THE 2014 ANNUAL REPORT
CARDIOVASCULAR RESEARCH
INSTITUTE OF VERMONT
The Cardiovascular Research Institute of Vermont is dedicated to reducing the incidence, morbidity, and mortality of heart and vascular diseases through improving prevention, diagnosis, and treatment.

By fostering collaborations among departments at The University of Vermont and The University of Vermont Medical Center, the Cardiovascular Research Institute of Vermont encourages the critical thinking that challenges assumptions and promotes excellence in clinical practice.
Message from the Director

The University of Vermont (UVM) and The University of Vermont Medical Center have a tradition of excellence in cardiovascular research—this report highlights important accomplishments in 2014.

The Cardiovascular Research Institute of Vermont (CVRI) is broadly inclusive of all who engage in cardiovascular research at UVM and its Medical Center. Our mission is to foster cardiovascular research by supporting career development and by spotlighting outstanding accomplishments.

Designated Distinguished Investigators of the CVRI highlight the legacy of cardiovascular research. Career development is augmented in multiple ways, including an Early Career Advisory Committee that is charged with guiding CVRI activity to support career development; travel awards to assist early career investigators so they may present research findings at scientific meetings; and invited speakers who enhance collaboration, stimulate new discoveries, and interact directly with early career investigators to inspire commitment to cardiovascular research.

Progress toward the ultimate goal, improving care of patients with cardiovascular disease, is demonstrated by the many publications in cardiovascular research authored by investigators at our academic medical center. Much of this research was made possible by extramural funding for scientific discovery.

As you read through these pages, I trust you will join me in appreciating the depth and breadth of cardiovascular research and in applauding the commitment of our investigators who continuously strive for excellence.

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Board of Directors

David J. Schneider, M.D., F.A.C.C., F.A.H.A., Director
Professor of Medicine, University of Vermont College of Medicine
Director of Cardiovascular Services, University of Vermont Health Network
Director, Cardiovascular Research Institute of Vermont

Dr. Schneider’s roles at the UVM Health Network and the Cardiovascular Research Institute provide him the opportunity to translate scientific advances into improved care of patients. His research focuses on thrombosis, platelet function, and fibrinolysis as they relate to atherosclerotic cardiovascular disease. His research efforts include the development of anti-thrombotic agents and novel methods to assess the risk of thrombosis and bleeding.

Ira Bernstein, M.D.
Professor and John Van Sicklen Maeck Chair of Obstetrics, Gynecology & Reproductive Sciences, University of Vermont College of Medicine; Medical Director of Women’s Services, University of Vermont Medical Center

Dr. Bernstein served as Senior Associate Dean for Research at the UVM College of Medicine from 2009-2014, and was Director of Maternal Fetal Medicine and its fellowship program from 2003-2009. His research examines human integrative cardiovascular physiology and he has been funded from NIH for a series of projects examining pre-pregnancy determinants of preeclampsia. Dr. Bernstein has served on several study sections at NIH, including two years as the chair of Pregnancy and Neonatology.

Marilyn J. Cipolla, Ph.D., F.A.H.A.
Professor of Neurological Sciences, University of Vermont College of Medicine

Dr. Cipolla’s research focuses on cerebral hemodynamics and cerebrovascular function under normal and pathologic conditions, including ischemic stroke and preeclampsia. Internationally recognized for her work, she is scientific advisor to the NIH and WHO and past President of the Perinatal Research Society. She is a Fellow and Established Investigator of the AHA and was named University Scholar in 2015.

Mary Cushman, M.D., M.Sc., F.A.H.A.
Professor of Medicine, Division of Hematology/Oncology, University of Vermont College of Medicine; Director, Thrombosis and Hemostasis Program, University of Vermont Medical Center

Dr. Cushman studies causes of cardiovascular-related diseases including heart disease, stroke, cognitive impairment and venous thrombosis. She uses biomarkers and genetic data from large epidemiologic studies where her lab serves as biorepository and analysis lab, and has authored over 400 publications. She is a Board Director of the American Heart Association and is Senior Guest Editor of Circulation.

Harold L. Dauerman, M.D., F.A.C.C.
Professor of Medicine, Division of Cardiovascular Medicine, University of Vermont College of Medicine; Interventional Cardiologist, University of Vermont Medical Center

Dr. Dauerman’s research focuses on high risk atherosclerotic coronary syndromes and structural heart disease. He has investigated acute myocardial infarction pathophysiology with highly sensitive intracoronary imaging devices and applied systems-based approaches to optimize heart attack patient care; he has helped develop minimally invasive technologies to treat patients with aortic valve disease. He served as vice-chair of the American Heart Association Mission Lifeline program and is the Editor in Chief of Coronary Artery Disease.

Mark T. Nelson, Ph.D., F.A.H.A.
University Distinguished Professor and Chair of Pharmacology, University of Vermont College of Medicine

Dr. Nelson’s goal is to understand the control of smooth muscle and endothelial cell function by ion and calcium signaling. A major focus is to understand the control of brain microcirculation in health and small vessel disease. Research approaches cover the spectrum from molecular, cellular, intact tissue, whole organ and in vivo, and a number of genetic mouse models are used to unravel the control mechanisms. Dr. Nelson is internationally recognized for his cutting edge research.

