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After my first year as dean, I remain confident that Stanford Medicine is poised to lead the biomedical revolution by advancing innovation, empowering future leaders, and transforming patient care. To advance innovation, we must seek to protect the high-risk, high-reward science that Stanford is known for. To empower future leaders, we must provide students and trainees with the skills needed for a changing biomedical landscape. And to transform patient care, we must deliver health care that is accountable, coordinated, and patient-centered.

It has been exciting to witness the growth and development of the Stanford Cardiovascular Institute (CVI) under the new leadership of Joseph Wu, MD, PhD, Professor of Cardiovascular Medicine and of Radiology. Stanford has a long, proud history of impact on cardiovascular research and patient care, and innovations emerging from the CVI – from groundbreaking stem cell discoveries to novel methods and tools for disease detection and treatment – continue to transform cardiovascular care. I am especially impressed by the institute’s commitment to education through its intensive training programs and many forums for trainees and faculty to exchange research ideas.

The CVI represents the forefront of basic, translational and clinical cardiovascular research at Stanford. It brings together the brilliant scientists, the state-of-the-art facilities, and the resources that are needed to lead the biomedical revolution in cardiovascular research and patient care. Under the leadership of Joseph Wu, I am confident that the Stanford Cardiovascular Institute will be a national leader in advancing innovation, empowering future leaders, and transforming patient care.

Lloyd B. Minor, MD
The Carl and Elizabeth Naumann
Professor for the Dean of the School of Medicine
and Professor, by courtesy, of Neurobiology and of Bioengineering
Letter from the Director

2013 was a dynamic year for the Stanford Cardiovascular Institute (CVI), with many exciting changes and new opportunities for growth. However, our mission remains the same: to deliver excellent clinical care, offer a world-class education, and conduct cutting-edge cardiovascular research. As heart disease remains the number one killer in developed countries and its incidence is growing rapidly in developing countries, it is imperative that all disciplines of medicine and science work together to tackle this scourge. The CVI is proud to be part of this effort; our members collaborate actively with investigators worldwide to integrate knowledge from diverse disciplines, with the goal of translating basic science discoveries into improved tools for cardiovascular disease detection, prevention and treatment.

In late 2012, Dr. Robert C. Robbins, our previous CVI Director, left to become the President and Chief Executive Officer of the Texas Medical Center. In 2013, I was offered the opportunity to lead the CVI as its Director. It is a demanding role given the NIH funding crisis, yet I am excited about what we have accomplished in 2013 and what we plan to do in the years to come. The CVI, formed a decade ago in 2004, now includes more than 500 Stanford basic scientists, graduate students, clinician-scientists, and other researchers working on heart and vascular disease. A key mission of the institute is to coordinate the activities of scientists, engineers, educators, and physicians committed to improving the cardiovascular health of patients and to educate and train the next generation of leaders in this field.

One of the highest priorities for the CVI is to recruit, retain, and advance the work of premier physicians, scientists, young investigators and students. Towards this goal, we have successfully recruited Sean M. Wu, MD, PhD (see page 78), a pioneer in the discovery of multipotent cardiac progenitor cells and the recipient of an NIH Director’s New Innovator Award, from the Cardiovascular Research Center at Massachusetts General Hospital/Harvard Medical School. Furthermore, the CVI has initiated two ongoing faculty searches, one in basic/translational science and one in cardiovascular imaging.

In 2013, we also recruited three outstanding Consulting Professors—a first for the CVI (see page 11): Philip Sager, MD, an expert in cardiovascular drug safety who is active in the regulatory community; Richard Lawn, MD, a former Senior Scientist at Genentech and the former Vice President of Discovery Research at CV Therapeutics; and Eran Leitersdorf, MD, founder and Chairman of the Israeli Atherosclerosis Society and former Dean of the Hebrew University
Faculty of Medicine. Finally, we assembled an external advisory board of leading cardiovascular physicians and scientists from throughout the United States to provide the institute with guidance and counsel (see page 10). We look forward to working closely with our consulting professors and external advisory board members in the coming year to advance the mission of the CVI.

In addition to the CVI’s own recruits, we are excited by the recruitment of outstanding new talent to the Stanford University School of Medicine. Kenneth W. Mahaffey, MD (see page 49), an international leader in the design and conduct of large-scale cardiovascular trials, joined the Department of Medicine as the Vice Chair of Medicine for Clinical Research on August 1, 2013. Y. Joseph Woo, MD (see page 76), a nationally recognized heart surgeon and leading researcher in new approaches to cardiovascular care, started as the chair of the Department of Cardiothoracic Surgery on January 1, 2014. David J. Maron, MD (see page 50), a leader in comparative effectiveness research, joined the Division of Cardiovascular Medicine as Clinical Professor and Director of Preventative Cardiology on January 1, 2014. These recruits strengthen the foundation for our institute’s goal of being the world’s top cardiovascular disease program.

As the home for cardiovascular science at Stanford, one of CVI’s main purposes is to fund groundbreaking cardiovascular-related research projects that bring together new collaborative and interdisciplinary groups. With partnership from the Child Health Research Institute (CHRI), the CVI was able to fund eight outstanding seed grants in 2013 that reflect the breadth and vision of the CVI (see page 91).

Education and training of future leaders in cardiovascular research and treatment continues to be central to the mission of the CVI (see page 83). This goal is reflected not only in medical student teaching but also in undergraduate and postdoctoral training, continuing medical education, and summer programs for high school students. We support the administration of three NIH-funded T32 postdoctoral fellow training programs, and in 2013 we developed an intensive K Award Course designed to help CVI-affiliated T32 trainees and postdoctoral fellows develop competitive NIH Career Development Award applications (see page 83). We also provided 18 competitive travel awards for CVI postdoctoral fellows/trainees to present their groundbreaking work at national or international conferences related to cardiovascular research.

OTHER HIGHLIGHTS OF THE YEAR INCLUDE THE FOLLOWING:

• We held a successful CVI Annual Retreat in September with over 200 participants from Stanford University (see page 94). The retreat featured keynote addresses from Shaun Coughlin, MD, PhD, Director of the UCSF Cardiovascular Research Institute, and Paul Yock, MD, Director of Stanford Biodesign.

• We doubled the number of visiting distinguished speakers at our weekly seminar series “Frontiers in Cardiovascular Science” (see page 92). Some of the featured speakers included: Mark Anderson, MD, PhD, Professor and Director of the Cardiovascular Research Center at the University of Iowa Carver College of Medicine; Michael S. Lauer, MD, Director, Division of Cardiovascular Sciences, NHLBI; Jeffrey Robbins, PhD, Profes-
Letter from the Director

• We greatly expanded our communication and outreach efforts. In addition to the monthly CVI newsletter, which primarily targets referring physicians, we now distribute a CVI Quarterly newsletter to our members and leading cardiovascular researchers around the world. This newsletter showcases the academic and research activities and accomplishments of CVI members.

• We set up the CVI Biomarker and Phenotyping Core Laboratory. This new core, led by Francois Haddad, MD (see page 33), will facilitate biomarker research in cardiovascular disease and provide imaging evaluation of cardiac and endothelial function and arterial stiffness.

• We set up the CVI Cardiovascular Pharmacology Core Laboratory. This new core, led by Jayakumar Rajadas, PhD (see page 60), will facilitate transformation of biophysical ideas into biomaterial and drug delivery technologies. These technologies include microencapsulation of drugs, vascular grafts, bio-implants, development of small molecule and protein-based drugs, and regeneration of cardiovascular tissues.

• We hired a clinical trials manager, Edward Finn, to provide support to CVI members and their interdisciplinary clinical research trials.

In 2014, the CVI will continue to provide organizational structure and expert resources to help coordinate the activities of scientists, engineers, educators, and physicians committed to improving cardiovascular health. I am confident that our institute will continue its history of leadership in research, clinical care, and education programs in cardiovascular medicine, and maintain our position as one of the premiere organization in cardiovascular medicine. We are determined to reduce the impact of cardiovascular diseases in our lifetime and lay the foundation for eliminating these diseases for future generations.

Joseph C. Wu, MD, PhD
Director, Stanford Cardiovascular Institute
Professor, Department of Medicine (Cardiovascular Medicine) and of Radiology
Leadership

Joseph C. Wu, MD, PhD
Director, Stanford Cardiovascular Institute
Professor, Department of Medicine (Cardiovascular Medicine) and of Radiology

Ronald L. Dalman, MD
Dr. Walter C. Chidester Professor of Surgery
Chief, Division of Vascular Surgery

Dominik Fleischmann, MD
Professor, Department of Radiology
Chief, Cardiovascular Imaging

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

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

Mark R. Nicolls, MD
Associate Professor,
Department of Medicine
Chief, Pulmonary and Critical Care Medicine

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

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

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

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

Y. Joseph Woo, MD
Chair, Cardiothoracic Surgery
Professor, Cardiothoracic Surgery

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

Paul Yock, MD
Martha Meier Weiland Professor of Bioengineering and Medicine;
and Professor, by courtesy,
of Mechanical Engineering
Director of Biodesign
The Stanford Cardiovascular Institute (CVI) Executive Committee oversees CVI operations. Its members represent cardiovascular research, education, and clinical care, ensuring that the CVI remains the home for cardiovascular health at Stanford. The committee is comprised of Associate Directors in various disciplines, as listed below, that serve two-year-year terms.

