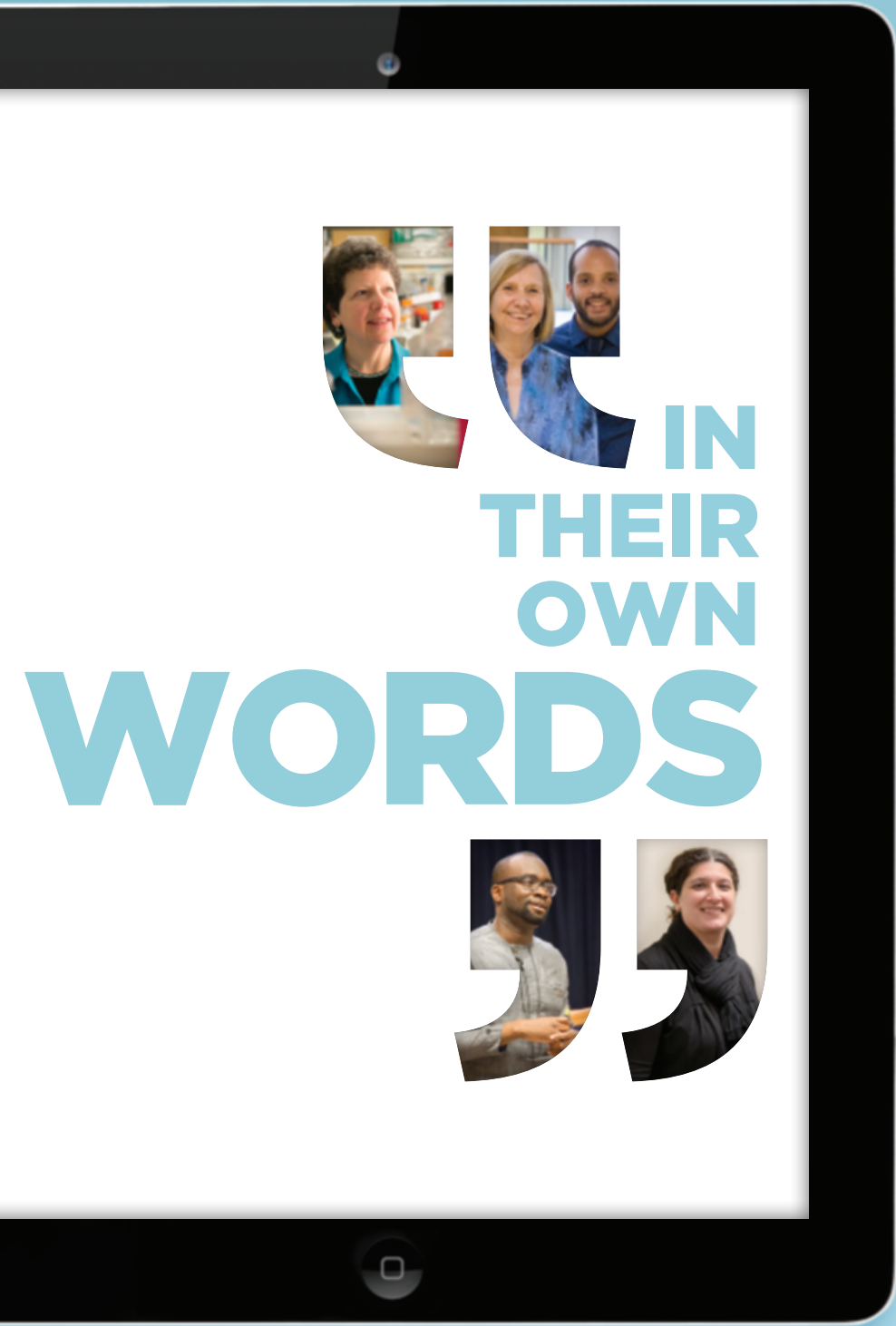


DEPARTMENT OF MEDICINE ANNUAL REPORT 2017



IN THEIR OWN WORDS



Beth Israel Deaconess
Medical Center



HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

This report is interactive. Use the Table of Contents, hyperlinks, and home button to navigate to an article or resource.



IN
THEIR
OWN



WORDS

Table of Contents

2

From the Chair

3

Departmental Organization

4

Eileen Reynolds, MD
A Conversation with Molly Hayes, MD

6

Jacyln Giannakoulis

8

Emmanuel Mensah, MD, MBA

10

Barbara Kahn, MD, MS

12

Adam Rodman, MD, MPH

14

Vicki Boussiotis, MD, PhD

16

Alexa McCray, PhD
A Discussion with Jorge Rodriguez, MD

19

Clinical Care
Continuously Improving Patient Care in an Expanding Health System

22

Honors and Accolades

24

Medical Education
Training the Next Generation of Physicians

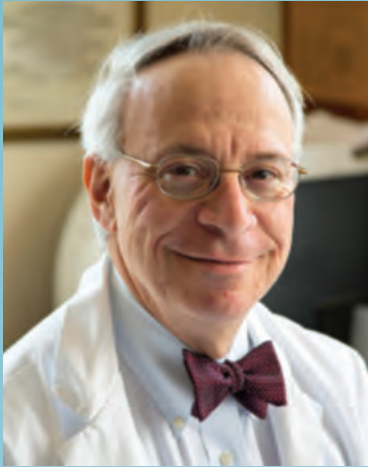
26

Biomedical Research
Pushing Boundaries and Advancing Science to Save Lives

32

Research Funding

In Memoriam (inside back cover)



Dear Colleagues and Friends,

“Most annual reports, including our own, typically offer third-person accounts of an organization’s yearly highlights and significant achievements. This year however, we’ve decided to try something new. This year’s report, *In Their Own Words*, presents first-person accounts from faculty, staff, donors, and patients—a sampling of the passionate and thoughtful people who make this department what it is. The features take various forms, including personal reflections, interviews, and excerpts from talks given during the year. The report covers highlights in the areas of clinical care, scientific inquiry, medical education, and network growth. But it also touches on topics rarely addressed in annual reports—unconscious bias, inclusivity, and equity. Like most organizations across the country, we’re grappling with these difficult issues, and we think there’s virtue in honesty and transparency.

In addition to these first-person accounts, I am pleased to share with you additional information that tells the story of the department in 2017. This includes selected academic publications, research funding, major honors and awards, and notable clinical volume statistics.

As we know from practicing medicine, it is by listening to our patients’ stories and analyzing relevant data that we are most likely to understand their clinical condition. Here, too, we believe that by providing you with both narratives and data, you will get a fuller picture of our department. I’m proud of the many accomplishments of our faculty and staff this year, and I feel honored to work with them. We hope you enjoy this report.”

Warm Regards,

Mark L. Zeidel, MD
Chair, Department of Medicine

Administration

Mark Zeidel, MD
Chair, Department of Medicine

Mark Aronson, MD
Vice Chair, Quality

Donald Cutlip, MD
Vice Chair, Clinical Care in the Community

Tony Hollenberg, MD
Vice Chair, Mentorship

Barbara Kahn, MD, MS
Vice Chair, Research Strategy

Eileen Reynolds, MD
Vice Chair, Education

Peter Weller, MD
Vice Chair, Research

Kevin Maguire, MS
Chief Administrative Officer

Jennie Greene, MS
Director, Communications

Tim McDermott, MHA
Executive Director, Finance and Business Operations

Paul Hart Miller
Director, Network Operations

Scot Sternberg, MS
Director, Quality Improvement

Clinical Divisions

Allergy and Inflammation

Peter Weller, MD
Division Chief

Nicholas Lord, MHA
Division Administrator

Cardiovascular Medicine

Robert Gerszten, MD
Division Chief

John DiGiorgio, MPS-HHSA
Division Administrator

Departmental Organization

This list reflects our administration and leadership as of September 2017.

Endocrinology, Diabetes and Metabolism

Anthony Hollenberg, MD
Division Chief

Nicholas Lord, MHA
Division Administrator

Gastroenterology

J. Thomas Lamont, MD
Division Chief (interim)

Sara Montanari
Division Administrator

General Medicine and Primary Care

Eileen Reynolds, MD
Division Chief

Blair Bisher, MHA
Division Administrator

Patrick Curley, MS
Division Administrator

Gerontology

Lewis Lipsitz, MD
Division Chief

Kerry Falvey
Division Administrator

Hematology/Oncology

Manuel Hidalgo, MD, PhD
Division Chief

Brian Duckman, MHA/MBA
Division Administrator (interim)

Infectious Diseases

Peter Weller, MD
Division Chief

Nicholas Lord, MHA
Division Administrator

Nephrology

Martin Pollak, MD
Division Chief

Kerry Falvey
Division Administrator

Pulmonary, Critical Care and Sleep Medicine

J. Woodrow Weiss, MD
Division Chief

Brian Duckman, MHA/MBA
Division Administrator

Rheumatology

George Tsokos, MD
Division Chief

Patricia Harris
Division Administrator

Research Divisions

Clinical Informatics

Charles Safran, MD
Division Chief

Clinical Nutrition

Bruce Bistrian, MD, PhD, MPH
Division Chief

Experimental Medicine

Jerome Groopman, MD
Division Chief

Genetics

Pier Paolo Pandolfi, MD, PhD
Division Chief

Hemostasis and Thrombosis

Bruce Furie, MD
Division Chief

Immunology

Cox Terhorst, PhD
Division Chief

Interdisciplinary Medicine and Biotechnology

Vikas Sukhatme, MD, PhD
Division Chief

Signal Transduction

Alex Toker, PhD
Division Chief

Translational Research

Steven Freedman, MD, PhD
Division Chief

Transplant Immunology

Terry Strom, MD
Division Chief

Center for Virology and Vaccine Research

Dan Barouch, MD, PhD
Division Chief



The Department Welcomes a New Chief Administrative Officer

Kevin Maguire, MS, joined the Department of Medicine in 2017 as its new Chief Administrative Officer. The position was previously held by Sam Skura, MPH, MBA, who moved into a new role as BIDMC's Senior Vice President of Ambulatory and Clinical Services. Maguire previously worked at Boston Medical Center (BMC) where he held leadership roles for 18 years, most recently as the Senior Administrative Director in the Departments of Neurology and Neurosurgery. Prior to BMC, he worked at New England Baptist Hospital for six years as the Director of Outpatient Programs. He reflects on his new role at BIDMC:

“It's always exciting to start a new job, but coming to BIDMC and the Department of Medicine at this particular juncture is thrilling. The BIDMC and Medicine networks are expanding, providing care to more people every day, closer to where they live and work. This growth will benefit our system and our patients, and the Department and the medical center are very well-positioned to make this a smooth process. I've been impressed by the strong leadership here, and I'm honored to have joined an organization dedicated to providing high quality and compassionate care across New England.”

Eileen Reynolds, MD

A Conversation with Molly Hayes, MD

Eileen Reynolds, MD, the Department of Medicine's Vice Chair for Education and a primary care physician in Healthcare Associates, was appointed Chief of the Division of General Medicine and Primary Care this year. She is the immediate past President of the Society of General Internal Medicine. Before becoming Vice Chair for Education, Dr. Reynolds spent 13 years as Director of BIDMC's Internal Medicine Residency Program. She received her MD at Harvard Medical School and completed residency at the University of California, San Francisco, before doing a general internal medicine fellowship at University of Pennsylvania.

Below are excerpts from a discussion that she had with Molly Hayes, MD, a faculty member in the Division of Pulmonary, Critical Care and Sleep Medicine. Dr. Hayes received her MD from Tufts University School of Medicine and completed her residency, chief residency, and fellowship at Johns Hopkins University. She is a new Associate Program Director of the Residency Program. Her research at BIDMC focuses on improving end-of-life communication in the Intensive Care Unit (ICU) and evaluating methods of teaching critical thinking.

Hayes: I was fortunate to have amazing clinical training, but the emphasis on education is unique here. I want to be a career educator, to perform rigorous research in an environment that would not only support me but allow me to thrive, which is why I came to BIDMC. What drew you to BIDMC?

Reynolds: As a medical student at Harvard, I appreciated the focus at this hospital on medical education in the context of a top research institution. I also thought the principles of generalism were palpable. Beth Israel Hospital stood out to me as a place where specialists were important, but generalists were too. I saw it as a place where, as a generalist woman, I could have many leadership opportunities.

Hayes: This year you assumed the position of Chief of the Division of General Medicine and Primary Care. What are some of the greatest challenges and rewards you've faced so far?

Reynolds: This is a very large division—it's about 130 total faculty members—so it's been a very fast-paced several months trying to get my arms around all that goes on. There are a lot of rewards. One is that the group is incredibly devoted to teaching and education. Also, it's rewarding to get to sit and talk with so many faculty members about what their aspirations are and what they value. One of our most exciting new initiatives is a comprehensive strategic plan for the primary care practice, thinking about how—in the future of population-based and value-based payments—we should be structuring our clinical practice, our teams, and our compensation models. It'll be a wonderful opportunity for engaging the faculty.

