stent-graft repair, mitral valve repair, and valve-sparing aortic root replacement.

Those who cannot remember the past are condemned to repeat it.
— George Santayana (1863-1952)

SELECTED PUBLICATIONS


Daria Mochly-Rosen, PhD
George D. Smith Professor of Translational Medicine
Professor, Chemical and Systems Biology
Co-director, SPARK - Stanford’s Translational Research Program
President and Founder, SPARK GLOBAL

CURRENT RESEARCH

Our basic research focuses on elucidating molecular events that contribute to heart diseases, generating tools to interfere with these pathologies and the translation of them into drug leads. We have used both rationally designed peptides and small molecules to regulate key signaling events and metabolism in the myocardium. Our research has led to several clinical trials using drugs that were developed in our laboratory at Stanford. My passion for translational research led me to create and co-direct SPARK that helps scores of inventors at Stanford move their early research discoveries to clinical trials and/or to licensing for drug development. I am the Founder and Co-director of SPARK - Stanford’s Translational Research Program Program and the Founder and President of SPARK GLOBAL, a network of translational scientists without borders, now in ~70 institutes on six continents.

I believe that it is our social responsibility to ensure that basic and clinical discoveries are translated into products that benefit patients. By providing the knowhow and the tools, together with industry experts we are making it happen.

SELECTED PUBLICATIONS


**Drp1/Fis1-mediated Mitochondrial Fragmentation Leads to Lysosomal Dysfunction in Cardiac Models of Huntington’s Disease.** Joshi AU, Ebert AE, Hailsselassie B, Mochly-Rosen D. *J Mol Cell Cardiol*, 130:160-169, 2019.


Jonathan Myers, PhD
Clinical Professor, Medicine - Cardiovascular Medicine
Research Coordinator, Exercise Physiology Lab, VA Palo Alto Health Care System

EMAIL drj993@aol.com
PROFILE med.stanford.edu/profiles/jonathan-myers
WEB cardiology.org

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


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

EMAIL sanjiv1@stanford.edu
PROFILE med.stanford.edu/profiles/sanjiv-narayan
LAB https://narayanlab.stanford.edu

CURRENT RESEARCH
I direct a translational clinical laboratory, focused on applying bioengineering and computational approaches to better understand symptomatic and life threatening heart rhythm disorders. In recent years we have developed personalized computational models and novel mapping catheters to reveal repetitive drivers for atrial fibrillation and ventricular fibrillation, whose ablation may improve clinical outcomes. These sites may exhibit rotational or focal patterns on traditional activation maps. Our current focus is on defining how disorganized waves in fibrillation organize, and how organized sites disorganize (fibrillatory conduction), by applying machine learning to signal types at various spatial scales. Our lab focuses on developing open-access tools and mobile technology for improved patient care.

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

SELECTED PUBLICATIONS


RESEARCHER PROFILES

Mark R. Nicolls, MD
Professor, Medicine - Division of Pulmonary, Allergy and Critical Care Medicine
Chief, Division of Pulmonary, Allergy and Critical Care Medicine
Director, Lung Immunology
Endowed Chair: The Stanford Professor of Pulmonary and Critical Care Medicine

EMAIL mnicolls@stanford.edu
PROFILE med.stanford.edu/profiles/mark-nicolls
LAB nicollslab.stanford.edu
DIVISION pulmonary.stanford.edu

CURRENT RESEARCH
I specialize in the treatment of lung transplant patients. I have practiced pulmonary and critical care medicine for 20 years. We focus on how the immune system contributes to vascular injury leading to a variety of diseases and pathology with a special focus on lung transplantation, pulmonary hypertension, COPD, and lymphedema.

SELECTED PUBLICATIONS


Koen Nieman, MD, PhD
Associate Professor of Medicine (Cardiovascular Medicine) and Radiology (CV Imaging)

EMAIL knieman@stanford.edu
PROFILE med.stanford.edu/profiles/koen-nieman

CURRENT RESEARCH
Dr. Nieman is a cardiologist and associate professor in the departments of cardiovascular medicine and radiology. He investigates advanced cardiac imaging techniques, and current research interest include stress myocardial perfusion CT, CT-based fractional flow reserve, machine-learning approaches to disease differentiation, imaging-guided decision making and the clinical value of cardiac CT in ischemic heart disease. Dr. Nieman was born in the Netherlands, obtained his medical degree at the Radboud University in Nijmegen (1998), and completed his cardiology training at the Erasmus University Medical Center in Rotterdam (2008). His research in cardiac CT at the Erasmus University resulted in a PhD degree in 2003. In 2004 he performed an imaging fellowship at the Massachusetts General Hospital (Harvard Medical School) in Boston, MA. Dr Nieman became faculty at Erasmus (cardiology/radiology) in 2008 and was scientific director of cardiac CT and MRI and clinical director of the intensive cardiac care unit until he joined Stanford in 2016.