**Associate Director in Basic Research**
Marlene Rabinovitch, MD
Dwight and Vera Dunlevie Professor of Pediatric Cardiology
Professor (by courtesy), Developmental Biology

**Associate Director in Cardiothoracic Surgery**
Y. Joseph Woo, MD
Chair, Cardiothoracic Surgery
Professor, Cardiothoracic Surgery

**Associate Directors in Cardiovascular Imaging**
Dominik Fleischmann, MD
Professor, Radiology
Chief, Cardiovascular Imaging
Director of CT, Stanford Hospital and Clinics
Medical Director, Stanford 3DQ Lab

**Associate Directors in Clinical Research**
William Fearon, MD
Associate Professor,
Medicine - Cardiovascular Medicine
Director, Interventional Cardiology

**Associate Directors in Cardiovascular Medicine**
Alan C. Yeung, MD
Li Ka Shing Professor of Medicine (Cardiology)
Medical Director, Cardiovascular Health, Stanford Medicine
Chief (Clinical), Division of Cardiovascular Medicine

**Associate Director in Education and Training**
Daniel Bernstein, MD
Alfred Woodley Salter and Mabel G. Salter
Endowed Professor of Pediatrics (Cardiology)
Stanford University

**Associate Director in Finance and Administration**
Jason Irwin
Director of Finance and Administration

**Associate Director in Innovation**
Paul Yock, MD
Martha Meier Weiland Professor of Medicine
Professor, Bioengineering
Professor, Medicine - Cardiovascular Medicine
Professor (by courtesy), Mechanical Engineering
Graduate School of Business
Director, Stanford Bodesign

**Associate Director in Junior Faculty Development**
Jennifer A. Tremmel, MD, MS
Assistant Professor, Medicine - Cardiovascular Medicine
Clinical Director, Women’s Heart Health at Stanford

**Associate Directors in Outcome & Prevention**
Mark Hlatky, MD
Professor, Health Research and Policy
Professor, Medicine - Cardiovascular Medicine
Director, Stanford-Kaiser Cardiovascular Outcomes Research Center
Director, Health Services Research Masters Degree Program

**Marcia L. Stefanick, PhD**
Professor, Medicine - Stanford Prevention Research Center
Professor, Obstetrics and Gynecology

**Paul A. Heidenreich, MD, MS**
Professor, Medicine - Cardiovascular Medicine
Professor (by courtesy), Health Research and Policy
Director of Echocardiography, VAPHCS
Research Associate, Primary Care and Outcomes Research Center

**Associate Director in Program Management**
Janet Kalesnikoff, PhD
Associate Director,
Stanford Cardiovascular Institute

**Associate Director in Translational Research**
Philip S. Tsao, PhD
Professor, Medicine - Cardiovascular Medicine
Associate Chief of Staff for Research and Development, VAPAHCS

**Associate Director In Translational Research**
Sean M. Wu, MD, PhD
Assistant Professor,
Medicine - Cardiovascular Medicine
Assistant Professor (by courtesy), Pediatrics
Endowed Faculty Scholar, Child Health Research Institute

**Associate Director in Vascular Surgery**
Ronald L. Dalman, MD
Dr. Walter C. Chidester Professor of Surgery
Chief, Division of Vascular Surgery

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Stanford Cardiovascular Institute | page 7
The Stanford Cardiovascular Institute (CVI) Steering Committee is responsible for providing guidance on the overall strategic direction of the institute. This committee, which includes representatives from the major areas of cardiovascular disease research and clinical care, provides guidance on and oversight of CVI objectives and initiatives.

Joseph C. Wu, MD, PhD
Professor, Medicine - Cardiovascular Medicine
Professor, Radiology
Director, Stanford Cardiovascular Institute

Euan A. Ashley, MRCP, DPhil
Associate Professor, Medicine - Cardiovascular Medicine
Associate Professor, Genetics
Associate Professor (by courtesy), Pathology
Director, Stanford Center for Inherited Cardiovascular Disease
Director, Stanford Cardiopulmonary Exercise Testing Laboratory
Co-Director, Clinical Genomics Service

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

Atul Butte, MD, PhD
Chief, Division of Systems Medicine
Associate Professor, Pediatrics
Associate Professor, Genetics
Associate Professor (by courtesy), Computer Science, Medicine and Pathology

Michael D. Dake, MD
Thelma and Henry Doelger Professor of Cardiothoracic Surgery
Medical Director, Cath/Angio Laboratories

Ronald L. Dalman, MD
Dr. Walter C. Chidester Professor of Surgery
Chief, Division of Vascular Surgery

Alexander Dunn, PhD
Assistant Professor, Chemical Engineering

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

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

Francois Haddad, MD
Clinical Assistant Professor, Medicine
Director, Stanford CVI Biomarker and Phenotypic Core Laboratory

Robert A. Harrington, MD
Arthur L. Bloomfield Professor of Medicine
Chair, Department of Medicine
Director of Clinical Investigation, Stanford Cardiovascular Institute

Sarah Heilshorn, PhD
Assistant Professor, Materials Science and Engineering
Assistant Professor (by courtesy), Chemical Engineering
Assistant Professor (by courtesy), Bioengineering

Paul A. Heidenreich, MD, MS
Professor, Medicine - Cardiovascular Medicine
Professor (by courtesy), Health Research and Policy
Director of Echocardiography, VAPAHC
Research Associate, Primary Care and Outcomes Research Center

Mark Hlatky, MD
Professor, Health Research and Policy
Professor, Medicine - Cardiovascular Medicine
Director, Stanford-Kaiser Cardiovascular Outcomes Research Center
Director, Health Services Research Masters Degree Program

Ngan F. Huang, PhD
Assistant Professor, Cardiothoracic Surgery - Adult Cardiac Surgery
Biomedical Engineer, VA Palo Alto Health Care System

Joshua W. Knowles, MD, PhD
Instructor, Medicine - Cardiovascular Medicine

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

Mark A. Krasnow, MD, PhD
Professor, Biochemistry
Investigator, Howard Hughes Medical Institute
Executive Director, Wall Center for Pulmonary Vascular Diseases

Nicholas Leeper, MD
Assistant Professor, Surgery - Vascular Surgery
Assistant Professor, Medicine - Cardiovascular Medicine
Steering Committee

David Liang, MD, PhD
Associate Professor, Medicine - Cardiovascular Medicine
Associate Professor (by courtesy), Electrical Engineering
Director, Stanford Center for Marfan Syndrome and Aortic Disorders

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

Michael V. McConnell, MD, MSEE
Professor, Medicine - Cardiovascular Medicine
Professor (by courtesy), Electrical Engineering and Molecular and Cellular Physiology
Co-Director, Noninvasive Imaging Section, Division of Cardiovascular Medicine
Director, Preventive Cardiology Clinic

Daria Mochly-Rosen, PhD
Professor, Translational Medicine
Professor, Chemical and Systems Biology
Professor (by courtesy), Neurosurgery
Co-director, SPARK - Stanford's Translational Research Program

Philip E. Oyer, MD
Roy B. Cohn-Theodore A. Falasco
Professor in Cardiothoracic Surgery
2013 Interim Chair, Cardiothoracic Surgery

Thomas Quertermous, MD
William G. Irwin
Professor in Cardiovascular Medicine
Chief (Research), Division of Cardiovascular Medicine

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

Jayakumar Rajadas, PhD
Director, BioADD
Assistant Director, Cardiovascular Pharmacology, CVI

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

Marcia L. Stefanick, PhD
Professor, Medicine - Stanford Prevention Research Center
Professor, Obstetrics and Gynecology

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

Philip S. Tsao, PhD
Professor, Medicine - Cardiovascular Medicine
Associate Chief of Staff for Research and Development, VAPAHCS

Minang ‘Mintu’ Turakhia, MD, MAS
Assistant Professor, Medicine - Cardiovascular Medicine
Director, Cardiac Electrophysiology at the VAPAHCS

Paul J. Utz, MD
Professor, Medicine - Immunology and Rheumatology
Program Director, Medical Scientist Training Program (MSTP)

Hannah A. Valantine, MD, MRCP
Professor, Medicine - Cardiovascular Medicine
Senior Associate Dean for Diversity and Leadership

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

Y. Joseph Woo, MD
Chair, Cardiothoracic Surgery
Professor, Cardiothoracic Surgery

Sean M. Wu, MD, PhD
Assistant Professor, Medicine - Cardiovascular Medicine
Assistant Professor (by courtesy), Pediatrics
Endowed Faculty Scholar, Child Health Research Institute

Phillip C. Yang, MD
Associate Professor, Medicine - Cardiovascular Medicine
Director, Laboratory for Cellular and Molecular MRI of Cardiovascular Stem Cells
Director, Cardiothoracic MRI Program

Alan C. Yeung, MD
Li Ka Shing Professor of Medicine (Cardiology)
Medical Director, Cardiovascular Health, Stanford Medicine
Chief (Clinical), Division of Cardiovascular Medicine

Paul Yock, MD
Martha Meier Weiland Professor of Medicine
Professor, Bioengineering
Professor, Medicine - Cardiovascular Medicine
Professor (by courtesy), Mechanical Engineering and Graduate School of Business
Director, Stanford Biodesign
External 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

**Victor J. Dzau, MD**
President and CEO
Duke University Health System

**Jonathan Epstein, MD**
William Wikoff Smith Professor of Medicine
Chair, Department of Cell and Developmental Biology
Scientific Director, Penn Cardiovascular Institute
University of Pennsylvania

**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

**Joseph Loscalzo MD, PhD**
Chairman, Department of Medicine
Brigham and Women’s Hospital
Hersey Professor of the Theory and Practice of Medicine
Harvard Medical School
Editor, *Circulation*

**Robert Bolli MD, FAHA**
Professor of Medicine, Physiology and Biophysics
Director, Institute of Molecular Biology
Chief, Division of Cardiology
Vice Chairman for Research
University of Louisville
Editor, *Circulation Research*

**Douglas Losordo, MD**
Adjunct Professor of Medicine
Northwestern University
Chief Medical Officer, NeoStem, Inc.

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

**Michael Bristow, MD, PhD**
Professor, Medicine
University of Colorado

**Eric Olson, PhD**
Professor and Chair, Molecular Biology
UT Southwestern Medical Center

**Robert C. Robbins, MD**
President and CEO
Texas Medical Center

**Clyde Yancy, MD**
Magerstadt Professor of Medicine
Professor of Medical Social Science
Chief, Division of Cardiology
Northwestern University Feinberg School of Medicine
Associate Director, Bluhm Cardiovascular Institute
Northwestern Memorial Hospital

**Eric J. Topol, MD**
Director, Scripps Translational Science Institute
Chief Academic Officer, Scripps Health
Professor of Genomics
The Scripps Research Institute

**Howard Rockman, MD**
Professor, Medicine
Duke University Medical Center
Editor, *Journal of Clinical Investigation*

**Joseph Loscalzo MD, PhD**
Chairman, Department of Medicine
Brigham and Women’s Hospital
Hersey Professor of the Theory and Practice of Medicine
Harvard Medical School
Editor, *Circulation*
DID YOU KNOW?