Hayes: You are also the Co-Chair of the Department's Committee for the Advancement of Women. Can you tell me about the Committee and what you're working on?



*Eileen Reynolds, MD (left)
and Molly Hayes, MD (right)*

Reynolds: The committee is a group of about a dozen of us (mostly women) nominated from across the Department and charged with working on advancing women's experience in the Department to feel as equitable and supported as possible. Some examples of our requests and work include a recently completed audit of salary equity, an annual series of networking lunches where speakers come with skill-building activities, and some planned trainings on unconscious bias. We've worked very hard with Harvard Medical Faculty Physicians (HMFP), along with Dr. Mark Zeidel (Chair of Medicine) and Dr. Hope Riciotti (Chair of Obstetrics/Gynecology), on maternity and paternity leave benefits, which were improved about a year ago.



Hayes: You wear a lot of hats: physician, educator, and leader. How do you do it all?

Reynolds: For anyone who wears many hats, you have to rely on a really great home support structure. My husband, who is a professor at Mass Eye and Ear, is an incredible partner. We moved to my hometown and my dad retired to be our nanny, which was an incredible gift that helped us with childcare early on. Under each of my hats are many incredibly talented and passionate faculty and staff colleagues who share my work. I feel really lucky to work in medical education at an institution with such rich resources. The support where I work is part of the reason I've been successful.

Hayes: What would you say is your proudest achievement at BIDMC?

Reynolds: I would have to say it was 13 years as the Residency Program Director and the close to 800 residents who came through our program. My achievements are actually their achievements. I'm reminded what a gift it was for me to be the Program Director whenever I hear about former residents—I get a note in the mail or a picture of their baby, or I see a publication or hear about a leadership position they've taken. We've been a home—hopefully both a supportive and rigorous home—for the residents who have come through our doors over many years. And now I hope to be able to do that same thing for the faculty in the Division of General Medicine and Primary Care.



**UNDER EACH OF
MY HATS ARE MANY
INCREDIBLY TALENTED
AND PASSIONATE
FACULTY AND STAFF
COLLEAGUES WHO
SHARE MY WORK.**

Jaclyn Giannakoulis

Jaclyn Giannakoulis is a member of BIDMC's Patient and Family Engagement Program and serves on the Intensive Care Unit (ICU) Advisory Council. Her mother and husband have both received care at the medical center. This year, she teamed up with Jennifer Stevens, MD, Assistant Professor of Medicine and Associate Director of the Medical Intensive Care Unit (MICU), on a new project to improve inpatient consultations. The project emphasizes effective communication between specialists, hospitalists, primary care physicians, patients, and family members. She is a co-principal investigator on the study with Dr. Stevens.



How did you first become involved in BIDMC's Patient and Family Engagement Program?

I became involved shortly after my mother passed. Someone reached out to me from the program to follow up on some of the things I had mentioned while my mother was in the ICU. I had talked about how grateful I was that she received such compassionate care while she was ill.

Right around the time that my mom passed, my husband got sick. He had been on dialysis, and after the experience we had with my mother at BIDMC, we knew that he should receive his care there as well. He now receives care through Jeffrey William, MD, a BIDMC nephrologist and wonderful doctor.

Based on my experiences, I've been very happy to be able to provide constructive feedback to the medical center through the BIDMC Patient and Family Engagement Program.

Overall, how did you feel about the care your family has received at BIDMC?

Amazing. Even with the outcome of my mother passing, which is something I think about on a daily basis, there's still something that differentiates BIDMC from other hospitals, and that's the compassionate care. That should always accompany excellent clinical care. You hear people say 'I don't care about bedside manner if they know what they're doing.' I think it has to be both, and BIDMC provides both high quality and compassionate care. Of course, there's always room for improvement. That's what the Patient Family Advisory Council (PFAC) is all about. I'm happy to be able to provide that feedback.

How did you wind up partnering with Dr. Stevens on the inpatient consultation project?

Dr. Stevens was one of the doctors involved in my mother's care. I happened to see her at one of our ICU PFAC meetings. We remembered each other, and soon she asked if I'd be interested in working on the grant. I jumped at it because she was so kind to my mother and because improving inpatient consultations is an important goal.

What's your role in the project?

I helped with some of the questions on a survey that we sent to patients and family members as well as to primary care doctors and consultants. Now that we're getting results, I'm helping to take some observations from each of the surveys to see if there are commonalities. There are several people involved in the project, but the team always makes me feel valued. That's what BIDMC is like—the people who work there always make you feel like you're contributing to something greater.

You have your own blog about your experience with your husband navigating his health issues. What kinds of things do you write about?

Yes, it's called *Paul and Jackie's Journey: Going Home* and it's about home hemodialysis versus in-center dialysis. We didn't know about home-based dialysis until Paul started to get care at BIDMC. It's been so great for him that we wanted more people to know about it. It's made him feel so much better. He and I love to travel, and now we can again because on home hemodialysis he doesn't need a full day after treatment to recover. He's been able to do more and see more. We went to Hawaii. It's been great to see him do some of the things that he felt like he couldn't do before.

COMPASSIONATE QUALITY CARE

Do you have any advice for health care providers at BIDMC in terms of things to continue or to improve upon?

At the beginning of my husband's journey, before we came to BIDMC, we were not given options like home hemodialysis because the care team assumed he wouldn't be interested. At BIDMC, the team at the Transplant Institute said, 'Here are all the options you have.' And then you get to choose what's right for you. That distinguishes an amazing medical staff from everyone else. So I'd just say, be sure to keep letting the patients make the decisions that are best for them using the knowledge provided by the medical staff. This also helps to build confidence and trust in the medical team.

”



Emmanuel Mensah, MD, MBA

Emmanuel Mensah, MD, MBA, a graduate of BIDMC's Internal Medicine Residency Program, is joining the Department of Medicine faculty. Originally from Ghana, he received a full scholarship to attend the United World College in Canada, where he completed high school. After graduating from Dartmouth College, he earned a joint MD/MBA at Harvard Medical School and Harvard Business School. He will be dividing his time between working as a hospitalist at BIDMC, providing care at a regional hospital in Ghana, and consulting for McKinsey and Company. Dr. Mensah delivered Medical Grand Rounds in May 2017, and the following are excerpts from his talk.

“ I’m here to talk to you about the power of unconscious bias. I started learning about this over a cup of coffee. I have a really good friend, Ben, whom I’ve known for a long time. He’s a white kid from Connecticut. He is very smart. He reads a lot, and we have these amazing conversations. And one thing Ben brought up in one of our conversations was this concept of the Implicit Association Test. It’s a concept within social psychology that assesses a person’s automatic associations. Ben wanted us to take this online test on race. I was a little worried because I’ve known Ben for a long time; and my fear was if his results were against black people this would destroy our friendship. But Ben was persistent, and so we took the test. And, lo and behold, Ben’s result showed an automatic preference for white people over black people. Now I was highly disappointed. This is someone I’ve known for a long time; I trust him, I thought he saw me as an equal, respected me. So the question now is how do I go about talking to Ben about race? What made this conversation even more difficult was that this was also my result. I took this test six more times just to make sure, and it was real. At first I thought: Hold on a second, I’m black. What is going on here? I was really frustrated and within that frustration I decided to go on a journey to explore

hidden biases in my life and in medicine, as well as what I could do about it. As the first part of my journey, I started looking at an Institute of Medicine report from 2003. This report came out at that time because there were a lot of studies out there stating that the majority of Americans were uninformed about the disparities in care between blacks and whites. If you look at some of the data for HIV, black people die 7.5 times more than whites. The question is why? Is HIV more powerful

IT’S NOT JUST ABOUT BEING A GOOD DOCTOR, BUT IT’S ABOUT BEING COMPASSIONATE AND THOUGHTFUL, REALIZING THAT OUR HUMANITY IS INTERTWINED WITH THE HUMANITY OF OTHERS

in the blood of black people than white people? And this goes for so many other conditions—from coronary bypass to renal replacement therapy, breast cancer, even kidney transplantation in kids. Why these differences in care? Being the smart people we are, we can come up with so many theories: social determinants of health care, genetics, this and that. But the one thing we don’t talk about is hidden biases. The Institute of Medicine actually concluded

that prejudice and stereotypes on the part of providers may actually lead to a lot of these biases and a lot of these disparities.

So why all these biases and why do people have all these beliefs? Whenever I had a question of why, my journey took me to the history of medicine. Because I believe that when we don’t know where we came from, it’s hard to understand where we are or where we are going. In addition, the truth is, until the lion learns to speak, stories of the hunt shall always glorify the hunter. In my journey through the history of medicine, I realized that medical culture often mirrors the larger culture of inequality.

What can we do? Here are some solutions that I started thinking through. There was a good paper last year in the *New England Journal of Medicine*, talking about Black Lives Matter. And I like the values it presented. The first one is to learn and

accept the United States’ racist roots. The second one was understand how racism has shaped our narrative. And the third thing is to define and name it, whether it be sexism or racism. I’ve been in so many situations where we let it go because we don’t want to make people uncomfortable.

So how to interrupt biases? Be open and aware of your own biases because it’s really hard to stop this. You have to find tricks to

interrupt it, but this awareness is the first step. The other thing is to increase health care workforce diversity. Well-intentioned providers are not immune to stereotypes, and when we make decisions based on these, we cause significant unintended disadvantages to others. Because of this, I'm still on my journey, and doing three things: educate, accept, and act.

We all work really hard to make a difference in the lives of our patients. But the fact that these differences in care exist, whether it be by race, gender, sexual orientation, or language, means that we have a lot of work to do. We need to look in the mirror and realize that it's not just about being a good doctor, but it's about being compassionate and thoughtful, realizing that our humanity is intertwined with the humanity of others.

But I'm hopeful. I'm hopeful because I know that there are so many people in this room who are doing amazing work to solve some of these problems. And so I'm here to tell you something that Milton tells me whenever he sees me. Milton is an elderly black gentleman on the West campus who carries trays from patients' rooms to the kitchen. Every time he sees me—proud of seeing a black doctor—he runs up and says, 'Doc! Keep moving on.' And so I'm here to tell you the same thing—'Keep moving on'—because when I look at some of the worst crimes on earth—from slavery, to colonization, to apartheid, to Tuskegee, to holocaust, to genocide—what bothers me about these crimes is that so many good people did nothing. Martin Luther King framed it well when he said, 'In the end we will remember not the words of our enemies, but the silence of our friends.'

”



Barbara Kahn, MD, MS

Barbara Kahn, MD, MS is an internationally recognized physician-scientist who has made seminal discoveries elucidating the molecular mechanisms underlying obesity and diabetes. Dr. Kahn's work establishing that the fat cell regulates whole body insulin sensitivity has led to important insights into Type 2 diabetes pathogenesis and new therapeutic approaches. In 2017, the originality and impact of her work was recognized by her election to the National Academy of Sciences, and she became the first female faculty member from BIDMC to receive this prestigious honor. Dr. Kahn was elected to the National Academy of Medicine in 2005. Dr. Kahn is the first woman in the Department of Medicine to receive an endowed chair at Harvard Medical School (the George R. Minot Chair) and was the 2016 recipient of the Banting Medal for Scientific Achievement, the highest award given by the American Diabetes Association. She has mentored nearly 100 trainees and is leading efforts to implement unconscious bias training as a member of Medicine's Advancement of Women Committee. She is the Department's Vice Chair for Research Strategy and has served as Chief of both the Diabetes Unit and the Division of Endocrinology, Diabetes, and Metabolism.

“What originally drew you to medicine and later endocrinology?”

