# CARDIOVASCULAR MEDICINE

**Mark Josephson, MD, Chief — The Cardiovascular Medicine Division at BIDMC is committed to providing high-quality care to our patients, promoting the educational mission of academic medicine and advancing state-of-the-art research in cardiovascular medicine. The Division, which is an integral part of BIDMC's CardioVascular Institute, includes some of the most highly-regarded cardiovascular experts in the world, and it is their exemplary patient care, teaching and research that make possible this year's many accomplishments.**

## Highlights

### Genetic Heart Disease Research

Pathological hypertrophy, an abnormal growth of the heart that frequently leads to heart failure, is often seen in adults after a heart attack or in response to stressors such as high blood pressure. It can also be found in children born with a certain genetic mutation, which can have lethal consequences. To better understand pathological hypertrophy, Dr. Maria Kontaridis created a mouse model of LEOPARD syndrome, an inherited disorder caused by mutations in the Shp2 phosphatase. By engineering a mouse that harbored the most common human mutation, Dr. Kontaridis was able to replicate the features seen in patients, including cardiac hypertrophy, and investigate the responsible molecular mechanisms. She found that... of the mTOR kinase. Remarkably, she also discovered that the cardiac defects were completely reversed by treatment with rapamycin, an inhibitor of mTOR that is already approved for clinical use in other contexts. These results suggest that rapamycin or similar mTOR inhibitors could be useful for treating LEOPARD syndrome patients and possibly patients with other more common forms of pathological cardiac hypertrophy. Dr. Kontaridis has been widely recognized for her groundbreaking work, which was published this year in the *Journal of Clinical Investigation*.

### New Faculty

This year the Division welcomed several talented new physicians to its staff. Dr. Alfred Buxton, an internationally-recognized electrophysiologist who specializes in risk stratification for sudden death, joined the Division from Brown University where he was Chief of Cardiology. Dr. Saumya Das joined the Division from Massachusetts General Hospital to serve as a molecular genetics physiologist. Dr. Das is also developing a genetic arrhythmia clinic and has been working with Dr. Anthony Rosenzweig on a K grant from the National Institutes of Health. Dr. Elad Anter joined the Division from the University of Pennsylvania. He will help lead a complex ablation effort and will develop a whole animal experimental electrophysiology laboratory. Drs. Anne Riley and Meghan York, graduates of the Division's fellowship program, will be augmenting the clinical cardiology program at BID-Needham. They will also be part of the new Women's Cardiovascular Health Program.



*Top: Maria Kontaridis, PhD*

### Center for Comparative Efficacy, Cost Effectiveness and Ethics

Dr. Mark Josephson, Division Chief and Director of the Harvard-Thorndike Electrophysiology Institute and Arrhythmia Service, is developing a new Center for Comparative Efficacy, Cost Effectiveness and Ethics. With the involvement of fellow physician-researchers in the Division, including Drs. Alfred Buxton, Daniel Kramer and Matthew Reynolds, the Center builds upon the previous work of BIDMC's Medical Device Safety Institute. With the ultimate goal of improving outcomes for patients with cardiovascular disease worldwide, the Center will evaluate drugs, medical devices, treatments and procedures by conducting clinical trials as well as studying outcomes data compiled at BIDMC and at other institutions. It will serve as a resource for clinicians and investigators, offering expert assistance and guidance in developing and executing clinical trials. The Center will disseminate research results by publishing its findings in medical journals and presenting them at national conferences.

## Honors and Awards

**Zoltan Arany, MD, PhD –** Elected Member of the American Society for Clinical Investigation; received an Ellison Foundation Young Scholar Award and an R21 Award from the National Heart, Lung and Blood Institute; and was a finalist for an Early Career Investigator Award at the 2011 Keystone Cardiovascular Symposium.

**Saumya Das, MD, PhD –** Named American Heart Association Melvin Marcus Competition Finalist.

**Federica del Monte, MD, PhD –** Received an R21 Award from the National Heart, Lung and Blood Institute.

**Anthony Rosenzweig, MD –** Elected Member of the Association of American Physicians. He also received an R01 Award from the National Heart, Lung and Blood Institute.

**Connie Tsao, MD –** Received the Samuel Levine American Heart Association Young Investigators Award.

**Maria Kontaridis, PhD –** Received the Early Independent Career Investigator Award at the 2011 Keystone Symposium in Cardiovascular Disease. She was also awarded the 2010 American Heart Association Best Basic Cardiovascular Sciences Abstract in a national scientific session.

**Dwayne Pinto, MD –** Received the Emerging Leaders Mentorship Program award from the American College of Cardiology - Society of Cardiovascular Angiography and Interventions.

**C. Michael Gibson, MD –** Presented at the largest plenary session of late-breaking trials at the American Heart Association. His pivotal Atlas Study has received significant national media coverage.

**Mark Josephson, MD, Patricia Come, MD, C. Michael Gibson, MD, Joseph P. Kannam, MD, Roger J. Laham, MD, and Warren J. Manning, MD –** Recognized by *Boston Magazine* as 2010 "Top Docs."

## Patient Spotlight

***Frederick Schoch —*** *Three years ago, I developed atrial fibrillation and I feared that I'd have to give up a longtime passion – competitive rowing. After medication prescribed at another hospital failed, I went to see Dr. Mark Josephson, Chief of Cardiovascular Medicine, who successfully performed a non-surgical catheter ablation. A year after the procedure, I'm happy to report that I finished first in the 50-Plus category in Boston's Head of the Charles Regatta.*

### Women's Cardiovascular Health Program

The Division's Women's Cardiovascular Health Program reached critical mass this year with the recruitment of additional faculty. Led by cardiologist Dr. Loryn Feinberg, the staff now includes seven female cardiologists: Drs. Feinberg, Francesca Nesta Delling, Airley Fish, Anne Riley, Karen Thomas, Francine Welty and Meghan York. Specializing in the unique cardiac health needs of women, the program aims to evaluate and manage the following: women's cardiovascular risk factors, treatment of heart disease in women, pre-pregnancy risk assessment, care of pregnant women with cardiac disease and cardiovascular disease related to women's cancer treatment. The Women's Cardiovascular Health Program, which previously existed on an informal basis, will be formally launched in 2012 with ads in *Redbook*, *Good Housekeeping*, *Women's Day*, *Boston Globe Magazine* and on local television and radio stations, along with a patient education forum on women's cardiovascular health.

*The Women's Cardiovascular Health Program team. Clockwise from left: Francine Welty, MD, Karen Thomas, MD, Anne Riley, MD, Airley Fish, MD, Francesca Nesta Delling, MD, and Loryn Feinberg, MD. Meghan York, MD, is not shown here.*

## Faculty

**Amjad AlMahameed, MD, MPH**
**Evan Applebaum, MD**
**Zoltan Arany, MD, PhD**
**Julian Aroesty, MD**
**Aparna Bhagavat, MD**
**Alfred Buxton, MD**
**Matthew Coggins, MD**
**James Chang, MD**
**Donald E. Cutlip, MD**
**Saumya Das, MD, PhD**
**Federica del Monte, MD, PhD**
**Heather Duffy, PhD**
**Loryn S. Feinberg, MD**
**Eli Gelfand, MD**
**Ernest V. Gervino, ScD**
**C. Michael Gibson, MD, MS**
**Charles I. Haffajee, MD**
**Yuchi Han, MD**
**Thomas H. Hauser, MD**
**Robert W. Healy, MD**
**Kalon Ho, MD, MSc**
**Francis Hubbard, MD**
**Mark Josephson, MD**
**Lilian Joventino, MD**
**Peter Myung-Hoon Kang, MD**
**Joseph P. Kannam, MD**
**Maria I. Kontaridis, PhD**
**Roger J. Laham, MD**
**David E. Leeman, MD**
**Stanley Lewis, MD**
**Jian Li, PhD**
**William Maisel, MD, MPH**
**Warren Manning, MD**
**John E. Markis, MD**
**Murray A. Mittleman, MD, DrPH**
**Bruce Nearing, MD**
**Reza Nezafat, PhD**
**J. Peter Oettgen, MD**
**Thomas D. O'Halloran, MD**
**Panagiotis Papageorgiou, MD, PhD**
**Dana C. Peters, PhD**
**Duane S. Pinto, MD**
**Jeffrey Popma, MD**
**Carl Rasmussen, MD, PhD**
**Matthew R. Reynolds, MD, MSc**
**Anthony Rosenzweig, MD**
**Samuel Shubrooks, MD**
**Alexei V. Shvilkin, MD**
**Karen Thomas, MD**
**Richard L. Verrier, PhD**
**Francine Welty, MD, PhD**
**Gregory Wellenius, MD**
**Susan Yeon, MD**
**Peter J. Zimetbaum, MD**

## Selected Publications


Reynolds MR, Walczak J, White SA, Cohen DJ, Wilber DJ. Improvements in symptoms and quality of life in paroxysmal atrial fibrillation patients treated with radiofrequency catheter ablation vs. antiarrhythmic drugs. *Circ Cardiovasc Qual Outcomes* 2010; 3:615-23.