The external advisory board is comprised of recognized leaders in the cardiovascular field who bring a broad range of expertise to help the CVI continue to do outstanding science. The committee provides advise on initiatives and strategic directions for the Stanford CVI.
Established in 2001, the Vera Moulton Wall Center became part of the Stanford Cardiovascular Institute in 2010. The Wall Center seeks to enhance the lives of patients with pulmonary vascular disease by providing the highest level of clinical care, providing advanced training opportunities for physicians and other health care providers, and participating in clinical and bench-top research in pulmonary vascular disease.

A leader in clinical care, the Wall Center is one of the largest combined adult and pediatric pulmonary hypertension (PH) programs in the nation. The eBay clinical fellowship provides intensive clinical training in pulmonary vascular disease and Stanford is one of the few programs in the nation to offer this advanced training.

The Wall Center Seed Grant program was started in 2011 to foster new collaborations between programs and to promote innovative and groundbreaking research in pulmonary hypertension campus wide. To date, more than $750k has been awarded to support promising bench, clinical, and translational research projects.

Active in the community, the Wall Center proudly hosts the annual 5k Race Against PH. With more than 2,000 participants, the event brings together patients, families, care providers, and the community to raise funds and awareness for pulmonary hypertension.

Along with the Wall Center’s cutting-edge research, education, and clinical programs, Stanford boasts internationally recognized experts in pulmonary hypertension and pulmonary vascular disease which add to the wealth of collaborative and innovative opportunities within the Cardiovascular Institute. For more about the Wall Center visit: wallcenter.stanford.edu
Research Disciplines

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

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

**CLINICAL (ADULT):**
Michael D. Dake, MD
William Fearon, MD
Michael Fischbein, MD, PhD
Robert A. Harrington, MD
Sharon Hunt, MD
David Lee, MD
Kenneth W. Mahaffey, MD
David J. Maron, MD
Philip E. Oyer, MD
Stanley G. Rockson, MD
Paul J. Utz, MD
Cornelia M. Weyand, MD, PhD

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

**CARDIOVASCULAR IMAGING:**
Rajesh Dash, MD, PhD
Dominik Fleischmann, MD
Sanjiv ‘Sam’ Gambhir, MD, PhD
Craig Levin, PhD
Michael V. McConnell, MD, MSEE
Patricia K. Nguyen, MD
Joseph C. Wu, MD, PhD
Phillip C. Yang, MD

**CELLULAR & MOLECULAR BIOLOGY:**
Alexander Dunn, PhD
Brian Kobilka, MD
Matthew Porteus, MD
James Spudich, PhD

**CLINICAL (PEDIATRICS):**
Daniel Bernstein, MD
Anne Dubin, MD
David Rosenthal, MD
Stephen J. Roth, MD, MPH
Research Disciplines

DEVELOPMENTAL BIOLOGY:
Daniel Bernstein, MD
Gerald R. Crabtree, MD
Mark A. Krasnow, MD, PhD
Pilar Ruiz-Lozano, PhD
Sean M. Wu, MD, PhD

GENOMICS & BIOINFORMATICS:
Russ B. Altman, MD, PhD
Themistocles Assimes, MD, PhD
Euan A. Ashley, MRCP, DPhil
Carlos Bustamante, PhD
Atul Butte, MD, PhD
Joshua W. Knowles, MD, PhD
Thomas Quertermous, MD
Michael Snyder, PhD

ION CHANNELS & ARHYTHMIAS:
Bianxiao Cui, PhD
Ricardo Dolmetsch, PhD
Merritt Maduke, PhD
Paul J. Wang, MD
Minang ‘Mintu’ Turakhia, MD, MAS

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

METABOLIC DISEASES:
Brian Feldman, MD
Fred Kraemer, MD
Thomas Quertermous, MD
Gerald Reaven, MD

OUTCOMES & PREVENTION:
Themistocles Assimes, MD, PhD
Glenn Chertow, MD, PhD
Victor Froelicher, MD
Christopher Gardner, PhD
Robert A. Harrington, MD
Paul A. Heidenreich, MD, MS
Mark Hlatky, MD
John P. A. Ioannidis, MD, DSc
Philip Lavari, PhD
Kenneth W. Mahaffey, MD
David J. Maron, MD
Jonathan Myers, PhD
Marcia L. Stefaniak, PhD
Wolfgang Winkelmayer, MD, ScD
Minang ‘Mintu’ Turakhia, MD, MAS

STEM CELL BIOLOGY:
Helen M. Blau, PhD
Michael Longaker, MD
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
Marcia L. Stefanick, PhD
Jennifer A. Tremmel, MD, MS
Hannah A. Valantine, MD, MRCP

PULMONARY BIOLOGY:
Vinicio A. de Jesus Perez, MD
Mark A. Krasnow, MD, PhD
Mark R. Nicoll, MD
Marlene Rabinovitch, MD
Dr. Norman Shumway, right, performs a heart bypass surgery.

Credit: Jose Mercado / Stanford News Service
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


RESEARCHER PROFILES

Theyistocles ‘Tim’ Assimes, MD, PhD
Assistant Professor, Medicine - Cardiovascular Medicine
Attending Cardiologist, Palo Alto VA Health Care System

EMAIL tassimes@stanford.edu
PROFILE med.stanford.edu/profiles/Themistocles_Assimes

CURRENT RESEARCH
My investigative focus is the identification of polymorphisms that predispose to various common diseases encountered by adult cardiologists in multiple race/ethnic groups through large-scale population genetic studies. These diseases include coronary artery disease (CAD), peripheral arterial disease (atherosclerosis of the arteries in the abdomen and legs) and risk factors for atherosclerosis in general such as high cholesterol, diabetes, obesity, smoking, and insulin resistance (a pre-diabetic state that also predisposes to coronary atherosclerosis). In addition to playing an important role in the design, conduct, analysis, and interpretation of human genetic population studies of complex cardiovascular traits, I have also served as a liaison to molecular biologists in our division who wish to pursue mechanistic studies that will shed light on the biology behind these new genetic associations.

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


CURRENT RESEARCH

One of my laboratory’s main focuses is on the role of adrenergic receptors in modulating the balance between cardiotoxicity and cardioprotection. Our recent work has examined the role of $\beta_2$-receptor subtypes in genetic and acquired cardiomyopathies, and the role of $\beta_2$-receptor signaling in the regulation of mitochondrial activation. Another focus in our lab has been on the molecular mechanisms of RV hypertrophy and its transition to heart failure, a critical issue for pediatric patients. We have developed novel models of the failing RV and have characterized unique patterns of gene and miR expression in RV failure. I am also involved in clinical research in heart failure/transplantation. Our current studies examine two novel biomarkers for post-transplant lymphoproliferative disorder in pediatric solid organ transplant recipients. Finally, I have begun working with members of the Stem Cell Institute to apply iPSC technology to the unique problems faced by pediatric heart failure patients.

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

SELECTED PUBLICATIONS

Deletion of the “cardioprotective” $\beta_2$-adrenergic receptor prevents the development of dilated cardiomyopathy in mice. Fajardo G, Zhao M, Urashima T, Bernstein D. J Mol Cell Cardiol. 2013; 63C: 155-64.


CURRENT RESEARCH

My laboratory elucidates the molecular mechanisms that control cell fate to design treatments for human skeletal and cardiac muscle diseases. Using a cell fusion approach, we showed that the differentiated state is not fixed and irreversible. These heterokaryons are now a potent tool for determining the sequence of molecular switches that reprogram cell fates. By combining bioengineering and biochemistry, we are finding novel regulators that enhance the function of stem cells resident in our tissues, such as muscle stem cells, with the goal of restoring strength post-injury. Additionally, we have found that the lethal dilated cardiomyopathy characteristic of Duchenne muscular dystrophy is in part mediated by telomere length and are developing new strategies for treating heart disease.

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


Atul Butte, MD, PhD
Chief, Division of Systems Medicine
Associate Professor, Pediatrics
Associate Professor, Genetics
Associate Professor (by courtesy), Computer Science, Medicine and Pathology

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CURRENT RESEARCH
My laboratory builds and applies tools that convert more than 400 trillion points of molecular, clinical, and epidemiological data -- measured by researchers and clinicians over the past decade -- into diagnostics, therapeutics, and new insights into disease. The long-term research goal of my laboratory is to solve problems relevant to genomic medicine by developing new methodologies in translational bioinformatics.

Hundreds of trillions of points of data are just waiting for you...to use these data to create new diagnostics and therapeutics.

SELECTED PUBLICATIONS


Michael D. Dake, MD
Thelma and Henry Doelger Professor of Cardiothoracic Surgery
Medical Director, Cath/Angio Laboratories

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

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

SELECTED PUBLICATIONS


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


RESEARCHER PROFILES

Rajesh Dash, MD, PhD
Assistant Professor, Medicine – Cardiovascular Medicine
Medical and Scientific Director, Stanford South Asian Translational Heart Initiative (SSATHI)
Director, Falk Cardiovascular MRI Facility

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PROFILE med.stanford.edu/profiles/Rajesh_Dash/

CURRENT RESEARCH

My research focuses on molecular imaging of cell signaling in the heart. I develop molecular imaging probes that track to injured heart tissue, such that non-invasive techniques, like cardiac MRI, can visualize these injury signals in real-time. The translational goal of my research is to develop new ways to detect early cardiac injury before permanent damage occurs, so that preventive medical therapy can be started. I am applying some of these imaging strategies in select high-risk patients, such as chemotherapy patients. I also lead the research efforts of the Stanford South Asian Translational Heart Initiative, or SSATHI. SSATHI’s mission is to detect, treat, and prevent the onset of coronary disease, insulin resistance, and dyslipidemia of young South Asians through early screening, education, and lifestyle management.