David M. Warshaw, Ph.D., F.A.H.A.
Professor and Chair of Molecular Physiology & Biophysics, University of Vermont College of Medicine

Dr. Warshaw’s research focuses on the structure and function of cardiac muscle proteins in normal and failing hearts. Genetic mutations to the tiny protein molecular motors that power the heart are the leading cause of sudden death in young athletes. He is an Established Investigator and Fellow of the American Heart Association. He has organized numerous international conferences and symposia, and was a Scientific Advisor for the NIH Nanomedicine Initiative.
Leadership Council

Members of the Cardiovascular Leadership Council serve as ambassadors for the Cardiovascular Research Institute of Vermont (CVRI), its Board of Directors, Investigators and Faculty, in the overall effort to educate and engage Vermonters and the broader community in support of cardiovascular medicine.

Mary Evslin is co-founder of NG Advantage LLC, a Vermont-based company that delivers natural gas to large industrial plants not on a gas pipeline. Previously, she was a founder of Marketing and Customer Success at ITXC, where she developed and led the company’s global marketing efforts from start-up through IPO and secondary offering. Earlier in her career she worked for then-U.S. Representative Jim Jeffords. She is on the Board of Trustees of Champlain College and the Vermont/New Hampshire Chapter of the American Red Cross, and was the first chair of the Board of Directors of the Vermont Telecommunications Authority. Mary lives in Stowe with her husband, Tom.

Peter Gibbs is a Vice President at Engineering Ventures PC, a civil and structural engineering firm in Burlington. Previously, he owned his own engineering firm based in Westport, N.Y., and has been a practicing site and civil engineer for over 30 years. Peter holds a Master of Engineering from Rensselaer Polytechnic Institute, and Bachelor of Science degrees in both Ocean Engineering and Civil Engineering from the Florida Institute of Technology. He is a member of the Construction Specification Institute, a volunteer with Engineers Without Borders, and a licensed U.S. Coast Guard Captain. Peter and his wife Lauren reside in Shelburne.

Paul Millman is a founder and president of Chroma Technology Corp., one of the most important suppliers of optical filters and mirrors to the world’s biotech industry. He is a graduate of the New School and the Antioch New England Graduate School and serves as director of the Vermont Business Roundtable and Valley Net. He is on the Steering Committee of ReThink Health in the Upper Valley and president of the Westminster (Vermont) Fire and Rescue Association. He is also a former director of Vermont Business for Social Responsibility and former chair of the Vermont Employee-Ownership Center. He lives in Westminster with his partner Wendy Cross.

Mark Ray is the Director of Public Relations at KSV, a Burlington marketing communications firm. A graduate of Middlebury College, he honed his skills in NYC at three top PR firms before returning to Vermont in 1994. In 2001, Mark co-founded an annual event in memory of his father, a cyclist who died of heart disease, and has raised over $120,000 for heart disease research and education. Mark served as vice chair of the Make-A-Wish Foundation’s Vermont board in 2013, and has also served on the boards of the American Heart Association in Vermont and the Middlebury College Alumni Association. Mark lives with his wife and two children in Shelburne.

Patrick Robins is founder and chairman of The SymQuest Group, Inc., a regional technology services company. Previously, Pat was Chairman and CEO of McAuliffe, Inc. A graduate of St. Michael’s College and the Tuck School of Business at Dartmouth, Pat serves as a Director at Merchants Bancshares, is a managing member of Sideronics LLC, and Director of Butternut Mountain Farms, a national distributor of maple products. He holds board positions on the Downtown Burlington Development Corp., the VNA, Cynosure, Inc., the UVM Medical Center, the Vermont Chamber of Commerce, and the Vermont Land Trust. Pat and his wife, Lisa Schamberg, reside in Burlington.

Glen Wright is a certified public accountant, serving as Managing Partner at KPMG LLP in Burlington until 2002. Since then, he has continued his work as a business and tax consultant in Burlington and Reddick, Florida. Glen is Chairman of the Board of Cynosure, Inc., whose mission is to provide financial support for economic development in Chittenden County through investment and management of real estate projects. He has been a board member of the Flynn Theatre for the Performing Arts, the Vermont Business Roundtable, the YMCA, the UVM Medical Center Foundation and Chittenden Bank. Glen and his wife Rosemarie, divide their time between South Hero and Florida.
Cardiologist and heart rhythm specialist Peter Spector, M.D., is on a mission to improve the cure rate for a form of the most common heart rhythm disorder – atrial fibrillation (AF) – and has already earned a patent as he works towards this goal.

Roughly six to eight million cases of AF exist in the U.S., but despite its prevalence, medications only work in about 45 percent of patients. An alternative to medication exists; a procedure – called catheter ablation – is effective in about 75 percent of patients with intermittent AF, but the technique works poorly in the majority of AF patients, who suffer from a chronic form of the condition.

