MESSAGE FROM THE DIRECTOR

The Cardiovascular Research Institute of Vermont (CVRI) seeks to foster cardiovascular research. We accomplish this mission by promoting collaboration, highlighting research accomplishments in cardiovascular disease, and supporting career development. In the pages that follow you will see the mission of the CVRI brought to life as we highlight efforts designed to improve the care of patients with cardiovascular disease and highlight achievements that include grant funding, participation in clinical trials, and the publication of research findings.

In July 2017, the University of Vermont invested Benedek Erdos, M.D., Ph.D. as the inaugural Bloomfield Early Career Professor in Cardiovascular Research. Dr. Erdos was selected by the Board of Directors of the CVRI who felt that he was exceptionally well qualified for this prestigious honor. Dr. Erdos has pioneered an innovative hypothesis that brain-derived neurotrophic factor may be a common mediator of hypertension. His research uses novel genetic tools that could change our ability to treat hypertension and prevent cardiovascular events because hypertension is a major cause of morbidity and mortality. The Board felt that the support provided by this Professorship should enhance the likelihood of success for this talented junior investigator.

Dr. Martin Bloomfield, an alumnus of the University of Vermont and a member of the Cardiovascular Leadership Council, has chosen to give back to his alma mater in a meaningful manner by endowing this Professorship that is designed to both recognize and support an extraordinary early career investigator in cardiovascular research.

Jim Ray, who was an avid cyclist who died of heart disease in 1996. Early Career Investigators in cardiovascular research are the beneficiaries because funds raised by this ride in 2017 were used to support attendance of early career scientists and physicians at leading-edge conferences and educational forums. Additional support for early career investigators is provided by a gift from Paul Millman (also a member of the Cardiovascular Leadership Council) and his company, Chroma Technologies. This funding supports summer research projects in cardiovascular disease by first-year medical students.

The Early Career Advisory Committee of the CVRI actively promotes cardiovascular research and enhanced collaboration through a series of events designed to encourage scientific exchange. This spring, the Early Career Advisory Committee awarded small grants to junior investigators. The selection process has been educational for both the applicants and the Early Career Advisory Committee, who were provided with a "grant review boot camp" by their Board advisor, Dr. Mary Cushman.

We are proud of the accomplishments achieved in cardiovascular research at the University of Vermont. Thank you for taking the time to learn about these accomplishments in the pages that follow.
Cardiovascular Research News

CUSHMAN PRESENTS STUDY ON INCREASED TV VIEWING & BLOOD CLOT RISKS AT AHA

Philip Ades, M.D., CVRI Distinguished Investigator and UVM Professor of Cardiovascular Medicine, provided his presentation at the American Heart Association’s Scientific Sessions 2017 in Anaheim, Calif, November 2017.

“Watching TV itself isn’t likely bad, but we tend to snack and sit still for prolonged periods while watching,” said Mary Cushman, M.D., M.Sc., co-author of the study and professor of medicine at the Larner College of Medicine at the University of Vermont and a CVRI Board of Directors member.

Prolonged TV viewing has already been associated with heart disease involving blocked arteries, but this is the first study in a western population to look at blood clots in veins of the legs, arms, pelvis, and lungs called venous thromboembolism or VTE.

Among 15,158 middle-aged (45-64 years) participants in the Atherosclerosis Risk in Communities Study, researchers found that the risk of developing a venous thromboembolism for the first time was:
- 1.8 times higher in those who reported they watch TV “very often” compared with those who watch TV “never or seldom”;
- 1.8 times higher in participants who met recommended guidelines for physical activity and reported watching TV “very often” compared with those who reported watching TV “never or seldom”;
- Increased with more TV viewing both for life-threatening clots in the extremities and those in the lungs; and while obesity was more common in people who watch TV “very often” compared with those who watch TV “never or seldom”;
- Each year, it is estimated that between 300,000 to 600,000 people in the U.S. develop venous thromboembolism. Besides avoiding prolonged TV watching, people can lower their risk by maintaining a healthy weight and staying physically active.

Other co-authors on the research presentation are Yasuhiko Kubota, M.D., and Aaron R. Folsom, M.D., M.P.H., of the University of Minnesota School of Public Health; Neil Zakai, M.D., M.Sc., of the UVM Larner College of Medicine; and Wayne D. Rosamond, Ph.D., M.S., of the University of North Carolina’s Gillings School of Global Public Health.