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

SELECTED PUBLICATIONS


CURRENT RESEARCH

My laboratory is interested in the molecular basis of T and B lymphocyte recognition, as well as the control of differentiation and functional responses in these cells. These studies have ranged from analyzing the inherent diversity of these highly diverse molecules and relating it to their function and specificity, to basic aspects of TCR biochemistry and cell biology. We also developed peptide-MHC tetramers which are useful for staining and isolating specific T cells in both basic science and clinical applications. We also try to relate what we have learned in basic immunology using mouse models to understanding the human immune system. Here we have employed systems biology approaches to understand vaccine responses, twin studies to understand the relative influence of environment versus genetics, and T cell repertoire studies to understand self vs non-self capabilities and the origin of memory T cell responses.

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


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 pathway 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.

EDUCATION/TRAINING

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

CLINICAL FOCUS

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

HONORS & AWARDS

Pulmonary Hypertension Association Award for Outstanding K08
Be Heard Rare Challenge Disease International Award
Best Basic Science Abstract Award, American Heart Association (AHA)
FELLOW
American College of Chest Physicians; AHA; Pulmonary Vascular Research Institute; Robert Wood Johnson Foundation

EDITORIAL BOARD
American Journal of Respiratory and Critical Care Medicine; Pulmonary Circulation

SELECTED PUBLICATIONS


CURRENT RESEARCH

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

SELECTED PUBLICATIONS


CURRENT RESEARCH

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


Peter J. Fitzgerald, MD, PhD

Professor, Medicine - Cardiovascular Medicine
Professor (by courtesy), Electrical Engineering
Director, Center for Cardiovascular Technology and Innovation
Director, Core Cardiovascular Analysis Laboratory (CCAL)

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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


CURRENT RESEARCH

My research focuses on how to generate the best images to provide clinically important anatomic and functional information for cardiac and vascular diseases. This includes evaluation of new CT technology with improved temporal and spatial resolution, to enable and improve surgical and endovascular treatment planning of e.g. aortic diseases, and developing and optimizing clinical cardiac and vascular imaging strategies, and sophisticated 3D and 4D image post-processing. We are also working on new MR techniques for improved myocardial tissue characterization on a cellular level, as well as visualization of complex flow in adult congenital heart diseases.

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
Director, ECG and Exercise Laboratories VAPAHS
Cardiologist Consultant, Sports Medicine

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CURRENT RESEARCH

Some call it an obsession, others call it a reason not to retire, but I’ve been concentrating on the clinical significance of research emanating from the unprecedented interest in phenomena occurring on the downslope of the R wave (i.e., the general area where ventricular depolarization and repolarization overlap).

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
Electrocardiography
Sports Medicine
Assessment of the Diagnostic/Prognostic/Exercise Capacity
Information from Clinical Testing

HONORS & AWARDS
FORMER CHIEF AND ASSISTANT CHIEF
OF CARDIOLOGY (1983-1992)
Long Beach VAMC and UC Irvine
Military Service – Lt Col USAFMC
(1963-1977):
FORMER ASSISTANT CHIEF OF
CARDIOLOGY Wilford Hall USAFMC
FORMER DIRECTOR Cardiac
Catheterization Lab and Exercise
testing School of Aerospace Medicine
FELLOW
American College of Cardiology (ACC);
American Heart Association; American
College of Sports Medicine
SESSION CHAIR
ACC Scientific Session 2013; Sudden
Cardiac Death in Athletes Symposium 2012
CURRENT RESEARCH

My 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, 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 gene therapy. 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.

Why should surgery be limited to what the human eye sees? You should be able to be guided by microscopic cellular and molecular events.

SELECTED PUBLICATIONS


CURRENT RESEARCH

My research focuses on better understanding right heart failure and pulmonary hypertension. We are currently investigating the value of novel imaging and inflammatory biomarkers that can lead to earlier diagnosis and better risk stratification of patients with right heart failure. Our Core Laboratory is also facilitating translational discoveries in the field of heart failure, hypertension and stem cell therapy.

Before answering complex questions, one has to start by better understanding normal variant. We hope to achieve this through comprehensive physiological phenotyping and a focused approach to biomarker discovery.

SELECTED PUBLICATIONS


Robert A. Harrington, MD
Arthur L. Bloomfield Professor of Medicine
Chair, Department of Medicine
Director of Clinical Investigation, Stanford Cardiovascular Institute

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

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

SELECTED PUBLICATIONS


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.

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


Clinical reminders attached to echocardiography reports of patients with reduced left ventricular ejection fraction increase use of beta-blockers: a randomized trial. Heidenreich PA, Gholami P, Sahay A, Massie B, Goldstein MK. *Circulation*. 2007; 115(22): 2829-34.

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


Mark Hlatky, MD
Professor, Health Research and Policy
Professor, Medicine - Cardiovascular Medicine
Director, Stanford-Kaiser Cardiovascular Outcomes Research Center
Director, Health Services Research Masters Degree Program

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CURRENT RESEARCH

My major interests are in cardiovascular health services research, outcomes research, evidence-based medicine, and cost-effectiveness analysis. I introduce data collection about economic and quality of life endpoints in several randomized trials, principally trials of therapies for cardiovascular disease (coronary angioplasty, stents, and bypass surgery; diabetes management).

I am 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
Clinical Associate Professor, Medicine - Cardiovascular Medicine
Co-Director, Stanford Cardiovascular Core Analysis Laboratory (CCAL)

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CURRENT RESEARCH
My laboratory is recognized worldwide as a leading centralized resource of image analysis in the conduct of research studies and clinical trials in the field of cardiovascular medicine. Specifically, we have served as a core laboratory for over 135 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 380 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


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 nanofibrillar scaffolds, we are studying how the ECM influences lineage commitment processes such as differentiation, transdifferentiation, and nuclear reprogramming. The fundamental insights of cell-ECM interactions are applied towards translational applications with respect to improving the survival and regenerative capacity of transplanted cells, as well as for engineering vascularized cardiovascular tissues.

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

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

SELECTED PUBLICATIONS


RESEARCHER PROFILES

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

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CURRENT RESEARCH
My research and clinical work focus on advancing long-term postoperative care for heart transplant recipients. I truly enjoy both taking care of patients and the opportunity to mentor cardiology fellows at Stanford.

My favorite things include old Porsches, Siamese cats, orchids, and travel.

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 how research is reported, and in the interdisciplinary enhancement of existing research methods for study design and analysis in biomedicine.

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


CURRENT RESEARCH

The fundamental theme of my work is the application of genetics to improve human health. I view this as a continuum from Discovery -> to the development of Model Systems -> to clinical Translation -> to larger Public Health efforts. Much of my work focuses on discovery of genetic variants underlying cardiovascular disease. We are translating these findings to the clinic in a randomized trial where we are asking if we can improve an individual’s risk by giving them information about their inherited risk of heart disease. We are also creating human induced pluripotent stem cell (iPSC) lines to model the genetic networks that produce disease. Finally, as the Chief Medical Officer for a patient-led, non-profit (The FH Foundation), we are attempting to raise the profile of familial hypercholesterolemia (FH), an inherited disease that causes extremely elevated LDL cholesterol levels and risk of coronary disease. We have partnered with patients and organizations like the CDC, ACC and AHA to increase public health awareness of FH and have recently launched a national patient registry called “CASCADE FH”.

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

SELECTED PUBLICATIONS


CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


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.

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

Alveolar progenitor and stem cells in lung development, renewal, and cancer. Desai T, Brownfield D, Krasnow MA. Nature. 2013 [Accepted].


RESEARCHER PROFILES

Calvin Kuo, MD, PhD
Professor, Medicine - Hematology
Professor, Chemical and Systems Biology
Co-Lead, Cancer Biology Program, Stanford Cancer Institute

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LAB kuolab.stanford.edu

CURRENT RESEARCH

A major focus of my laboratory is the definition of molecular mechanisms of central nervous system angiogenesis, 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. My group has substantial interests in other aspects of angiogenesis including generation of floxed mouse alleles for the endothelial-expressed miR-126/Egfl7 locus, in which the microRNA miR-126 is nested within intron 7 of the Egfl7 locus, and an evolving interest in endothelial-hepatocyte interactions in vivo with regulation of hepatic insulin signaling. Another focus of my laboratory is the study of gastrointestinal malignancies, intestinal stem cell (ISC) biology and relevant niches using in vivo and in vitro organoid culture approaches. In other activities, we have further collaborated with numerous groups to analyze stem cell niches in muscle and bone marrow using systemic Wnt and VEGF inhibition.

The future belongs to the discontented.
- Robert W. Woodruff

SELECTED PUBLICATIONS


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

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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, particularly as Stanford’s local principal investigator for numerous endograft trials and having accumulated one of the largest series of fenestrated and snorkel/chimney procedures for 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.

