Celebrating 75 Years of Distinction

Groundbreaking research in the use of thrombolytics for acute myocardial infarction (AMI). Advancements in cardiac imaging, mechanical assist devices, and aortic and mitral valve repair. Development of the MAZE procedure to treat chronic atrial fibrillation. Internationally recognized research into cardio-genetics, heart failure, and other areas that have led to changes in best practices and therapeutic advances that have improved patient outcomes.

These are just a few of the outstanding achievements in a Cardiovascular Division that continues to build upon the legacy of its founders and advance the understanding and treatment of cardiovascular diseases. “This rich legacy is reflected not only by the impact of our discoveries and milestones on the medical and scientific fields, but also by the large numbers of cardiology leaders trained by the Division who have gone on to establish their own legacies,” says Sumanth Prabhu, MD, the Tobias and Hortense Lewin Distinguished Professor of Cardiovascular Diseases and Chief of the Cardiovascular Division. “Today we have more than 80 faculty and have more than 300 fellows who have completed our training program and continue to provide excellent cardiovascular care or pursue groundbreaking scientific and clinical research.”

The legacy began in 1947 when the Cardiology Division was established at Barnes Hospital under the leadership of Dr. John Smith. In 1969, Dr. Charles Oliver served as the first chief of cardiology at the adjacent Jewish Hospital of St. Louis. At both institutions, faculty were recognized for outstanding advancements in cardiovascular medicine.

At Jewish Hospital, Dr. Sol Sherry first used streptokinase as a thrombolytic agent to treat AMI in 1958. Building upon that, Dr. Burton Sobel, Chief of Cardiology at Barnes Hospital from 1973 to 1993, pioneered the development of tissue plasminogen activators (tPA) as clot-dissolving agents that reduced deaths due to acute myocardial infarction and coronary artery disease. “The epicenter in the US for pioneering reperfusion therapy by coronary thrombolysis for AMI in the mid-1980s was here at WashU and BJH, which is why I wanted to come here,” says long-time faculty member Richard Bach, MD, director of the Cardiac Intensive Care Unit and Hypertrophic Cardiomyopathy Center of Excellence and Section Chief of Critical Care Cardiology. “Dr. Sobel, along with Steven Bergmann, MD, PhD; Phil Ludbrook, MD; and Alan Tiefenbrunn, MD, worked together to administer tPA to the first patient in the United States in 1984. Few treatment advances have been as dramatic as reperfusion was for AMI, and this therapy has saved countless hearts and lives over the past 35 years.” Following in their footsteps, Dr. Bach later led efforts that established best-practice guidelines for management of AMI patients, leading to the hospital being ranked among the Top 5 in the country for the lowest MI mortality rate by the Center for Medicare Services (CMS). Over at The Jewish Hospital,
I want to take this opportunity to invite you to a special event. The celebration of the 75th anniversary of our Cardiovascular Division will take place on November 11, 2022, here at Washington University School of Medicine.

This celebration is a chance for all of us to honor our Division’s past of discovery and distinction and take pride in the tradition of excellence in patient care, cardiovascular training, and research. As noted in our front page story, we have a strong foundation of advancing the field of cardiovascular medicine and in training the next generation of clinicians, investigators, and physician-scientists. We are rich in opportunities — with nationally ranked hospitals and internationally renowned faculty, community outreach initiatives, unique investigator pathways and an abundance of clinical training pathways. I’m proud, and humbled, to carry on this tradition of excellence and lead this division as Chief.

It is my hope that you will join us in November to help us honor our past, share memories, and hear about the latest research, education and clinical care updates that are all hallmarks of how we enrich our discipline and move the field forward.

Sumanth D. Prabhu, MD
Tobias and Hortense Lewin
Distinguished Professor
Chief, Cardiovascular Division

SAVE THE DATE
75th Anniversary of the Cardiovascular Division
November 11, 2022
Eric P. Newman Conference Center
Washington University School of Medicine

Dr. Louis Lange (Chief from 1986-1993) was nationally recognized for his research into lipid absorption and metabolism. Dr. Samuel Wickline, JH Chief from 1994 to 1997, brought the use of cardiac magnetic resonance imaging as both a clinical and research tool in cardiology to the forefront and procured the first dedicated cardiac MR scanner in the Midwest in 1995.