Spector’s three-year project – funded by a $1 million grant from Vermont residents Tom and Mary Evslin after Mr. Evslin was treated for a heart condition at The University of Vermont Medical Center – has yielded innovative technology that offers a potential new approach to catheter ablation of AF and led to creation of an impressive intellectual property portfolio covering the catheters, signal processing algorithms and other aspects of his research. He was awarded the first of these U.S. patents in November 2014, and as of January 2015, a second patent application has been allowed.

Through all of these efforts, Spector and colleagues hope to help the many patients suffering from chronic AF to maintain a regular heart rhythm, thus reducing their risk of stroke and providing them with a significantly higher quality of life.

“If our therapy is even 10 percent more effective, it will help an enormous number of people,” says Spector.

SPARK-VT, launched at UVM in 2012, brings the experience and insight of a panel of distinguished and successful entrepreneurs to the critical evaluation of promising innovative applications of new knowledge. Those adjudged to be most meritorious receive start-up funding and milestone evaluation by the panel. In 2014, UVM Associate Professor of Medicine Jeffrey Spees, Ph.D., earned a SPARK-VT award for his research on Cell-Kro, a grafting agent composed of insulin and a peptide derived from Connective Tissue Growth Factor. Cell-Kro has been shown in early studies to improve the adhesion, proliferation, survival, and migration of cardiac stem cells grafted to a heart injured from a heart attack. In 2013, Associate Professor of Medicine Markus Meyer, M.D., earned an award for his project to develop a fast and inexpensive way to test for heart function: A simple device to administer a small dose of nitrogen to a patient and time its flow through the body. Meyer completed follow-up studies on the heart function monitor, created a startup company to support his venture, and submitted a Small Business Innovation Research (SBIR) grant.
Translating Groundbreaking Cardiovascular Research Into Improved Regional Care

A procedure tested during a clinical trial at the University of Vermont to replace heart valves using catheters instead of open heart surgery received approval in July 2014 from the Food and Drug Administration for use in two categories of patients. The American Heart Association and the American College of Cardiology have also added Transcatheter Aortic Valve Replacement (TAVR) to their guidelines.

Patients from Vermont and northern New York who had failing heart valves but could not tolerate open heart surgery (the current standard of care for valve replacement) or were at high risk for complications or death during surgery were among the first in the country to receive this groundbreaking treatment. The UVM Medical Center was one of only 45 sites in the trial and has enrolled over 100 regional patients in research trials and registries studying and developing TAVR.

During TAVR, an artificial valve is placed on a catheter and is advanced to the heart from a vessel in the leg or chest, similar to what happens when inserting a stent. When the new valve is released, it pushes the diseased valve out of the way and begins functioning immediately.

“TAVR is truly a lifesaving treatment and we’re very pleased our heart team was involved in determining its effectiveness,” said clinical investigator Harry Dauerman, M.D. “It’s a great example of the value of having an academic medical center in our region — we not only have the expertise and resources to deliver the most advanced treatments, but we are also involved in developing them.”

UVM has continued to take the lead in enrollment of high risk, off label patients in an ongoing national TAVR research registry and has now developed one of the highest volume clinical TAVR programs in our region.

The Totman Medical Research Fund

The Totman Medical Research Trust supports an interdepartmental, highly interactive research group focused on key aspects of brain artery function from molecules to clinical applications. The program is housed in the Department of Pharmacology, under the supervision of University Distinguished Professor and Chair Mark T. Nelson, Ph.D., who hosts an annual session with Fund leaders and researchers (above, in 2014) to hear presentations and share ideas.

The Fund was established through the generosity of Ray Totman, a businessman from Malone, New York. After his death in 1988, a gift from his estate established the Ray W. Totman and Ildah Totman Medical Research Fund, to be used for scientific and medical research concerning Ischemic Cerebrovascular Disease.

CVRI Supports AHA Go Red for Women

The American Heart Association’s Vermont Go Red for Women Luncheon attracts 500 attendees each year to the organization’s Heart Month event held in Burlington every February. The University of Vermont College of Medicine, University of Vermont Medical Center and Cardiovascular Research Institute of Vermont co-sponsor the event, which includes a morning panel discussion, silent auction, and luncheon keynote and survivor presentations. UVM Professor of Surgery and Cardiothoracic Surgeon Frank Ittleman, M.D. (shown above), was named Vermont’s 2014 recipient of the Crystal Heart Award, which recognizes an individual who has contributed to the mission of the American Heart Association and American Stroke Association. Vermont AHA Board Chair Mary Cushman, M.D., M.Sc., presented the award to Dr. Ittleman.
With travel awards, research seminars, and an Early Career Advisory Committee available to them, junior investigators who are affiliated with the Cardiovascular Research Institute of Vermont (CVRI) have plenty of rich opportunities at their disposal.

The Early Career Advisory Committee is at the heart of the CVRI support of the future of cardiovascular research and medicine. Its eight members, selected by application to the CVRI Board of Directors, represent multiple of departments and levels of expertise—they range from fourth-year medical students to early career faculty members in Microbiology, Molecular Genetics and Obstetrics, Gynecology and Reproductive Sciences. In addition to coordinating events such as Journal Clubs for their peers, committee members participate in the planning of the Visiting Professorships and report regularly to the CVRI Board on issues faced by their early career colleagues. The committee is shepherded by Mary Cushman, M.D., M.Sc., director of the Thrombosis and Hemostasis Program, professor of medicine in the Hematology/Oncology Division, professor of pathology, and a member of the CVRI Board for whom mentoring has long been a professional passion. She says that inviting early career individuals to dinners with visitors and to professional development events where they are welcome to present their work and get feedback, is important on several levels.