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


EDUCATION/TRAINING
MD UCSD
GENERAL SURGERY RESIDENCY
Harbor-UCLA Medical Center
VASCULAR SURGERY FELLOWSHIP
Stanford University
BOARD CERTIFICATION
Vascular Surgery, ABS

CLINICAL FOCUS
Complex Endovascular Aneurysm Repair
Surgical Simulation and Education
Thoracic Outlet Syndrome

HONORS & AWARDS
United States National Principal Investigator-Medtronic Abdominal Branch Trial
CVI Seed Grant (2013)
PREsIDENT
Northern California Vascular Surgery Society
PROGRAM CHAIR
Western Vascular Society
PROGRAM COMMITTEE
Vascular Annual Meeting
COUNCILOR-AT-LARGE
Association for Program Directors in Vascular Surgery (APDVS)
SIMULATION COMMITTEE CHAIR
APDVS
MEMBERSHIP CHAIR
Peripheral Vascular Surgery Society
**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 such as the genome-wide association study (GWAS) platform to prioritize candidates for molecular investigation. Currently, we focus on the chromosome 9p21 locus, which is well recognized as the most important heritable locus for heart attack, stroke and aneurysm. We employ genetically targeted mouse models and molecular assays to define the biology responsible for risk at this locus and ‘reverse translate’ the GWAS findings. We aim to fully translate our findings from bench to bedside through our translational Vascular Medicine research group and have the ultimate goal of developing novel cardiovascular therapeutics - designed specifically for carriers of genetic risk variants.

...I found the task so truly arduous...that I was almost tempted to think...that the movement of the heart was only to be comprehended by God... - William Harvey (On the Motion of the Heart and Blood, 1628)

**SELECTED PUBLICATIONS**


RESEARCHER PROFILES

Lawrence Leung, MD
Maureen Lyles D’Ambrogi Professor of Medicine
Chief of Staff, VA Palo Alto Health Care System

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DIVISION hematology.stanford.edu

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

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

SELECTED PUBLICATIONS


CURRENT RESEARCH

My primary research focus is the design and conduct of multicenter clinical trials and analyses of important clinical cardiac issues using large patient databases. My research focuses on novel anticoagulation agents for the treatment of acute coronary syndromes and atrial fibrillation, the study of agents targeted to protect the myocardium during reperfusion therapy for acute myocardial infarction, and the evaluation of cardiovascular safety of diabetic therapies. I am also interested in the methodology of clinical trials. Current research activities include standardization of the definition of myocardial infarction used in clinical trials, the adjudication of suspected clinical endpoint events, and evaluation of evidence-based operations in the conduct of large multinational clinical trials.

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

SELECTED PUBLICATIONS


RESEARCHER PROFILES

David J. Maron, MD
Clinical Professor, Medicine - Cardiovascular Medicine
Director, Preventive Cardiology

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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 the Study Co-Chair of the ISCHEMIA trial, an NIH/NHLBI-funded trial that compares the effectiveness of two initial management strategies—a conservative (optimal medical therapy alone) versus an invasive (optimal medical therapy plus cardiac catheterization and revascularization)—in patients with stable ischemic heart disease and at least moderate ischemia.

We need to focus on prevention to shrink the burden of disease, and perform only those procedures that are shown to improve prognosis and quality of life.

SELECTED PUBLICATIONS


CURRENT RESEARCH

My research focus is the development and clinical translation of advanced non-invasive methods to detect, characterize, and prevent diseases of the blood vessel wall, including coronary atherosclerosis, carotid, and aortic disease. These include novel MRI, ultrasound, and molecular imaging techniques, as well as leveraging mobile health technologies to enhance disease prevention. Integral to this research has been ongoing collaboration with engineers, radiologists, surgeons, biologists, and chemists.

We need to transform cardiovascular care toward early disease detection and prevention, particularly as risk factors continue to increase worldwide.

SELECTED PUBLICATIONS


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 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


CURRENT RESEARCH

Our research group focuses on clinical applications of exercise testing and training in patients with cardiovascular disease. 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, coronary disease, mild cognitive impairment, gene expression, and abdominal aortic aneurysm disease.

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


CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


CURRENT RESEARCH

My laboratory focuses primarily on the contribution of the immune response to lung disease. We are specifically examining the contribution of inflammation to the development of pulmonary hypertension. We also study how airway remodeling occurs in transplantation with specific respect to the microvascular circulation and to the initiation of fibroproliferation.

The marriage between pulmonary and cardiac medicine is such a natural one and our disciplines can learn so much from each other.

SELECTED PUBLICATIONS


Philip E. Oyer, MD
Roy B. Cohn-Theodore A. Falasco Professor in Cardiothoracic Surgery
2013 Interim Chair, Cardiothoracic Surgery

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DEPARTMENT ctsurgery.stanford.edu

CURRENT RESEARCH
I am interested in the development of artificial heart assist devices. I am also interested in heart transplantation, heart-lung transplantation, cardiothoracic surgery, valvular surgery, thoracic aortic surgery, and ventricular assist device insertion.

SELECTED PUBLICATIONS


Ada Poon, PhD
Assistant Professor, Electrical Engineering

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


CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


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 Director, Cardiovascular Pharmacology, Stanford CVI

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CURRENT RESEARCH

My research oversees the application of various technologies in a research domain aimed at the development of novel formulations and therapeutics of inventing targeted drug delivery systems. For the past 15 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 extracellular interactions between amyloid aggregates and Eph2 and prion receptors. I am developing specific ligands to prevent these interactions. In addition, I have used biophysical and pharmacological approaches to identify optimal microenvironments in which to implant cardiomyocytes to repair injured hearts. My expertise in stem cell survival and differentiation is currently utilized in developing technology for high yield survival of purified cardiovascular cells in various transplantations and imaging studies.

Science is the attempt to make the chaotic diversity of our sense-experience corresponds to a logically uniform system of thought. - Albert Einstein

SELECTED PUBLICATIONS


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

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

SELECTED PUBLICATIONS


CURRENT RESEARCH
My clinical and translational research interests focus on improving the outcomes of newborns, infants, and children following cardiopulmonary bypass surgery for congenital heart defects. Mortality for these patients is fortunately now low, but morbidity related to prolonged ICU stay persists and can have a lifelong impact on function.

It is estimated that there are now 2 million people living in the United States with congenital heart disease. In 2012 more than half of these individuals are 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 institutions.

SELECTED PUBLICATIONS


CURRENT RESEARCH

Heart failure and coronary artery disease are leading clinical problems in the western countries with limited therapeutical options (www.americanheart.org). The heart, however, has endogenous mechanisms of repair that could potentially be enhanced pharmacologically and be used as novel approaches for treatment. Based on a genetic, stem cell and biochemical approaches, research in the Ruiz-Lozano’s laboratory focuses on the discovery, analysis and applications of endogenous cardiac repair systems with particular emphasis on the role of epicardial progenitor cells.

The faculty of art is to change events; the faculty of science is to foresee them. - Henry Thomas Buckle.

SELECTED PUBLICATIONS


CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


CURRENT RESEARCH

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

Every cell in the body has a 'dynamic city plan' (its cytoskeleton); maintenance of this highly organized structure is fundamental to the development and function of all cells.

SELECTED PUBLICATIONS


Marcia L. Stefanick, PhD
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Professor, Obstetrics and Gynecology

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

Menopausal hormone therapy should not be used to prevent cardiovascular disease in women; the focus should be on lifestyle, i.e., physical activity and weight control.

SELECTED PUBLICATIONS

Menopausal hormone therapy and health outcomes during the intervention and extended post-stopping phases of the Women’s Health Initiative randomized trials. Manson JE, Chlebowski RT, Stefanick ML, [+29 authors], Wallace RB. JAMA. 2013; 310(13): 1353-68.


CURRENT RESEARCH

Women's Heart Health at Stanford has 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


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 for risk assessment.

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

SELECTED PUBLICATIONS


CURRENT RESEARCH

The goal of my research is to improve the outcomes of the treatment of heart rhythm disorders, with a focus on atrial fibrillation (AF). We have developed a multidisciplinary outcomes research program that draws upon technical knowledge, principals, and methods from computer science, biostatistics, economics, health services research, epidemiology, and clinical cardiac electrophysiology, which is my practicing medical specialty. 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. Our TREAT-AF retrospective study of over 500,000 patients with newly-diagnosed AF is the largest known research cohort of AF patients.

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


CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


Hannah A. Valantine, MD, MRCP
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Senior Associate Dean for Diversity and Leadership

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CURRENT RESEARCH

CLINICAL RESEARCH: Heart transplantation pathophysiology of acute and chronic rejection; mechanisms of cardiac allograft vasculopathy and role of cytomegalovirus; echocardiographic markers of diastolic dysfunction for non-invasive diagnosis of acute rejection; genomic approaches to rejection surveillance including gene expression profiling and donor DNA sequencing. GENERAL CARDIOLOGY: Heart disease in women.

DIVERSITY AND LEADERSHIP: Diversity and faculty career development in academic medicine; faculty mentoring programs; unconscious bias and stereotype threat as barriers to faculty career advancement for women.


Changing the culture of academic medicine to eliminate the gender leadership gap: 50/50 by 2020. Valantine HA, Sandborg C. Acad Med. 2013; 88; No.10.


CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


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 cells 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 expressed on the surface of cancer stem cells that protects them by providing a ‘don’t eat me’ signal to phagocytic cells of the innate immune system) as a cancer therapeutic, and identifying cancer stem cells from a variety of blood and solid cancers.

In every aspect of stem cell and progenitor cell biology, and its applications to regenerative medicine, I believe it must start with purification, purification, and purification; substituting impure or unsubstantiated cell populations will in the end only confuse the scientist and the clinical trialist.

SELECTED PUBLICATIONS


CURRENT RESEARCH

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

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

SELECTED PUBLICATIONS


CURRENT RESEARCH

My research focuses on two primary areas: amyloidosis and cardiac complications of cancer therapy. As Co-Director of one of the nation’s largest Amyloid Centers, I collaborate with partners throughout the campus on clinical trials, epidemiologic research, and laboratory-based research dedicated to a better understanding of and better treatments for cardiac amyloidosis. In the area of cardiac complications of cancer therapy (“Cardio-Oncology”), I collaborate with partners in the Divisions of Hematology and Medical Oncology to investigate optimal screening and treatment of cancer-therapy associated cardiac disease.