In 1997, Barnes Hospital and The Jewish Hospital of St. Louis merged to become one academic institution. Two separate cardiology divisions led by Michael Cain, MD (BH) and Samuel Wickline, MD, (JH) combined to form one Cardiovascular Division. Among the challenges of such a merger: “Resistance to change,” acknowledges Dr. Cain, who served as chief of the combined division for the next 10 years. “But we shifted the previous competitive energy between our institutions to become a competitive force against the world. We did that by creating an environment and decision-making process based on trust, respect, collaboration, and objectivity. The result was that our research, education, and clinical programs became stronger and more competitive.” Under Dr. Cain’s leadership, a Center for Cardiovascular Research (CCR) was established, led by Daniel Kelly, MD, who went on to serve as the next Chief of the Cardiovascular Division and who was internationally recognized for research into cardiac metabolism and heart failure. He was followed by Douglas Mann, MD, who served as the next Division chief from 2009 to 2019. His priorities were focused on expansion and support of research activities that translated into better patient care and outcomes. “We expanded the depth and breadth of research programs and recruited Jeanne Nerbonne, PhD, to lead a re-invigorated CCR,” recalls Dr. Mann. “That led to the establishment of an annual campus-wide Cardiovascular Research Day. We also expanded opportunities for scientific investigator pathways and enhanced our cardiology fellowship program to include a third year of sub-specialty training.”

“We will continue to honor the work of the many physicians and scientists who have been a part of our division over the past 75 years,” says Dr. Prabhu. “With the novel research and outstanding patient care and teaching we provide today, I have no doubt this wonderful legacy will continue for years to come.”

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If you are interested in making a donation to the Cardiovascular Division, please contact Rachel A. Hartmann in the Medical Advancement Office at: 314-935-9715 or rachel_hartmann@wustl.edu

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Alumni Update

Michael E. Cain, MD, FAHA, FACC, FHRS
Cardiology Fellow, 1977–1979
Chief, Cardiovascular Division, 1994–2006
Currently: Professor of Medicine and Biomedical Engineering, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, NY

Dr. Cain recently stepped down after serving as Vice President for Health Sciences (2011-2021) and Dean of the Jacobs School of Medicine and Biomedical Sciences at the University at Buffalo from 2006 to 2021. Prior to his time in New York, Dr. Cain had a long-standing history with Washington University School of Medicine. He completed his cardiology fellowship here before moving to the University of Pennsylvania to obtain advanced training in cardiac electrophysiology. He subsequently returned to WashU as the inaugural director of the Clinical Cardiac Electrophysiology Laboratory at Barnes Hospital and rose to become Chief of the Cardiovascular Division from 1994 to 2006.

As Dean of the Univ. at Buffalo’s School of Medicine, Dr. Cain spearheaded construction of a new Clinical and Translational Research Center as well as a new ambulatory care center and a new medical school facility. He was instrumental in establishing the university’s departments of Biomedical Engineering and Biomedical Informatics and created the Medical Education and Educational Research Institute. As VP for Health Sciences, Dr. Cain also oversaw four health science schools (Dental Medicine, Nursing, Public Health and Health Professions, and Pharmacy and Pharmaceutical Sciences).

Favorite WashU Memories: Dr. Cain says at WashU, there was a “magical environment where innovation was possible. Camaraderie and internal collaborations allowed for not only achievement of excellence in many areas, but also the development of lifelong friendships.” Among his fondest memories was the support and leadership of former Division Chief Dr. Burton Sobel and Dr. Peter Corr, who served as Dr. Cain’s research mentor. During his own time as head of the Cardiovascular Division, Dr. Cain facilitated the integration of cardiology programs after the merger of Barnes and Jewish hospitals. Always interested in advancing the field, Dr. Cain fostered a strong environment of clinical excellence, vibrant research, and dynamic training opportunities. “We enhanced collaborations with cardiothoracic surgery and pediatric cardiology, and established new fellowship pathways in cardiac imaging, heart failure, and adult congenital heart disease,” he recalls. “We also expanded clinical locations. It was these combined efforts that led to the Division achieving a Top 10 cardiovascular ranking in U.S. News & World Report’s listing of Best Hospitals in America.”