SELECTED PUBLICATIONS


Patricia K. Nguyen, MD
Assistant Professor, Medicine - Cardiovascular Medicine

EMAIL pknguyen@stanford.edu
PROFILE med.stanford.edu/profiles/patricia-nguyen

CURRENT RESEARCH

Dr. Nguyen is a cardiologist and assistant professor in the Division of Cardiovascular Medicine at Stanford University. She is also Director of Advanced Imaging and Co-Director of the Cardiac Rehabilitation Program at the VA Palo Alto Medical Center. She graduated from Johns Hopkins Medical School and finished her internal medicine residency at New York Presbyterian Hospital. She then completed her fellowship in cardiovascular medicine and advanced imaging at Stanford University. Her laboratory focuses on developing better diagnostic and therapeutic strategies for the management of coronary artery disease. Her research projects include studies evaluating how stem cells can be applied for treatment of coronary heart disease, how the adaptive immune system contributes to atherosclerosis, and how exercise improves cardiovascular health.

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

SELECTED PUBLICATIONS


Latha Palaniappan, MD, MS
Professor of Medicine - General Medical Disciplines

EMAIL: lathap@stanford.edu
PROFILE: med.stanford.edu/profiles/latha-palaniappan

CURRENT RESEARCH
My work focuses on the study of diverse populations, chronic disease, and prevention. My group specifically seeks to address the gap in knowledge of health in Asian subgroups and other understudied racial/ethnic minorities (PACS 5R01DK081371, CASPER R01HL126172, and CAUSES R01MD007012). I co-founded (with Dr. Bryant Lin) the Center for Asian Health Research and Education (CARE) at Stanford in 2018. My current work examines the clinical effectiveness of structured physical activity programs for diabetes management (Initiate and Maintain Physical Activity in Clinics - IMPACT, 5R18DK096394), as well as best exercise regimens for normal-weight diabetics (Strength Training Regimen for Normal Weight Diabetics - STRONG-D, 2R01DK081371). I implement evidence based genetic and pharmacogenetic testing in Primary Care Clinics as the Scientific Director of Precision Genomics and Pharmacogenomics in Primary Care. I am the faculty lead of the Precision Health Biobank at Stanford, a population based biobank designed to accelerate genetic and other -omics discovery.

SELECTED PUBLICATIONS


RESEARCHER PROFILES

Marco V. Perez, MD
Associate Professor, Medicine - Cardiovascular Medicine

EMAIL mvperez@stanford.edu
PROFILE med.stanford.edu/profiles/marco-perez
WEB familyheart.stanford.edu

CURRENT RESEARCH

Dr. Marco Perez’s research goal is to better understand the fundamental causes of cardiovascular disease through the study of genetics and epidemiology. His group studies the genetic variations and environmental exposures that are associated with conditions such as atrial fibrillation and heart failure. He has led the studies of atrial fibrillation in Women’s Health Initiative, one of the largest nation-wide population-based cohorts. He is currently conducting a large study monitoring for silent or asymptomatic atrial fibrillation in women from the WHI randomized to exercise intervention, and is co-PI in the Apple Heart Study, a clinical trial using the Apple Watch to screen for atrial fibrillation. He is interested in understanding the paradox that atrial fibrillation is less common in African Americans and Hispanics, despite a greater burden of risk factors such as hypertension. As director of the Stanford Inherited Arrhythmia Clinic, he evaluates families with rare inherited arrhythmias associated with sudden death such as Long QT and Brugada Syndromes and explores their links with novel genes. He is particularly interested in studying the genetic causes of very early onset atrial fibrillation. He also studies how best to use the electrocardiogram to identify patients at risk for atrial fibrillation and athletes at risk for life-threatening arrhythmias due to conditions such as hypertrophic cardiomyopathy. His genetic studies have led to the discovery of promising novel therapeutic targets that his group is now studying at a functional level.

SELECTED PUBLICATIONS


Ada Poon, PhD
Associate Professor, Electrical Engineering

EMAIL adapoon@stanford.edu
PROFILE med.stanford.edu/profiles/ada-poon
WEB biosystems.stanford.edu

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


Stephen Quake, PhD

Lee Otterson Professor in the School of Engineering and Professor of Bioengineering, Applied Physics, and (by courtesy), of Physics

EMAIL quake@stanford.edu
PROFILE med.stanford.edu/profiles/stephen-quake
DIVISION cvmedicine.stanford.edu
LAB quakelab.stanford.edu

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


My laboratory is interested in the molecular mechanisms that mediate vascular disease pathophysiology and the risk for these diseases. The approach is primarily genetic, using human cohorts and large scale genome wide studies to identify genes that associate with disease and risk, and molecular genetic studies to define the mechanisms of these associations. At the human level, we collaborate with a number of centers around the world through the CARDIoGRAM+ C4D consortium to further identify coronary heart disease loci, and our group serves as the organizing center searching for loci that associate with gold standard measures of insulin sensitivity, the GENESIS study. For loci identified through these studies, we work to identify mechanisms by which causal variation is responsible for altered gene structure or function, and employ cellular and genetic mouse models to identify how encoded factors participate in the disease process.

When not working on disease genes, I enjoy listening to blues music.