Parker MW, Mittleman MA, Waksmonski CA, Sanders G, Riley MF, Douglas PS, Manning WJ. Pulmonary hypertension and long-term mortality in aortic and mitral regurgitation. *Am J Med* 2010; 123:1043-8.

Marin TM, Keith K, Davies B, Conner DA, Guha P, Kalaitzidis D, Wu X, Lauriol J, Wang B, Bauer M, Bronson R, Franchini KG, Neel BG, Kontaridis MI. Rapamycin normalizes hypertrophic cardiomyopathy in a mouse model of LEOPARD Syndrome-associated PTPN11 mutation. *J Clin Invest* 2011; 121:1026-43.

Battaglia L, Aronson M, Neeman N, Chang JD, A "smart" heart failure sheet: using electronic medical records to guide clinical decision-making. *Am J Med* 2011; 124:118-20.

Ashida N, Senbanerjee S, Kodama S, Foo SY, Coggins M, Spencer JA, Zamiri P, Shen D, Li L, Sciuto T, Dvorak A, Gerszten RE, Lin CP, Karin M, Rosenzweig A. IKKβ regulates essential functions of the vascular endothelium through kinase-dependent and -independent pathways. *Nat Commun* 2011; 2:318.

Boström P, Mann N, Wu J, Quintero PA, Plovie E, Gupta R, Xiao C, MacRae CA, Rosenzweig A* and Spiegelman BM.* C/EBPβ controls exercise induced cardiac growth and protects against pathological cardiac remodeling. *Cell* 2010; 143:1072-83. *Authors contributed equally, co-corresponding.

Brott TG, Hobson RW, 2nd, Hoard G, Roubin GS, Iark VM, Brooks W, Marckey A, Hill MD, Leimgruber PP, Sheffet AJ, Howard VJ, Moore WS, Vocks JH, Hopkins IN, Cutlip DE, Cohen DJ, Popma JJ, Ferguson RD, Cohen SN, Blackshear JL, Silver FL, Mohr JP, Lal BK, Meschia JF. Stenting versus endarterectomy for treatment of carotid-artery stenosis. *N Engl J Med* 2010; 363:11-23.


Dr. Roger Laham received a patent this year for a novel catheter-based device that ligates the left atrial appendage on the outside of the heart. This patent has resulted in the launch of SentreHEART, a company that produces the device, commercially known as LARIAT. Dr. Laham also received a device and methods patent for his work on Cardiac Myotissue Transplantation that promises improved cardiac function and myocardial regeneration and repair in patients after myocardial infarction and congestive heart failure.

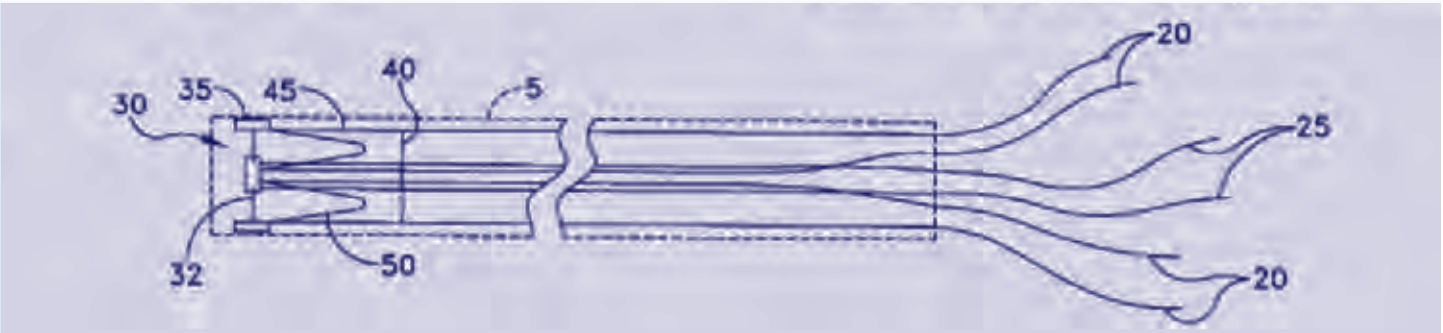


*Illustration from patent application for catheter-based device. Courtesy of Roger Laham, MD.*