I went to medical school to find out how the human body works. I was interested in helping people learn to live with chronic illnesses like diabetes. During my internal medicine residency, I was amazed to learn how little was known about the cellular mechanisms by which hormones like insulin work and about the complex physiological interactions that regulate blood glucose. At that time, people with diabetes still monitored their glycemic control with crude tests of urinary glucose. Reports began to emerge from the United Kingdom of small studies in which patients were learning to perform home blood glucose monitoring. I thought that could be a major breakthrough in diabetes management but we needed to determine whether it was superior to urine glucose monitoring and whether it would have psychological effects. Would patients become frustrated if their blood glucose was not in the desired range and they did not know what to do about it? So my first research study was to compare the physiological and

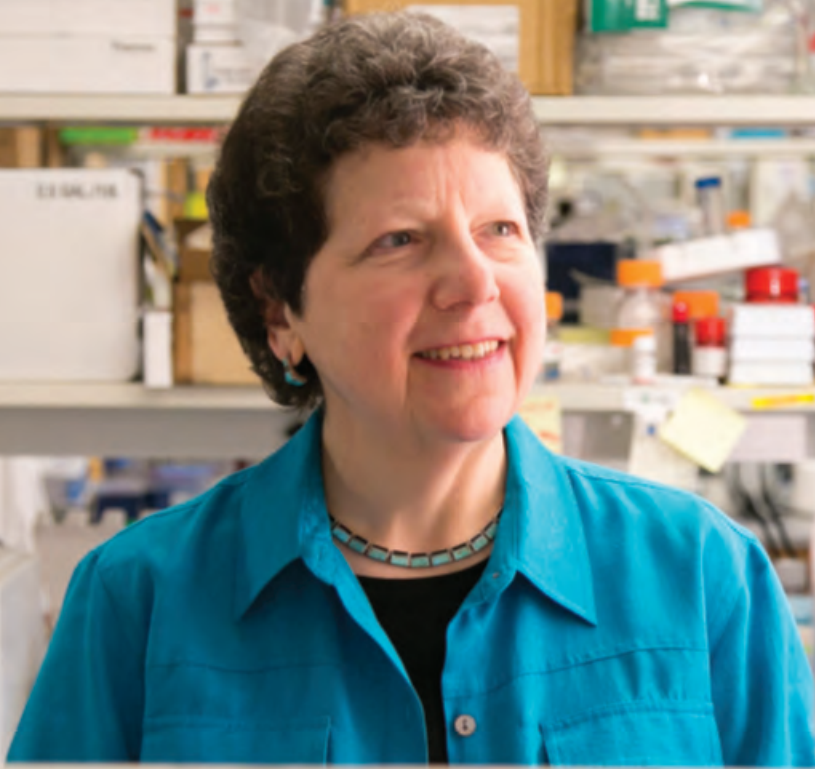
psychological effects of home urine and fingerstick blood glucose monitoring in a county hospital diabetic population. The result was that all the patients who stayed in the study improved their diabetes control regardless of monitoring modality (i.e., the attention and feedback from the study personnel had a positive impact on glycemic control). When I visited major diabetes research centers in the UK to compare our results, I sensed the excitement and promise of diabetes research and realized that diabetes care might not have to be so stagnant and depressing. I was highly motivated to learn how to do cutting-edge research and I entered a cell biology laboratory at the National Institutes of Health (NIH) to investigate the cellular mechanisms by which insulin stimulates glucose uptake into cells.

What has been your most exciting or seminal research to date?

After my Endocrine Fellowship at the NIH, I came to Beth Israel Hospital as an Instructor. Shortly thereafter, the insulin-regulated glucose transporter, GLUT4, was cloned. I was fortunate to carry out some of

the first investigations of GLUT4 regulation in humans with obesity and diabetes. This work, along with my team's observations in genetic mouse models that we created, led to the discovery that reduction of GLUT4 and glucose transport in adipocytes is a critical early factor in the development of Type 2 diabetes. In fact, eliminating GLUT4 selectively from adipocytes severely impairs insulin action on glucose transport, and surprisingly, results in insulin resistance in muscle and the liver as well. This was paradigm-shifting. Our ensuing studies have elucidated the molecular pathways mediating these effects. Most recently, my lab, along with the lab of Alan Saghatelian, PhD, showed that GLUT4-mediated glucose





WHAT I WANT MOST FOR MY PATIENTS IS A CURE FOR BOTH TYPE 1 AND TYPE 2 DIABETES.

transport in adipocytes stimulates the synthesis of a novel class of bioactive lipids that are made in our tissues and have anti-diabetic and anti-inflammatory effects. We are very excited about moving these lipids to the clinic to prevent and treat Type 2 diabetes.

How do your clinical practice and research intersect?

Taking care of patients keeps me in touch with the ongoing challenges that people with diabetes face. I am constantly reminded of the unpredictable nature of blood glucose regulation even when patients are meticulous and dedicated to tight glycemic control. This makes me

passionate about finding better, more reproducible and durable therapies and prevention strategies for diabetes. In my laboratory, we design mechanistic studies based on insights from caring for patients. We perform the studies at the cellular and molecular levels and in animal models to definitively show 'cause and effect.' Then we return to humans to prove these mechanisms are truly important for human metabolic health.

What advice do you have for aspiring biomedical researchers?

I encourage my trainees and junior faculty members to pursue the unexpected results even more than the expected results. Some

of our most important findings have come from data that challenged accepted dogma. We need paradigm shifts to find a cure for diabetes. I also encourage trainees to develop collaborations with scientists from other disciplines to expand the mechanistic insights and potential impact of their work. I currently work closely with a chemical biologist and a synthetic chemist; our collaborations are making make this one of the most exciting and powerful stages in my career.



Adam Rodman, MD, MPH



Adam Rodman, MD, MPH, first visited Botswana during his residency at Oregon Health and Science University (OHSU) in Portland, Oregon. Through the BIDMC-OHSU Botswana Program, he did a residency elective in 2015 and then a global health fellowship in 2016-2017 at Scottish Livingstone Hospital, located in Molepole, Botswana. Dr. Rodman recently joined the Department of Medicine's faculty as a hospitalist. He hosts a popular podcast, *Bedside Rounds*, which features medical histories and mysteries. The podcast includes a special annual report installment he produced during his final days in Botswana. Dr. Rodman reflects on global health and his past year, split between Boston and Botswana.

“As a member of the second cohort of clinical fellows in global health at BIDMC, I hope I can be forgiven for having a little bit of whiplash. I've spent half of the last year attending with the Hospital Medicine Program at BIDMC and the other half attending at Scottish Livingstone Hospital (SLH), a district hospital in Botswana in southern Africa. On the surface, the two hospitals couldn't look more different. When it's cold in Botswana, I round with my team in a winter coat and gloves since the windows need to be opened to combat the spread of tuberculosis. There

are drug and equipment shortages, and I've had to scrounge and improvise kits for essential procedures like a thoracentesis or a lumbar puncture. My patients often call me at home or show up on my ward unannounced, ready for their follow up. And if I have to start a patient on a drip medication, I do about five minutes of math and then mix the medications myself before connecting them to a drip counter. There are no clinical pharmacists to rely on at SLH. But if you dig a little bit deeper, you start to notice that the medical centers aren't so different after all. In both places, I work with eager young interns and medical

officers, guiding them through the care of their very sick patients. At SLH, in addition to working with Botswanan trainees, I oversee a rotating cadre of American medical residents from BIDMC and across the United States who visit SLH for a month-long global health elective. In both places I work with my colleagues to improve health systems. In fact, the data from my early-goal directed therapy quality improvement project for sepsis treatment were presented at the International Society for Quality in Healthcare. And in both settings I have the honor of caring for my patients, counseling and comforting them and their families through some of the hardest times in their lives.

Even my hobbies mostly stayed the same. I continued to produce my medical podcast *Bedside Rounds* while in Botswana, releasing episodes about topics as varied as the assassination of President Garfield and the Victorian fear of being buried alive—though the speed of the internet

**I HAVE THE HONOR OF CARING
FOR MY PATIENTS, COUNSELING
AND COMFORTING THEM AND THEIR
FAMILIES THROUGH SOME OF THE
HARDEST TIMES IN THEIR LIVES**



Adam Rodman, MD, MPH (middle) with members of a sepsis quality improvement team at Scottish Livingstone Hospital in Botswana

often conspired against me. And somehow, despite our busy days, my wife and I still managed to go hiking and exploring throughout beautiful southern Africa.

This last year has been an amazing and also eye-opening experience, not only for all the differences but also the unexpected similarities. And ultimately

global health is about recognizing these similarities and using them to build lasting relationships.



Vicki Boussiotis, MD, PhD

Vicki Boussiotis, MD, PhD, is a Professor of Medicine at Harvard Medical School and a member of the Department of Medicine's Division of Hematology/Oncology. A native of Greece, she is a world-renowned researcher in cancer immunology. In 1991, she joined the Harvard community as a postdoctoral student in the laboratory of Lee Nadler, MD, at the Dana-Farber Cancer Institute. The team was generating insights that profoundly impacted the field of immunology: the discovery of the B7 family of costimulatory molecules. Dr. Boussiotis's first postdoctoral project revealed that additional B7-like molecules exist and led to the cloning of the second member of the B7 family (B7-2; CD86). The subsequent discovery of additional members of the B7 superfamily and modulation of these pathways has elicited the most robust anti-tumor responses in the history of cancer immunotherapy—seminal work that Dr. Boussiotis has advanced over the eight years she has been at Beth Israel Deaconess Medical Center.

Did you know from an early age that you wanted to be a scientist?

I did. I always loved science. I always wanted to ask the basic questions and understand 'why' from a molecular standpoint. But I wanted to take it in a direction that would have an impact on people's lives, particularly in the context of disease. That's why I chose to go to medical school, and I have no reservations about that choice. I enjoy taking the knowledge from basic science that we develop in our lab and seeing that it is going to help patients. I have been blessed to see the work of my basic research repeatedly translated to treatments that helped patients who received stem cell transplantation and cancer therapy. It's a very rewarding and humbling experience.

Why was cancer research of particular interest?

Cancer touches people's lives in a way that is unique and irreversible and makes a big mark. I felt this is where I wanted to be—first to support people at the moment that they need it more than anything and, second, to be able to make a difference to future development of treatments and discoveries. I was particularly attracted to hematological diseases and cancers, leukemia, and transplantation. I felt that bone marrow stem cells were magical and had so much potential—all the energy, wisdom, and abilities for a cell to go from being new to very well-differentiated.

What is your team currently working on?

My research group is investigating mechanisms and signaling pathways involved in regulation of activating and inhibitory T cell responses. Mechanistic understanding of signaling and molecular pathways that regulate T cell responses

is of major therapeutic interest in cancer. Specifically, targeted intervention to such pathways provides the means to modulate the immune responses either for augmentation in order to induce anti-tumor immunity or for suppression in order to prevent graft versus host disease (GvHD). This is the leading cause of non-relapse mortality in patients with hematologic malignancies, who receive allogeneic hematopoietic stem cell transplantation. Our laboratory was among the first to determine that T cell tolerance is not a default state but is induced and maintained by active signaling processes. Ongoing work involves the mechanistic understanding of how metabolic reprogramming affects of the functional fate of immune cells toward productive immunity versus tolerance and immune exhaustion in the tumor microenvironment by dissecting the role of co-stimulatory and co-inhibitory receptors in regulating energy generation and metabolic programs in the context of cancer. Our group is part of hematopoietic stem cell transplantation research team at the Dana-Farber/Harvard Cancer Center and has conducted several translational studies on the mechanisms of immune reconstitution after hematopoietic stem cell transplantation. Our ultimate goal is to translate our findings from basic T cell biology into novel approaches for induction of anti-tumor immunity, prevention of GvHD and improvement of immune reconstitution after allogeneic hematopoietic stem cell transplantation.

Having completed residency in Greece and in the United States, how would you compare medical education in the two countries?

The difference between medical education here and in Greece is huge. What I found was that everything here is really provided to the learner. You have a very experienced

mentor, you have somebody who is guiding you in every little step—a second-year resident or a fellow. There is nothing like this in Greece. Basically what you learn in Greece in medical education is how to teach yourself. So I think that people who have the opportunity to do medical school and residency here are so blessed.

What do you enjoy most about your job?

I love research. For me, my lab is my life. There's a song that says 'love is life,' and I say 'lab is life.' For me, research is so important—it's a way of thinking,

it's a way of living, it's a way of being. It's really... myself. This is why I get so excited to see the young generation come into science, feeling the passion and the enthusiasm. It reinforces my interest and my heart connection to science. Working on science projects and science papers is, for me, the number one highlight of the day. Usually what is rewarding is the same thing that is very frustrating: when you get the results of an experiment on which you already have an established hypothesis and an expectation of what's going to be and you don't see that: you see something completely different. And

then you start thinking completely out of the box – called 'hypothesis.' Then you start thinking in these other terms to which your experimental results guide you and you start discovering the exciting part, which is, in fact, knowing Nature. Because that's how Nature reveals itself – through the unexpected result. I find that is the major highlight of every day and a reward that is worth every effort.



**RESEARCH
IS SO
IMPORTANT.
IT'S A WAY
OF THINKING,
IT'S A WAY
OF LIVING,
IT'S A WAY
OF BEING.**



Alexa McCray, PhD

A Discussion with Jorge Rodriguez, MD



Alexa McCray, PhD, is a Professor of Medicine and a founding Co-Director of the Center for Biomedical Informatics at Harvard Medical School. She is also a member of BIDMC's Division of Clinical Informatics. She previously directed a research division of the National Library of Medicine at the National Institutes of Health. Dr. McCray was elected to the National Academy of Medicine (formerly the Institute of Medicine) in 2001.

Below are excerpts from a discussion she had with Jorge Rodriguez, MD, a Clinical Informatics fellow and hospitalist at BIDMC. As an immigrant to the U.S., Dr. Rodriguez is particularly interested in the experience of limited-English-speaking individuals navigating online health information. He is using census data and "web scraping" technology to study 1,400 different sites regarding their accessibility.

Rodriguez: I've always been interested in bringing together medicine, social justice, and technology, and clinical informatics has been an exciting and somewhat unexpected path for me. How did you become interested in the field of clinical informatics?