**SELECTED PUBLICATIONS**


RESEARCHER PROFILES

Marlene Rabinovitch, MD

Endowed Chair, Dwight and Vera Dunlevie Professorship in Pediatric Cardiology
Director, Basic Science and Engineering Initiative, Stanford Children’s Health
Betty Irene Moore Children’s Heart Center

EMAIL marlener@stanford.edu
PROFILE med.stanford.edu/profiles/marlene-rabinovitch
LAB med.stanford.edu/labs/rabinovitchbland

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 PPARγ mediated gene regulation. We relate mutant BMPR2 to heightened GM-CSF mediated macrophage recruitment, and PPARγ 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


Jayakumar Rajadas, PhD
Founding Director, Biomaterials and Advanced Drug Delivery Laboratory
Assistant Professor, Division of Pulmonary, Allergy, and Critical Care
Assistant Director, Cardiovascular Pharmacology, Stanford CVI
Adjunct Full Professor, UCSF

EMAIL jayraja@stanford.edu
PROFILE med.stanford.edu/profiles/jayakumar-rajadas
LAB bioadd.stanford.edu

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


Kristy Red-Horse, PhD
Associate Professor of Biology and the Institute of Stem Cell Biology and Regenerative Medicine

EMAIL kredhors@stanford.edu
PROFILE med.stanford.edu/profiles/kristy-red-horse
LAB redhorselab.stanford.edu/

CURRENT RESEARCH

My laboratory studies how coronary vessels of the heart develop during embryogenesis and how they regenerate following cardiac injury. The unifying theme among all of our projects is to study coronary development and regeneration at cellular resolution within the context of the intact organ. Our long-term goal is to contribute knowledge towards the advancement of clinical treatments for cardiovascular disease.

SELECTED PUBLICATIONS


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.


RESEARCHER PROFILES

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

EMAIL rockson@stanford.edu
PROFILE med.stanford.edu/profiles/stanley-rockson
CENTER stanfordhospital.org/cardiovascularhealth/lymphaticvenous

EDUCATION/TRAINING
MD Duke University
MEDICINE RESIDENCY & INTERNSHIP
Harvard University
CARDIOLOGY FELLOWSHIP
Harvard University
BOARD CERTIFICATION
Internal Medicine, ABIM
Cardiovascular Disease, ABIM

CLINICAL FOCUS
Lymphatic and Venous Disease
Peripheral Vascular Disease
Consultative Cardiology

HONORS & AWARDS
Morris and Caroline Barkon Lecture, University of Pittsburgh
Pioneer Award, Lymphatic Research Foundation
E. William Hancock Cardiovascular Medicine Teaching Award, Stanford University
Franklin G. Ebaugh Jr. Award for Mentoring Medical Students, Stanford University
CHAIR, SCIENTIFIC ADVISORY COMMITTEE Lymphatic Research Foundation
FELLOW American College of Cardiology; American College of Angiology; American College of Physicians; Society of Vascular Medicine and Biology

CURRENT RESEARCH
I have devoted the last fifteen years of my career to the clinical and translational investigation of lymphatic vascular disease. More specifically, my laboratory and clinical research team focus on: biomarker identification and validation in lymphatic vascular disease; applications of therapeutic lymphangiogenesis; drug therapies for acquired lymphedema; and pharmacologic prevention of cancer-induced lymphedema. Having studied and characterized lymphatic vascular disease in small animal models, we are increasingly attempting to apply these insights to the human clinical problem of lymphedema. In 1995, I co-founded, and currently direct, the Stanford Center for Lymphatic and Venous Disorders, a specialized center for the diagnostic evaluation and focused therapy of lymphedema and allied diseases.

I agree with Woody Allen: 'I don't want to achieve immortality through my work. I want to achieve it by not dying.'

SELECTED PUBLICATIONS


RESEARCHER PROFILES

David Rosenthal, MD
Professor of Pediatrics (Pediatric Cardiology)

EMAIL davidnr@stanford.edu
PROFILE med.stanford.edu/profiles/david-rosenthal

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


ELSA GYANG ROSS, MD
Assistant Professor of Surgery, Division of Vascular Surgery and Medicine, Biomedical Informatics Research

E-Mail elsie.ross@stanford.edu
Profile profiles.stanford.edu/elsie-ross
Lab med.stanford.edu/rosslab.html

CURRENT RESEARCH
Artificial intelligence and machine learning to identify patients at risk for, or already affected by, PAD through analysis of unstructured electronic health records.

Big data and advanced analytics will help physicians and surgeons deliver higher quality care to the right patients at the right time. My goal is to ensure that we develop the right tools for our vascular patients and remain on the cutting edge of the data science revolution.

SELECTED PUBLICATIONS


EDUCATION/TRAINING
MD Stanford University School of Medicine
Residency 0+5 Stanford University Vascular Surgery Integrated

CLINICAL FOCUS
Vascular Surgery
Preventative health
Peripheral vascular disease
Carotid disease
Venous disease
AAA

HONORS & AWARDS
Soros Fellow, Paul & Daisy Soros Fellowship for New Americans (2008-2010)
Association for Academic Surgery Young Investigators Award, Association for Academic Surgery (AAS)
Society of University Surgeons Junior Faculty Award, Society of University Surgeons (SUS) 2018-2019
NIH-NHLBI funded K01 Award
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


Karim Sallam, MD
Assistant Professor of Medicine - Cardiovascular Medicine
EMAIL sallam@stanford.edu
PROFILE med.stanford.edu/profiles/karim-sallam

CURRENT RESEARCH
Our research focuses on improving diagnosis, risk stratification and treatment of cardiomyopathy disorders by leveraging clinical data and transnational models of disease. Through improved understanding of genotype-specific mechanisms of disease and better fidelity in defining phenotype, my lab aims to improve care for cardiomyopathy patients. We are currently examining arrhythmic features of cardiomyopathy and cardiomyopathy-arrhythmia overlap syndromes and using patient-specific induced pluripotent stem cell derived cardiomyocytes to augment risk stratification and therapy for those patients.