The National Heart, Lung, and Blood Institute funded the study.

Andrew Lombardo, UVM graduate student in molecular physiology and biophysics. 3D MODEL SYSTEM ILLUSTRATES HOW MOLECULAR MOTORS NAVIGATE

Andrew Lombardo, M.S., CVRI graduate student in molecular physiology and biophysics provided his presentation at the American Heart Association’s Scientific Sessions 2017 in Anaheim, Calif, November 2017.

“Similar to a tightrope artist carefully walking between two buildings, myosin motors have to navigate their cargo in a relatively straight line through the intersections despite the option to turn or stop.”

“In addition to Lombardo and Warshaw, co-authors on the study include UVM Molecular Physiology and Biophysics Ph.D. Yusuf Ali, Ph.D., Research Engineer Guy Kennedy, and CVRI Distinguished Investigator Kathleen Trybus, Ph.D, as well as Sam Walcott of the Department of Mathematics, University of California, Davis. This work was funded by the National Institutes of Health, National Science Foundation, and the National Aeronautics and Space Administration.

ADES’ CARDIAC REHAB EXPERTISE FEATURED IN CONSUMER REPORTS ARTICLE

Philip Ades, M.D., is featured in a Consumer Reports article titled, “Which, Missing from Your Heart-Attack Recovery Plan?” Part of the problem, as Ades explained, is the lack of geographically available options. “There are too few in many big cities, and in rural areas you could be a 3-hour drive from the nearest cardiac rehabilitation center,” he says. “Physical activity improves fitness, and if fitness is improved it’s easier to do daily activities. From small improvements in physical function can greatly improve quality of life and self-esteem, and lead to overall better health.”
Physician scientists can find inspiration—and solutions—in every corner of an academic medical center: the clinic, the research arena, or while teaching. That’s how Peter Spector, M.D., a University of Vermont professor of medicine and director of electrophysiology at The UVM Medical Center, came to co-develop—with Professor of Medicine and engineer Jason Bates, Ph.D.—a three-dimensional computational model of a human heart called Visible EP.

No matter the source of the inspiration, its ultimate focus remains the same: the development of new knowledge that can be put to use to offer better, more successful treatments and therapies to improve patients’ lives.

The software technology that Spector and Bates built is as remarkable as their collaboration. Spector came to the table with the vision of the final product and a deep understanding of electrophysiology and how the heart works, but was unfamiliar with the programming process. Bates possessed programming skills and expertise in computational models. Together, they produced a technology that very accurately models the electrical behavior of the human heart, to the smallest level of detail.

Bates and Spector created Visible EP (which stands for “electrophysiology”) as a means to gain a better understanding of how to cure the most common abnormal heart rhythm—atrial fibrillation (AF)—which afflicts more than five million people in the U.S. alone. Previous treatments had been less than adequate.

The result of their teamwork is a program that mimics the behavior of the heart from every aspect, as well as features the ability to provide unpredictable responses—a phenomenon called emergent behavior. While the parts of the heart and the rules of interaction have been programmed into the system, the computational heart model’s reaction is entirely emergent, says Spector.

“We’ve made, essentially, a living, breathing, interactive human heart,” he says. “It will sit there and beat in what would be the equivalent of a normal rhythm; you can induce every sort of abnormal heart rhythm that you can imagine that a patient could have, and it’s all happening on a computer screen.”

Visible EP’s emergent behavior feature makes it an attractive tool for medical education, as well as research applications. Because it can’t be readily seen, electrophysiology has been regarded as a particularly difficult specialty to teach; the field was waiting for just such a teaching tool as Visible EP.

Spector uses the Visible EP technology in his arrhythmia research lab. Using this computer model, combined with studies of the real human heart, the group has proposed a new approach to analyzing an individual patient’s electrical activity and to using this information to guide a new type of ablation. In addition, the team has developed a new catheter, signal processing...
algorithms and a mapping approach for treatment of AF. This work was initially sponsored by a generous grant from the Evslin Foundation.

One patient who typifies the beneficial outcomes that come from cardiovascular research is Paula Desseau of Essex Junction, Vt. Desseau has lived life with atrial fibrillation — “afib,” as she refers to it — for many years.