Favorite Leisure Activities: Dr. Cain loves to travel. Among his many trips, was one to Malaysia with his wife, Peggy. The two also hosted an annual Boat Ride with the Dean as a fundraiser for the University at Buffalo’s medical student community clinic.
FACULTY NEWS

New Faculty

Anubha Agarwal, MD, MSc, has been named Assistant Professor of Medicine and Co-Director of the Global Cardiovascular Health (GCVH) program within the Global Health Center in the Department of Medicine. Her goal is to develop and implement evidence-based interventions to improve the cardiovascular health of under-treated populations globally, including in the United States. She also provides clinical care for inpatient cardiology and the cardiology consult service. Dr. Agarwal holds a medical degree from Stanford University School of Medicine and a master’s degree in Global Health Science from Northwestern, where she also completed her cardiovascular training. Three research fellowships in global cardiovascular health research followed — in Kenya and Australia, as well as in India, where she served as an NIH Fogarty Global Health Fellow. At Washington University, Dr. Agarwal has a Pathway to Independence (K99/R00) award to further her global cardiovascular health research.

Zainab Mahmoud, MD, MSc joins as an Instructor in Medicine. Dr. Mahmoud completed her cardiovascular fellowship at WashU and received advanced clinical training in cardio-obstetrics. Concurrently, she also earned a master’s degree in Health Policy from the Imperial College in London. Dr. Mahmoud has received the ACC/ABC Merck Research Fellowship Award to pursue patient-oriented research in Nigeria focused on hypertensive disorders of pregnancy. Collaborating with global health researchers in Nigeria and United States, she seeks to improve the cardiovascular care of pregnant women and ultimately decrease maternal morbidity and mortality, both in the US and in Nigeria.

David Rawnsley, MD, PhD, joins as an Instructor in Medicine. Dr. Rawnsley is a graduate of the WashU Physician Scientist Training Program and completed both his residency in internal medicine and cardiology fellowship here. Postdoctoral training was in the laboratory of Dr. Abhinav Diwan, where he identified a novel role for the E3 ubiquitin ligase TRAF2 in cardiomyocyte mitophagy, and a novel role for proteostasis in cardiomyocytes under metabolic stress from excessive lipid accumulation. That research led to a successful K08 career development grant to further independent research studying the role of lysosomes and autophagy in cardiovascular development and in cardiac repair with the goal of translating findings into novel therapeutics.

Nancy K. Sweitzer, MD, PhD, joins as Professor of Medicine in the Heart Failure/Transplant Section and Director of Clinical Research. Dr. Sweitzer also serves as Vice Chair of Clinical Research for the Department of Medicine. Dr. Sweitzer earned her MD/PhD from the University of Wisconsin. Her PhD in Physiology involved the study of the contractile biophysics of single cardiac myocytes. She pursued post-graduate internal medicine and cardiology training at Brigham and Women’s Hospital in Boston. She joined the faculty at Harvard and then returned as faculty at the University of Wisconsin, where she served as Director of Clinical Research, Director of Quality and Director of the Fellowship Program. In 2014, she moved to the University of Arizona at Tucson and was named Chief of Cardiology and Director of the Sarver Heart Center. She also was the co-director of the graduate program in Clinical Translational Science. Dr. Sweitzer will lead the integration and expansion of clinical research and clinical trials in the Division, and the Department.

Isik Turker, MD, PhD, joins the faculty as Assistant Professor of Medicine in the Cardio-Oncology Section. Dr. Turker completed her internal medicine residency and cardiology fellowship at Indiana University. She practiced as a non-invasive cardiologist and then went on to receive advanced training in cardio-oncology as well as completed a T32 research fellowship at Vanderbilt University. Her research focused on progression of hypertension and atherosclerosis in patients receiving immune checkpoint inhibitors. At WashU, she will focus on clinical inpatient and outpatient cardio-oncology and will continue her research on cardiovascular side effects of targeted therapies and immunotherapy.

Notes

Linda Peterson, MD, FACC, FAHA, FASE, Professor of Medicine and Radiology, has been named President-elect of the international Society for Heart and Vascular Metabolism (SHVM). The Society provides a forum for investigators with interests in the multiple roles of intermediary metabolism in the cardiovascular system. Dr. Peterson’s research focuses on the roles that obesity, insulin resistance, and diabetes have on myocardial metabolism, structure, and function. She also researches nutritional therapies for heart failure and is a member of the Department of Internal Medicine’s Diabetes Research Center. Dr. Peterson was on the board of SHVM from 2015 to 2019. She travels to Seoul, South Korea in mid-October to be installed as president. SHVM also will hold its annual meeting in St. Louis in 2024.