Talent wins games, but teamwork and intelligence win championships. — Michael Jordan

SELECTED PUBLICATIONS


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**


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

EMAIL  mpsnyder@stanford.edu
PROFILE  med.stanford.edu/profiles/michael-snyder
LAB  snyderlab.stanford.edu

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

Precision health relies on the ability to assess disease risk at an individual level, detect early preclinical conditions and initiate preventive strategies. We have used deep longitudinal omics profiling and wearable monitoring to better manage health and make health-related discoveries, to identify relevant molecular pathways associated with standard clinical measures, and to assess the impact of personalized longitudinal big data on a understanding health and early detection of disease. Altogether, we conclude that deep longitudinal profiling can lead to actionable health discoveries and provide important information relevant for precision health.

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

SELECTED PUBLICATIONS


Edda Spiekerkoetter, MD
Associate Professor of Medicine, Pulmonary and Critical Care Medicine
Director, Stanford Hereditary Hemorrhagic Telangiectasia (HHT) Center of Excellence

EMAIL eddas@stanford.edu
PROFILE profiles.stanford.edu/edda-spiekerkoetter
LAB med.stanford.edu/spiekerkoetterlab.html

CURRENT RESEARCH

My research focuses on the importance of the Bone Morphogenetic Protein Receptor 2 (BMPR2) signaling pathway in pulmonary vascular disease with a focus on pulmonary arterial hypertension (PAH) and hereditary hemorrhagic telangiectasia (HHT) as well as right ventricular (RV) adaptation to an increased afterload. In 2000, two independent groups discovered mutations in the BMPR2 pathway as the genetic basis for pulmonary arterial hypertension (PAH). Over the past years more mutations, either directly involved in the BMPR2 pathway (ENDOGLIN, ALK1, SMAD9) or indirectly linked to the BMPR2 pathway (CAVEOLIN-1), were discovered, emphasizing the central role of BMPR2 signaling in familial PAH. Furthermore, reduced BMPR2 expression and signaling is a feature of other sporadic or idiopathic forms of PAH. Hypothesizing that increasing BMPR2 signaling might improve PAH, we performed a High-Throughput Screen of FDA approved drugs and identified the immunosuppressive drug FK506 (Tacrolimus) as the main BMPR2 activator. FK506 rescued endothelial dysfunction in PAH, prevented and reversed PH in rodent models of experimental PH (JCI 2013) and reduced the degree of RV cardiac fibrosis. This discovery has led to the compassionate use of the compound in end-stage PAH patients (AJRCCM 2015) as well as a phase II clinical trial to test the safety, tolerability and efficacy of low-dose FK506 in PAH at Stanford (ERJ 2017). A second repurposed drug, Enzastaurin, that reverses experimental PAH by increasing BMPR2 expression through the novel BMPR2 modifier gene FHIT (Fragile Histidine Triad) is ready to be tested clinically. Furthermore, my lab is interested in the molecular and histological events that govern RV failure and recovery using the PA banding and de-banding mouse model that we recently developed as well as the role of the BMPR2 pathway in pulmonary arteriovenous malformations in HHT.


SELECTED PUBLICATIONS


RESEARCHER PROFILES

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

EMAIL jspudich@stanford.edu
PROFILE med.stanford.edu/profiles/james-spudich
LAB spudlab.stanford.edu

Current Research

Our general research interest is the structure and function of molecular motors in vitro and in vivo, with emphasis on understanding the molecular basis of muscle contraction. Our major areas of specific interest are the molecular basis of energy transduction that leads to ATP-driven myosin movement on actin, the roles of the myosin family of molecular motors in eukaryotic cells, the regulation of actin and myosin interaction and their assembly states, and the biochemistry and regulation of the attachment of molecular motors to their corresponding cargo.

The detailed understanding we have developed of how myosin transduces the chemical energy of ATP hydrolysis into mechanical movement has led us to our current focus on human hypertrophic cardiomyopathy (HCM) caused by missense mutations in human β-cardiac myosin. Our goal is to elucidate the molecular basis of hyper-contractility seen clinically resulting from HCM mutations. We postulated that a majority of HCM mutations shift β-cardiac myosin heads from a sequestered off-state to an active on-state for interaction with actin, resulting in the hyper-contractility seen clinically. This is different from earlier prevailing views, and is the basis of all of our current research. We now have extensive evidence for this hypothesis using a combination of the various high-resolution technologies we have developed over the years as well as new approaches. Our work is now providing possible paths forward for therapeutic intervention for cardiomyopathy patients.