“If you look it up in a textbook, there’s no next move. We were stuck with pulling catheters out, waking Paula up, and telling her, ‘I’m sorry, there’s nothing we can do for you.’ But we knew from the work that we’re doing in the research lab that that’s not true. We used our catheters in a way that’s guided by the research work we’d done to tell us where we thought the fibrillation was coming from. We did a little bit more ablation than we had done already. That little bit made all the difference. Paula remained in normal rhythm for years after that final procedure.”

That research-based difference is something Paula Desseau thinks about every day.

“I don’t know if I’d be here today if Dr. Spector had not done all he did for me,” she says.
Benedek Erdos, M.D., Ph.D., an assistant professor in the Department of Pharmacology at the Robert Larner, M.D. College of Medicine at the University of Vermont, was invested in a formal ceremony on July 31, 2017 as the inaugural Martin E. Bloomfield ’56, M.D.’60 and Judith S. Bloomfield ’59 Early Career Professor in Cardiovascular Research.

The endowed professorship was established by Dr. Marty Bloomfield, a dual-degree UVM alumnus and retired cardiologist, and his wife, Judy, a fellow Catamount and retired psychologist. Dr. Erdos is receiving funding for two years, with potential funding for a third year, to support his research project: “Brain-Derived Neurotrophic Factor, a Novel Hypothalamic Mediator in Hypertension.”

Designed to significantly increase our understanding of the mechanisms of blood pressure regulation, the proposed studies in the Erdos Lab may help to identify novel therapeutic targets to treat hypertension. This faculty position is particularly significant because it marks the first time ever at the University of Vermont that an early-career professorship has been endowed. As federal funding for research becomes more competitive, private philanthropy can help launch promising young careers with the potential to benefit not only the University of Vermont, but society at large.

The Bloomfields’ decision to focus their philanthropic impact on an early-career professorship is based on personal experiences. At the time when Dr. Bloomfield was beginning his own career, research funding was not readily available. Years later, the Bloomfields’ son Dan — also a cardiologist — benefited early in his career through research funding from an endowed assistant professorship that serves as the inspiration for their gift.

Following remarks from UVM Foundation President and CEO Shane Jacobson, UVM President Tom Sullivan and Larner College of Medicine Dean Rick Morin, Dr. Erdos was presented with a medallion in front of family, friends, colleagues and students in the Hoehl Gallery at the Larner College of Medicine on the UVM campus. After receiving his medalion, Dr. Erdos invited Dr. Bloomfield to the podium to present the donor with a matching medallion, which was followed by comments from Dr. Bloomfield.

Now a revered campus tradition, the formal investiture ceremony recognizes the importance of endowed positions and is one of the highest honors UVM can bestow on its faculty members and the generous donors who make it possible.

Dr. Erdos received his medical degree and Ph.D. from Semmelweis University in Budapest, the oldest medical school in Hungary. Following post-doctoral work at Wake Forest University, he held research positions at the University of Florida prior to arriving at UVM in 2014.

Dr. Erdos’ research supports the mission of the CVRI, which leverages the world-class research facilities as well as clinical capabilities of the Larner College of Medicine and the UVM Medical Center to reduce the incidence, morbidity and mortality of heart and vascular diseases. Dr. Bloomfield in 2017 joined the Cardiovascular Leadership Council, a group of community members who serve as ambassadors for the CVRI.
Scholarly Events

The Cardiovascular Research Institute of Vermont (CVRI) brings outstanding scientists in cardiovascular medicine to The University of Vermont as Visiting Professors. A gift from Martin Bloomfield, M.D.’60 enables CVRI to host the Burton E. Sobel Visiting Professor series, which honors Burton E. Sobel, MD, the Founding Director of CVRI. In addition to formal lectures, each Sobel Visiting Professor participates in meetings with early career investigators and a “Scholar’s Tea,” where selected early career investigators meet as a group with the Visiting Professor to discuss any topic and ask any question that may come to mind.

BURTON E. SOBEL VISITING PROFESSOR SEMINARS

May 31 – June 1, 2017

ROBERT A. HARRINGTON, M.D.
Arthur L. Bloomfield Professor and Chair, Department of Medicine, Stanford University
Chair, FDA Cardiovascular and Renal Drugs Advisory Committee
and host of a regular podcast on theheart.org: The Bob Harrington Show
• Seminar: Education and Research in an Era of Quality, Big Data, Precision Medicine, and Digital Health
• Interactive Discussion: Social Media in Medicine: How social media is being used to access and disseminate science to both scientists and the public

October 4 – 6, 2017

DAVID C. GOFF, JR., M.D., PH.D.
Director, Division of Cardiovascular Sciences, National Heart, Lung, and Blood Institute
• Medicine Grand Rounds: Eliminating Cardiovascular Disparities through Community-Engaged Research: A thought exercise
• Interactive Discussion: Where’s the Funding Going: NHLBI Strategic Vision implementation for the Division of Cardiovascular Sciences

The Early Career Visiting Professorship was launched in 2017 by CVRI’s Early Career Advisory Committee (ECAC). These professorships bring to campus a successful early career investigator for a series of events focusing on trainees and junior investigators.