Sumanth D. Prabhu, MD, the Tobias and Hortense Lewin Distinguished Professor of Cardiovascular Diseases and Chief of the Cardiovascular Division, was the keynote speaker for the Robert M. Berne Distinguished Lectureship of the American Physiological Society. The lectureship award is presented annually at the APS Annual Meeting and recognizes an emerging leader in cardiovascular research whose investigations are at the peak of research innovation and productivity. Dr. Prabhu spoke on “Heart Failure as an Immune Mediated Disease.”
Cardiac Radiotherapy Induces Electric Conduction Reprogramming

A recent clinical study from Washington University School of Medicine brought together cardiologists, engineers, radiologists, and radiation oncologists to invent a novel and noninvasive radiation therapy to treat ventricular tachycardia. Building upon this groundbreaking discovery using focused radiation to treat scarred parts of the heart which harbor electrical short-circuits, the team of researchers studied the electrical effects of radiation therapy in hearts from mice and humans who had undergone heart transplantation. The study, which appeared in Nature Communications, found that radiation therapy targeted at the heart surprisingly can fix electrical problems that cause life-threatening arrhythmias. “Arrhythmias often happen because of slow electrical conduction speeds around and through scar,” says lead investigator Stacey L. Rentschler, MD, PhD. “Radiation therapy seems to kick up the speed faster by activating early developmental pathways that revert the diseased heart tissue back into a healthier state.” Specifically, scientists found that a single dose of radiation treatment temporarily activated Notch signaling, a developmental pathway that plays a significant role in the formation of the heart’s electrical conduction system. Dr. Rentschler and colleagues received a $3.2 million NIH grant to continue their studies of radiation therapy in multiple model systems, including mice, large animals, and humans, with the goal of translating these studies into improved patient outcomes.

Cardiovascular Precision Medicine Research Initiative Under Way

The Center for Cardiovascular Research (CCR) has established a robust Cardiovascular Precision Medicine Research Initiative (CPRI) to escalate efforts to identify and target the mechanisms that initiate and drive cardiovascular disease pathogenesis, specifically heart failure. At its core is a human cardiovascular tissue repository established by Jeanne Nerbonne, PhD, called the WU Translational Cardiovascular Biobank and Repository, and a separate Heart Failure Registry started by Douglas Mann, MD, that is a compilation of blood samples and medical information from patients with heart failure.

“We have thousands of samples going back to 2010 and continue to add to the repositories each year,” says CPRI director Kory J. Lavine, MD, PhD. “Nathan Stitziel, MD, PhD; Jeanne Nerbonne, PhD; and Michael Greenberg, PhD, are key members of this initiative. With tissue samples, we can touch the disease we study and conduct impactful research with advanced technologies to identify potential therapeutics. We also can leverage these tissue resources and share them with our partners across the globe to accelerate translational research.”

Lavine, also associate director of the CCR, says researchers are homing in on the underlying cellular landscape of cardiac diseases such as coronary artery disease, heart failure, and myocarditis. By using single cell sequencing and studying the transcriptome, he says specific types of cells can be identified for potential drug targeting. “We performed these type of analyses with dilated cardiomyopathy and cardiac sarcoidosis and discovered new types of immune cells that emerge during disease,” he says. This recent research is published in Nature Cardiovascular Research and accepted for Circulation Research.

Several grants support research within the Initiative. Additional support also comes from the School of Medicine and the Department of Medicine as well as the Cardiovascular Division. Lavine’s own research into the causes and mechanism of heart failure led to the development of an imaging tracer to visualize harmful monocytes and macrophages in the heart and a series of molecules that block interleukin-1 receptor-associated kinase (IRAK), a signaling pathway that is instrumental in activating inflammatory processes in this cell population. He and his colleagues recently received a $6 million grant from the NIH’s National Heart, Lung, and Blood Institute to develop new therapies for heart failure and the prevention of organ rejection following heart transplantation. Already, the team has identified macrophages that play key yet diverging roles in damaging inflammation and beneficial healing.
Mann Honored By American College of Cardiology

Douglas L. Mann, MD, the Ada L. Steininger Professor of Cardiology, and former chief of the Cardiovascular Division at Washington University School of Medicine, was honored with the American College of Cardiology’s 2022 Distinguished Scientist Award in the translational domain category. The award is given to an ACC fellow who has made major contributions to the advancement and translation of scientific knowledge in the field of cardiovascular disease. Dr. Mann, a renowned heart failure specialist, was honored for his extensive research, which has uncovered key roles for the immune system and inflammatory signals in the heart in the development and progression of heart failure.

Douglas Mann, MD