McCray: I have a long, serendipitous route as to how I got here. I am trained as a theoretical linguist so I did my PhD in linguistics and became involved in computational linguistics through a short-term stint that I did at the IBM Watson Research Center. Then I had the opportunity to work for almost twenty years at the National Institutes of Health's National Library of Medicine where I was eventually the director of the research division called the Lister Hill National Center for Biomedical Communications. There I did a whole range of biomedical informatics research and was very lucky to have the opportunity to design and develop ClinicalTrials.gov.

Rodriguez: What are some of your current projects?

McCray: I work on a project called the Undiagnosed Diseases Network where we are trying to integrate clinical information with genomic data. In clinical informatics, people tend to analyze data, for example, in the electronic health record system. And, yes, we want to do that, but that's primarily clinical information. But now we bring that together with genomic information. We do whole exome and whole genome sequencing, together with a complete clinical evaluation, and then you have a much better chance of figuring out what's going on with this individual, particularly if you can find similar individuals by structuring the data in such a way that you can compare 'apples to apples.'

Rodriguez: BIDMC has been referred to as one of the 'most wired' hospitals and has been recognized by the American Hospital Association for this. In what ways do you think we're leading the way?

McCray: Beth Israel was one of the first hospitals to have its own electronic health record (EHR), developed in the Division of Clinical Informatics. But we haven't just rested on our laurels; we have continued to improve the system over time. For

instance, Tom Delbanco and colleagues have created the now widely implemented OpenNotes, which makes it possible for me, as a patient, to see my medical record. In addition to that, BIDMC's Chief Information Officer, John Halamka, is nationally involved in these activities.

Rodriguez: On a clinical level, working directly with patients, I mostly see the benefits of clinical informatics, such as clinical decision support through the EHR. But I know there may be drawbacks in terms of one-on-one communication between physicians and patients. Is this a concern you have?

McCray: The EHR can become a real problem if the clinician is typing into the computer and not interacting with the patient. Clinicians have to spend so much time with electronic health records, entering data into a computer—they say, 'This is not why I went to medical school, to become a clerk entering data into a computer.' On the other hand, there are significant benefits to both patients and their doctors if there is ready access to the patient's information at the time of the clinical encounter.



Rodriguez: I feel like BIDMC has been great in terms of its commitment to community health, especially in the area of informatics. The Office of Diversity, Inclusion and Career Advancement supports a lot of the work that I do. How have you found the culture here in terms of supporting your work?

McCray: I've found the Department of Medicine to be nothing but supportive. The Chair of Medicine, Dr. Zeidel, sets the tone, and there's a collaborative nature and openness to different ways of being a faculty member here. I'm not a clinician, but I have something to offer, and there's recognition of that.





Donald Cutlip, MD (left) and Paul Hart Miller (right)

Clinical Care

Continuously Improving Patient Care in an Expanding Health System

New Leadership for a Growing Network

The Department of Medicine’s network of community partners continued to expand in 2017. Our physicians now provide care in over 40 locations, including member and clinically-affiliated hospitals, and community health centers. The medical center recently signed a definitive agreement with Lahey Health, New England Baptist Hospital, Mount Auburn Hospital, and Anna Jaques Hospital to create a high-quality, lower-cost health care system. In response to our recent growth, the Department has created a new clinical leadership position to oversee the expanding network. Donald Cutlip, MD, assumed the role of Vice Chair for Clinical Care in the Community, in which he works closely with Paul Hart Miller, Medicine’s Director of Network Operations. Dr. Cutlip is a Professor of Medicine at Harvard Medical School, and prior to assuming this role, served as Cardiology Section Chief for Interventional Cardiology and as the Director of BIDMC’s renowned Interventional Cardiology Fellowship Program. Dr. Cutlip reflects on his new role and the exciting growth that necessitated it.

“As an academic cardiologist for the past 20 years and a community primary care internist for 10 years before that, I appreciate the importance of providing high-quality, convenient, and cost effective care to people in the geographic areas where they live and work. I have always valued the relationships we at BIDMC have with our owned and affiliated community health centers and partnering community hospitals. So I was pleased and proud to accept the Department of Medicine’s newly-created position of Vice Chair for Clinical Care in the Community. Working closely with Paul Hart Miller, I will be reviewing our current collaborations with various partners and affiliates, and helping to develop a proactive approach to meeting our patients’ needs in their communities. This work is particularly exciting and necessary given the network expansion that is underway. This year we also welcomed Peter Healy as the new president of BIDMC. I’m thrilled to be part of these efforts, and I look forward to being a part of our ongoing leadership in responding to the changing healthcare environment as the shining example of value-based population health care.”

Clinical Volume

Department of Medicine Clinical Volume at BIDMC’s Boston Hub

Clinical revenue	\$67,718,696
Patient days in hospital	104,901
Inpatient discharges	16,765
Observation discharges	3,642
Work RVUs	988,246
Outpatient visits	271,063
Endoscopic procedures	28,832
Cardiac catheterizations	4,765
Electrophysiology procedures	1,831
Patients in BIDMC’s Boston-based Healthcare Associates primary care practice	40,306

Clinical Care (continued)

Continuously Improving Patient Care in an Expanding Health System

Cardiac Direct Access Unit Reinvents Cardiac Care in New England



The Department of Medicine’s Division of Cardiovascular Medicine and BIDMC’s CardioVascular Institute (CVI) reached several milestones this year. The CVI, a comprehensive care center that combines expertise from Cardiovascular Medicine, Cardiac Surgery, and Vascular and Endovascular Surgery, celebrated its 10th anniversary.

BIDMC’s Smith Center for Outcomes Research in Cardiology thrived in its second year, applying rigorous scientific methods to assess clinical practices, therapies, and devices used in cardiovascular medicine. And BIDMC opened the Cardiac Direct Access Unit (CDAC). The first of its kind in New England, this outpatient unit offers immediate evaluation and treatment in an urgent care setting designed specifically for cardiology patients. Cardiologist **Michael Gavin, MD**, Medical Director of the CDAC, reflects on the new unit and what it means to patients and physicians.

“People shouldn’t have to wait to see a specialist when it involves their heart. Nor should they be forced to seek emergency care when they experience symptoms that are worrisome but not life-threatening. The CDAC solves this problem. Patients experiencing cardiac symptoms can be

referred by their physician to the CDAC to be seen the same day in a setting specially equipped to meet the needs of people with cardiac conditions. Operating around the clock Monday morning through noon on Saturday and staffed by experienced cardiologists, a nursing director, nurse practitioners, and nurses, the unit offers advanced diagnostic technologies and treatment options. Patients also have streamlined access to advanced cardiac imaging and treatment facilities, including a cardiac catheterization laboratory and an electrophysiology laboratory noted for pioneering innovative procedures. The launch of CDAC places BIDMC at the forefront of medical innovation. As a BIDMC cardiologist, I find it exciting and rewarding to know that we’re developing a new model for providing the best care to our patients when and where they need it.



Donors Support Groundbreaking Cancer Treatment, Research, and Outreach

Generous gifts from BIDMC donors this year are helping to advance Department of Medicine cancer treatment, research, and outreach. Randi and Brian Schwartz generously donated \$1.5 million to help further the research of David Avigan, MD, a member of the Division of Hematology/Oncology, the Chief of the Section of Hematological Malignancies and Bone Marrow Transplantation, and a leader in the field of patient-specific immunotherapy, vaccine development, and multiple myeloma research. The gift will also help support the development of a new translational research center, to be called the Randi and Brian Schwartz Family Cancer Immunotherapy and Cell Manipulation Facility. Randi Schwartz notes: “We truly feel blessed to support BIDMC’s incredible efforts to extend, improve, and ultimately save the lives of patients with myeloma and other cancers.”

Also this year, former chair of the BIDMC Board of Directors Steven B. Kay and his wife, Lisbeth Tarlow, helped support the BRCA Founder Mutations Outreach and Research Project by hosting a fundraising event at their home with members of the Boston Symphony Orchestra. The project is the first-ever national genetic testing campaign for cancer risk. It is being led by genetic specialists at five institution, including BIDMC’s Nadine Tung, MD, a member of the Division of Hematology/Oncology and a nationally-recognized expert in cancer genetics. Dr. Tung reflects, “Being able to identify these mutations in individuals who would not have received genetic testing otherwise is about saving lives. It is not just about the individuals who test positive. It is about their children, their siblings, their nieces, and nephews. It is about saving families.”

“ I WAS VERY SATISFIED WITH MY EXPERIENCE AT BIDMC. THE DOCTORS AND NURSES WERE VERY ATTENTIVE TO MY MEDICAL NEEDS AND PROVIDED EXCELLENT CARE. ”

—Bonnie Montgomery



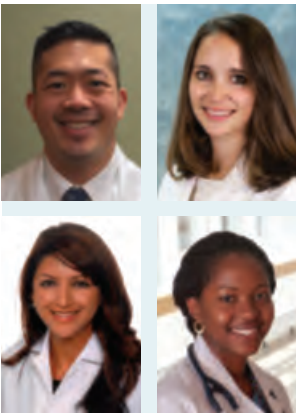
Bonnie Montgomery with internal medicine resident Noah Schwartz, MD

Honors and Accolades

Every year, members of the Department of Medicine receive numerous local, national, and international awards for their outstanding work in the areas of clinical care, research, and medical education. This is a sampling of the accolades bestowed upon members of the Department during the 2016-2017 academic year.

Dan Barouch, MD, PhD
Named "Bostonian of the Year" by the *Boston Globe Magazine*

Stephen Cannistra, MD
Named Editor-in-Chief of the *Journal of Clinical Oncology*



Ohn Chow, MD, Susan McGirr, MD, Donya Moheballi, MD, and Jazmine Sutton, MD
Harvard Medical School Class of 2017 Housestaff and Fellows Teaching Awards

Jon Crocker, MD
Humanitarian Services Award from the Society of Hospital Medicine

Tom Delbanco, MD, and Jan Walker, RN, MBA
The Health Data Liberator Award from Academy Health

Robert Flaumenhaft, MD, PhD
Outstanding Investigator Award from the National Heart, Lung, and Blood Institute

Gabriel Foster, MD
Harvard Medical School Dean's Community Service Award



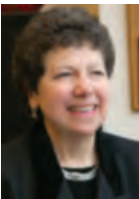
Jerome Groopman, MD
Nicholas E. Davies Memorial Scholar Award from the American College of Physicians



Marian Hannan, DSc, MPH
Excellence in Investigative Mentoring Award from the Rheumatology Research Foundation

Shoshana Herzig, MD, MPH
Named "Top Doc" by *ACP Hospitalist*

Kalon Ho, MD, MSc
F. Mason Sones, Jr, MD, FSCAI, Distinguished Service Award from the Society for Cardiovascular Angiography and Interventions



Barbara Kahn, MD, MS
Elected Member of the National Academy of Sciences



Dae Hyun Kim, MD, ScD
Outstanding Junior Investigator of the Year Award from the American Geriatrics Society

Samir Parikh, MD

Elected Member of the American Society for Clinical Investigation

Russell Phillips, MD

Barbara J. McNeil Faculty Award for Exceptional Institutional Service to Harvard Medical School and the Harvard School of Dental Medicine

Kathryn Stephenson, MD, MPH

Omolou Falobi Award for Excellence in HIV Prevention Research Community Advocacy from a coalition of HIV/AIDS advocacy organizations



Theodore Steinman, MD
Lifetime Achievement Award in Nephrology Education from the International Society of Nephrology



Vasileios Kyttaris, MD
Mary Betty Steven Young Investigator Prize from the Lupus Foundation of America



Martin Pollak, MD
Homer W. Smith Award for Outstanding Contributions in the Science of Nephrology from the American Society of Nephrology

John Torous, MD

Carol Davis Ethics Award from the American Psychiatric Association

Kenneth Mayer, MD

Appointed Editor-in-Chief of the *Journal of the International AIDS Society*

Alexa McCray, PhD, and Charles Safran, MD

Elected Founding Members of the International Academy of Health Sciences Informatics

Susan Redline, MD, MPH

William C. Dement Academic Achievement Award from the American Academy of Sleep Medicine

Harold Rosen, MD

Dr. Paul D. Miller ISCD Service Award from the International Society for Clinical Densitometry

Connie Tsao, MD

Heart Failure Young Investigator Award from the *Journal of the American College of Cardiology*

Junghong Zhou, PhD

Received the Health Sciences Research Award from the Gerontological Society of America

The Division of General Medicine and Primary Care Research Section

Inaugural Program Award for a Culture of Excellence in Mentoring from Harvard Medical School



Susan Mitchell, MD, MPH
Method to Extend Research in Time (MERIT) Award from the National Institute on Aging