EARLY CAREER VISITING PROFESSOR SEMINAR

October 29 – 31, 2017

BENJAMIN PROSSER, PH.D.
Assistant Professor, Department of Physiology, Pennsylvania Muscle Institute, Perelman School of Medicine, University of Pennsylvania and The American Heart Association’s 2017 “Outstanding Early Career Investigator”
• Research Seminar: Inotropy via Cytoskeletal Regulation
• Interactive Discussion: Establishing Independence: Lessons learned in starting a new lab

Nels Olson, Ph.D., assistant professor, Pathology and Laboratory Medicine and ECAC Chair (left) presents Benjamin Prosser, Ph.D., with the ECAC’s “Rising Star Award” for impressive achievement early in his research career.

David C. Goff, Jr., M.D., Ph.D. delivers his Medicine Grand Rounds, “Eliminating Cardiovascular Disparities through Community-Engaged Research: A thought exercise,” on October 5, 2017 in the Davis Auditorium of the University of Vermont Medical Center. Dr. Goff’s visit was supported by the Martin E. Bloomfield, M.D. ’60 Endowed Visiting Professorship Fund.
Connecting Our Scholars
The Cardiovascular Research Institute of Vermont encompasses the full range of scholarship, from young scientists and physicians at the start of their careers to our Distinguished Investigators with decades of notable work to their credit. Through travel awards, research seminars, and an Early Career Advisory Committee available to them, junior investigators who are affiliated with the CVRI have plenty of rich opportunities to interact with and learn from their more experienced colleagues.

CVRI TRAVEL AWARDS
American Heart Association EPI/Lifestyle 2017 Scientific Sessions
Portland, OR – March 2017
Daniel Douce, M.D.
Fellow, Hematology and Oncology, Department of Medicine
POSTER PRESENTATION: Acute renal failure from contrast-induced acute kidney injury

American College of Cardiology 66th Annual Scientific Sessions
Washington, DC – March 2017
Mehdi Rambod, M.D.
Fellow, Cardiovascular Division, Department of Medicine
POSTER PRESENTATION: Near-unsettled platelet orthopaedics and old patient foresmen: To close it or not to close it?

Society for Reproductive Investigation 64th Annual Scientific Meeting
Orlando, FL – March 2017
Theresa Nga-Ling Ko, Ph.D.
Postdoctoral Associate, Department of Obstetrics, Gynecology and Theral Sciences
POSTER PRESENTATION: Extrinsic versus intrinsic mechanisms of preeclampsia

International Society on Thrombosis and Haemostasis 26th Congress
Berlin, Germany – July 2017
Carole McBride, Ph.D.
Research Specialist, Department of Obstetrics, Gynecology and Reproductive Sciences
POSTER PRESENTATION: Revascularization of the mouse abdominal aorta during and after pregnancy

Military Health System Research Symposium 2017
Kissimmee, FL – August 2017
Laura M. Haynes, Ph.D.
Postdoctoral Associate, Department of Biochemistry
ORAL POSTER: Procoagulant dynamics in burn patients over time

American Society of Hematology
Atlanta, GA – December 2017
Heather Wright, DO
Fellow, Internal Medicine, Department of Medicine
POSTER PRESENTATION: Venous thromboembolism (VTE) increases the healthcare burden in patients with malignant glioma (shown left)

Experimental Biology 2017
Chicago, IL – April 2017
Daniel M. Collin, Ph.D.
Research Assistant Professor, Department of Pharmacology
POSTER PRESENTATION: Extracellular histones induce propagating Ca2+ influx, Ca2+ overload, and endothelial cell death in resistance-sized mouse mesenteric arteries

Society for Cardiovascular Angiography and Interventions
New Orleans, LA – May 2017
Sreedvus Chava, M.D.
Fellow, Cardiovascular Division, Department of Medicine
POSTER PRESENTATION: Coronary CT angiography to detect severe coronary artery disease prior to transcatheter aortic valve replacement