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“You want your trainees to have the opportunity to meet people who are leaders in their field—it teaches them how to interact with scientists outside our institution. This can often initiate new collaborations, inspire new projects, and develop new mentors.”

MARY CUSHMAN, M.D., M.Sc.
2014-15 EARLY CAREER ADVISORY COMMITTEE

**Patrick Hohl, D.O.**
1st year fellow  
Medicine – Cardiology

**Abbie Johnson, Ph.D.**
Postdoctoral Associate  
Neurological Sciences

**Kara Klingman Landry, B.A.**
4th year medical student  
UVM College of Medicine

**Dawei Li, Ph.D.**
Assistant Professor  
Microbiology and Molecular Genetics

**Kelley McLean, M.D.**
Assistant Professor  
Obstetrics, Gynecology and Reproductive Sciences

**Sean McMahon, M.D.**
1st year fellow  
Medicine – Cardiology

**Nels Olson, Ph.D.**
Postdoctoral Fellow  
Pathology and Laboratory Medicine

**Michael Previs, Ph.D.**
Assistant Professor  
Molecular Physiology and Biophysics

From left to right: Sean McMahon, M.D., Abbie Johnson, Ph.D., Kara Klingman Landry, Kelley McLean, M.D., Michael Previs, Ph.D., Dawei Li, Ph.D., Mary Cushman, M.D., M.Sc., Nels Olson, Ph.D., and Patrick Hohl, D.O.
The Next Generation: Travel Awards

Travel awards were established to cover educational travel costs for anyone early in his or her career who is a primary presenting author of an abstract at a regional or national meeting. It’s an honor, and it also means that money that would otherwise have to be used to pay for them to participate can be earmarked for direct research costs instead. Since July 2014, thirteen $2,000 awards have been made, sending assistant professors, postdoctoral fellows, residents in internal medicine, and graduate and medical students to regional, national and international meetings.

American Society of Nuclear Cardiology
2014 Annual Scientific Sessions
Baltimore, MA – September 18-21, 2014
Sean R. McMahon, M.D.
Internal Medicine Resident, Department of Medicine
Poster: Increased use of regadenoson in patients with abnormal troponin I in the era of sensitive troponin assays

American Heart Association
Scientific Sessions 2014
Chicago, IL – November 7-11, 2014
Zubin Agarwal, M.D., M.P.H.
Internal Medicine Resident, Department of Medicine
Poster: Galectin-3 and risk of stroke: The REasons for Geographic And Racial Differences in Stroke (REGARDS) cohort

Biophysical Society
59th Annual Meeting
Baltimore, MD – February 7-11, 2015
Michael J. Previs, Ph.D.
Assistant Professor, Department of Molecular Physiology and Biophysics
Poster and Oral: Myosin-binding protein C corrects an intrinsic non-uniformity in cardiac excitation-contraction coupling

American Heart Association
Epidemiology, Prevention, Lifestyle and Cardiometabolic Health 2015 Scientific Sessions
Baltimore, MD – March 3-6, 2015
Kristine Alexander, Ph.D., M.C.R.
Postdoctoral Fellow, Department of Medicine
Poster: Nonalcoholic fatty liver disease (NAFLD) and risk of incident cognitive impairment

Markus Degirmenci, M.D.
Internal Medicine Resident, Department of Medicine
Poster: Dehydroepiandrosterone (DHEAS) and risk of stroke in black and white Americans: The REasons for Geographic And Racial Differences in Stroke (REGARDS) cohort

Peter Durda
Graduate Student, Department of Pathology
Poster: Circulating soluble CD163 and risk of cardiovascular disease and all-cause mortality in older persons: the Cardiovascular Heart Study (CHS)

Kara Klingman Landry
UVM Medical Student, Class of 2015
Poster: Association of stroke risk biomarkers with stroke symptoms: the REasons for Geographic And Racial Differences in Stroke (REGARDS) cohort
Society for Reproductive Investigation
62nd Annual Scientific Meeting
San Francisco, CA – March 25-28, 2015

Erin Morris, M.D.
Fellow, Department of Obstetrics, Gynecology, and Reproductive Sciences
3 Posters: Prepregnancy blood pressure and history of first trimester loss contribute to birth weight and placental weight; Cerebral blood flow changes over pregnancy in women with a history of HELLP syndrome and those with prior preeclampsia; and Persistence of pregnancy-induced maternal uterine vascular remodeling in rodents

Lindsay Howe, B.S.
Graduate Student, Department of Obstetrics, Gynecology, and Reproductive Sciences
Poster: Obesity, body fat distribution and cardiovascular function in young nulliparous women