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

SELECTED PUBLICATIONS


CURRENT RESEARCH

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

Some of the most famous people in cardiac surgery (e.g., Norman Shumway) have led the program at Stanford over the years. It’s truly a privilege to become a part of this amazingly prestigious, high-powered academic institution.

SELECTED PUBLICATIONS


Joseph C. Wu, MD, PhD
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Professor, Radiology
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Edna C. Wu, MD, PhD
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CURRENT RESEARCH

My laboratory works on biological mechanisms of adult stem cells, embryonic stem cells (ESC), and induced pluripotent stem cells (iPSC). We use a combination of genetic and epigenetic profiling, tissue engineering, physiological testing, and molecular imaging technologies to better understand stem cell biology in vitro and in vivo. For adult stem cells, we are participating in several industry and NIH sponsored clinical trials. For ESC, we are currently studying their tumorigenicity, immunogenicity, and differentiation from CIRM funded grants. For iPSC, we are working on cardiovascular disease modeling, personalized drug screening, cell banking, and cell therapy. We also develop novel vectors and therapeutic genes for cardiovascular gene therapy applications.

The mission of Stanford CVI is to deliver excellence in clinical care, world-class education, and cutting-edge research.

SELECTED PUBLICATIONS


CURRENT RESEARCH

My research laboratory seeks to identify mechanisms responsible for human congenital heart disease, the most common cause of still-births in the U.S. and one of the major contributors to morbidity and mortality in infants and toddlers. We believe that by understanding the mechanisms regulating growth and differentiation of heart precursor cells during early embryonic development we can then apply these principles to understand the pathogenesis of adult onset heart diseases such as heart failure and arrhythmia where re-activation of early embryonic developmental program plays a central role. We currently use both genetically-modified mice as our living model to understand the biology of heart development as well as embryonic stem cells as a test-tube model to study the process of heart cell formation.

Given the difficult research funding climate, I hope in 20 years we can be proud of our efforts today to train the next generation of cardiovascular physician scientists.

SELECTED PUBLICATIONS


CURRENT RESEARCH

My laboratory is interested in visualizing the fundamental cellular and molecular processes of myocardial restoration by stem cells using cardiac MRI. By combining the chemical sensitivity of nuclear magnetic resonance with high spatial and temporal resolution, a wide range of biological events spanning from molecular to physiologic processes is characterized. This approach allows rapid transfer of innovative imaging tools to discover novel cardiovascular stem cell populations. Through extra-mural funding support from the NIH, AHA, and CIRM, key fundamental processes related to translation of stem cell biology are investigated, including engraftment, immunogenecity, tumorigenecity, epigenetic reprogramming, peri-infarct injury, and myocardial restoration. These tools are integrated to conduct multi-center clinical trial of novel cell therapies for a wide range of critical cardiovascular diseases, including acute MI, ischemic and non-ischemic cardiomyopathy, end-stage heart failure, and critical limb ischemia.

Success consists of going from failure to failure without loss of enthusiasm. - Winston Churchill

SELECTED PUBLICATIONS


CURRENT RESEARCH

My current research expands beyond stents and devices, trying to focus 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.

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 Weiland Professor of Medicine
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Professor, Medicine - Cardiovascular Medicine
Professor (by courtesy), Mechanical Engineering and Graduate School of Business
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CURRENT RESEARCH

My current research focuses on development and testing of catheter-based delivery systems for cardiac cell transplantation and new catheter and molecular imaging techniques for cardiology. I also maintain an active interest in intravascular ultrasound development and clinical trials. I founded and direct the Program in Biodesign, a unit of Stanford’s Bio-X initiative that focuses on invention and technology transfer related to biomedical engineering.

There is a fusion now going on between the mechanical aspects of medical device design and the biochemical and biologic aspects of medical device design.

SELECTED PUBLICATIONS


3/9/1981
Dr. Bruce Reitz (left) and Dr. Norman E. Shumway photographed during the first combined heart-lung transplant performed at Stanford University Medical Center.

Credit: Chuck Painter / Stanford News Service
The Stanford Cardiovascular Institute (CVI) Education and Training Committee is charged with overseeing and defining the educational aspect of the CVI and its goals. The committee meets on a quarterly basis and its members include representatives from the major cardiovascular disease areas.

One of the primary missions of the CVI is to educate and train the next generation of leaders in the field of cardiovascular medicine. A meaningful cardiovascular education engages people at all education levels and provides a full spectrum of experiences. This includes not only continuing to develop a first-rate education for medical students, but also providing cardiovascular educational opportunities for undergraduate students, graduate students and postdoctoral fellows from a variety of disciplines.

The CVI provides a number of forums for students, postdoctoral fellows and faculty to exchange research ideas. These include:

FRONTIERS IN CARDIOVASCULAR SCIENCE This weekly lecture series provides a forum for Stanford scientists and distinguished visiting lecturers to present cutting-edge research and network with the CVI Community (see page 92).

MED 223 – CARDIOVASCULAR AND PULMONARY (CVP) SCIENCES SEMINAR The purpose of this course is to familiarize medical students with the spectrum of basic, clinical and translational CVI research beyond their specific area of chosen investigation. The course is lead by a team of four CVI faculty: Patricia K. Nguyen, MD; Marlene Rabinovitch, MD; Stanley G. Rockson, MD; and Philip S. Tsao, PhD.

FRIDAYS AT FALK This weekly series features current research from postdoctoral fellows and graduate students, providing a forum to exchange ideas and to sharpen presentation skills. The Friday afternoon seminar is also a chance for postdoctoral fellows and students to socialize at the end of the week.

TACKLING YOUR K - A STEP-BY-STEP COURSE TO STRENGTHEN YOUR NIH CAREER DEVELOPMENT AWARD The purpose of this course is to help CVI-affiliated postdoctoral fellows and instructors develop competitive NIH Career Development K Award applications. The course is lead by Crystal Botham, PhD.

Additionally, the CVI offers postdoctoral training fellowships for MDs and PhDs in three different research areas: vascular disease (page 84), myocardial biology (page 86), and cardiovascular imaging (page 88). These NIH-funded T32 programs balance rigorous research training with directed educational curricula and career development opportunities with the goal of producing independent researchers. The programs emphasize career development, publications, oral presentations, and grant submissions as the means of achieving this goal.
This program trains a total of six postdoctoral fellows over two years in the following areas of vascular medicine and research: vascular reactivity and thrombosis; vascular regeneration and development; metabolic or lifestyle influences on vascular outcomes; proteomic markers and genetic determinants of vascular disease; gender and ethnicity differences in vascular disease; and vascular bioengineering. Thirty-one faculty mentors from nineteen different departments within the School of Medicine and the University provide a variety of approaches from which to address fundamental questions about vascular disease. A structured curriculum, well-defined mentorship, and both internal and external evaluations ensure that fellows receive training in both research and career development to prepare them for independent careers.

CURRENT TRAINEES

WENDY ALTMAN, PhD
Mentor Beth Pruitt, PhD  Co-Mentor Daniel Bernstein, MD
T32 Research Project Microsystems and methodologies for the study of cardiomyocyte mechanotransduction // Dr. Altman is a scientist and engineer; her multidisciplinary research background spans nanotechnology, biomedical engineering, space sciences and cardiovascular biology. She is interested in developing critically needed high-throughput tools to study cell biomechanics.

KELLY DOWNING, PhD
Mentor Nicholas Leeper, MD  Co-Mentor John Cooke, MD, PhD
T32 Research Project The role of CDKN2B in angiogenesis // Dr. Downing earned her PhD in 2012 in Nutritional Sciences; she studied the role of adipocytes and obesity in cardiovascular diseases. The focus of her postdoctoral research is investigating the mechanisms of genetic risk factors that predispose to these diseases.

BRIAN PIENING, PhD
Mentor Michael Snyder, PhD  Co-Mentor Tracey McLaughlin, MD
T32 Research Project A genomic check-up: large-scale monitoring of molecular changes that occur in a patient’s blood // Dr. Peining works in the field of genomics and proteomics; he is interested in applying computational methods to systems-level biological problems. He conducted his doctoral studies at the Fred Hutchinson Cancer Research Center and University of Washington, where he studied the effects of genetic epistasis on the cell’s ability to replicate and repair DNA.
SHARLA POWELL-WHITE, PhD
Mentor Wei Zhou, MD  Co-Mentor Philip S. Tsao, PhD
T32 Research Project The effect of glycemic conditions on vascular dysfunction and associated treatments // Dr. Powell-White received her PhD in Pharmacognosy from the University of Illinois Chicago (Dissertation title: Serotonergic Botanicals for Menopausal Treatment). Her postdoctoral research focuses on understanding the underlying mechanisms of vascular dysfunction involved in atherosclerosis and restenosis.

ZHIFEI SHAO, MD, PhD
Mentor Lawrence Leung, MD  Co-Mentors Philip S. Tsao, PhD and John Morser, PhD
T32 Research Project Thrombomodulin in vascular inflammation and adaptive immunity: a role beyond anti-coagulation // Dr. Shao received his MD in China and PhD from Creighton University (Dissertation title: Functional Responses of Lung Dendritic Cell Subsets in Fli3 Ligand-induced Immunomodulation in Allergic Asthma). His research focuses on identifying binding partners of thrombomodulin lectin-like domain and the significance of such interaction in vascular biology.

EVANGELINE TZATZALOS, PhD
Mentor Joseph C. Wu, MD, PhD  Co-Mentor Ellen Kuhl, PhD
T32 Research Project To develop a human disease model for atherosclerosis with endothelial cells derived from induced pluripotent stem cells (iPSCs). // Dr. Tzatzalos received her PhD in Biomedical Engineering from Rutgers University (Dissertation title: A regulatory element for interneuron progenitors in the developing vertebrate central nervous system). She is currently using iPSCs to study contractile force generation in normal and disease states of the cardiovascular system.