American Heart Association Annual Scientific Sessions
Anaheim, CA – November 2017
Lakshmi Nambiar, M.D.
Fellow, Cardiovascular Division, Department of Medicine
POSTER PRESENTATION: Left ventricular end-diastolic volume predicts exercise capacity in patients with a normal ejection fraction

American Society of Nuclear Cardiology, 22nd Annual Scientific Session
Kansas City, MO – September 2017
Sherri Khadanga, M.D.
Fellow, Cardiovascular Division, Department of Medicine
POSTER PRESENTATION: Ratio of myocardial uptake to blood pool activity in dual-time-point 18F-FDG PET for the diagnosis of cardiac sarcoidosis

TCT – Transcatheter Cardiovascular Therapeutics
Denver, CO – October 2017
Amir Azarbal, M.D.
Fellow, Cardiovascular Division, Department of Medicine
POSTER PRESENTATION: Acute kidney recovery in patients undergoing transcatheter aortic valve replacement

CVRI TRAVEL AWARDS
American Heart Association EPI/Lifestyle 2017
Portland, OR – March 2017
Daniel Douce, M.D.
Fellow, Hematology and Oncology, Department of Medicine
POSTER PRESENTATION: Association of sickle cell trait with common electrocardiographic abnormalities in the Reasons for Geographic and Racial Differences in Stroke (REGARDS) study

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Understanding the causes and consequences of cardiovascular disease, from the molecular to the patient level, requires robust research to address these issues. The Larner College of Medicine carries out significant research that continues to expand our understanding of cardiovascular disease. Since the Larner College of Medicine was founded in 2017, it has received $85 million in funding from multiple sources, including federal, state, corporate, and non-profit funds.

**Cardiac Muscle**

- **National Institutes of Health (NIH)**
  - R01 HL133860
  - R01 HL131181
  - R01 HL133840
  - R01 HL132820

- **American Heart Association (AHA)**
  - Grant 17GRNT31160006

**Vascular Biology / Thrombosis**

- **National Institutes of Health (NIH)**
  - R01 HL131106
  - R01 HL131106
  - R01 HL131106

**Other Sources**

- **Other Sources**
  - Vermont, New York and Quebec Regional Heart Failure Research Network - $1,800,000

For a complete list of grants and funding sources, please visit [WWW.MED.UVM.EDU/CVRI](http://WWW.MED.UVM.EDU/CVRI) for continued updates.
### Funding from Other Agencies

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<th>Agency</th>
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<tr>
<td>Naval Health Research Center (NHRC) BAA 13-001</td>
<td>Complex Systems Approach to Characterizing Trauma-Induced Coagulopathy</td>
<td>NHRC</td>
<td>$2,613,270</td>
<td>Kathleen Brummel-Ziedins, Ph.D.</td>
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<td>European Union 666881 Horizont 2020</td>
<td>Small Vessel Disease in a Mechanistic Perspective: Targets for Intervention - Affected Pathways and Mechanisms for Prevention of Stroke and Dementia</td>
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<td>Mark T. Nelson, Ph.D.</td>
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<td>British Heart Foundation</td>
<td>Imaging Small Artery Endothelial Calcium Signals in Human Obesity: Does Damage to TRPV4 Channel Function Explain Endothelial Dysfunction? Clinical Research Training Fellowship at UVM for Majid Ahmed</td>
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<td>Adam S. Greenstein, Ph.D., and Mark T. Nelson, Ph.D.</td>
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<td>Fondation Leducq</td>
<td>Pathogenesis of Small Vessel Disease of the Brain</td>
<td>North American Coordinator: Mark T. Nelson, Ph.D.</td>
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<td>Totman Medical Research Trust</td>
<td>Cerebrovascular Research</td>
<td>Mark T. Nelson, Ph.D.</td>
<td>$150,000</td>
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### Clinical Trials/Industry Support

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<td>Sanofi</td>
<td>Novel Markers of Thrombotic Risk</td>
<td>David J. Schneider, M.D.</td>
<td>$372,000</td>
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<td>Bayer Healthcare</td>
<td>GALILEO: A Randomized Trial of Antiplatelet versus Antithrombotic Strategy with Rivaroxaban to Improve Outcomes after TAVR</td>
<td>Harold Dauerman, M.D.</td>
<td>$100,000</td>
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<td>Zeus Scientific</td>
<td>Measurement of sPLA2-IIA Protein Levels and Assessment of Associations with Cardiovascular Disease</td>
<td>Nancy Jenny, Ph.D.</td>
<td>$115,912</td>
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### Welcome Soiree