Lowell Schnipper, MD

Special Recognition Award from the American Society of Clinical Oncology



Gerald Smetana, MD, and Peter Weller, MD

Selected 2016 Masters by the American College of Physicians



Daniele Ölczyk, MD, MS
Harvard Medical School Shore Fellowship and the Harvard Medical School Academy Fellowship in Medical Education

Medical Education

Training the Next Generation of Physicians



Graduating residents,
chief medical residents,
and education leadership

Residency Leadership

Residency Program Director
C. Christopher Smith, MD

Primary Care Program Director
Howard Libman, MD (outgoing)
Kelly Graham, MD (incoming)

Associate Program Directors
Jonathan Crocker, MD
Grace Huang, MD
Jakob McSparron, MD
Kenneth Mukamal, MD, MPH
Benjamin Schlechter, MD
Anjala Tess, MD
Anita Vanka, MD
Christina Wee, MD
Julius Yang, MD, PhD

Education Manager
Ruth Colman

Chief Medical Residents
Jake Decker, MD
Rahul Ganatra, MD, MPH
Sarah Lieber, MD
Jason Matos, MD
Jason Moran, MD
Jazmine Sutton, MD

Undergraduate Education Leadership

Core I Clerkship
Amy Weinstein, MD, MPH
Course Director
John Danziger, MD
Course Co-Director

Core II Clerkship
Pamela Hartzband, MD
Course Director
Alexander Carbo, MD
Course Director

Practice of Medicine Clerkship
Ronald Silvestri, MD
Site Director
Daniel Sullivan, MD
Associate Site Director

Anita Vanka, MD
Associate Site Director

Primary Care Clerkship
Susan Frankl, MD
Site Director

Fellowship Program Directors

Cardiovascular Medicine
Joseph Kannam, MD

Electrophysiology
Alfred Buxton, MD

Interventional Cardiology
Jeffrey Popma, MD

Non-Invasive Cardiology
Warren Manning, MD

Clinical Informatics
Charles Safran, MD

**Endocrinology, Diabetes,
and Metabolism**
Alan Malabanan, MD

Gastroenterology
Ciaran Kelley, MD

Advanced Endoscopy
Ram Chuttani, MD

Celiac Disease
Daniel Leffler, MD

Hepatology

Michelle Lai, MD

Inflammatory Bowel Disease
Alan Moss, MD

Motility

Anthony Lembo, MD

Transplant Hepatology
Nezam Afdhal, MD

**General Medicine
and Primary Care**
Christina Wee, MD, MPH
Gloria Yeh, MD, MPH

Gerontology

Sarah Berry, MD, MPH

Global Health

Jonathan Crocker, MD

Hematology/Oncology
Reed Drews, MD

Hospice and Palliative Medicine
Mary Buss, MD, MPH

Infectious Diseases

Wendy Stead, MD

Christopher Rowley, MD, MPH
Associate Director

Nephrology

Stewart Lecker, MD
Pulmonary and Critical Care

Pulmonary and Critical Care
Jakob McSparron, MD
Associate Director

Asha Anandaiah, MD
BIDMC Site Director

Sleep Medicine

Robert Thomas, MD

Rheumatology

Robert Shmerling, MD (*outgoing*)
Vasileios Kytтарis, MD (*incoming*)



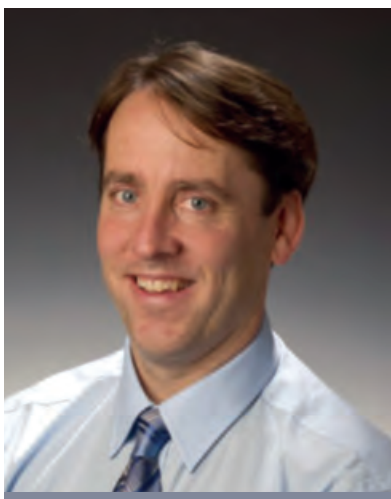
Residency Track Enhanced for Aspiring Physician-Scientists

Steve Freedman, MD, PhD, is the Director of the BIDMC Pancreas Center, Chief of the Division of Translational Research, Director of the Grant Review and Support Program (GRASP) at Harvard Catalyst, and Director of the Residency Program's newly reformatted Physician-Scientist Track. He is an internationally recognized expert in exocrine pancreatic disease, particularly pancreatitis and cystic fibrosis in adults and children. Dr. Freedman reflects on the track and his longtime connection to research at BIDMC:

“As the Director of the updated Physician-Scientist Track in BIDMC's Internal Medicine Residency Program, I'm proud to announce that we welcomed our first new group of Physician-Scientist Track residents this year. Our program has always been supportive of residents with a passion for scientific investigation through mentoring programs and research electives, and we are excited about this new opportunity to provide even more guidance and dedicated research time

to MDs or MD/PhDs interested in pursuing a career as a physician-scientist. Through workshops, the track aims to improve skills like strategic grant writing, publication best practices, and technical writing. Additionally, we provide the opportunity to work alongside the many BIDMC faculty members performing cutting-edge research—basic, translational, epidemiologic, and clinical research. Residents receive BIDMC's exceptional clinical training and have the potential to pursue 'short tracking' through the ABIM Research Pathway.

As an MD/PhD alumnus of our residency program, I have first-hand knowledge of how committed and successful our program and its faculty are to nurturing the research career goals of our residents. Thanks to my residency and fellowship mentors, I enjoy a rich and rewarding career as a clinician-scientist; now I am thrilled with this opportunity to help train and nurture the next generation.



New Education Director Appointed in Response to Opioid Epidemic

In response to the dramatic increase in opioid use disorder in New England, the Department of Medicine has appointed **Christopher Rowley, MD, MPH**, to serve in the newly created role of Director of Addiction and Opioid Use Disorder Education. A member of the Division of Infectious Diseases (ID) and Associate Program Director of its fellowship program, Dr. Rowley earned BIDMC's ID Service and Leadership Award this year. Dr. Rowley sees patients in Boston as well as at the BIDMC-affiliated Outer Cape Health Services' Provincetown Health Center, and he is the Director of HIV Medicine for Outer Cape. Dr. Rowley comments on the crisis and the Department's response:

“As providers, we are caring for an increasing number of patients suffering from the physical and psychosocial consequences of opioid use disorder. But as a national medical community, we have been slow to address our limitations and implicit biases in caring for patients who are often marginalized in society due to this highly stigmatized illness. The Department of Medicine recognizes the imperative to address the disorder in patients under our care, realizing that this is often the greatest health concern each is facing. By educating medical students, house staff, and attending physicians—and empowering them to recognize and treat opioid use disorder—the Department is helping to ensure that we deliver the best care possible to patients and family members who are impacted by this devastating illness.

Biomedical Research

Pushing Boundaries and Advancing Science to Save Lives

SELECTED PUBLICATIONS

Allergy and Inflammation

Lax T, Dizon DS, Birrer M, Long A, Del Carmen M, Goodman A, Krasner C, Penson RT, Growdon W, Camargo CA Jr, Banerji A. [Extended carboplatin infusion does not reduce frequency of hypersensitivity reaction at initiation of retreatment in patients with recurrent platinum-sensitive ovarian cancer.](#) *J Allergy Clin Immunol Pract* 2017; 1:177-8.

Smith KM, Rahman RS, Spencer LA. [Humoral immunity provides resident intestinal eosinophils access to luminal antigen via eosinophil-expressed low-affinity fcy receptors.](#) *J Immunol* 2016; 9:3716-24.

Wang HB, Akuthota P, Kanaoka Y, Weller PF. [Airway eosinophil migration into lymph nodes in mice depends on leukotriene C4.](#) *Allergy* 2017; 6:927-36.

Wechsler ME, Akuthota P, Jayne D, Khoury P, Klion A, Langford CA, Merkel PA, Moosig F, Specks U, Cid MC, Lugmani R, Brown J, Mallett S, Philipson R, Yancey SW, Steinfeld J, Weller PF, Gleich GJ, EGPA Mepolizumab Study Team. [Mepolizumab or Placebo for Eosinophilic Granulomatosis with Polyangiitis.](#) *N Engl J Med* 2017; 20:1921-32.

Weller PF. [Leukocyte lipid bodies – structure and function as “eicosomes.”](#) *Trans Am Clin Climatol Assoc* 2016; 127:328-40.

Cardiovascular Medicine

Cohen AT, Harrington RA, Goldhaber SZ, Hull RD, Wiens BL, Gold A, Hernandez AF, Gibson CM, APEX Investigators. [Extended thromboprophylaxis with betrixaban in acutely ill medical patients.](#) *N Engl J Med* 2016; 375:534-44.

Demartino ES, Dudzinski DM, Doyle CK, Sperry BP, Gregory SE, Siegler M, Sulmasy DP, Mueller PS, Kramer DB. [Who decides when the patient can't? US state statutes on alternate decision makers.](#) *N Engl J Med* 2017; 376:1478-82.

Gibson CM, Mehran R, Bode C, Halperin J, Verheugt FW, Wildgoose P, Birmingham M, Ianus J, Burton P, van Eickels M, Korjian S, Daaboul Y, Lip GY, Cohen M, Husted S, Peterson ED, Fox KA. [Prevention of bleeding in patients with atrial fibrillation undergoing PCI.](#) *N Engl J Med* 2016; 375:2423-34.

McCabe JM, Waldo SW, Kennedy KF, Yeh RW. [Treatment and outcomes of acute myocardial infarction complicated by shock after policy changes in New York State Public Reporting.](#) *JAMA Cardiology* 2016; 1:648-54.

Ngo D, Sinha S, Shen D, Kuhn EW, Keyes MJ, Shi X, Benson MD, O'Sullivan JF, Keshishian H, Farrell LA, Fifer MA, Vasan RS, Sabatine MS, Larson MG, Carr SA, Wang TJ, Gerszten RE. [Aptamer-based proteomic profiling reveals novel candidate biomarkers and pathways in cardiovascular disease.](#) *Circulation* 2016; 134:270-85.

Center for Virology and Vaccine Research



Abbink P, Larocca RA, De La Barrera RA, Bricault CA, Moseley ET, Boyd M, Kirilova M, Li Z, Ng'ang'a D, Nanayakkara O, Nityanandam R, Mercado NB, Borducchi EN, Agarwal A, Brinkman AL, Cabral C, Chandrashekar A, Giglio PB, Jetton D, Jimenez J, Lee BC, Mojta S, Molloy K, Shetty M, Neubauer GH, Stephenson KE, Peron JP, Zanotto PM, Misamore J, Finneyfrock B, Lewis MG, Alter G, Modjarrad K, Jarman RG, Eckels KH, Michael NL, Thomas SJ, Barouch DH. [Protective efficacy of multiple vaccine platforms against Zika virus challenge in rhesus monkeys.](#) *Science* 2016; 353:1129-32.

Borducchi EN, Cabral C, Stephenson KE, Liu J, Abbink P, Ng'ang'a D, Nkolola JP, Brinkman AL, Peter L, Lee BC, Jimenez J, Jetton D, Mondesir J, Mojta S, Chandrashekar A, Molloy K, Alter G, Gerold JM, Hill AL, Lewis MG, Pau MG, Schuitemaker H, Hesselgesser J, Geleziunas R, Kim JH, Robb ML, Michael NL, Barouch DH. [Ad26/MVA therapeutic vaccination with TLR7 stimulation in SIV-infected rhesus monkeys.](#) *Nature* 2016; 540:284-7.

Evans TI, Li H, Schafer JL, Klatt NR, Hao XP, Traslavina RP, Estes JD, Brenchley JM, Reeves RK. [SIV-induced translocation of bacterial products in the liver mobilizes myeloid dendritic and natural killer cells associated with liver damage.](#) *J Infect Dis* 2016; 213:361-9.

Liu J, Ghneim K, Sok D, Bosche WJ, Li Y, Chipriano E, Berkemeier B, Oswald K, Borducchi E, Cabral C, Peter L, Brinkman A, Shetty M, Jimenez J, Mondesir J, Lee B, Giglio P, Chandrashekar A, Abbink P, Colantonio A, Gittens C, Baker C, Wagner W, Lewis MG, Li W, Sekaly RP, Lifson JD, Burton DR, Barouch DH. [Antibody-mediated protection against SHIV challenge includes systemic clearance of distal virus.](#) *Science* 2016; 353:1045-49.

Wagh K, Bhattacharya T, Williamson C, Robles A, Bayne M, Garrity J, Rist M, Rademeyer C, Yoon H, Lapedes A, Gao H, Greene K, Louder MK, Kong R, Karim SA, Burton DR, Barouch DH, Nussenzweig MC, Mascola JR, Morris L, Montefiori DC, Korber B, Seaman MS. [Optimal combinations of broadly neutralizing antibodies for prevention and treatment of HIV-1 clade C infection.](#) *PLoS Pathog* 2016; 12:e1005520.

Clinical Informatics

Chiu DT, Solano JJ, Ullman E, Pope J, Tibbles C, Horng S, Nathanson LA, Fisher J, Rosen CL. [The integration of electronic medical student evaluations into an emergency department tracking system is associated with increased quality and quantity of evaluations.](#) *J Emerg Med* 2016; 51:432-9.