2013 PAST TRAINEES

STEPHANIE PIECEWICZ, PhD
Mentor Calvin Kuo, MD, PhD  Co-Mentor John Cooke, MD, PhD
T32 Research Project Endothelial-hepatocyte signaling crosstalk regulates glucose metabolism // Dr. Piecewicz is currently a Product Development Manager at Bell Biosystems, a start-up specializing in synthetic organelles. She focuses on acquiring customers and partners, managing collaborative projects, and developing strategy toward optimizing Bell’s first product, a magnetic particle for tracking cells in vivo.

NAZISH SAYED, MD, PhD
Mentor John Cooke, MD, PhD  Co-Mentor Ed Morcaski, PhD
T32 Research Project Role of innate immunity in nuclear reprogramming // Dr. Sayed is currently an Assistant Professor in the Department of Cardiovascular Sciences at the Methodist Hospital Research Institute. The goal of his lab is to understand if manipulation of innate immune signaling can be used to modify cell fate and whether the epigenetic plasticity induced by these pathways plays a role in reprogramming and regeneration.
Research Training in Myocardial Biology

CURRENT TRAINEES

CAROL CHO, PhD
Mentor James Spudich, PhD  Co-Mentor Thomas Quertermous, MD
T32 Research Project Biomechanical characterization of human cardiac myosin // Dr. Cho received her BS in Biological Sciences from Seoul National University, and her PhD in Biochemistry and Molecular Biology from UCSF, where she worked on the molecular structure of cytoplasmic dynein. At Stanford, Dr. Cho continues to work on understanding molecular motor proteins.

MICHAEL CORONADO, PhD
Mentor Daniel Bernstein, MD  Co-Mentor TBD
T32 Research Project Role of β-adrenergic subtype signaling in cardiac mitochondrial dynamics // Dr. Coronado attended the University of California, Riverside where he received a BS in Biochemistry and conducted undergraduate research in toxicology. He received his PhD from the Johns Hopkins University where he conducted research on sex differences in CVB3-Myocarditis and dilated cardiomyopathy.

AYCA ERBILGIN, PhD
Mentor Euan A. Ashley, MRCP, DPhil  Co-Mentor TBD
T32 Research Project Using gene expression network analysis to study the genetics of heart disease // Dr. Erbilgin received her PhD in Microbiology, Immunology, and Molecular Genetics from UCLA. During her doctoral research, she studied the genetics of atherosclerosis, using a mouse model to identify genetic factors and mechanisms responsible for atherogenesis in the vessel wall.

DID YOU KNOW?

This training grant, which started July 1, 2010, has had 11 trainees. Nine of the 18 faculty mentors on this training grant have had T32 trainees.

This multidisciplinary program brings together postdoctoral fellows and faculty from six complementary areas: genetics and genomics; cellular signaling; molecular imaging; physiology and phenotyping; cardiac development and regeneration; and outcomes research and population science. This program trains six postdoctoral fellows from MD and PhD backgrounds together over a one to three year period beginning July 1 every year, combining myocardial biology research with a structured educational program. This program has eighteen faculty mentors from the School of Medicine, representing Cardiovascular Medicine, Pediatric Cardiology, Radiology, Pathology, Chemical Systems Biology, Molecular Imaging, Molecular Physiology, Bioengineering, Biochemistry, and Health Sciences Research.
2013 PAST TRAINEES

**CLINT MILLER, PhD**
Mentor Thomas Quertermous, MD  Co-Mentor Euan A. Ashley, MRCP, DPhil
T32 Research Project Mapping the causal variants and regulatory mechanisms of the TCF21 association in coronary heart disease // Dr. Miller received a PhD in Pharmacology from the University of Rochester, where he studied cyclic nucleotide signaling networks in cardiac and vascular remodeling. He is currently defining the regulatory mechanisms of genetic variation associated with heart disease risk.

**KARIM SALLAM, MD**
Mentor Joseph C. Wu, MD, PhD  Co-Mentor Sean M. Wu, MD, PhD
T32 Research Project Use of iPSC derived cardiomyocytes to characterize angiotensin II mediated cardiac remodeling // Dr. Sallam completed his undergraduate and medical school training at the University of Pittsburgh. He did his internal medicine residency and cardiology fellowship at Stanford University.

**FRANCES BARRON, PhD**
Mentor Joseph C. Wu, MD, PhD  Co-Mentor Daniel Bernstein, MD
T32 Research Project Understanding atrial fibrillation using induced pluripotent stem cells // Dr. Barron is currently the Associate Director of Clinical Development for a small consulting company, Judy Page INC, in Solana Beach, CA. They provide regulatory affairs, pharmacovigilance and clinical trial management for small biotech and virtual companies both locally and internationally.

**FREDERICK DEWEY, MD**
Mentor Euan A. Ashley, MRCP, DPhil  Co-Mentor Russ Altman, MD, PhD
T32 Research Project Integrative genomics of cardiovascular biology // Dr. Dewey is an ACGME clinical fellow in Cardiovascular Medicine at Stanford Hospital and Clinics. He maintains active research interests in the genetic basis of familial cardiomyopathy and transcriptional control of adaptive and maladaptive cardiovascular stress response.
This program brings together postdoctoral fellows and faculty from three complementary areas – clinical, engineering, and molecular imaging – to train the next generation of CV imaging investigators for successful careers. This program trains postdoctoral fellows over two years and emphasizes collaborative interaction in four areas: multi-modality CV Imaging; multi-disciplinary innovation; translational CV imaging; and research career development. 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 application. The twenty-one faculty mentors are a critical component of the CVIS program, with a balance of MD and PhD mentors across the core collaborative departments. They are grant-funded faculty engaged in a broad range of cardiovascular imaging research with experience training successful young investigators.

CURRENT TRAINEES

HOSSEIN BAHRAMI, MD, PhD, MPH
Mentor Michael V. McConnell, MD, MSEE
Co-Mentors Paul A. Heidenreich, MD, MS and Mark Hlatky, MD
T32 Research Project Cardiac imaging // After medical school, Dr. Bahrami completed his PhD and two master degrees in Epidemiology and Biostatistics at Johns Hopkins University; he was involved with MESA (Multi-Ethnic Study of Atherosclerosis). He completed his internal medicine residency at Yale and then came to Stanford for his cardiology fellowship.

NICK MORDWINKIN, PhD, PharmD
Mentor Joseph C. Wu, MD, PhD Co-Mentor Christopher Contag, PhD
T32 Research Project Modeling disease mechanisms of diabetic cardiomyopathy using human iPS cells // Dr. Mordwinkin received his PharmD from Nova Southeastern University in 2004, and his PhD in Pharmaceutical Sciences from the University of Southern California in 2012. His doctoral dissertation investigated the role of peptides of the renin-angiotensin system in diabetes mellitus-induced cardiac dysfunction.

DID YOU KNOW?

// The first group of 4 trainees in this two year program started July 2009 and the second group of 4 started July 2011. As of July 2013, there are 2 trainees with plans for 2 new per year.
This Career Development Program (CDP) in ‘Omics’ of lung diseases with a major focus on pulmonary arterial hypertension (PAH), awarded by the NIH-NHLBI, started on September 1, 2013. This CDP will allow us to equip the next cadre of MD and PhD scientists with interdisciplinary and bioinformatic skills to integrate new high throughput genomic, proteomic and metabolic platforms to gain a better understanding of disease pathophysiology. Two to four trainees will be supported each year, with the first cohort of fellows are expected to start early 2014.

**PIs:** Marlene Rabinovitch, MD; Michael Snyder, PhD; Mark R. Nicolls, MD
The Stanford Cardiovascular Institute (CVI) seed grants provide funding for groundbreaking cardiovascular related research in the general areas of cardiac, vascular or pulmonary development and disease. These awards are intended to bring together new collaborative and interdisciplinary groups that can address high-risk, high-reward questions from a variety of perspectives by applying new techniques and methods to cardiovascular-related problems.

2012 (FY13) CVI SEED GRANT RECIPIENTS

Last year the CVI, with generous support from the Child Health Research Institute (CHRI), funded a record number of 12 seed grants. Seed Grant Recipients:

**PI Eugene Butcher, MD**  
Coagulation factor VIII: endothelial origin and mechanisms of cell-specific and clinical dysregulation

**PI Manish Butte, MD, PhD**  
Measuring electromechanical asynchrony in iPSC-CM using atomic force microscopy

**PI Christopher Contag, PhD**  
Molecular mechanisms of fetal bradycardia due to placental infection

**PI Rajesh Dash, MD, PhD**  
Arrhythmogenic impact of restorative stem cell therapy in the infarcted porcine myocardium

**PI Ngan F. Huang, PhD**  
Induced pluripotent stem cell-derived aligned vascular graft with improved patency

**PI Michaela Kiernan, PhD**  
A brief assessment tool for a heart-healthy diet

**Co-PIs Jason Merker, PhD; Joshua W. Knowles, MD, PhD**  
Hybrid genotyping of a well-phenotyped healthy control population as a community resource for exome studies

**PI Patricia K. Nguyen, MD**  
Evaluating the risk of low dose radiation: are patients being harmed by medical imaging tests?

**PI Marco Perez, MD**  
Genetic variation near HCRTR2 is associated with dramatic improvement of heart function in patients with heart failure

**PI Pilar Ruiz-Lozano, PhD**  
Engineered embryonic epicardium activates cardiac regeneration – a preclinical study in pigs

**PI Edda Spiekerkoetter, MD**  
Increasing BMP signaling to improve right ventricular function in congenital heart disease

**PI Richard Zare, PhD**  
Conductive nanoparticle composites for cardiac implants
2013 (FY14) CVI SEED GRANT RECIPIENTS

This year the CVI, again with generous help from the CHRI, funded 8 seed grants, which reflect the breadth and vision of the CVI.