The event, held in the Garden Atrium at UVMMC, provided an opportunity for newcomers to meet others interested in cardiovascular research and learn about the programs and funding available through CVRI.
Cardiac Muscle

Acute myocardial hypertrophy
of neonatal cardiac myocytes
underlines the process of cardiac
growth and remodeling. J. Physiol.
2017;595:2721-30.


Cardiovascular Research Institute of Vermont • 2018 ANNUAL REPORT

Research Publications: 2017 Highlights

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 diagnosis, prevention, and treatment. We are pleased to provide a sampling of the research and high-profile presentations from our University of Vermont colleagues engaged across various disciplines of cardiovascular research.

Cardiovascular Disease


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Cardiovascular Disease


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 advocate and engage Vermonters and the broader community in support of cardiovascular medicine.

Marty Bloomfield, M.D.
New York, N.Y.

Lauren Curry
Westford, Vt.

Mary Evslin
Stowe, Vt.

Peter Gibbs
Shelburne, Vt.

Glen Wright
Shelburne, Vt.

Board of Directors

David J. Schneider, M.D., F.A.C.C., F.A.H.A., Director
Professor of Medicine, UVM Larner College of Medicine; Director, Cardiovascular Institute of Vermont

Mark Nelson, Ph.D.
Keynote Speaker: Capillaries as Decoders of Neural Rhythm in the Brain: Translating thought into blood flow

Marilyn Cipolla, Ph.D.
Regulation of Vascular Resistance in the Brain: Physiology and Pathophysiology

Alliance Sante Quebec
Quebec, Canada – October 2017
Russell Tracy, Ph.D.
The Research University of the Future

International Symposium on Collaterals to the Brain
Los Angeles, CA – November 2017
Marilyn Cipolla, Ph.D.
Impact of Hypertension on Pial Collateral Function

American Heart Association Annual Scientific Sessions
Anaheim, CA – November 2017
Neil Zakai, Ph.D.
Cutting the Atherothrombotic Risk in Patients with Diabetes Mellitus: Frontiers in Medicine: Risk Stratification and Management of Acute Pulmonary Embolism

American Society of Hematology 59th Annual Meeting
Atlanta, GA – December 2017
Neil Zakai, Ph.D.
Recent Cerebral Sinus Thrombosis: Why was anticoagulation not enough?

International Society on Thrombosis and Haemostasis 2017 Congress
Berlin, Germany – July 2017
Mara Olson, Ph.D.
A Basal-State Monocyte Gene Transcription Profile is Associated with Circulating Levels of T1 Cells: the Multi-Ethnic Study of Atherosclerosis (MESA)

International Symposium on Resistance Arteries
Manchester, UK – September 2017
Mark Nelson, Ph.D.
Impact of Hypertension on Pial Collateral Function

American Heart Association International Stroke Conference
Houston, TX – February 2017
Marilyn Cipolla, Ph.D.
Sanguinate™ Opens Collaterals, Improves Perfusion and Decreases Infarction in Spontaneously Hypertensive Rats

Japanese Circulation Society
Kanazawa, Japan – March 2017
Mary Cushman, M.D., M.Sc.
Current Use of Antiplatelet Agents for Acute Coronary Syndromes in the United States

Trans-NIH Workshop on Chronic Inflammation Biomarkers in Disease Development and Prevention
Rockville, MD – May 2017
Russell Tracy, Ph.D.
Development of Chronic Disease Biomarkers Based on Inflammation and Adaptive Immunity

International Society for Advancement of Cytometry 32nd Congress
Boston, MA – June 2017
Margaret Doyle, Ph.D.
Cellular Biomarker Discovery: Assay Validation and Quality Control in High-Throughput Population Studies with an Eye Towards Clinical Utilization

International United Leukodystrophy Foundation Meeting
Minneapolis, MN – July 2017
Fabrice Dabertrand, Ph.D.
Capillary Control of Cerebral Blood Flow, and Its Disruption in Small Vessel Disease

American Heart Association International Stroke Conference
Houston, TX – February 2017
Marilyn Cipolla, Ph.D.
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