Quintana Y, Safran C, Marin HF, Massad E, Gutierrez MA, Rodrigues RJ, Sigulem D. [Global Health Informatics, 1st Edition — an Overview](#) 2016; 1-13.

Quintana Y, Crotty B, Fahy D, Orfanos A, Jain R, Kaldany E, Lipsitz L, Engorn D, Rodriguez J, Pandolfo F, Bajracharya A, Slack WV, Safran C. [InfoSAGE: Use of online technologies for communication and elder care.](#) *Stud Health Technol Inform* 2017; 234:280-5.

Ramoni RB, Mulvihill JJ, Adams DR, Allard P, Ashley EA, Bernstein JA, Gahl WA, Hamid R, Loscalzo J, McCray AT, Shashi V, Tift CJ, Undiagnosed Diseases Network, Wise AL. [The undiagnosed diseases network: accelerating discovery about health and disease.](#) *Am J Hum Genet* 2017; 100:185-92.

Torous J, Roberts LW. [Needed innovation in digital health and smartphone applications for mental health: transparency and trust.](#) *JAMA Psychiatry* 2017; 74:437-38.

Clinical Nutrition

Anez-Bustillos L, Dao DT, Gell GL, Baker MA, Gura KM, Bistrrian BR, Puder M. [Redefining essential fatty acids in the era of novel intravenous lipid emulsions](#). *Clinical Nutrition* 2017; in press.

Bistrrian BR. [Protein calorie malnutrition and obesity: Nutritional collaboration from MIT to the bedside and the clinic](#). *Metabolism* 2017; in press.

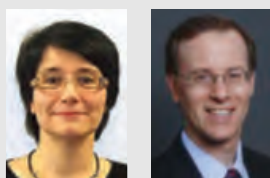
Hoffer LF, Bistrrian BR. [Nutrition in critical illness: a current conundrum](#). *F1000Res* 2016; 5:2531.

Endocrinology, Diabetes, and Metabolism

Campbell JN, Macosko EZ, Fenselau H, Pers TH, Lyubetskaya A, Tenen D, Goldman M, Verstegen AM, Resch JM, McCarroll SA, Rosen ED, Lowell BB, Tsai LT. [A molecular census of arcuate hypothalamus and median eminence cell types](#). *Nat Neurosci* 2017; 20:484-96.

Cohen D, Newman L, Fishman L. [Twelve tips on writing a discussion case that facilitates teaching and engages learners](#). *Med Teach* 2017; 39:147-152.

Farr OM, Upadhyay J, Gavrieli A, Camp M, Spyrou N, Kaye H, Mathew H, Vamvini M, Koniaris A, Kilim H, Srnka A, Migdal A, Mantzoros CS. [Lorcaserin administration decreases activation of brain centers in response to food cues and these emotion- and salience-related changes correlate with weight loss effects: a four week long randomized, placebo-controlled, double-blinded clinical trial](#). *Diabetes* 2016; 65:2943-53.



Gavril A, Hasselgren PO, Glasgow A, Doyle AN, Lee AJ, Fox P, Gautam S, Hennessey JV, Kolodny GM, Cypess AM. [Variable cold-induced brown adipose tissue response to thyroid hormone status](#). *Thyroid* 2016; Epub ahead of print.

Livneh Y, Ramesh RN, Burgess CR, Levandowski KM, Madara JC, Fenselau H, Goldey GJ, Diaz VE, Jikomes N, Resch JM, Lowell BB, Andermann ML. [Homeostatic circuits selectively gate food cue responses in insular cortex](#). *Nature* 2017; 546:611-16.

Experimental Medicine

Feng D, Steinke JM, Krishnan R, Birrane G, Pollak MR. Functional validation of an alpha-actinin-4 mutation as a potential cause of an aggressive presentation of adolescent focal segmental glomerulosclerosis: Implications for genetic testing. *PLoS One* 2016; 11:e0167467.

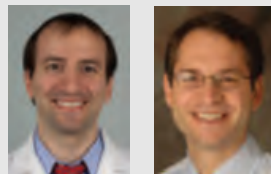
Prasad A, Khudaynazar N, Tantravahi RV, Gillum AM, Hoffman BS. [ON 01910.Na \(rigosertib\) inhibits PI3K/Akt pathway and activates oxidative stress signals in head and neck cancer cell lines](#). *Oncotarget* 2016; 7:79388-400.

Prasad A, Kulkarni R, Jiang S, Groopman JE. [Cocaine enhances DC to T-cell HIV-1 transmission by activating DC-SIGN/LARG/LSP1 complex and facilitating infectious synapse formation](#). *Sci Rep* 2017; 7:40648.

Sharma AK, Birrane G, Anklin C, Rigby AC, Alper SL. [NMR insight into myosin-binding subunit coiled-coil structure reveals binding interface with protein kinase G-Ix leucine zipper in vascular function](#). *J Biol Chem* 2017; 292:7052-65.

Gastroenterology

Cheifetz AS, Gianotti R, Lubner R, Gibson PR. [Complementary and alternative medicines used by patients with inflammatory bowel diseases](#). *Gastroenterology* 2017; 152:415-29.



Feuerstein JD, Castillo NE, Akbari M, Belkin E, Lewandowski JJ, Hurley CM, Lloyd S, Leffler DA, Cheifetz AS. [Systematic analysis and critical appraisal of the quality of the scientific evidence and conflicts of interest in practice guidelines \(2005-2013\) for Barrett's Esophagus](#). *Dig Dis Sci* 2016; 61:2812-22.

Grossberg LB, Ezaz G, Grunwald D, Cohen J, Falchuk KR, Feuerstein JD. [A national survey of the prevalence and impact of cytomegalovirus infection among hospitalized patients with ulcerative colitis](#). *J Clin Gastroenterol* 2016; 150:S394-S395.

Jiang ZG, Tapper EB, Connelly MA, Pimentel CM, Feldbrugge L, Kim M, Krawczyk S, Afdhal N, Robson SC, Herman M, Otvos JD, Mukamal K, Lai M. [Steatohepatitis and liver fibrosis are predicted by the characteristics of very low density lipoprotein in nonalcoholic fatty liver disease](#). *Liver Int* 2016; 36:1213-20.

Longhi MS, Moss A, Jiang ZG, Robson SC. [Purinergic signaling during intestinal inflammation](#). *J Mol Med (Berl)* 2017; Epub.

General Medicine and Primary Care

Bell SK, Gerard M, Fossa A, Delbanco T, Folcarelli P, Sands K, Lee BS, Walker J. [A patient feedback reporting tool for OpenNotes: Implications for patient-clinician safety and quality partnerships](#). *BMJ Qual Saf* 2017; 26:312-22.

Burns RB, Schonberg MA, Tung NM, Libman H. [Should we offer medication to reduce breast cancer risk?: Grand Rounds discussion from Beth Israel Deaconess Medical Center](#). *Ann Intern Med* 2016; 165:194-204.

Herzig SJ, Schnipper JL, Doctoroff L, Kim CS, Flanders SA, Robinson EJ, Ruhnke GW, Thomas L, Kripalani S, Lindenauer PK, Williams MV, Metlay JP, Auerbach AD. [Physician perspectives on factors contributing to readmissions and potential prevention strategies: a multicenter survey](#). *J Gen Intern Med* 2016; 31:1287-93.

Mafi JN, Wee CC, Davis RB, Landon BE. [Comparing use of low-value health care services among US advanced practice clinicians and physicians](#). *Ann Intern Med* 2016; 165:237-44.

Schonberg MA, Li V, Marcantonio ER, Davis RB, McCarthy EP. [Predicting mortality up to 14 Years among community-dwelling adults aged 65 and older](#). *J Am Geriatr Soc* 2017; 65:1310-15.

Biomedical Research (continued)

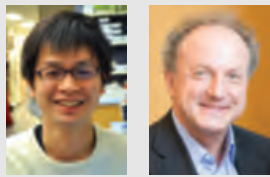
Pushing Boundaries and Advancing Science to Save Lives

SELECTED PUBLICATIONS

Genetics

Esteller M, Pandolfi PP. [The epitranscriptome of noncoding RNAs in cancer](#). *Cancer Discovery* 2017; 7:359-68.

Matsumoto A, Clohessy JG, Pandolfi PP. [SPAR, a lncRNA encoded mTORC1 inhibitor](#). *Cell Cycle* 2017; 16:815-16.



Matsumoto A, Pasut A, Matsumoto M, Yamashita R, Fung J, Monteleone E, Saghatelian A, Nakayama KI, Clohessy JG, Pandolfi PP. [mTORC1 and muscle regeneration are regulated by the LINC00961-encoded SPAR polypeptide](#). *Nature* 2017; 541:228-23.

Zheng W, Umitsu M, Jagan I, Tran CW, Ishiyama N, BeGora M, Araki K, Ohashi PS, Ikura M, Muthuswamy SK. [An interaction between Scribble and the NADPH oxidase complex controls M1 macrophage polarization and function](#). *Nat Cell Biol* 2016; 18:1244-52.

Gerontology

Berry SD, Lee Y, Zullo AR, Kiel DP, Dosa DD, Mor V. [Incidence of hip fracture in United States nursing homes](#). *J Gerontol A Biol Sci Med Sci* 2016; 71:1230-4.

Lorbergs AL, O'Connor GT, Zhou Y, Travison TG, Kiel DP, Cupples LA, Rosen H, Samelson EJ. [Severity of kyphosis and decline in lung function: the Framingham Study](#). *J Gerontol A Biol Sci Med Sci* 2017; 72:689-94.

Kim DH, Huybrechts KF, Patorno E, Marcantonio ER, Park Y, Park Y, Levin R, Abdurrob A, Bateman BT. [Adverse events associated with antipsychotic use in hospitalized older adults after cardiac surgery](#). *J Am Geriatr Soc* 2017; 65:1229-37.

Mitchell SL, Mor V, Gozalo PL, Servadio JL, Teno JM. [Tube feeding in US nursing home residents with advanced dementia](#), 2000-2014. *JAMA* 2016; 316:769-70.

Vasunilashorn SM, Dillon ST, Inouye SK, Ngo LH, Fong TG, Fong TG, Jones RN, Travison TG, Schmitt EM, Alsop DC, Freedman SD, Arnold SE, Metzger ED, Libermann TA, Marcantonio ER. [High c-reactive protein predicts delirium incidence, duration, and feature severity after major noncardiac surgery](#). *J Am Geriatr Soc* 2017; 65:e109-e116.

Hematology/Oncology

Juvekar A, Hu H, Yadegarynia S, Lyssiotis CA, Ullas S, Lien EC, Bellinger G, Son J, Hok RC, Seth P, Daly MB, Kim B, Scully R, Asara JM, Cantley LC, Wulf GM. [Phosphoinositide 3-kinase inhibitors induce DNA damage through nucleoside depletion](#). *Proc Natl Acad Sci USA*. 2016; 113:E4338-47.

Rangachari D, VanderLaan PA, Shea M, Le X, Huberman MS, Kobayashi SS, Costa DB. [Correlation between classic driver oncogene mutations in EGFR, ALK, or ROS1 and 22C3-PD-L1 ≥50% expression in lung adenocarcinoma](#). *J Thorac Oncol* 2017;12:878-83.

Robson M, Im S, Senkus E, Xu B, Domchek SM, Masuda N, Delaloge S, Li W, Tung N, Armstrong A, Wu W, Goessl C, Runswick S, Conte P. [Olaparib for metastatic breast cancer in patients with a germline BRCA mutation](#). *NEJM* 2017; 377:523-33.

Wallin JJ, Bendell JC, Funke R, Sznol M, Korski K, Jones S, Hernandez G, Mier J, He X, Hodi FS, Denker M, Leveque V, Cañamero M, Babitski G, Koeppen H, Ziai J, Sharma N, Gaire F, Chen DS, Waterkamp D, Hegde PS, McDermott DF. [Atezolizumab in combination with bevacizumab enhances antigen-specific T-cell migration in metastatic renal cell carcinoma](#). *Nature Communications* 2016; 7:12624.

Yong KJ, Basseres DS, Welner RS, Zhang WC, Yang H, Yan B, Alberich-Jorda M, Zhang J, Lobo de Figueiredo-Pontes L, Battelli C, Hetherington CJ, Ye M, Zhang H, Maroni G, O'Brien K, Magli MC, Borczuk AC, Varticovski L, Kocher O, Zhang P, Moon YC, Sydorenko N, Cao L, Davis TW, Thakkar BM, Soo RA, Iwama A, Lim B, Halmos B, Tenen DG and Levantini E. [Targeted BMI1 inhibition impairs tumor growth in lung adenocarcinomas showing low CEBPa expression](#). *Sci Transl Med* 2016; 8:350ra104.