Co-PiS Gerald Berry, MD; Curt Scharfe, PhD
Co-Is Kitchener Wilson, MD, PhD; Justin Odegaard, MD, PhD
A clinical-grade next generation sequencing assay for targeting DNA mutations in inherited non-syndromic cardiomyopathies

PI Alexander Dunn, PhD
Co-PiS Gerald Fuller, PhD; Lorelei Shoemaker, PhD; Steven Chang, MD
Endothelial cell fate specification in response to fluid flow

PI Susan Fernandes, LPD, PA-C
Co-I George Lui, MD
Risk factors for acquired cardiovascular disease in adults with congenital heart disease

Co-PiS Jason T. Lee, MD; Apurva Mehta, PhD; Drew Nelson, PhD
A novel approach for studying the mechanical behavior of atherosclerotic plaque

PI Nicholas Leeper, MD
Co-I Andrew Connolly, MD, PhD
The paradoxical role of Cdkn2b in vessel sprouting and vessel maturation in atherosclerosis

PI Daria Mochly-Rosen, PhD
Co-PiS Daniel Bernstein, MD; Tobias Meyer, PhD
Identifying the master integrator of cardiac cell-fate decision

PI Beth Pruitt, PhD
Co-PI Sean M. Wu, MD, PhD
Co-Is Euan A. Ashley, MRCP, DPhil; Daniel Bernstein, MD; Alexander Dunn, PhD; Kathy Ruppel, PhD; James Spudich, PhD
Genetic tracking and functional assessment of atrial- and ventricular-specific cardiomyocytes from induced pluripotent stem cells

PI Sandra Tsai, MD, MPH
Co-Is Jennifer A. Tremmel, MD, MS; Wes Alles, PhD; Katharine Sears, PhD
Randomized control trial to improve cardiovascular health in postpartum women diagnosed with preeclampsia

Seed grants are essential for opening doors to discovery. With this support, our investigators can pursue the 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
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 the thought leaders in cardiovascular science, this seminar series facilitates the initiation of new collaborations and accelerates science at Stanford.

In 2013, the CVI hosted a total of 34 speakers; 20 national/international speakers and 14 local Stanford/Bay Area speakers. Some of the outside speakers that were invited to Stanford in 2013 are as follows:

- **1/15/2013** James Min, MD  
  Associate Professor of Medicine, Imaging and Biomedical Sciences  
  Director, Cardiac Imaging Research  
  Cedars Sinai Medical Center

- **1/29/2013** Thomas L. Force, MD  
  Professor of Medicine  
  Clinical Director, Center for Translational Medicine  
  Temple University

- **2/5/2013** Mark McCarthy, MD  
  Robert Turner Professor of Diabetes  
  Chairman of the Oxford Centre for Diabetes, Endocrinology and Metabolism

- **2/12/2013** Roberta A. Gottlieb, MD  
  Frederick G. Henry Chair in Life Sciences  
  Director, SDSU BioScience Center  
  San Diego State University

- **2/19/2013** Bruce Conklin, MD  
  Senior Investigator, Roddenberry Center for Stem Cell Biology and Medicine at Gladstone Institutes  
  Professor, Medical Genetics and Cellular and Molecular Pharmacology, UCSF

- **3/5/2013** Andreas M. Zeiher, MD  
  Professor and Head of the Division of Cardiology  
  Goethe University, Germany

- **4/2/2013** Benoit G. Bruneau, PhD  
  Associate Director and Senior Investigator  
  Gladstone Institute of Cardiovascular Disease

- **4/16/2013** Charles Antzelevich, PhD  
  Executive Director and Director of Research  
  Masonic Medical Research Laboratory

- **4/23/2013** Douglas Losordo, MD  
  Adjunct Professor of Medicine  
  Northwestern, Feinberg School of Medicine

- **5/7/2013** Richard Lee, MD  
  Professor of Medicine, Harvard Medical School  
  Brigham and Women’s Hospital

- **5/14/2013** Peter J. Fitzgerald, MD, PhD  
  Professor of Medicine and Engineering Director, CV Technology  
  Stanford Cardiovascular Medicine

- **6/4/2013** Jeffrey Robbins, PhD  
  Professor of Pediatrics and Chair, Molecular Cardiovascular Biology  
  Associate Chair, Cincinnati Children’s Research Foundation

- **8/20/2013** Michael S. Lauer, MD  
  Director, Division of Cardiovascular Sciences  
  National Heart, Lung, and Blood Institute, NIH

- **10/22/2013** Alan Daugherty, PhD, DSc  
  Senior Associate Dean of Research  
  University of Kentucky  
  Editor, ATVB

- **10/29/2013** Stefan Jovin, MD, PhD  
  Medical Director Cardiovascular Research  
  Fred Meijer Heart and Vascular Institute

- **11/5/2013** Mark E. Anderson, MD, PhD  
  Professor and Director of the Cardiovascular Research Center  
  University of Iowa

- **11/26/2013** Luiz Belardinelli, MD  
  Senior Vice President of Cardiovascular Therapeutics, Gilead Sciences, Inc.

- **12/3/2013** Norman Stockbridge, MD, PhD  
  Director Division of Cardiovascular and Renal Products (DCaRP), FDA

- **12/17/2013** Ali J. Marian, MD  
  Professor and Director, Center for Cardiovascular Genetic Research  
  Texas Heart Institute
2014 Confirmed Outside Speakers:

1/7/2014 Judith S. Hochman, MD
Professor of Medicine
New York University

1/21/2014 Brian Black, PhD
Professor and Associate Director,
Cardiovascular Research Institute, UCSF

2/4/2014 Howard A. Rockman, MD
Professor of Medicine, of Cell Biology, and of Molecular Genetics and Microbiology
Duke University

2/11/2014 Sanjay Sharma, MD
Professor of Cardiology
St. George's University of London

2/18/2014 Dan M. Roden, MD
Professor of Medicine and Pharmacology
Vanderbilt University

2/25/2014 Roger Hajjar, MD
Professor of Medicine
Director, Cardiovascular Research Center
Mount Sinai Hospital

3/4/2014 Mukesh Jain, MD
Director, Case Cardiovascular Research Institute
Ellery Sedgwick Jr. Chair and Distinguished Scientists University Hospitals
Case Western University

3/25/2014 Jil Tardiff, PhD
Professor of Medicine
University of Arizona

4/8/2014 Steven R. Houser, PhD
Professor of Medicine
Temple University

4/29/2014 Doug L. Mann, MD
Professor of Medicine
Chief, Cardiology
Washington University

5/6/2014 Gregory Hundley, MD
Professor of Internal Medicine - Cardiology
Wake Forest School of Medicine

6/3/2014 Jonathan R. Lindner, MD
M. Lowell Edwards Professor of Cardiology
Knight Cardiovascular Institute
Oregon Health and Science University

6/17/2014 David G. Harrison, MD
Betty and Jack Bailey Professor of Medicine and Pharmacology
Director, Division of Clinical Pharmacology
Director, Center for Vascular Biology
Vanderbilt University

LI KA SHING CENTER

The Frontiers of Cardiovascular Science weekly lecture series takes place in the Li Ka Shing Center for learning and knowledge (LKSC). The LKSC is a reflection of Stanford School of Medicine’s commitment to take medical education to new frontiers. It aspires to foster a unique confluence of cutting-edge medicine, modern teaching methods, and advanced technologies that will transform the way physicians and medical researchers are trained.

lksc.stanford.edu
The Stanford Cardiovascular Institute (CVI) holds an annual retreat for its members. The retreat is an opportunity to share intramural research findings and to stimulate interdisciplinary research collaboration and development among CVI members. The 2013 retreat was held at the Li Ka Shing Center for Learning and Knowledge (LKSC) on September 12-13 and attendance was just over 200.

This year’s program included a half-day educational symposium featuring “A conversation with Dr. Michael Snyder, PhD: Life as an Academic Scientist, Genome Entrepreneur, and Department Chair”, Stanford Core Facilities workshops, a nursing research workshop, and a career panel discussion featuring a Senior Editor from Nature Publishing Group, an intellectual property attorney, and representatives from both industry and academia.

The full-day main retreat featured keynote addresses from Shaun Coughlin, MD, PhD, Director of the UCSF Cardiovascular Institute, and Paul Yock, MD, Director of Stanford Biodesign. There were two roundtable discussions (“Risk Prediction from Genome Profiling: Are we Ready for Primetime?” and “The Good, the Bad, and the Ugly about Clinical Research at Stanford”), faculty talks (by Kenneth W. Mahaffey, MD, and Mark M. Davis, PhD), and presentations by the 2011 CVI seed grant recipients. Students and fellows presented their research findings at the poster session, with awards given to the top three posters as judged by an expert panel of researchers. Other highlights included oral presentations by the Young Investigator Award nominees, the announcement of the 2013 CVI Seed Grant recipients, and two networking social receptions.

The Annual Retreat is a popular event every year and we look forward to it continuing to grow along with the CVI.
Innovation in science and technology provide the foundation for improving cardiovascular care and saving lives. The Stanford Cardiovascular Institute is at the forefront of today’s ongoing advances in cardiovascular disease research and therapy. Through pioneering new initiatives and facilities, we are accelerating collaborations that integrate knowledge from diverse disciplines and promote the translation of discoveries into improved methods for cardiovascular disease prevention, detection and treatment.

Donors can provide critical support to a wide variety of programs to advance investigations into the biological mechanisms of cardiovascular disease and to develop innovative patient care programs. This support will help Stanford lead the way in cardiovascular research, education, and patient care.

Alma and Marvin Burkett, pictured in their Silicon Valley home, have made generous gifts to help physician-scientists better understand and develop new treatments for cardiac arrhythmia.

I'm delighted to be a CVI annual donor. Their discoveries will provide the pathway to better prediction and prevention of heart disease as well as life-saving medical practices in the future.

—Christopher ‘Kit’ Kaufman

It means a great deal to us to know we are helping leaders in cardiac research develop even better methods and devices to care for heart patients everywhere. Amazing advances are being made by Stanford CVI researchers, and we are pleased our support will ultimately help bring their work to patients.