SELECTED PUBLICATIONS


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


CURRENT RESEARCH

My research focus is an amalgam of pediatric echocardiography, vascular health in children, and use of the internet to deliver care to children with acquired and congenital heart disease. We have various noninvasive modalities to easily acquire vascular health measures in children. In the past year, we completed a study investigating telehealth interventions in 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. We have also completed a pilot home tele-echo study where we taught parents of pediatric heart transplant patients to acquire echo images of their children's hearts. This study showed that parents are able to acquire reliable images for evaluation by an experienced echocardiographer. 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.

SELECTED PUBLICATIONS


Jennifer A. Tremmel, MD, MS
Assistant Professor, Medicine - Cardiovascular Medicine
Clinical Director, Women’s Heart Health at Stanford

Recurrent 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


Sandra Tsai, MD, MPH
Clinical Associate Professor, Medicine
Primary Care, Population Health, and Cardiovascular Institute

EMAIL: sandra.tsai@stanford.edu
PROFILE: med.stanford.edu/profiles/Sandra-Tsai

CURRENT RESEARCH
My research focuses on the development of behavioral modification strategies to improve cardiovascular health in pregnant women at risk for blood pressure complications, such as preeclampsia. We are interested in understanding how improvements in cardiovascular risk factors during pregnancy may affect rates of pregnancy complications and future cardiovascular risk. We collaborate with the Stanford Department of Obstetrics to care for women who either start pregnancy obese or gain too much weight during pregnancy.

SELECTED PUBLICATIONS


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 Precision Medicine, VAPAHCS
Director, VA Epidemiology Research and Information Center for Genomics at VAPAHCS

CURRENT RESEARCH

My laboratory’s primary interests are in understanding the molecular underpinnings of vascular disease as well as assessing disease risk. We use a wide range of biochemical, molecular, and physiological techniques to make primary observations in cell systems as well as preclinical models. Furthermore, we continue to extend our findings to human subjects in order to confirm their clinical applicability. Current research projects include the role of microRNAs in regulating atherosclerosis and abdominal aortic aneurysm disease; elucidating the impact of insulin resistance and obesity in vascular disease; and identification of biomarkers (genetic and protein) for risk assessment. I am VA Palo Alto Epidemiology Research and Information Center (ERIC) for Genomics as well as Co-Principal Investigator of the VA’s national Million Veteran Program, currently the world’s largest biobank for genomic health research.

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

SELECTED PUBLICATIONS


Genetics of Blood Lipids Among ~300,000 Multi-ethnic Participants of the Million Veteran Program. Klarin D, Damrauer SM; [35 authors], Global Lipids Genetics Consortium; Myocardial Infarction Genetics (MiGen) Consortium; Geisinger-Regeneron DiscovEHR Collaboration; VA Million Veteran Program, Concasto J, Gaziano JM, O’Donnell CJ, Tsao PS, Kathiresan S, Rader DJ, Wilson PWF, Assimes TL. Nat Genet, 2018;50:1514-1523.


Mintu P. Turakhia, MD, MAS
Associate Professor, Medicine - Cardiovascular Medicine
Executive Director, Stanford Center for Digital Health
Chief, Cardiac Electrophysiology at the VA Palo Alto Health Care System

EMAIL mintu@stanford.edu
PROFILE med.stanford.edu/profiles/Minang-Turakhia
TWITTER @leftbundle

CURRENT RESEARCH
I am a cardiac electrophysiologist, outcomes researcher, and clinical trialist. The goal of my research is to improve the outcomes of the treatment of heart rhythm disorders, with a focus on atrial fibrillation (AF), which affects 5 million Americans and can cause stroke and heart failure. By using large administrative, medical record, registry, and implantable device data, my group takes a “Big Data” approach to fill evidence gaps in understanding quality of care, predicting AF-related complications, and comparing effectiveness of treatment strategies. This has led to important contributions in health services and outcomes research that have reshaped professional society guidelines and clinical practice. More recently, we have extended our work to answer questions regarding atrial fibrillation screening, medication adherence, and digitally-enabled treatment strategies. Dr. Marco Perez and I are co-PIs of the Apple Heart Study, a fully digital and virtual end-to-end study to evaluate whether smartwatches can effectively and accurately identify atrial fibrillation. This work has allowed a large team at Stanford to develop the infrastructure for pragmatic studies using smartphone applications and wearable sensors and devices.

Atrial fibrillation is one of the most commonly treated conditions in all of health care. Yet, it is astonishing how little we understand the disease, how to best treat it, and who is at highest risk for complications.

SELECTED PUBLICATIONS


RESEARCHER PROFILES

Paul J. Utz, MD
Professor of Medicine
Associate Dean for Medical Student Research, Stanford School of Medicine
Director Emeritus, Stanford Medical Scientist Training Program
Faculty Director and Founder, Stanford Institutes of Medical Research (SIMR)
Associate Director of Education, Institute for Immunity, Transplantation and Infection (ITI), Division of Immunology & Rheumatology

EMAIL  pjutz@stanford.edu
PROFILE  med.stanford.edu/profiles/Paul-Utz
LAB  utzlab.stanford.edu

CURRENT RESEARCH

My lab actively collaborates with many investigators on the Stanford campus, and across the world to disseminate and implement newly-invented technologies. We study autoimmune diseases, including systemic lupus erythematosus, rheumatoid arthritis, scleroderma, myositis, primary biliary cirrhosis, Sjögren’s disease, type I diabetes, vasculitis, multiple sclerosis, and mixed connective tissue disease. In addition to better understanding the pathogenic mechanisms involved in autoimmunity, we are developing bench-to-bedside technologies for immune diseases. Our group made several breakthrough inventions, such as protein arrays, peptide arrays, HIT, lysate arrays, Intel arrays, and EpiTOF. Additionally, I am Director of the Leadership Center of Francis Collins’ $41M Accelerating Medicines Partnership in RA/SLE initiative.

I am Founder and Program Director for the Stanford Institutes of Medicine Research (SIMR) Program for high school students, which has hosted ~900 students in labs over 20 years. I also developed the Stanford EXPLORE Lecture Series. This program covers the basic science fundamentals represented by various research areas at Stanford Medicine. In 2018, I was appointed Stanford Associate Dean for Medical Student Research to promote physician investigator development across the physician-scientist career continuum. I will continue to provide high-level oversight of SIMR and the MSTP while focusing on new efforts to create programs such as a new Physician Scientist Career Development Program and Berg Scholars Program for MD students to build careers as investigators and leaders.

SELECTED PUBLICATIONS


Paul J. Wang, MD
Professor, Medicine (Cardiovascular Medicine)
Professor, by courtesy, of Bioengineering
Director, Cardiac Arrhythmia Service and Cardiac Electrophysiology Laboratory

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
DIRECTOR
Arrhythmia Advanced Treatment Center, Stanford Cardiovascular Health
CO-DIRECTOR
Stanford Center for Arrhythmia Research
MEMBER
American Heart Association Council on Clinical Cardiology; Committee on Council Operations; National Science and Clinical Education Life-Long Learning Committee
CO-DIRECTOR
2019 Stanford Biodesign New Arrhythmia Technologies Retreat
RECIPIENT
2017 American Heart Association Clinical Cardiology Distinguished Achievement Award
EDITOR-IN-CHIEF
Circulation: Arrhythmia and Electrophysiology

CURRENT RESEARCH
My research centers on the development of innovative approaches to the treatment of arrhythmias, including catheter ablation techniques, implantable devices, and less invasive treatments. My clinical research includes atrial fibrillation, ventricular tachycardia, supraventricular arrhythmias and implantable devices. I have collaborations with Bioengineering, Mechanical Engineering, and Electrical Engineering. I am the Center Director for the AHA Strategically Focused Research Network Joe and Linda Chlapty DECIDE Grant for Shared Decision Making in Atrial Fibrillation Stroke Prevention. Some goals of my research program are to create: 1) a more effective methods of catheter ablation, 2) more reliable implantable pacemakers and leads, 3) a combined surgical-catheter approach to ablation, 4) noninvasive methods of ablation, 5) new solutions to prevent sudden cardiac death.

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

SELECTED PUBLICATIONS


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

EMAIL irv@stanford.edu
PROFILE med.stanford.edu/profiles/Irving-Weissman
LAB stemcell.stanford.edu/about/Laboratories/weissman

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 it’s 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


Cornelia M. Weyand, MD, PhD
Professor, Medicine - Immunology and Rheumatology
Chief, Division of Immunology and Rheumatology
Director, Center for Translational Medicine

CURRENT RESEARCH

My laboratory examines autoimmune and autoinflammatory disease, with emphasis on immune defects in vasculitis, coronary artery disease and rheumatoid arthritis. The heart of this work is to develop new strategies to suppress unwanted inflammation and to boost beneficial immune responses. We have approached this goal by defining and characterizing immune defects on a mechanistic level and by bed-to-bench and bench-to-bed translation.

In large vessel vasculitis, we have defined mechanisms that protect the vessel wall from inflammatory attack and have characterized how the immune privilege of the vessel wall breaks down to enable vasculitis. Vasculitogenic T cells aberrantly express the oncogene NOTCH1, and vasa vasorum endothelial cells express the NOTCH ligand Jagged1. Also, deficiency of the immuno-inhibitory PD1/PD-L1 checkpoint causes unleashing of auto-aggressive T cells. Rheumatoid arthritis is an autoimmune disease associated with high cardiovascular risk. A molecular hallmark of the disease is the metabolic reprogramming of T cells and macrophages. We have assigned defects in bioenergetic regulation to mistrafficking of intracellular proteins, lysosomal dysfunction and insufficient mitochondrial DNA repair. We have described that loss-of-function of DNA repair molecules leads to telomeric instability, abnormal cell cycle progression and premature aging of the immune system. Immuno-aging results in the co-existence of immune failure with uncontrolled inflammation. Our current studies explore how defined tissue niches instruct tissue-dwelling immune cells to sustain inflammation, how the DNA repair machinery controls the immune aging process and how bioenergetic strategies determine cellular behavior.

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

SELECTED PUBLICATIONS


Ronald Witteles, MD
Professor, Medicine - Cardiovascular Medicine
Co-Director, Stanford Amyloid Center
Program Director, Internal Medicine Residency Training Program
Co-Director, Stanford Multidisciplinary Sarcoidosis Program
Associate Editor, JACC: CardioOncology

EMAIL witteles@stanford.edu
PROFILE med.stanford.edu/profiles/Ronald-Witteles
AMYLOID CENTER med.stanford.edu/amyloidcenter.html
SARCOIDOSIS PROGRAM med.stanford.edu/sarcoidosis.html
RESIDENCY PROGRAM medicine.stanford.edu/education/residency.html

CURRENT RESEARCH

My research focuses on three primary areas: amyloidosis, cardiac complications of cancer therapy, and sarcoidosis. As Co-Director of one of the world’s largest amyloid centers, I collaborate with partners throughout the campus on clinical trials, epidemiologic research, and laboratory-based research dedicated to a better understanding of and better treatments for cardiac amyloidosis. In the area of cardiac complications of cancer therapy (“Cardio-Oncology”), I collaborate with partners in Hematology and Medical Oncology to investigate optimal screening and treatment of cancer-therapy associated cardiac disease, and I serve as Associate Editor for the country’s leading Cardio-Oncology journal, JACC: CardioOncology. In the area of sarcoidosis, I serve as Co-Director for and lead the cardiology program for the Stanford Multidisciplinary Sarcoidosis Program, investigating novel diagnostic and treatment options.

My career goal is to pursue excellence in and integration of the three cornerstones of academic medicine—clinical care, scholarship, and education.

SELECTED PUBLICATIONS


CURRENT RESEARCH

My research focus is the development of novel genetic, molecular and cellular strategies for treating myocardial ischemia and heart failure. We are investigating new paths to myocardial repair through angiogenesis, stem cells and tissue engineering. We are conducting biomechanical engineering studies of heart valve operations. We are also exploring the newest techniques and devices for heart care: innovative approaches to mitral and aortic valve repair; smaller, more efficient mechanical heart pumps; and operations performed without stopping the heart.

Innovative pioneering cardiovascular surgeons Shumway, Reitz, and Robbins built and led the Stanford program to preeminence. It is truly a privilege to become a part of this amazingly prestigious, high-powered academic institution.

SELECTED PUBLICATIONS


RESEARCHER PROFILES

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

Director, Stanford Cardiovascular Institute  
Simon H. Stertzer, MD, Professor of Medicine & Radiology

**EMAIL** joewu@stanford.edu  
**PROFILE** med.stanford.edu/profiles/Joseph-Wu  
**LAB** wulab.stanford.edu

**CURRENT RESEARCH**

My lab focuses 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 the "clinical trial in a dish" concept, and (iv) implement precision cardiovascular medicine for disease prevention and treatment of patients. My lab uses a combination of advanced genomics, stem cells, cellular & molecular biology, physiological testing, and molecular imaging technologies to better understand molecular and pathophysiological processes.

The missions of the Stanford CVI are to deliver excellence in clinical care, world-class education, and cutting-edge research that will improve the medical care and quality of life of our patients.

**SELECTED PUBLICATIONS**

Dysregulation of PDGRFB Contributes to the Pathogenesis of LMNA-related Dilated Cardiomyopathy.  

A Human iPSC Double-reporter System Enables Purification of Cardiac Lineage Subpopulations With Distinct Function and Drug Response Profiles.  

Autologous iPSC-based Vaccines Elicit Anti-tumor Responses In Vivo.  

High-throughput Screening of Tyrosine Kinase Inhibitor-induced Cardiotoxicity Using Human Induced Pluripotent Stem Cells.  

Abnormal Activation of TGFbeta Signaling as a Pathogenesis of Left Ventricular Non-compaction Cardiomyopathy.  

Human Induced Pluripotent Stem-derived Cardiomyocytes Recapitulate the Predilection of Breast Cancer Patients to Doxorubicin-induced Cardiotoxicity.  
RESEARCHER PROFILES

Sean M. Wu, MD, PhD
Associate Professor of Medicine (Cardiovascular Medicine) and Associate Professor (by courtesy), Pediatrics

EMAIL smwu@stanford.edu
PROFILE med.stanford.edu/profiles/Ming-Wu
LAB seanwulab.stanford.edu

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 stem cells as a test-tube model to study the process of heart cell formation. In addition, we are using human induced pluripotent stem cells from patients with heart diseases to address the mechanism of their disease formation and to develop new treatments involving engineered 3D tissue for therapy.

SELECTED PUBLICATIONS


Fan Yang, PhD
Associate Professor of Orthopedic Surgery and of Bioengineering

EMAIL fanyang@stanford.edu
PROFILE med.stanford.edu/profiles/Fan-Yang
WEB fanyanggroup.com

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


Phillip C. Yang, MD

Associate Professor, Medicine - Cardiovascular Medicine
Director, Cardiovascular Stem Cell Laboratory
Director, Cardiothoracic MRI Program

EMAIL phillip@stanford.edu
PROFILE med.stanford.edu/profiles/Phillip-Yang

CURRENT RESEARCH

Our research interest focuses on the fundamental molecular and cellular processes of myocardial regeneration and restoration. We employ novel in vivo multi-modality molecular and cellular imaging technology to translate basic discovery in stem cell biology. Autologous iPSCs are considered a potential landmark solution. Translational effort of this revolutionary biology is investigated through the secretomes generated from patient- and disease-specific iPSC-cardiovascular cells and their molecular cargo to implement precision medicine. Through NIH/NHLIB-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


Induced Pluripotent Stem Cell (iPSC)-Derived Exosomes for Precision Medicine in Heart Failure. Yang PC. Circ Res. 2018 Mar 2;122(5):661-663.


Alan C. Yeung, MD

Li Ka Shing Professor of Medicine (Cardiology)
Medical Director, Cardiovascular Health, Stanford Medicine

EMAIL ayeung@stanford.edu
PROFILE med.stanford.edu/profiles/Alan-Yeung
DIVISION cvmedicine.stanford.edu

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


Paul Yock, MD
Martha Meier Welland Professor of Medicine
Professor, Bioengineering
Professor, Medicine - Cardiovascular Medicine
Professor (by courtesy), Mechanical Engineering
Director, Stanford Byers Center for Biodesign

EMAIL: yock@stanford.edu
PROFILE: med.stanford.edu/profiles/paul-yock
BIODESIGN: biodesign.stanford.edu

CURRENT RESEARCH
I am the founder and director of the Byers Center for Biodesign, a multidisciplinary training and support program for physicians and engineers with the ambition and talent to become health technology innovators. The Center has educational/training programs at multiple levels including a postgraduate fellowship, multiple graduate and undergraduate classes and a faculty training program. In addition, Biodesign administers seed grant programs and a mentoring system for faculty and students who seek to translate health technology innovations into patient care.

A well-characterized need is the DNA of a good invention.

SELECTED PUBLICATIONS


RESEARCHER PROFILES

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

EMAIL zamanian@stanford.edu
PROFILE med.stanford.edu/profiles/Roham-Zamanian
WEB http://med.stanford.edu/pulmonary.html
http://med.stanford.edu/wallcenter.html

EDUCATION/TRAINING
MD University of California Irvine
RESIDENCY and INTERNSHIP
University of Irvine Medical Center
FELLOWSHIP
Stanford University
SUPER-FELLOWSHIP (2004-2006)
eBay Pulmonary Vascular Fellow, Vera Moulton Wall Center for Pulmonary Vascular Disease
BOARD CERTIFICATION
Pulmonary Disease, ABIM (2006)

HONORS & AWARDS
Junior Faculty Scholar Award, Vera Moulton Wall Center (2013-2018)
Fellow of the American College of Chest Physicians, American College of Chest Physicians (2008)
Faculty Teaching Award, Dept of Medicine, Stanford (2007)
Young Investigator Career Development Award, Entelligence Actelion Young Investigators Program (2006-2007)
Fellow of the Year, Univ of California, Irvine Medical Center (2002-2003)
Resident Research Presentation Award, Univ of Calif, Irvine Medical Center - Dept of Medicine (2001)
Case Presentation Award, ACCP - Chest 2000 (2000)

CURRENT RESEARCH
My research is focused on the development of risk prediction and leading-edge phenotyping strategies for patients with pulmonary arterial hypertension (PAH), as well as the translation of basic laboratory discoveries into clinical therapeutics at bedside. Over the past 5 years, I have been involved in the design, implementation, analysis, and reporting of phase 1 and phase 2 proof of concept PAH clinical trials.

My heroes are the ones who survived doing it wrong, who made mistakes, but recovered from them.
— Bono, U2.

SELECTED PUBLICATIONS


RESEARCHER PROFILES

Richard Zare, PhD
Marguerite Blake Wilbur Professor in Natural Science and Professor (by courtesy) of Physics

EMAIL zare@stanford.edu
PROFILE med.stanford.edu/profiles/Dick-Zare
LAB web.stanford.edu/group/Zarelab/

EDUCATION/TRAINING

PHD Harvard University

HONORS & AWARDS

National Medal of Science, National Science Foundation (1983)
Wolf Prize in Chemistry (2005)
Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM), U.S. Office of Science and Technology Policy (2009)
Priestley Medal of the American Chemical Society (2010)
BBVA Foundation Frontiers of Knowledge Award in the Basic Sciences category (2010)
King Faisal International Prize in Science, King Faisal Foundation (2011)
Othmer Gold Medal from the Chemical Heritage Foundation (2017)
National Hero’s Medal, 70th Anniversary of the Founding of the People’s Republic of China (2019)
Yusuf Hamied Visiting Professorship (2019)

CURRENT RESEARCH

Current research in the Zare lab explores wide-ranging questions in physical and analytical chemistry, from the study of elementary chemical reactions to chemical analysis of extraterrestrial materials. The major focus of these efforts is chemical analysis on the nanoscale. The team has devised tools and techniques to examine molecules in extremely tiny volumes – the volumes characteristic of what is found in heterogeneous structures in mineral samples or in the contents of cells and subcellular compartments. Group members have also made contributions to understanding chemical reactions in microdroplets.

SELECTED PUBLICATIONS


Stark-induced Adiabatic Raman Passage Examined Through the Preparation of D(2) (v=2, j=0) and D(2) (v=2, j=2, m = 0). Perreault WE, Mukherjee N, Zare RN. J Chem Phys. 2019 Jun 21;150(23):234201.


Selective Synthesis in Microdroplets of 2-Phenyl-2,3-dihydrophthalazine-1,4-dione From Phenyl Hydrazine With Phthalic Anhydride or Phthalic Acid. Gao D, Jin F, Yan X, Zare RN. Chemistry. 2019 Jan 28;25(6):1466-1471.