Hemostasis and Thrombosis



Bekendam RH, Bendapudi PK, Lin L, Nag PP, Pu J, Kennedy DR, Feldenzer A, Chiu J, Cook KM, Furie B, Huang M, Hogg PJ, Flaumenhaft R. [A substrate-driven allosteric switch that enhances PDI catalytic activity](#). *Nat Commun* 2016; 7:12579.

Bowley SR, Fang C, Merrill-Skoloff G, Furie BC, Furie B. [Protein disulfide isomerase secretion following vascular injury initiates a regulatory pathway for thrombus formation](#). *Nat Commun* 2017; 8:14151.

Flaumenhaft R, Furie B. [Vascular thiol isomerases](#). *Blood* 2016; 128:893-901.

Stopa JD, Baker KM, Grover SP, Flaumenhaft R, Furie B. [Kinetic-based trapping by intervening sequence variants of the active sites of protein-disulfide isomerase identifies platelet protein substrates](#). *J Biol Chem* 2017; 292:9063-74.

Stopa JD, Neuberg D, Puligandla M, Furie B, Flaumenhaft R, Zwicker JI. [Protein disulfide isomerase inhibition blocks thrombin generation in humans by interfering with platelet factor V activation](#). *JCI Insight* 2017; 2:e89373.

Interdisciplinary Medicine and Biotechnology

Costa MD, Davis RB, Goldberger AL. [Heart Rate Fragmentation: a new approach to the analysis of cardiac interbeat interval dynamics](#). *Front Physiol* 2017; 8:255.

Hager B, Yang AC, Brady R, Meda S, Clementz B, Pearson GD, Sweeney JA, Tamminga C, Keshavan M. [Neural complexity as a potential translational biomarker for psychosis](#). *J Affect Disord* 2017; 216:89-99.

Mantia C, Uhlmann EJ, Puligandla M, Weber GM, Neuberg D, Zwicker JI. [Predicting the higher rate of intracranial hemorrhage in glioma patients receiving therapeutic enoxaparin](#). *Blood* 2017; 129:3379-85.

Ren J-G, Seth P, Ye H, Guo K, Husain Z, Sukhatme VP. [Citrate suppresses tumor growth in multiple models through inhibition of glycolysis, the tricarboxylic acid cycle and the IGF-1R pathway.](#) *Sci Rep* 2017; 7Z:4537.

Seth P, Csizmadia E, Hedblom A, Vuerich M, Xie H, Li M, Serena LM, Wegiel B. [Deletion of lactate dehydrogenase-A in myeloid cells triggers antitumor immunity.](#) *Cancer Res.* 2017; 77:3632-43.

Immunology

Laurie SJ, Liu D, Wagener ME, Terhorst C, Ford ML. [2B4-mediated inhibition of proliferation and glycolytic capacity attenuate CD8+ T Cell responses during transplantation.](#) *Cutting Edge. J Immunol* 2017; in press.

Rogers GL, Shirley JL, Zolotukhin I, Kumar SRP, Sherman A, Perrin GQ, Hoffman BE, Srivastava A, Basner-Tschakarjan E, Wallet MA, Terhorst C, Herzog RW. [2017 Plasmacytoid and conventional dendritic cells cooperate in cross-priming AAV capsid-specific CD8+T cells.](#) *Blood* 2017; 129:3184-95.

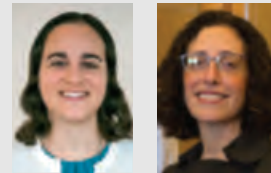
Wang N, Keszei M, Halibozek P, Engel P, Terhorst C. [Slamf6 negatively regulates autoimmunity.](#) *Clinical Immunol* 2016; 173:19-26.

Yigit B, Wang N, Chen S, Chiorazzi N, Terhorst C. [Inhibition of reactive oxygen species \(ROS\) limits tumor expansion in a mouse model of CLL.](#) *Leukemia* 2017; in press.

Zhou J, O'Keeffe M, Liao G, Zhao F, Terhorst C & Bing Xu. 2016. [Design and synthesis of nanofibers of self-assembled de novo Glycoconjugates towards mucosal lining restoration and anti-inflammatory drug delivery.](#) *Tetrahedron* 2016; 72:6078-83.

Infectious Diseases

Chen SY, Giurini JM, Karchmer AW. [Invasive systemic infection following hospital treatment for diabetic foot ulcer: Risk of occurrence and effect on mortality.](#) *Clin Infect Dis* 2017; 64:326-34.



LaSalvia MT, Branch-Elliman W, Snyder GM, Mahoney MV, Alonso CD, Gold HS, Wright SB. [Does adjunctive tigecycline improve outcomes in severe-complicated, nonoperative Clostridium difficile infection?](#) *Open Forum Infect Dis* 2017; 4:ofw264.

Lavallée C, Labbé AC, Talbot JD, Alonso CD, Marr KA, Cohen S, Laverdière M, Dufresne SF. [Risk factors for the development of Clostridium difficile infection in adult allogeneic hematopoietic stem cell transplant recipients: A single-center study in Québec, Canada.](#) *Transpl Infect Dis* 2017; 19.

Karchmer AW. [Definitive treatment for methicillin-sensitive Staphylococcus aureus bacteremia: data versus a definitive answer.](#) *Clinical Infect Dis* 2017; 65:107-9.

Tucker JD, Hughes MA, Durvasula RV, Vinetz JM, McGovern VP, Schultz R, Panosian Dunavan C, Wilson M, Milner DA, LaRocque RC, Calderwood SB, Guerrant RL, Weller PF, Taylor TE. [Global health postdoctoral training: A mixed methods evaluation of a postdoctoral training program.](#) *Clin Infect Dis* 2017; 12:1768-72.

Nephrology

Brown RS, Patibandla BK, Goldfarb-Rumyantzev AS. [The survival benefit of "Fistula First, Catheter Last" in hemodialysis is primarily due to patient factors.](#) *J Am Soc Nephrol* 2017; 28:645-52.

Chen CW, Drechsler C, Suntharalingam P, Karumanchi SA, Wanner C, Berg AH. [High glycated albumin and mortality in persons with diabetes mellitus on hemodialysis.](#) *Clin Chem* 2017; 63:477-85.

Danziger J, Young RL, Shea KM, Duprez DA, Jacobs DR, Tracy RP, Ix JH, Jenny NS, Mukamal KJ. [Circulating Des-gamma-carboxy prothrombin is not associated with cardiovascular calcification or stiffness: The Multi-Ethnic Study of Atherosclerosis \(MESA\).](#) *Atherosclerosis* 2016; 252:68-74.

Kupferman J, Amador JJ, Lynch KE, Laws RL, López-Pilarte D, Ramírez-Rubio O, Kaufman JS, Lau JL, Weiner DE, Robles NV, Verma KP, Scammell MK, McClean MD, Brooks DR, Friedman DJ. [Characterization of mesoamerican nephropathy in a kidney failure hotspot in Nicaragua.](#) *Am J Kidney Dis* 2016; 68:716-25.

Sharma AK, Birrane G, Anklin C, Rigby AC, Alper SL. [NMR insight into myosin-binding subunit coiled-coil structure reveals binding interface with protein kinase G- \$\alpha\$ leucine zipper in vascular function.](#) *J Biol Chem* 2017; 292:7052-65.

Pulmonary, Critical Care, and Sleep Medicine

Hayes M, Schwartzstein RM. [Critical thinking in critical care: five strategies to improve teaching and learning in the intensive care unit.](#) *Ann Am Thorac Soc* 2017; 14:569-75.

Myers L, Mikhael B, Currier P, Berg K, Jena A, Donnino M, Andersen LW. [American Heart Association's get with the guidelines-resuscitation investigators. The association between physician turnover \(the "July Effect"\) and survival after in-hospital cardiac arrest.](#) *Resuscitation* 2017; 114:133-40.

Peng YJ, Zhang X, Gridina A, Chupikova I, McCormick DL, Thomas RJ, Scammell TE, Kim G, Vasavda C, Nanduri J, Kumar GK, Semenza GL, Snyder SH, Prabhakar NR. [Complementary roles of gasotransmitters CO and H₂S in sleep apnea.](#) *Proc Natl Acad Sci USA* 2017; 114:1413-18.

Riviello ED, Buregeya E, Twagirumugabe T. [Diagnosing acute respiratory distress syndrome in resource limited settings: the Kigali modification of the Berlin definition.](#) *Curr Opin Crit Care* 2017; 23:18-23.

Sweerus K, Lachowicz-Scroggins M, Gordon E, LaFemina M, Huang X, Parikh M, Kanegai C, Fahy JV, Frank JA. [Claudin-18 deficiency is associated with airway epithelial barrier dysfunction and asthma.](#) *J Allergy Clin Immunol* 2017; 139:72-81.

Biomedical Research (continued)

Pushing Boundaries and Advancing Science to Save Lives

SELECTED PUBLICATIONS

Rheumatology

Biasal AR, Presumey J, Das A, van der Poel C, Lapchak P, Mesin L, Victora G, Tsokos GC, Mawrin C, Herbst, R, Carroll MC. [Type I interferon promotes microglia dysfunction and synapse loss in Lupus](#). *Nature* 2017; 546:539–43.

Comte D, Karampetsou MP, Kis-Toth K, Yoshida N, Bradley SJ, Mizui M, Solomon JR, Kyttaris VC, Tsokos GC. [SLAMF3 engagement enhances IL-2 sensitivity and favors regulatory T cell differentiation in systemic lupus erythematosus patients](#). *Proc Natl Aca Sci USA* 2016; 113:9321-6.

Kasper IR, Juriga MD, Giurini JM, Shmerling RH. [Treatment of tophaceous gout: When medication is not enough](#). *Semin Arthritis Rheum* 2016; 45:669-74.

Satyam A, Kannan LK, Matsumoto N, Geha M, Lapchak P, Ro Dale Lucca JJ, Shi GP, Bosse R, Tsokos M and Tsokos GC. [Intracellular activation of complement 3 is responsible for intestinal tissue damage during mesenteric ischemia](#). *J Immunol* 2016; 198:788-97.

Yoshida N, Comte D, Mizui M, Otomo K, Rosetti F, Mayadas TN, Crispin JC, Bradley S, Koga T, Kono M, Tenbrock K, Karampetsou M, Kyttaris VC, and Tsokos GC. [ICER controls Th17 cell differentiation and regulates autoimmune pathology](#). *Nature Commun* 2016; 7:12993.

Signal Transduction

Breitkopf SB, Ricoult SJH, Yuan M, Xu Y, Peake DA, Manning BD, Asara JM. [A relative quantitative positive/negative ion switching method for untargeted lipidomics via high resolution LC-MS/MS from any biological source](#). *Metabolomics* 2017; Epub.

Brown KK, Spinelli JB, Asara JM, Toker A. [Adaptive reprogramming of de novo pyrimidine synthesis is a metabolic vulnerability in triple-negative breast cancer](#). *Cancer Discovery* 2017; 7:391-9.

Guo J, Chakraborty AA, Liu P, Gan W, Zheng X, Inuzuka H, Wang B, Zhang J, Zhang L, Yuan M, Novak J, Cheng JQ, Toker A, Signoretti S, Zhang Q, Asara JM, Kaelin WG Jr, Wei W. [pVHL suppresses kinase activity of Akt in a proline-hydroxylation-dependent manner](#). *Science* 2016; 353:929-32.

Henry WS, Laszewski T, Tsang T, Beca F, Beck AH, McAllister SS, Toker A. [Aspirin suppresses growth in PI3K-mutant breast cancer by activating AMPK and inhibiting mTORC1 signaling](#). *Cancer Research* 2017; 77:790-801.

Manning BD, Toker A. [AKT/PKB Signaling: Navigating the network](#). *Cell* 2017; 169:381-405.

Translational Research

Bell SK, Roche SD, Johansson AC, O'Reilly KP, Lee BS, Sands KE, Talmor DS, Brown SM. [Clinician perspectives on an electronic portal to improve communication with patients and families in the intensive care unit](#). *Annals of the American Thoracic Society* 2016; 13:2197-206.

Kumar S, Ooi CY, Werlin S, Abu-El-Haija M, Barth B, Bellin MD, Durie PR, Fishman DS, Freedman SD, Garipey C, Giefer MJ, Gonska T, Heyman MB, Himes R, Husain SZ, Lin TK, Lowe ME, Morinville V, Palermo JJ, Pohl JF, Schwarzenberg SJ, Troendle D, Wilschanski M, Zimmerman MB, Uc A. [Risk factors associated with pediatric acute recurrent and chronic pancreatitis: lessons From INSPPIRE](#). *JAMA Pediatr* 2016; 170:562-9.

Martin CR, Cheesman A, Brown J, Makda M, Kutner AJ, DaSilva D, Zaman M, Freedman SD. [Factors determining optimal fatty acid absorption in preterm infants](#). *J Pediatr Gastroenterol Nutr* 2016; 62:130-6.