Carole McBride
Graduate Student, Department of Obstetrics, Gynecology, and Reproductive Sciences
3 Posters: Factors influencing early pregnancy uterine arterial blood flow and resistance index; Maternal hypertension and major morbidity in infants born 22 to 29 weeks gestation; and Physical fitness and cardiovascular phenotype in young women

Experimental Biology 2015
Boston, MA – March 28-April 1, 2015

Thomas A. Longden, Ph.D.
Postdoctoral Fellow, Department of Pharmacology
Poster: Unique ion channel property of brain capillary endothelial cells

Yao Li
Graduate Student, Department of Pharmacology
Poster: Rho kinase regulates myogenic depolarization of cerebral parenchymal arterioles

International Society for Stem Cell Research
2015 Annual Meeting
Stockholm, Sweden – June 24-17, 2015

Krithika Rao
Graduate Student, Department of Medicine
Oral: CTGF-D4/LRP6 signaling promotes adult epicardial cell grafts after MI

“The ability to underwrite expenses early in a young researcher’s career is crucial to his or her success, and we’re here to support our junior investigators.”

HAROLD DAUERMAN, M.D.
Distinguished Investigators

The Cardiovascular Research Institute of Vermont (CVRI) recognized six University of Vermont faculty in 2014 as Distinguished Investigators, recognizing the long-term high impact of their work in cardiovascular research. Appointed for a period of five years, the inaugural group was celebrated in April 2014.

George Osol, Ph.D.
Professor of Obstetrics, Gynecology and Reproductive Sciences

Dr. Osol’s research is focused on vascular adaptations in pregnancy—in particular, the process of uterine artery remodeling in both normal and hypertensive pregnancies. Uterine vasculature undergoes more expansion during gestation than any other blood vessel in the human body ever does; insufficient remodeling or excessive constriction can result in preeclampsia and intrauterine growth restriction. Osol is program director for the NIH Center of Excellence in Women’s Reproductive Health Research and a 2010 University Scholar. His work has received NIH support for more than 25 years.

Russell Tracy, Ph.D.
Professor of Pathology

Dr. Tracy’s Laboratory for Clinical Biochemistry Research was the clearinghouse for the massive Exome Sequencing Project sponsored by NIH’s National Heart, Lung and Blood Institute (NHLBI). His own research was an integral part of the ESP’s HeartGO consortium, as well as the NHLBI’s Cardiovascular Heart Study and the National Center for Biotechnology Information’s Multi-Ethnic Study of Atherosclerosis. Tracy, interim senior associate dean for research, LCBR director, and 2009 University Scholar, is exploring genetic risk factors related to myocardial infarction and atherosclerosis, among other diseases.
Kathleen M. Trybus, Ph.D.
Professor of Molecular Physiology and Biophysics

Dr. Trybus is engaged in the study of molecular motors and their cargo. Specifically, she has zeroed in on how myosin activity is regulated, and how it moves actin and produces force. Trybus is also interested in the mechanisms that cause mutations in smooth muscle actin to result in vascular disease—in particular, thoracic aneurysms and coronary artery disease—by expressing homogenous normal and mutant vertebrate actins in the baculovirus/insect cell expression system, and has followed the polymerization of single actin filaments in real time.

Philip Ades, M.D.
Professor of Medicine

Dr. Ades’ father died of heart disease at a young age, and his own work is dedicated to ensuring that others don’t suffer the same fate. With a research and clinical spotlight on weight loss in obese coronary patients, Ades, who is director of Cardiac Rehabilitation and Prevention, teaches patients that exercise is medicine, but everyone needs a specific dose. His research, which has had consistent NIH funding since 1988, focuses on the treatment and prevention of disability in older patients with coronary artery disease and patients with chronic heart failure.
Scholarly Events

The Cardiovascular Research Institute of Vermont (CVRI) brings outstanding scientists in cardiovascular medicine to The University of Vermont as Visiting Professors. These visits include a major lecture and a series of interactions with trainees and junior investigators.

CVRI Visiting Professors

October 10, 2014
Translational Stroke Research: A Personal Perspective
MARC FISHER, M.D., M.SC.
Professor Emeritus of Neurology, University of Massachusetts
Editor-in-Chief of Stroke

November 7, 2014
Peripheral Artery Disease: Clinical Insights and Contemporary Treatments to Preserve Life and Limb
MARK CREAGER, M.D.
Professor of Medicine, Harvard Medical School; Senior Physician, Brigham and Women’s Hospital; President-Elect of the American Heart Association

November 18, 2014
In Search of the Holy Grail: Where Next in Prediction of Preeclampsia?
LESLIE MYATT, PH.D.
Professor of Obstetrics and Gynecology, Director of the Center for Pregnancy and Newborn Research, University of Texas Health Science Center San Antonio

March 5, 2015
Mitochondrial Dynamism and Heart Disease
GERALD DORN, PH.D.
Philip and Sima K. Needleman Professor and Associate Chair for Translational Research, Department of Internal Medicine, and Director of Center for Pharmacogenomics, Washington University

May 8, 2015
Heart Failure
MARVIN KONSTAM, M.D.
Professor of Medicine, Tufts University; Chief Physician Executive, The CardioVascular Center at Tufts Medical Center

Sobel Visiting Professor

Honoring Burton E. Sobel, M.D., the Founding Director of the CVRI.

March 26-27, 2015
The Inaugural Sobel Visiting Professor
JOSEPH LOSCALZO, M.D., PH.D.
Chair and Physician-in-Chief, Department of Medicine, Brigham and Women’s Hospital; Hersey Professor of the Theory and Practice of Medicine, Harvard Medical School; Editor-in-Chief of Circulation
• Seminar: How to Write and Publish a Paper: Lessons Learned as an Author, Mentor, and Editor
• Grand Rounds: Systems Pathobiology and Personalized Cardiovascular Medicine
• Master’s Tea and dinner with the Early Career Advisory Committee

Alpert Visiting Professor

Honoring Norman Alpert, Ph.D., Professor and Chair of the UVM Department of Molecular Physiology and Biophysics from 1966 to 1995.

May 3-5, 2015
The Inaugural Alpert Visiting Professor
LESLIE A. LEINWAND, PH.D.
Howard Hughes Medical Institute Professor of Molecular, Cellular and Developmental Biology, Chief Scientific Officer, BioFrontiers Institute, University of Colorado Boulder
Events planned include a seminar “Translating Python Biology to Mammalian Hearts,” and Early Career Discussion Forum.
PATENT ACTIVITY

New Patent Filed

Jeffrey L. Spees, Ph.D.
- Cell-Kro (C-terminal domain 4 of CTGF and Insulin)

Ongoing Patent Activity

Marilyn J. Cipolla, Ph.D.
- Methods of treating diseases associated with PPARγ
- Oxidized LDL as a biomarker for brain injury in preeclampsia

David J. Schneider, M.D.
- Compositions and methods for assaying platelet reactivity and treatment selection

Peter Spector, M.D.
- Method and systems for optimizing detection and treatment of atrial fibrillation
- Methods and systems for mapping cardiac fibrillation
- Methods and systems for optimizing lesion placement to minimize and treat cardiac fibrillation
- Methods and systems for minimizing and treating cardiac fibrillation
- Methods and systems for determining spatiotemporal variability for mapping cardiac fibrillation
- Catheter systems and related methods for mapping, minimizing and treating cardiac fibrillation
- Methods and systems for assessing cardiac fibrillogenicity
- An interactive tissue model for simulating the electrical activity of excitable tissues

Companies Formed

Markus Meyer, M.D.
- SimMedTec, LLC
  To develop a handheld circulation monitor

SELECTED SCHOLARLY PRESENTATIONS

Mary Cushman, M.D., M.Sc.
Clinical Roles for Thrombophilia Testing: the 4Ps Approach
Thrombosis and Hemostasis Summit of North America
April 2014; Chicago, IL

Saulius Butenas, Ph.D.
Activation, Activity and Inactivation of FVIII in FVIII Products
XXXI International Congress of the World Federation of Hemophilia
May 2014; Melbourne, Australia

Kathleen E. Brummel-Ziedins, Ph.D.
Correlation of Bleeding and Thrombotic Phenotypes with Computational Modeling of Thrombin Generation
2014 7th Symposium on Hemostasis:
Old System, New Players, New Directions
May 2014; Chapel Hill, NC

Harold L. Dauerman, M.D.
Chair of Programming for the Clinical Cardiology Council and Scientific Sessions Programming Committee Member
2014 American Heart Association Annual Scientific Sessions
November 2014; Chicago, IL

Marilyn J. Cipolla, Ph.D.
Targeting Parenchymal Arterioles for Treatment of Acute Stroke
Brain Ischemia and Stroke (BIS) 2014 Conference
December 2014; Rome, Italy
Research Funding: Highlights

Understanding the causes and consequences of cardiovascular disease, from the molecule to the patient to populations to policy, drives a robust research enterprise at the University of Vermont, and represents a significant portion of the $81 million in funding received by the College of Medicine in 2014. Grant support comes from Federal, State, Corporate and Non-Profit sources; a sampling of recent awards is presented below.

**Government Funded Research: NIH, NHLBI, DMRDP, and other related awards**

**DMRDP**

*Systems Biology for Biological Responses to Severe Hemorrhage – UVM*

Co-PI: Kenneth Mann, Ph.D. and Kathleen Brummel-Ziedins, Ph.D.

$1,503,734

**HL-13-025**

*Analysis and Characterization of Trauma-Induced Coagulopathy*

*Project 2 – The Role of Factor Xla in TIC*

Saulius Butenas, Ph.D.

*Project 6 – Analysis and Characterization of Trauma-Induced Coagulopathy*

PI: Kathleen Brummel-Ziedins, Ph.D.

$23,999,991

**K08 HL096841**

*Regional and Racial Differences in Hemostasis and Risk of Stroke and Heart Disease*

PI: Neil Zakai, M.D.

$130,599

**N01 HC95166**

*Multietnic Study of Atherosclerosis (MESA) II – Laboratory Center*

PI: Russell Tracy, Ph.D.

$88,014

**NIH – NICHD**

*National Longitudinal Study of Adolescent Health – Wave V*

Subcontract PI: Mary Cushman, M.D., M.Sc.

$110,102

**NIH – NIEHS**

*Effects of Perfluoroalkyl Chemicals on Stroke Incidence and Mortality Local*

Subcontract PI: Mary Cushman, M.D., M.Sc.

$6,746

**NIH 13761**

*Ad5.AC6 Gene Transfer for CHF: Use of Intracoronary AC6 Gene Therapy to Improve Symptomatic Heart Failure*

Local PI: Matthew Watkins, M.D.

$26,000

**P01 HL095488-01**

*Calcium Signaling in the Cerebrovascular Unit in Health and Disease*

PI: Mark Nelson, Ph.D.

$11,447,202

**P01 HL059408-11**

*Cardiac Myosin Binding Protein-C: Molecular Mechanisms of Actomyosin Modulation*

PI: David Warshaw, Ph.D.

$10,274,400

**P20 GM103644-01A1**

*Vermont Center for Behavior and Health*

Local PI: Stephen Higgins, Ph.D.

$1,533,382

**P50 DAO36114**

*Tobacco Centers of Regulatory Science*

Local PI: Stephen Higgins, Ph.D.

$2,924,426

**PPG Project 1**

*Molecular Mechanisms of ACTA2 Missense Mutations*

PI: Kathleen Trybus, Ph.D.

$1,952,220

**PPG Project 2 P01 HL095488**

*Cav channels, TRP channels and vasomotor function in cerebral arterioles*

PI: Joseph Brayden, Ph.D.

$1,362,000
PPG Project 3: P01 HL095488-01
*Cerebrovascular Function during Ischemia and Reperfusions*
PI: Marilyn Cipolla, Ph.D.
$1,900,000

PPG Project 4 P01 HL095488
*Impact of SAH on parenchymal arterioles and neurovascular coupling*
PI: George Wellman, Ph.D.
$1,205,000

R01 HL071944-05
*Pre-pregnancy Phenotype and Predisposition to Preeclampsia*
PI: Ira Bernstein, M.D.
$1,881,250

R01 NS045940-10
*The Role of the Blood-brain Barrier in Seizure during Pregnancy and Preeclampsia*
PI: Marilyn Cipolla, Ph.D.
$1,667,970

R01 HL059367
*Epidemiology of Venous Thrombosis and Pulmonary Embolism*
Local PI: Mary Cushman, M.D., M.Sc.
$205,334

R01 AG023629
*Exceptional Survival: Trajectories to Function*
Subcontract PI: Mary Cushman, M.D., M.Sc.
$36,230

R01
*The Myofilament Basis of HFpEF*
PI: Martin M. LeWinter, M.D.
$191,000

R01 HL120877
*Analysis and Characterization of Trauma-Induced Coagulopathy*
PI: Kenneth Mann, Ph.D., and Mark T. Nelson, Ph.D. (Lead Project 12 and Co-I Project 1)
$23,769,600
Research Funding: Highlights (continued)

Non-Profit Funded Research

**American Heart Association**
*Coupled myosin Va motor communication during cargo transport in vitro*
PI: M. Yusuf Ali, Ph.D.
$308,000

*Functional interaction between platelet-derived growth factor receptor-beta and cyclic-AMP-dependent protein kinase A*
PI: Paula Deming, Ph.D.
$308,000

*Hydrogen peroxide and age-related sympathetic nervous system dysregulation*
PI: Benedek Erdos, Ph.D., M.D.
$308,000

*Mechanisms of EGF receptor activation leading to decreased cerebral blood flow after subarachnoid hemorrhage*
PI: Masayo Koide, Ph.D.
$308,000

**Fondation Leducq**
*Pathogenesis of Small Vessel Disease of the Brain*
North American Coordinator: Mark T. Nelson, Ph.D.
$6,000,000 (5 years)

**March of Dimes Foundation**
*Mechanical Control of Chromosome Geometry*
PI: Jason Stumpff, Ph.D.
$82,500

**Preeclampsia Foundation Vision Award**
*The Role of Efflux Transporters on the Blood-brain Barrier in Preventing Seizure During Pregnancy*
PI: Erica Hammer, M.D.
$25,000

**Totman Medical Research Trust**
*Cerebrovascular Research*
PI: Mark T. Nelson, Ph.D.
$150,000

**Industry Sponsored Research**

**Abbott Vascular**
*ABSORB 3: A randomized trial comparing a fully bioresorbable drug eluting poly lactic acid polymer coronary stent versus a permanent everolimus eluting coronary stent*
PI: Harold Dauerman, M.D.
$44,500

**Baxter BioScience**
*Evaluation of B-domainless Factor VIII Products*
PI: Saulius Butenas, Ph.D.
$399,824
**Boston Scientific**
*Prospective Randomized Evaluation of the WATCHMAN LAA Closure Device In Patients with Atrial Fibrillation Versus Long Term Warfarin Therapy (PREVAIL) and Continued Access to PREVAIL (CAP2)*
PI: Daniel Lustgarten, M.D.
$66,000

**diaDexus**
*Lipoprotein-Associated Phospholipase A2 (Lp-PLA2) Activity and the Risk of Stroke, Coronary Heart Disease and Cognitive decline in REGARDS*
PI: Mary Cushman, M.D., M.Sc.
$50,340

**Medtronic**
*A Novel Treatment for Heart Failure with Preserved Ejection Fraction*
PI: Markus Meyer, M.D.
$100,000

**Attain Performa Quadripolar Lead Clinical Study**
PI: Daniel Lustgarten, M.D.
$9,400

**CoreValve® Expanded Use and Continued Access Transcatheter Aortic Valve Replacement Registries**
PI: Harold Dauerman, M.D.
$873,500 for 92 patients

**CoreValve® Surgical Replacement and Transcatheter Aortic Valve Implantation (SURTAVI and Pivotal Randomized Trials)**
PI: Harold Dauerman, M.D.
$273,400 for 26 patients

**Pacing-induced Remodeling in a Swine Model of Left Ventricular Hypertrophy II**
PI: Markus Meyer, M.D.
$75,000

**Pacing-induced Remodeling in a Swine Model of Left Ventricular Hypertrophy III**
PI: Markus Meyer, M.D.
$20,000

**Product Performance Platform**
PI: Robert Lobel, M.D.
$23,000

**SIMPPLICITY HTN-3: A randomized trial of renal denervation versus maximal medical therapy for severe hypertension**
PI: Harold Dauerman, M.D.
$100,000

**Sanofi**
*Odyssey Outcome Trial*
PI: Friederike Keating, M.D.
$56,000

**St. Jude Medical**
*Quadripolar Pacing Post Approval Study*
PI: Daniel Lustgarten, M.D.
$7,700

**The Medicines Company**
*Transition from Cangrelor to Ticagrelor, Prasugrel, and Clopidogrel*
PI: David J. Schneider, M.D.
$136,800
Research Publications: A Sampling

Across our academic medical center campus, throughout the region, and around the world, teams of physicians and scientists are dedicated to reducing the incidence, morbidity, and mortality of heart and vascular diseases through improving prevention, diagnosis and treatment. We are pleased to present a sampling of publications from our University of Vermont colleagues engaged across a wide range of cardiovascular research.

Heart/Muscle Function and Failure, Heart Rhythm Disorders


**Hemostasis/Thrombosis**


Bouchard BA, Gissel MT, Whelihan MF, Mann KG, Butenas S. Platelets do not express the oxidized or reduced forms of tissue factor. Biochim Biophys Acta. 2014;1840:1188-93


Research Publications: A Sampling (continued)


Rehabilitation and Prevention


Myocardial Infarction Genetics Consortium I. Inactivating mutations innpc1l1 and protection from coronary heart disease. NEJM. 2014; 371:2072-82.


Vascular Biology/Vascular Intervention/Myocardial Infarction/Stroke


Vascular Function in Pregnancy: Preeclampsia


In Memory of

Burton E. Sobel, M.D.

University Distinguished Professor of Medicine
E.L. Amidon Professor and Chair of Medicine
Founding Director, Cardiovascular Research Institute of Vermont

An inspiring and internationally-recognized leader in cardiovascular medicine, Dr. Sobel founded the Cardiovascular Research Institute of Vermont (CVRI) in 2002 and served as its Director until his death in 2013. To honor his memory and continue his legacy, the Burton E. Sobel, M.D. Memorial Fund was established at the University of Vermont.

After graduating from Cornell University, Dr. Sobel obtained his M.D. from Harvard Medical School (magna cum laude) followed by a residency in Internal Medicine at Peter Bent Brigham Hospital and cardiology training at the National Institutes of Health. He began his career on the faculty at the University of California San Diego and then joined Washington University in St. Louis as Director of the Cardiovascular Disease Division. He subsequently rose to become Distinguished Professor in Cardiovascular Disease and Director of the Center for Cardiovascular Research. In 1994, Dr. Sobel relocated to the University of Vermont to lead the Department of Medicine, and was honored as an inaugural University Distinguished Professor in 2009.

He received many prestigious awards; led diverse research and training programs funded by the National Institutes of Health, the American Diabetes Association, and the American Heart Association; published more than 800 manuscripts; edited major cardiovascular and medical scientific journals; and held several patents.

Dr. Sobel was a consummate scholar. Research he led was responsible for enzymatic sizing of myocardial infarction and subsequently thrombolytic therapy for the treatment of ST elevation myocardial infarction. During the past two decades Dr. Sobel focused his energy on diabetes and particularly the role of plasminogen activator inhibitor type-1 (PAI-1). During his career he was the editor or associate editor of top medical journals including Circulation, the Journal of Clinical Investigation, American Journal of Physiology and Coronary Artery Disease and served on numerous scientific advisory committees for the NIH and other premier research organizations. He was also a highly regarded leader in subspecialty societies including the American College of Cardiology, the American Heart Association and the Society for Experimental Biology and Medicine. Dr. Sobel’s contributions were nationally recognized through numerous honors and awards including Distinguished Scientist of the American College of Cardiology, election to the Society of Clinical Investigation, and the 2010 Distinguished Scientist Award from the Society for Experimental Biology and Medicine, who also honored him with the named Burton E. Sobel Annual Young Investigator Award.