Robinson DT, Palac HL, Baillif V, Van Goethem E, Dubourdeau M, Van Horn L, Martin CR. [Long chain fatty acids and related pro-inflammatory, specialized pro-resolving lipid mediators and their intermediates in preterm human milk during the first month of lactation](#). *Prostaglandins Leukot Essent Fatty Acids* 2017; 121:1-6.

Struyvenberg MR, Martin CR, and Freedman SD. [Practical guide to exocrine insufficiency: Breaking the myths](#). *BMC Medicine* 2017; 15:29.

Transplant Immunology

Borges TJ, O'Malley JT, Wo L, Murakami N, Smith B, Azzi J, Tripathi S, Lane JD, Bueno EM, Clark RA, Tullius SG, Chandraker A, Lian CG, Murphy GF, Strom TB, Pomahac B, Najafian N, Riella LV. [Codominant role of interferon-γ and interleukin-17-producing T cells during rejection in full facial transplant recipients](#). *Am J Transplant* 2016; 16:2158-71.

Thornley TB, Agarwal KA, Kyriazis P, Ma L, Chipashvili V, Aker JE, Korniotis S, Csizmadia E, Strom TB, Koulmanda M. [Contrasting roles of islet resident immunoregulatory macrophages and dendritic cells in experimental autoimmune type 1 diabetes](#). *PLoS One* 2016. 11:e0150792.

Thornley T, Kyriazis P, Agarwal K, Fang Z, Ma L, Chipashvili V, Koulmanda M, Strom TB. [Genetic TIM-4 deletion promotes immunoregulatory tissue-resident macrophage survival and lowers the barrier to cardiac allograft tolerance](#). *Am J Transplant* 2016; 16.

Starling RC, Stehlik J, Baran DA, Armstrong B, Stone JR, Ikle D, Morrison Y, Bridges ND, Putheti P, Strom TB, Bhasin M, Guleria I, Chandraker A, Sayegh M, Daly KP, Briscoe DM, Heeger PS, CTOT-05 consortium. [Multicenter analysis of immune biomarkers and heart transplant outcomes: results of the clinical trials in organ transplantation-05 study](#). *Am J Transplant* 2016; 16:121-36. Epub.

Quality Improvement

Bell SK, Mejilla R, Anselmo M, Darer JD, Elmore JG, Leveille S, Ngo L, Ralston JD, Delbanco T, Walker J. [When doctors share visit notes with patients: a study of patient and doctor perceptions of documentation errors, safety opportunities and the patient-doctor relationship](#). *BMJ Qual Saf* 2017; 26:262-70.

Bates CK, Yang J, Huang G, Tess AV, Reynolds E, Vanka A, Caines L, Smith CC. [Separating residents' inpatient and outpatient responsibilities: improving patient safety, learning environments, and relationships with continuity patients](#). *Acad Med* 2016; 91:60-4.

Carbo AR, Goodman EB, Totte C, Clardy P, Feinbloom D, Kim H, Kriegel G, Tess A, et al. [Resident case review at the departmental level: a win-win scenario](#). *Am J Med* 2016; 129:448-52.

Migdal A, Sternberg SB, Oshin A, Aronson MD, Hennessey J. [Building a quality management system for a thyroid nodule clinic](#). *Thyroid* 2016; 26:825-30.



Zerillo JA, Goldenberg BA, Kotecha RR, Tewari AK, Jacobson JO, Krzyzanowska MK. Interventions to improve oral chemotherapy safety and quality: a systematic review. *JAMA Oncol* 2017; Epub ahead of print.

Education Publications

Fazio SB, Demasi M, Farren E, Frankl S, Gottlieb B, Hoy J, Johnson A, Kasper J, Lee P, McCarthy C, Miller K, Morris J, O'Hare K, Rosales R, Simmons L, Smith B, Treadway K, Goodell K, Ogur B. [Blueprint for an undergraduate primary care curriculum.](#) *Academic Medicine* 2016; 91:1628–1637.

Fessler DA, Huang GC, Potter J, Baker JJ, Libman H. [Development and implementation of a Novel HIV primary care track for internal medicine residents.](#) *J Gen Intern Med* 2017; 32:350-354.

Richards CJ, Mukamal KJ, DeMelo N, Smith CC. [Fourth-year medical school course load and success as a medical intern.](#) *J Grad Med Educ* 2017; 9:58-63.

Remus, KE, Honinberg M, Tummalapali L, Cohen LP, Fazio S, Weinstein AR. [A chronic disease management student-faculty collaborative practice: educating students on innovation in health care delivery.](#) *Acad Med* 2016; 91:967-71.

William J, Huang GC, Herzog S, Zeidel M. [A comparative physiology course may encourage academic careers in renal fellows.](#) *Med Sci Educator* 2016; 26:357.

Kenneth Mukamal, MD, MPH, Associate Professor of Medicine and member of the Division of General Medicine and Primary Care, received a major grant this year from the National Institute on Alcohol Abuse and Alcoholism, part of the National Institutes of Health (NIH). One of the largest NIH grants in the history of the Department (with a commitment of over \$37 million in its initial phase), this funding will support Dr. Mukamal's Moderate Alcohol and Cardiovascular Health Trial (MACH15). A multicenter, worldwide, randomized clinical trial, MACH15 aims to determine the effects of one serving of alcohol daily compared to no alcohol on cardiovascular disease among adults at above-average risk. A secondary objective of the study is to evaluate the impact of one serving of alcohol (versus no alcohol) on diabetes risk. The study will involve 7,800 participants aged 50 years and older. Enrollees will come from up to 16 sites around the world and will be involved in the study for an average of six years. Dr. Mukamal comments on this significant grant and the important research it will enable.

“Humans have been drinking alcohol for perhaps as long as there have been humans, and the consequences of its consumption in excess are obviously profound and well-known. Remarkably, though, we have essentially no gold-standard evidence for what its effects are over the long run when consumed within sensible limits. This is the first opportunity ever to conduct a true long-term experiment with alcohol, to gain the type of knowledge that physicians have for literally every approved drug in the US but haven't had for alcohol until now.”



2017 RESEARCH FUNDING

Division	Funding Source	Direct Award	Indirect Award
Allergy and Inflammation	Federal Non-Federal	\$675,914 \$213,126	\$418,303 \$150
Cardiovascular Medicine	Federal Non-Federal	\$5,386,736 \$7,784,653	\$3,297,151 \$1,345,440
Clinical Informatics	Federal Non-Federal	\$888,233 \$257,177	\$144,763 \$25,917
Clinical Nutrition	Federal Non-Federal	— \$32,807	— —
Endocrinology, Diabetes, and Metabolism	Federal Non-Federal	\$6,872,557 \$2,854,099	\$4,056,827 \$244,275
Experimental Medicine	Federal Non-Federal	\$617,335 \$749,709	\$325,114 \$105,820
Gastroenterology	Federal Non-Federal	\$3,111,800 \$4,183,975	\$1,917,204 \$938,541
General Medicine and Primary Care	Federal Non-Federal	\$10,998,944 \$5,339,109	\$1,655,825 \$561,071
Genetics	Federal Non-Federal	\$4,510,456 \$3,167,416	\$2,473,393 \$145,333
Gerontology	Federal Non-Federal	\$232,420 \$729,650	\$1,661 \$82,546
Gerontology/Hebrew Senior Life	Federal Non-Federal	\$5,989,899 \$1,363,821	\$2,305,164 \$137,088
Hematology/Oncology	Federal Non-Federal	\$10,424,616 \$8,905,258	\$4,452,105 \$1,276,610
Hemostasis and Thrombosis	Federal Non-Federal	\$1,914,371 \$146,248	\$875,249 \$11,556
Immunology	Federal Non-Federal	\$1,211,770 \$160,940	\$623,174 \$73,962
Infectious Diseases	Federal Non-Federal	\$1,821,200 \$294,350	\$614,853 \$61,739
Interdisciplinary Medicine and Biotechnology	Federal Non-Federal	\$2,012,194 \$1,869,430	\$599,232 \$274,375
Nephrology	Federal Non-Federal	\$3,310,668 \$5,056,740	\$1,887,282 \$850,300
Pulmonary, Critical Care, and Sleep Medicine	Federal Non-Federal	\$784,086 \$839,671	\$89,198 \$67,927
Rheumatology	Federal Non-Federal	\$1,991,655 \$141,185	\$1,232,509 \$16,081
Signal Transduction	Federal Non-Federal	\$113,082 \$86,889	\$80,727 \$70,112
Translational Research	Federal Non-Federal	\$579,650.75 \$1,296,004.72	\$382,995.54 \$257,995.80
Transplant Immunology	Federal Non-Federal	\$906,383 \$227,495	\$427,301 \$2,217
Virology and Vaccine Research	Federal Non-Federal	\$32,128,897 \$9,199,418	\$5,983,795 \$1,861,021
GRAND TOTAL		\$151,382,036	\$42,253,905

In Memoriam

Mark Josephson, MD



Mark and Joan Josephson

This year marked the passing of Mark Josephson, MD, an exceptional leader, researcher, clinician, and friend. Chief of the Department of Medicine's

Dr. Josephson earned his medical degree from Columbia University and completed his residency at Mount Sinai Hospital. While serving as a military medical officer during the Vietnam War, he was introduced to cardiac electrophysiology research at the Public Health Service Hospital in Staten Island, NY. He later completed a cardiology fellowship at the Hospital of the University of Pennsylvania, where he went on to build a premier electrophysiology service and become Chief of Cardiology. In 1992, Dr. Josephson established the Harvard-Thorndike Electrophysiology Institute and Arrhythmia Service at Beth Israel Hospital. In 2001, he was named the Chief of Cardiovascular Medicine at BIDMC and the Herman Dana Professor at Harvard Medical School.

AS MANY OF YOU KNOW, I'VE ALWAYS CONSIDERED MY LEGACY TO BE THE SUCCESS OF MY ACADEMIC CHILDREN AND GRANDCHILDREN. TO HAVE THE OPPORTUNITY TO NURTURE YOUNG PEOPLE AND WATCH THEM MAKE AN IMPACT IN MEDICINE IS SOMETHING FOR WHICH I AM ETERNALLY GRATEFUL.

Division of Cardiovascular Medicine from 2001 through 2015, he was a renowned leader and innovator in the field of electrophysiology and is considered the founder of the discipline. The Joan and Mark Josephson Scholar Award has been established to honor a faculty member who demonstrates commitment to the highest qualities of humanism in the care of patients within the Division of Cardiovascular Medicine.

Dr. Josephson transformed the field of cardiac electrophysiology to provide state-of-the-art therapies for those suffering from arrhythmias. He was the author of *Clinical Cardiac Electrophysiology Techniques and Interpretations*, a definitive work that has guided generations of cardiologists and electrophysiologists. He was the recipient of the American College of Cardiology's Distinguished Scientist Award. Dr. Josephson took the greatest

pride in the more than 250 cardiac electrophysiology fellows he trained.

The following are excerpts from remarks he made upon receiving the American Heart Association's Eugene Braunwald Award in 2013:

“As my career was developing, I had the privilege to teach and mentor young physicians who would ultimately become leaders in clinical electrophysiology and role models for future generations. It has been very rewarding to help develop young physicians both professionally and personally, to watch these young mentees grow from enthusiastic young physicians to independent investigators, clinician educators, division chiefs, deans, and excellent clinicians, has been very gratifying. In my opinion, the title 'mentor' is the highest title one can achieve in academic medicine. While the university rank of Professor by itself is a great achievement, it only recognizes one's personal accomplishments. The title of mentor means you have helped to mold and develop the careers of others. Their success is a much greater contribution to medicine. As many of you know, I've always considered my legacy to be the success of my academic children and grandchildren. To have the opportunity to nurture young people and watch them make an impact in medicine is something for which I am eternally grateful. I'd also like to thank my wife Joan for supporting me and encouraging me in these efforts and mostly for lovingly co-parenting all of these academic children.”

Department of Medicine
Beth Israel Deaconess Medical Center
330 Brookline Avenue, Boston, MA 02215
617-667-7000
bidmc.org/medicine

Beth Israel Deaconess Medical Center is a patient care, teaching and research affiliate of Harvard Medical School and consistently ranks as a national leader among independent hospitals in National Institutes of Health funding.

BIDMC is in the community with Beth Israel Deaconess Hospital-Milton, Beth Israel Deaconess Hospital-Needham, Beth Israel Deaconess Hospital-Plymouth, Anna Jaques Hospital, Cambridge Health Alliance, Lawrence General Hospital, Signature Healthcare, Beth Israel Deaconess HealthCare, Community Care Alliance and Atrius Health. BIDMC is also clinically affiliated with the Joslin Diabetes Center and Hebrew SeniorLife and is a research partner of Dana-Farber/Harvard Cancer Center and The Jackson Laboratory. BIDMC is the official hospital of the Boston Red Sox. For more information, visit www.bidmc.org.



**Beth Israel Deaconess
Medical Center**



**HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL**