

Beth Israel Deaconess Medical Center



HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

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Department of Medicine 2014 Annual Report

SCIENCE IN SERVICE RESEARCH IN TRANSLATION



Michelle Chung, student researcher.

HOME «|»

FROM THE CHAIR



Dear Colleagues and Friends,

The field of biomedical research is constantly evolving. With each day, an unexpected lab finding or an unforeseen clinical complication requires investigators to explore new territory and grapple with new research questions. This is happening across medical specialties in labs and clinics alike. Consider, for example, the following developments from just the past year:

- ~ A new institute was launched, dedicated to researching part of the human genome once considered "junk"
- ~ A paper was published on a new way to prevent one of the root causes of hospital-related morbidity and mortality among the elderly
- ~ A clinical trial was developed aimed at curing HIV/AIDS worldwide
- ~ Cutting-edge metabolism and nutrition research laid the groundwork for new personalized medicine programs

I'm proud to report that each of these is an accomplishment of the BIDMC Department of Medicine from 2014, and each reflects the robust research underway in the department.

I'm even prouder to note that each of these developments is an example of "Science in Service," the title of this year's report. Whether at the bench or the bedside—the lab or the clinic—the research efforts described in the following pages have a common goal: to help improve medicine and health care.

Furthermore, this research reflects the investigators behind it: members of the Medicine faculty who are inquisitive, analytic, thoughtful and, most importantly, committed—committed to applying their often highly specialized scientific expertise to the shared goal of improving people's health and lives.

Our faculty also continues to lead the way in clinical care and medical education, which along with research, make up our tripartite mission. Although it focuses on biomedical advances, this report also highlights a year of record clinical growth for the department as well as continued innovations in teaching.

We in the Department of Medicine are fortunate to be part of local and global biomedical communities dedicated to advancing the type of translational research, clinical care and medical education celebrated in this report. We thank you for your collaboration and look forward to your continued partnership.

Sincerely,

Mary, zodas

Mark L. Zeidel, MD Chair, Department of Medicine

DEPARTMENTAL ORGANIZATION

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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

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Acknowledgments

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BY THE NUMBERS 2014

36

HUMAN SUBJECT RESEARCH

(expedited) and 21 (exempt).

FACULTY DEGREES

Department of Medicine: 51 (full review), 49

556 MD

— **94** PhD

53 MD, PhD



NATIONAL INSTITUTES OF HEALTH AWARDS AND FUNDING

K Awards

- ~ BIDMC-wide: 56
- ~ Department of Medicine: 31

NIH Funding

- ~ **Top 3%** of all institutions internationally
- ~ **#6 of 91** independent hospitals
- ~ Department of Medicine received over \$66,000,000

PUBLICATIONS

~ Number of new publications by Medicine faculty and trainees in PubMed in 2014: 680

RESIDENTS AND FELLOWS

- ~ Number of internal medicine interns in the 2013-2014 class: 61
- ~ Number of 2014 internal medicine residency program graduates who went on to fellowships: 38

CLINICAL VOLUME

- ~ Inpatient discharges: 14,198
- ~ Observation discharges: 4,862

271,253 Outpatient visits

- ~ Patient days in hospital: 86,004
- ~ Individuals with a primary care provider in Medicine ("covered lives"): 41,000

2014

- ~ Work relative value units (RVUs): 867,527
- ~ Endoscopic procedures: 26,227
- ~ Cardiac catheterizations: 4,318



BIDMC AFFILIATED/LICENSED COMMUNITY HEALTH CENTERS

- ~ Over 100 members of the Department of Medicine practice at six BIDMC affiliated/licensed community health centers.
- ~ These six community health centers accounted for nearly 180,000 ambulatory visits and 3,000 admissions to BIDMC last year.



RESEARCH CORE REVENUE

22222

- ~ Revenue for all 20 BIDMC institutional research cores: \$3,533,956
- ~ Revenue for the 9 institutional research cores led by Medicine faculty: **\$2,109,799**
- ~ Medicine revenue: 59.7% of BIDMC-wide revenue







HOME « | »



Samuel Snider, MD, with patient Jim Gaudet.

REMEMBERING ROBERT C. MOELLERING, JR., MD

Adolf W. Karchmer, MD | George M. Eliopoulos, MD | Peter F. Weller, MD

On February 24, 2014, Robert C. Moellering, Jr., MD, died at the age of 77. He left behind his beloved wife Mary Jane Ferraro and his children Anne. Catherine and Robert, as well as scores of admiring and devoted colleagues, friends and former trainees.

After graduating from Harvard Medical School (HMS) in 1962, Bob completed his residency in internal medicine and a fellowship in infectious disease at Massachusetts General Hospital (MGH). He was then hired as faculty in the MGH Infectious Disease Unit, where he was quickly recognized as a stellar clinician with encyclopedic knowledge and impeccable clinical judgment as well as a remarkably productive researcher—a reputation he maintained throughout his career.

In 1981, Bob was named Physician-in-Chief and Chair of the Department of Medicine at New England Deaconess Hospital and the Shields Warren-Mallinckrodt Professor at Harvard Medical School. Starting with a department of only 20 full-time faculty primarily in cardiology, hematology/oncology, rheumatology and pulmonology, he recruited nationally- and internationally-recognized faculty in all of the subspecialties of a modern department of medicine. Under his 15-year chairmanship, the Department was also granted full academic appointing privileges at HMS—a formidable accomplishment.

After the merger of New England Deaconess Hospital and Beth Israel Hospital in 1996. Bob served several leadership roles at the new Beth Israel Deaconess Medical Center, including Chair of the Department of Medicine and Herrman L. Blumgart Professor of Medicine from 1998 through 2005. Providing wisdom, judgment and integrity, Bob helped lead the medical center through difficult post-merger times to its current position as a preeminent academic medical center and pillar of strength at HMS.

An extraordinary academic, Bob was an internationallyrecognized leader in infectious diseases with particular interests in mechanisms of antibiotic action and antibiotic resistance, and the development of new antimicrobials. He published more than 430 original articles; and he served as Editor-in-Chief of Antimicrobial Agents and Chemotherapy for a decade, as Editor-in-Chief of Infectious Disease Clinics of North America. and as Editor of the Sanford Guides to Antimicrobial Therapy and HIVIAIDS Therapy.

Throughout his career, Bob maintained a particular research interest in the Enterococcus spp. He defined the mechanism whereby cell wall-active penicillins and aminoglycosides interact to achieve bactericidal synergism against the enterococcus—a phenomenon that has been the cornerstone of therapy for enterococcal endocarditis. He contributed extensively to the understanding of vancomycin resistance in enterococci and to the development of resistance to linezolid in Staphylococcus aureus. Bob received numerous prestigious awards, including the Garrod Medal from the British Society of Antimicrobial Chemotherapy, the Feldman and Maxwell Finland Awards from the Infectious Disease Society of America (IDSA), the Hoechst-Roussel Award from the American Academy of Microbiology and the Alexander Fleming Award for Lifetime Achievement from the IDSA. Bob was a Fellow of the American Academy of Microbiology, a Master of the American College of Physicians and a Fellow of the IDSA, where he was also President in 1991.

Bob was a spectacular clinician with an uncanny ability to solve the most complex clinical conundrums. He was also committed to medical resident education and mentored countless trainees. Throughout his remarkable career, Bob maintained a fundamental decency, gentleness, integrity, humility and generosity.

of those around him. In his own words at the time of his retirement as Chair of the Department of Medicine. ability to work with you as a teacher, as a mentor, has provided my greatest professional satisfaction. You are my legacy. Your success is my success and will be forever." Bob's enduring legacy was on display at this fall's Celebration of Life Symposium, where over 200 friends, colleagues and trainees acknowledged his enormous impact on their lives and careers. (Watch wisdom with us.



Adolf W. Karchmer, MD, and George Eliopoulos, MD (left to right).

Claudie Thauvin, MD, and Francios Lebel, MD (left to right).



Eli Kaldany, Charles Safran, MD, Henry Feldman, MD, PhD, Adeeba Kamarulzaman, MD, Antoine Kaldany, MD, and Kazem Behbehani, PhD (left to right).

BEYOND BORDERS: INTERNATIONAL COLLABORATIONS IN CLINICAL INFORMATICS

Charles Safran, MD, Chief of the Division of Clinical Informatics, recalls the founding of the Division at Beth Israel Hospital over 40 years ago. "Back then, it was called 'Computer Medicine,'" he says. "We were one of the first academic divisions focused on the use of computers in health care."

Since then, the field has become essential, integrating technology into clinical practice. Decision support, clinical protocols and patient education are all part of the clinical informatics toolkit. But perhaps the most important innovation to come out of the field is the electronic health record (EHR). Here at BIDMC, the Online Medical Record (WebOMR)—which Safran and his team originally developed in 1989—has become the standard for storing and sharing patient information across BIDMC's ever-growing provider network.

Just as BIDMC has WebOMR, most other health care networks have their own EHRs. But these systems rarely "talk" to each other, meaning information doesn't travel with patients, who may receive care in various places. So when Safran and his team began to envision a next-generation EHR that could help ensure continuity of care and information-sharing across care providers, they looked beyond the US to an environment where there were fewer systems in place. In fact, they looked well beyond: to Kuwait, a small country at the top of Record (KBHR), a clinically intuitive and patient-centric EHR that is on its way to becoming, in the words of Safran, "the central nervous system of health care efforts throughout Kuwait."

Antoine Kaldany, MD, of Joslin Diabetes Center and BIDMC's Division of Nephrology, spearheaded the BIDMC-Dasman partnership and agrees that Kuwait and Dasman, in particular, have been ideal for this the Persian Gulf. There they partnered with the Dasman project. "Kuwait's citizens are open-minded and Diabetes Institute to create the Knowledge-Based Health eager to improve their health," says Kaldany. "And Dasman's Director-General, Dr. Kazem Behbehani, and his team have been exceptional partners." In fact, the collaboration has been so successful that Kaldany is leading efforts to broaden the international partnership In addition to being a clean slate for EHRs, Kuwait to include Malaysia and Indonesia. Behbehani, who launched global eHealth as a World Health Organization has one of the highest rates of diabetes in the world. Because managing the disease requires close executive in the early 1990s, believes that KBHR has coordination of primary care physicians and specialists, the potential to revolutionize health care in Kuwait and a unified and accessible health record is especially beyond. He says, "KBHR will help providers be more important in diabetes care. "Treatment and research efficient and to make better clinical decisions for their are strongly impacted by KBHR in that it forms a single patients. We hope to serve as a global model for the source of truth for both research and clinical data," says best technology that clinical informatics has to offer." Henry Feldman, MD, Chief Information Architect of the

KBHR team at BIDMC. "You don't have to combine data from many systems to come up with an answer about the patient."

This, as Feldman notes, is useful not only from a clinical standpoint but from a research perspective as well. The KBHR team is working on an exciting addendum to KBHR's information repository: a system called I2B2, developed as part of Harvard's Catalyst program. "I2B2 is a research database for integrating technology and informatics at the bedside," explains Safran. "It not only allows administrators and scientists to access records for performance evaluation or basic research, but it allows physicians to ask, 'Have we seen a patient like this before?' And if so, what happened? What were the diagnoses, the complications, the best medical regimens?"

TRAILBLAZING RESEARCH IN HIV

Since its launch two years ago, the <u>Center for Virology and Vaccine Research</u> (CVVR) has advanced the field of HIV research. The Center's Director, <u>Dan Barouch</u>, <u>MD</u>, <u>PhD</u>, and his team have made strides in the areas of both vaccines and therapy for HIV.</u>

The CVVR has had breakthroughs in both areas in the last year: a new HIV vaccine entered clinical trials with industry partner Johnson & Johnson at the end of 2014, and Barouch served as senior author on a paper exploring the use of monoclonal antibodies—cloned proteins that encourage a subject's immune system to attack diseased cells—to treat HIV.

The new vaccine, Barouch says, is the sixth clinical vaccine trial that the Center has initiated in recent years. This one in particular has potential to become a "global" vaccine—meaning it would be useful worldwide rather than just for a specific region. The proof-of-concept preclinical studies showed for the first time that "mosaic" HIV antigens—a blend of three major HIV proteins—gave rhesus monkeys partial protection against simian-human immunodeficiency virus (SHIV, a virus similar to HIV that infects monkeys). Barouch says, "The results suggest a path forward for the development of a global HIV vaccine and give us hope that such a vaccine might indeed be possible. A global vaccine would offer major biomedical and practical advantages."

In the area of HIV treatment, Barouch and his team received a \$20 million grant from the Bill & Melinda Gates Foundation to develop potent virus-specific monoclonal antibodies as a novel HIV therapy and potential cure strategy. The team studied the effects of PGT121, an antibody that has been observed to neutralize most strains of HIV-1 worldwide, in treating SHIV infection in rhesus monkeys. SHIV-infected monkeys responded remarkably well to this treatment: following a single antibody infusion, levels of the virus dropped to undetectable levels in under a week. Additionally, in monkeys with lower initial levels of the virus, undetectable levels of the virus were maintained even after antibody infusions stopped. "The data strongly encourage the development of monoclonal antibodies as a novel therapy for HIV in humans," says Barouch. The Gates grant will support the continuation of this research into proof-of-concept studies in monkeys and phase I and II clinical trials in HIV-infected humans.

The CVVR team continues to work toward both preventing and eradicating HIV. Looking to the future, Barouch says, "We're still in exploratory phases, but we're actively working on strategies for HIV vaccines and cures." Now that HIV/AIDS is largely a manageable but chronic condition, Barouch says, "Our focus is shifting. The goal is to eliminate it."





Dan Barouch, MD, PhD.



Mark Herman, MD, and Jody Dushav, MD, MMSc.

TARGETED RESEARCH AND PERSONALIZED CARE IN METABOLIC DISEASE

For many of the nearly 79 million US adults who suffer from obesity, blanket recommendations like "lower your carbohydrate intake" or "get more exercise" have proven ineffective.

So researchers and clinicians at BIDMC are looking more closely at obesity's neurobiological, hormonal and metabolic roots in the hopes of developing new, more targeted and personalized treatments treatments that work.

This is the goal of BIDMC's new Center for Nutrition and Metabolism. The Center, spearheaded by Chief of the Division of Endocrinology Anthony Hollenberg, MD, and endocrinologist Terry Maratos-Flier, MD, is an interdisciplinary, BIDMC-wide initiative to combine obesity research and clinical care and to encourage the collaboration of basic researchers, translational researchers and clinicians. The Center will have four

This finding is a key step toward developing components: a Personalized Care Center led by Jody personalized, nutrition-based treatment. The relationship Dushay, MD, MMSc; a Center for Translational Medicine between fructose and FGF21 is the first example, led by Dushay, Maratos-Flier and Chris Mantzoros, MD, Herman says, of a nutrient having a direct, measurable effect on the level of a specific hormone, aside from the PhD; community outreach programs; and a Discovery Laboratory consisting of 15 existing BIDMC research well-known ability of glucose to stimulate insulin. This is also among the first studies to show that fructose laboratories. ingestion has variable effects in humans. "We're very Among the investigators contributing to the Discovery interested in how different people react to different Laboratory is Mark Herman, MD, whose work focuses diets and regimens," says Herman. "For the first time, on the relationship between nutrient intake and we can begin to understand susceptibility [to nutrientmetabolic disease. Herman and fellow researchers such induced disorders] in a focused way." The eventual goal as Evan Rosen, MD, PhD, Young-Bum Kim, PhD, and is to find a genetic basis for individuals' responses to Pavlos Pissios, MD, are working closely with Dushay in different nutrients, which will allow for personalized risk the Center for Translational Medicine to move their basic assessments and targeted prevention and treatment. research from the bench to the bedside. Herman and Dushay's work is aimed at weight loss efforts, specifically As Dushay notes, the purpose of the Personalized Care through personalized nutrition consultation. Center will be to use this type of research and "apply it

One recent study led by Herman, Dushay and Maratos-Flier is particularly exciting in its potential to improve nutrition-based care. Earlier studies have linked high levels of fibroblast growth factor 21 (FGF21, a metabolic hormone that is made predominantly in the liver) with metabolic syndrome, a common constellation of risk factors that can lead to obesity, diabetes and heart disease. The BIDMC team was curious about

regulation of FGF21 given that interventions known to regulate it in animal models have not been effective in humans. They gave identical doses of fructose and glucose—simple sugars found in table sugar, highfructose corn syrup and fruit—to lean individuals and to individuals with metabolic syndrome. Their findings were groundbreaking: FGF21 responds acutely and robustly to fructose ingestion, but not glucose ingestion. Moreover, this response was increased in people with metabolic disease, an important distinction as fructose ingestion and elevated levels of FGF21 have previously been associated with cardiometabolic disease.

to people directly." Indeed, patients at the Center will have the option of participating in cutting-edge clinical trials of new, personalized therapies—to treat disease but also to prevent it to begin with. "We want to be forward-thinking about this," says Dushay. "We want to be preventative by developing novel ways to evaluate and reduce, or ideally eliminate, risk for our patients. That's the ultimate goal."

UNDERSTANDING THE PATIENT EXPERIENCE: BEYOND THE PRESCRIPTION

<u>Ted Kaptchuk</u> started research on alternative medicine at BIDMC in 1990. As he administered acupuncture and other treatments he had learned while training in China, he noticed that his patients' responses to treatments differed from those of his teachers' Chinese patients.

Given that the therapies were the same, he wondered what else might be impacting patients' outcomes. He became fascinated by the question of what factors other than clinical therapies themselves—influence patients' responses.

Kaptchuk, now a professor at Harvard Medical School (HMS) and Director of the <u>Program in Placebo</u> <u>Studies and the Therapeutic Encounter</u> at BIDMC and HMS, investigates elements of health care that, he says, are "often ignored in the pharmacocentric world." In particular, Kaptchuk has become one of the world's leading experts on the "placebo effect"—a phenomenon in which patients or research subjects report improvement in their health when treated with inactive substances. (Kaptchuck chuckles at this: "The effect of an inert substance is an oxymoron, of course.") The pharmacology of a drug explains only part of the patient's experience, he says, and his ultimate goal is to "illuminate what's in the dark."

A study published this year in Science Translational Medicine helps to do just that by quantifying how much pain relief is attributed to a drug's pharmacological effect versus the placebo effect. Working with Rami Burstein, PhD, Director of Pain Research in BIDMC's Department of Anesthesia, Critical Care and Pain Medicine, Kaptchuk studied over 450 migraine headaches in 66 people. After an initial headache episode, where patients received no treatment and documented their symptoms 30 minutes after the attack and again two hours later, participants were each given six envelopes with pills to take during each of their six subsequent migraine attacks. Two envelopes were labeled "Maxalt" (the migraine drug rizatriptan), intended to elicit a positive expectation from the participant; two were labeled "placebo" to elicit a negative expectation; and two were labeled "Maxalt or placebo" to elicit a neutral expectation. Despite the labels, in each pair of envelopes, one envelope actually

contained a Maxalt tablet and one contained a placebo pill. During subsequent attacks, patients again reported on their symptoms 30 minutes after and then two hours later.

The team's striking results added significantly to the existing body of research pointing to the power of the placebo. "Though Maxalt was superior to the placebo in alleviating pain, under each of the three messages the placebo effect accounted for at least 50% of the subjects' overall pain relief," says Kaptchuk. For example, when the Maxalt tablet was labeled "Maxalt," participants reported almost double the relief than when the Maxalt was labeled "placebo." And there was no difference between placebo labeled "Maxalt" and Maxalt labeled "placebo." The effectiveness of the drug without positive expectation was similar to the placebo with a positive expectation.

There was another surprising finding as well: even when participants received a placebo labeled "placebo," they reported more pain relief than with no treatment. As Kaptchuk explains, the idea of an "honest" placebo runs contrary to the idea that patients respond to placebos because they think they're getting active drugs and suggests that even known placebos could be used to boost pharmaceutical effects. This is particularly exciting to Kaptchuk, who seeks to "improve clinical outcomes of effective and marginally effective drugs."

More broadly, Kaptchuk's goal is to understand the ways in which care provided to patients—including the labels on medications and other forms of communication has powerful impacts on patient responses. He believes that medicine today downplays verbal and nonverbal communication, which he suspects has powerful effects on patients' responses to treatment. "Ultimately, it's what the provider does that isn't the drugs that I'm trying to quantify," he says.



Ted Kaptchuk.



Melissa Mattison, MD, Sharon Inouve, MD, MPH, and Edward Marcantonio, MD, SM (left to right).

A SHIFTING MINDSET IN DELIRIUM PREVENTION AND TREATMENT

occurred during fever or head trauma.

Despite these successful prevention and treatment Today, delirium is more precisely defined as the sudden onset of confusion or change in mental status programs, there's still much to be understood about that can be induced by physical illness, surgery or why and how delirium so profoundly affects the human hospitalization—often confused with but clinically body and brain. As BIDMC's Edward Marcantonio, MD, distinct from dementia. Affecting up to 42% of SM, a geriatrician and Section Chief for Research in the medical inpatients, delirium is associated with long-Division of General Medicine and Primary Care, explains, term complications for 20% of people and with as "Our current understanding of delirium is comparable much as a 33% rate of hospital mortality among to knowing that cholera could be stopped by sterilizing those 65 and older. water without understanding that there was a bacteria involved or how it caused disease."

Despite the toll it takes, delirium among hospital patients—particularly elderly ones—has historically been considered "somewhat inevitable and unavoidable." explains Sharon Inouye, MD, MPH, a BIDMC geriatrician in the Division of Gerontology and Director of the Aging Brain Center at the Institute for Aging Research, Hebrew SeniorLife (HSL). This changed in 1999, however, when Inouye and colleagues published findings on a new intervention called the Hospital Elder Life Program (HELP). Using the program, delirium was shown to be preventable and treatable through fairly basic steps like better hydration and mobilization.

These findings have informed national delirium This year, Marcantonio and Inouye developed and guidelines and have laid the foundation for several validated the 3D-CAM, a three-minute assessment delirium prevention and treatment programs. One such tool for diagnosing delirium. The 3D-CAM is part of a broader CAM (Confusion Assessment Method) toolkit program is the Global Risk Assessment and Careplan for the Elderly (GRACE) program, developed at BIDMC that is widely used to identify delirium and rate its and championed by Melissa Mattison, MD, a hospitalist severity. "This measure holds great promise to improve in the Division of General Medicine and Primary Care. understanding of the effects of delirium on clinical care, Using the HELP protocol as a starting point, GRACE prognosis, pathophysiology and response to treatment," standardized a "bundle," giving health care providers Inouye says. the necessary tools to prevent and treat delirium in a Here at BIDMC this body of research is already "very pragmatic way," says Mattison. A study of the benefiting older patients in real time, every day. In fact, bundle published in 2014 showed that elderly patients by preventing and treating delirium, the Medical Center were less likely to be prescribed high-risk drugs is also addressing falls, which as Mattison explains, like haloperidol or morphine, and more likely to be are one of the other primary causes of morbidity in discharged home than to extended care facilities. hospitalized older people. She notes, "Delirium impacts Now, Mattison is working on improving the system people's health and quality of life in so many ways. as part of a team developing "GRACE 2.0." This is one more reason to take it seriously."

According to medical historians, the earliest reference to delirium was in the first century AD by the Roman writer Celsus, who described it as a mental disorder that

- To better understand the underlying causes of delirium, Inouye and Marcantonio have partnered on the Successful Aging after Elective Surgery (SAGES) study
- funded by the National Institute of Aging, which is examining novel risk markers for delirium, including plasma biomarkers, advanced neuroimaging markers and cognitive reserve markers. Marcantonio says, "There are so many possible causes of delirium that we're often
- making an educated guess when we try to treat people. This research—developing an evidence base—is critical to making rational treatments to help our patients."

THE BUSINESS OF BIOTECHNOLOGY

At BIDMC, there is a select group of people who find themselves both running dynamic business enterprises and conducting cutting-edge biomedical research. They are the research faculty who lead BIDMC's 20 institutional core facilities. These "cores" are small businesses that serve BIDMC as well as the broader biomedical community—both nationally and internationally. They operate as fee-for-service establishments and their directors are responsible for running the front and back ends of these small companies.

The Department of Medicine has particularly close ties to these enterprises: of BIDMC's 20 cores, 9 are led by Medicine research faculty. Towia Libermann, PhD, and Manoj Bhasin, PhD, both faculty in the Division of Interdisciplinary Medicine and Biotechnology (IMBIO), are among them. They direct the Genomics, Proteomics, Bioinformatics and Systems Biology Center, with Libermann administrating Genomics and Proteomics and Bhasin running Bioinformatics and Systems Biology. Genomics and Proteomics provides the "hardware"—high-end equipment and methodologies for procedures like gene mutational analysis and genome-wide quantitative protein and gene profiling. Bioinformatics and Systems Biology, on the other hand, is the "software," offering services like experimental design assistance, analysis of omics data in disease pathophysiology, and identification of diagnostic, prognostic and predictive biomarkers.

Through their core, Bhasin and Libermann have collaborated with several top medical research institutions, including Dana-Farber Cancer Institute, Tufts Medical Center, Massachusetts General Hospital, Boston Children's Hospital, Brigham and Women's Hospital and Boston University. One of their longestrunning partnerships is with Massachusetts General's Benson-Henry Institute for Mind Body Medicine. Bhasin and Libermann have co-published multiple papers with Benson-Henry's Herbert Benson, MD, Gregory Fricchione, MD, and John Denninger, MD, PhD, over the last decade. "Our partnership with the Institute began when they came to us looking for genomics information," Libermann says, "but it turned into an ongoing collaboration." Their work focuses on the "relaxation response"—a phenomenon in which practices like meditation or prayer stimulate brain signals resulting in organs slowing down and increased blood flow to the brain.

Last year, Libermann and Bhasin's work with the Institute helped record, for the first time, rapid and guantifiable changes in gene expression induced by the relaxation response. Using bioinformatics techniques and equipment available through their core facility, Bhasin and Libermann assisted in collecting and analyzing subjects' blood samples before, immediately after and 15 minutes after listening to a relaxation response-eliciting CD. The blood samples provided information showing selective changes in gene expression, and these data were used to narrow down which biological pathways had been affected the most. "We wanted to find out which genes had more push or pull compared to others, so we focused on the systematic nature of gene interaction," notes Bhasin, referring to their analysis of targeted networks of genes rather than individual instances of enhanced or repressed gene expression.

The team found that regularly partaking in relaxation response activities further increases the body's immediate gene expression response. They also pinpointed some of the major biological pathways involved: energy metabolism, insulin secretion, inflammatory responses and stress pathways.

While conducting sophisticated research, Libermann and Bhasin—like other BIDMC core leaders—are also responsible for gauging competitive pricing and finding innovative ways to attract customers. When asked if they practice the relaxation techniques their research has shown to be beneficial, the two investigators smile. "We know it's helpful," says Bhasin. "It's just finding the time."



Manoj Bhasin, PhD, and Towia Libermann, PhD (left to right).



Martin Pollak, MD.

ILLUMINATING THE GENETICS OF **KIDNEY DISEASE**

Rhodesian trypanosomiasis, also called acute African sleeping sickness, takes a heavy toll when left untreated. Transmitted by the tsetse fly, the disease is most common in eastern Africa and can cause fever, anemia and death from cardiac failure. In response, evolution has favored genetic variations that are protective against the disease: namely, two common coding sequence variants of a gene called apolipoprotein L1 (APOL1).

In the United States today, these protective gene ESRD. And the variants are responsible for up to 40% variants are common among people of African descent. of kidney disease in African Americans who receive However, the same mutations that have been protective renal replacement therapy with either dialysis or kidney transplantation. This genetic association is one of the against acute African sleeping sickness have been shown to increase risk for a different, though also potentially strongest ever reported for a common disease and provides an explanation for the higher rates of kidney fatal, condition: kidney disease. disease in African-Americans relative to Caucasians. The BIDMC research team that "Nearly a third of the half million people in the US with made this discovery is headed by kidney disease are African American," says Friedman. Martin Pollak, MD, Chief of the "We hope to help eliminate this disparity by further Division of Nephrology. He and understanding how the APOL1 gene confers this risk."



fellow investigators found that APOL1 increased risk of several forms of non-diabetes-related kidney disease, including hypertension-attributed endstage renal disease (ESRD), idiopathic focal segmental glomerulosclerosis (FSGS) and HIV-associated nephropathy.

David Friedman. MD.

They originally published these findings in 2010. Since then, Pollak's team—along with David Friedman, MD, this critically important work." Seth Alper, MD, PhD, and members of their labs-According to Pollak, his ultimate goal is to save has continued to investigate the mechanism by which lives by better preventing, screening and treating APOL1 impacts the kidney. "We're attacking the individuals who carry this genetic mutation and are problem in a lot of different ways," Pollak says. therefore at increased risk of kidney disease. Currently, "We're doing anything we can think of that might be Pollak explains, "There are no good treatments for informative." This includes developing human, mouse these kidney diseases. We want to learn more about and fish models to better understand the genetics, the mechanism so that we can interfere with the cell biology and biochemistry of APOL1's interaction pathway." Sukhatme adds, "This innovative research with the kidney. is a tremendous example of how laboratory discoveries The APOL1 gene variants are associated with more than reach our patients and could help clinicians to better

tailor treatments to specific forms of kidney disease." a ten-fold increase in risk for FSGS and more than a seven-fold increase in risk for hypertension-attributed

The importance of this work has been reinforced by the National Academy of Sciences, who elected Pollak as a new member this year—one of only two elected from BIDMC and 84 nationally. While the award is given to individuals for their "distinguished and continuing achievements in original research" and not for specific findings, BIDMC's Chief Academic Officer Vikas Sukhatme, MD, PhD, notes, "Dr. Pollak's election to the National Academy of Sciences is a reflection of

A BREATH OF FRESH AIR FOR DYSPNEA SUFFERERS

Robert Banzett, PhD, and Robert Lansing, PhD, have been research collaborators for 30 years despite two apparent barriers. First, they work some 2,600 miles apart: Banzett has worked at Harvard since 1976 and at BIDMC since 2006, while Lansing's primary post is at the University of Arizona in Tucson. Second, they have very different areas of expertise: Banzett is a physiologist whereas Lansing is a psychologist. In other words, one focuses on the body, and the other, the mind.

However, through the years, the pair has overcome and even benefited from these differences. Undaunted by distance, Lansing Skypes in to weekly faculty meetings with Banzett and the team at BIDMC, which includes Richard Schwartzstein, MD, and Carl O'Donnell, ScD, MPH, also longtime collaborators. As for their areas of expertise, it's actually their differences that make possible Lansing and Banzett's collaboration, which they call "psychophysiology." More specifically, their research focuses on dyspnea, or shortness of breath, and the physiological mechanisms behind it as well as the psychological factors involved in measuring it.

Banzett compares dyspnea to pain, a symptom that health care providers have been monitoring for years, using the now-familiar 1-10 scale. But health care protocols rarely include questions about dyspnea, despite research indicating that it's often an equal or better indicator of morbidity and mortality than pain. Also, while pain is more common than dyspnea, some of Banzett and Lansing's research suggests that shortness of breath causes more anxiety than peripheral pain. (Visceral pain and dyspnea, they've found, can induce similar psychological responses.)

"Not only have we been leaving our patients to suffer from shortness of breath—and the related anxiety—in silence and without treatment, but we've been ignoring a valuable clinical indicator that should be used to inform prognosis and treatment plans," says Banzett.

But this is starting to change. Now, thanks to Banzett and Lansing's research—funded mostly by the Nursing Institute at the National Institutes of Health—on every Medical-Surgical floor at BIDMC, the initial patient intake process includes two questions about dyspnea, and patients are asked about shortness of breath during every shift. Kathy Baker, RN, MSN, another key member of the team, has been instrumental in implementing this process among the nursing staff.

Banzett and Lansing are also working to expand the treatments available to patients suffering from dyspnea. One of the therapeutics they're investigating is particularly innovative in that it's non-narcotic. It relies on an aerosol drug that sensitizes the stretch receptors in the lungs and creates the illusion of larger breaths, which has the potential to give patients some relief from the feeling of being short of breath—a terrible sensation with which Banzett is all too familiar, having had asthma since childhood.

Finding and improving ways to systematically address, measure and manage dyspnea has long been a personal passion of Banzett's. He recalls being in the hospital with his elderly father, noticing that the pain scale card was reliably stored near the head of every patient's bed. "My hope," he says, "is that before I die, the nurse will turn that card over and on the other side will be a scale for shortness of breath."





Banzett and Lewis Adams, PhD, took and published the first images of dyspnea in the brain in 2002.



HOME «|»





Faculty and trainees discuss a poster at Resident Scholarship Night.

THE NEXT GENERATION OF INVESTIGATORS: SPOTLIGHTS IN RESIDENT RESEARCH

"The important thing is not to stop questioning," said Albert Einstein. This is a valuable message for our internal medicine residents, who are given every opportunity to ask research questions—and often find answers.

Haider Warraich, MD

Patients with the type of heart rhythm disturbance known as atrial fibrillation are at risk of strokes. Blood pools due to the failure of the atrial chambers of the heart to contract, forming clots that float to the brain. Haider Warraich, MD, teamed up with <u>Warren</u> <u>Manning, MD</u>, to review echocardiograms of patients with episodic, paroxysmal atrial fibrillation. He found, surprisingly, that in some patients, the left atrial appendage was fibrillating in isolation even when the remainder of the atrium and the other chambers were contracting normally. This could explain why those who have only episodic atrial fibrillation are nonetheless at risk of stroke.

Sushrut Jangi, MD

What triggers exacerbations of multiple sclerosis (MS)? Sushrut Jangi, MD, brought a novel idea to <u>Howard</u> <u>Weiner, MD</u>, in the Partners Multiple Sclerosis Center: Perhaps relapses of multiple sclerosis could be due to changes in the gut microenvironment. Thus was launched a major effort to collect samples and sequence the gut microbiome in MS patients, which is now bearing first fruit and demonstrating clear differences between the microbiome in MS patients and normal controls. Jangi continues work on the project post-residency.

Chris Richards, MD

Leaders of the Internal Medicine Residency Program have long wondered whether students who undertake a heavy clinical elective load in the fourth year of medical school are better prepared for internship. In a collaboration with Program Director <u>Chris Smith, MD</u>, resident Chris Richards, MD, compared the intensity of fourth-year course work with multi-source performance evaluations collected by the residency program, observing that each intensive fourth year course (e.g., subinternship) significantly reduced the odds of a low clinical evaluation score in a multivariate analysis. These findings suggest that perhaps subinternships should be emphasized more during the fourth year of medical school.

Kristin MacArthur, MD

Standardizing care is an important precept for health care quality. Kristin MacArthur, MD, evolved a standard protocol for the treatment of acute pancreatitis in the Emergency Department and ICU, centering on early fluid resuscitation, early nutrition and a pancreatology consult. With a multidisciplinary team led by <u>Steven Freedman</u>, <u>MD</u>, PhD, Chief of the <u>Division of Translational Research</u>, MacArthur showed that clinical outcomes were improved in patients treated per protocol, as compared with pancreatitis patients treated at the clinician's discretion.

For the past nine years, three-quarters of our internal medicine residents have undertaken research projects like these. Helped by the program to find mentors, they learn the basics and develop their research projects in a two-week course in clinical study design and methods, taught by <u>Ken Mukamal, MD, MPH</u>. Though brief, the course is rigorous—with over 50 hours of faculty contact time—and effective. And the result of the course? Many novel projects like these, and 160 original papers published by residents since 2008.

GENETIC "JUNK" TRANSFORMED: DEVELOPING LIFE-SAVING THERAPIES FROM NON-CODING RNA

For much of the history of genetics, researchers focused on parts of the genome that code for proteins. This is the familiar "genetics" from entry-level biology courses: DNA (deoxyribonucleic acid), which makes up genes, communicates via RNA (ribonucleic acid). The genetic code is copied to messenger RNA (mRNA), which delivers genetic information to ribosomes. Ribosomes read the code to produce proteins. These proteins ultimately define physical traits.

Alongside these portions of DNA and mRNA, though, are portions of RNA that do not code for proteins, thus called "non-coding RNA." Scientists originally labelled these regions "junk."

But in 2010, researchers based at BIDMC began to see these "junk" portions of the genome in a new way, hypothesizing that non-coding RNA could play a part in gene regulation in conjunction with another type of RNA called microRNA. MicroRNA binds to mRNA—unlike mRNA, it doesn't transport genetic information from DNA to ribosomes. Rather, microRNA controls protein production by binding to and silencing mRNA, thus preventing genetic information from being translated into proteins. The team guessed that noncoding RNA could act as decoys, binding to microRNA before it binds to mRNA—meaning that "junk" RNA actually plays a critical role in controlling which proteins are produced and when. Subsequent research confirmed this, and even linked this regulatory function to genes associated with cancer and tumor formation. The team's findings were published in *Nature*.

In July 2014, Pier Paolo Pandolfi, MD, PhD, who served as a senior author on that seminal paper, helped found the new Institute for RNA Medicine (iRM) at the BIDMC Cancer Center. The Institute is dedicated to investigating non-coding RNA—in particular, adapting its regulatory function for therapeutic purposes, especially in cancer. The iRM is headed by Frank Slack, PhD, who recently joined the BIDMC team from the Department of Molecular, Cellular & Developmental Biology at Yale. "Non-coding RNAs have revealed themselves to be

great novel targets of anti-cancer therapies," says Slack, whose research has led to major breakthroughs in understanding microRNA function. Non-coding RNA expert John Rinn, PhD, has also joined Slack and Pandolfi in launching the Institute.

"How many musketeers were there?" Pandolfi asks, comparing himself, Rinn and Slack to Dumas' famed trio. Their D'Artagnan, he says, is BIDMC scientist Daniel Tenen, MD, whose expertise in gene regulation is central to the iRM's research goals. Tenen's work implicates noncoding RNAs in switching genes on or off by regulating DNA methylation. Pandolfi also credits Jeffrey Saffitz, MD, PhD, Chair of Pathology and a co-founder of the new Institute. With Slack at work alongside Pandolfi, Rinn, Tenen and the team's newest addition, pathologist Andrew Beck, MD, PhD, BIDMC has consolidated a significant international presence in RNA medicine.

BIDMC's CEO Kevin Tabb, MD, hails the Institute as the "first of its kind," noting that BIDMC's state-of-the-art facilities give the iRM a particular edge. The Cancer Center's "mouse hospital" is an especially valuable asset. In fact, the IRM will use "co-clinical trials," a model developed by Pandolfi in which human clinical trials and animal studies are conducted simultaneously to speed the testing of targeted cancer therapies. "The iRM will provide an interdisciplinary approach to expedite our scientific discoveries," says Pandolfi. "By bringing together a variety of experts, we can identify new noncoding RNA pathways, determine targets for therapeutic intervention and test candidate drugs."



Frank Slack, PhD. John Rinn, PhD. Pier Paolo Pandolfi, MD. PhD. and Daniel Tenen, MD (left to right).

HONORS AND AWARDS

Department of Medicine



Mark Zeidel, MD Received the 2014 Robert H. Williams, MD, Distinguished Chair of Medicine Award from the Association of Professors in Medicine. The award is presented annually to a physician who has demonstrated outstanding leadership as the chair of a department of internal medicine.

Allergy and Inflammation

Peter Weller, MD Awarded the 2013 Paul Ehrlich Lectureship at the International Eosinophil Society's 8th Biennial Symposium in Oxford, UK

Cardiovascular Medicine

Zoltan Arany, MD, PhD Honored with the Dvorak Young Investigator Award in Translational Research from Beth Israel Deaconess Medical Center.



Mark E. Josephson, MD Received the Paul Dudley White Award and the Eugene Braunwald Academic Mentorship Award from the American Heart Association.

Warren J. Manning, MD Won the Gold Medal Award from the Society for Cardiovascular Magnetic Resonance.

Anthony Rosenzweig, MD, PhD Recognized by the American Heart Association with the Collaborative Sciences Award.

Center for Virology and Vaccine Research

Dan Barouch, MD, PhD Inducted into the Association of American Physicians.

Raphael Dolin, MD Selected to present the Robert M. Chanock Memorial Lecture for the National Institutes of Health.

Igor Koralnik, MD Instated as Chief of the Division of Neuro-Immunology in the Department of Neurology at BIDMC.

R. Keith Reeves, PhD Earned the Early Career Faculty Grant from the American Association of

Clinical Informatics

Immunologists.

Charles Safran, MD

Received the 2013 Don Eugene Detmer Award for Health Policy Contributions in Informatics from the American Medical Informatics Association.

Clinical Nutrition

Bruce Bistrian, MD, PhD Reappointed Chair of the 2014 NASA Human Research Program Standing Review Panels and named Chair of the Nutrition Curriculum Subcommittee of the Division of Nutrition at Harvard Medical School

Endocrinology

Mark Andermann, PhD Named a Pew Scholar in the biomedical sciences, and awarded a Smith Family Award for Excellence in Biomedical Research.

Pamela Hartzband, MD, and Johanna Pallotta, MD Recognized as 2014 Best Doctors by Best Doctors.

James Hennessey, MD

Appointed an editor of the Endocrine Section for the NEJM Knowledge+ Internal Medicine Board Review by the Massachusetts Medical Society.

Barbara Kahn, MD Received the 11th Albert Lehninger Award from the Johns Hopkins University School of Medicine.

Christos Mantzoros, MD Awarded an Honorary PhD from the University of Patras in Greece.

Gastroenterology

Adam Cheifetz, MD, Michael Curry, MD, Douglas Pleskow, MD, and Sunil Sheth, MD, MB, BS Named 2013 Best Doctors by Boston Magazine.

Daniel Leffler, MD

Honored with the Dvorak Young Investigator Award in Health Services Research from Beth Israel Deaconess Medical Center.

Alan Moss, MD Named a Fellow of the American Gastroenterology Association.

General Medicine and Primary Care

Sigall Bell, MD Awarded the 2014 John Q. Sherman Award for Excellence in Patient Engagement, presented at the National Patient Safety Foundation annual meeting.

Suzanne Bertisch, MD, MPH Received the 2014 Wayne Hening Young Investigator Award at the International Restless Legs Syndrome Study Group.

Melissa Mattison, MD Won the 2014 Award for Clinical Excellence from the Society of Hospital Medicine.

Clyde Lanford Smith, MD, MPH

Honored with the 2014 Harvard Medical School Dean's Community Service Award for Lifetime Achievement.

Genetics

Pier Paolo Pandolfi, MD, PhD Received the 2013 Ethic International Award in Biomedicine from the Oscar Pomilio Foundation, the 2013 European Foundation Guido Venosta Award for Cancer Research, the 2013 Achievement Award in Science and Technology from the Italian Consulate of Boston and the 2014 America Award from the Italy-USA Foundation.

Gerontology

Sharon Inouye, MD, MPH Elected to Fellowship status in the Gerontological Society of America. and was named one of the 2014 "World's Most Influential Scientific Minds" by Thomson Reuters.

Douglas Kiel, MD, MPH Elected President of the American Society for Bone and Mineral Research.

Dae Kim, MD, ScD Earned his ScD in Epidemiology from

the Harvard School of Public Health. Tae Ho Lee, PhD

Received the New Investigator Award in Alzheimer's Disease from the American Federation for Aging Research.

Fellowship Awards.

IMBIO

Ary L. Goldberger, MD Invited speaker at the American Thoracic Society's annual national meeting.

Nadine Tung, MD Castle Connolly. Gerburg Wulf, MD

Kay Ash Grant and the 2013 Breast Cancer Research Foundation Grant. Hemostasis and Thrombosis

Bruce Furie, MD, and Kenneth Bauer, MD Named 2014 Best Doctors by Castle Connolly.

HOME «|»

Susan Mitchell, MD Elected to the Association of American Physicians.

Hematology/Oncology

Marc Garnick, MD Named the Harvard Medical School Gorman Brothers Clinical Professor

Kathleen Mahoney, MD

of Medicine.

Honored with the 2014 Anna D. Barker Fellowship in Basic Cancer Research from the American Association for Cancer Research, the 2014 Young Investigator Award from the Conquer Cancer Foundation of the American Society of Clinical Oncology and the Kidney Cancer Association and the 2014 Claudia Adams Barr Award from the Dana-Farber Cancer Institute.

Named a 2013 Top Doctor by

Received the 2013 Breast Cancer Alliance Grant Award, the 2013 Mary

Madalena Costa, PhD Appointed as a member of the advisory panel for the James S. McDonnell Foundation Postdoctoral

Chung-Kang Peng, PhD

Leader of an international team of scientists and engineers selected as finalists in the \$10 million Qualcomm Tricorder XPRIZE competition.

Pankaj Seth, PhD

Invited speaker at the Mouse Models of Human Cancers Consortium's 3rd Annual Co-Clinical Trials Workshop.

Nephrology

Martin Pollak, MD

Elected to the National Academy of Sciences.

Theodore Steinman, MD

Received the Massachusetts 2013 Top Doctors Award and the 2014 President's Award from the Renal Physicians Association.

Pulmonary, Critical Care and Sleep Medicine

David Roberts, MD

Served as the 2014 Thomas Neff Visiting Professor at the University of Colorado, Denver.

Rheumatology



Robert Schmerling, MD, and George Tsokos, MD Appointed Chair of the Committee on Ethics and Conflict of Interest and Basic Science Chair of the Annual Planning Meeting Committee at the American College of Rheumatology, respectively.

Honors and awards continues on page 32

Honors and awards continued from page 31

Robert Schmerling, MD, and George Tsokos, MD Named 2014 Top Doctors and Best Doctors by Castle Connolly.

George Tsokos, MD Appointed to the Nominating Committee of the Kunkel Society.

Translational Research



Steven Freedman, MD, PhD Invited speaker and chair at the New Frontiers in the Management of Pancreatic Diseases conference.

Steven Freedman, MD, PhD, and Camilia Martin, MD, MS Invited plenary speakers at the Maine Primary Care Association's 2013 Annual Conference.

Camilia Martin, MD, MS Recognized on the Honor Roll of the Biomedical Science Careers Program for Underrepresented Minorities at Harvard Medical School

Transplant Immunology

Maria Koulmanda, MSc, PhD Appointed President of the Cell Transplant Society.



Terry Strom, MD Received the Starzl Prize in Immunology and Surgery.

TEACHING HONORS AND AWARDS

Resident

Bracken Babula, MD Presented the Steven E. Weinberger Award for contributions to the residency program and for exemplifying the collegial spirit of BIDMC through membership, advocacy and leadership.

Kristin Beaver, MD, Steven Chen, MD, Katie Germansky, MD, Andrew Hale, MD, Elana Rosenthal, MD, and Luke Strnad, MD Received the Resident Teaching Award from the Harvard Medical School Class of 2014.

Jonah Cohen, MD

Earned the Katherine Swan Ginsburg Resident Award for embodying Dr. Ginsburg's qualities of intelligence, courage, dignity and compassion.

Jake Decker, MD, and Christopher Whitcomb, MD Received the Housestaff Award from the Nursing Department.

Jason Freed, MD Received the Lowell McGee Award, which is given to the senior resident who contributed the most to educating his/her fellow house officers.



Monica Fung, MD, and Randy Goldberg, MD Earned the James Tullis Award as intern and junior recipients, respectively, in recognition of intellectual growth and enthusiasm for learning.

Andrew Hale, MD, and David Lucier, MD Received the Medicine Quality Council Stoneman Award.

Andrew Hale, MD, Sharukh Lokhandwala, MD, and Roy Sriwattanakomen, MD Honored with the Principal Clinical Experience (PCE) Outstanding Resident-Fellow Teaching Award.

Glenn Hanna, MD

Presented the Resident as Teacher Award, which goes to the resident considered by medical students to be an outstanding teacher.



Elizabeth Targan, MD, and Vladimir Kaplinskiv, MD Earned the Elmer Hinton Award as intern and junior recipients, respectively, in recognition of outstanding physician-patient relationships.

Faculty

Andrew Ahn, MD Received the Hospitalist Medicine Teaching Award for exemplifying attributes of an outstanding clinician educator on the wards.

Robin Allister, MD, Mary Louise Ashur, MD, Steven Balk, MD, Gary Brissette, MD, Alexander Carbo, MD, Jason Freed, MD, Gyanprakash Ketwaroo, MD, Maria Kontaridis, MD, Andrew Korson, MD, Barbara LeVarge, MD, Katherine Lynch, MD, Alan Malabanan, MD, Diane McNally, MD, Eran Metzger, MD, Ari Moskowitz, MD, James Rabb,

MD, Robert Resnick, MD, Jeremy Richards, MD, Leon Sanchez, MD, Jules Schwaber, MD, Saurabh Sethi, MD, Ronald Silvestri, MD, Gordon Strewler, MD, Daniel Sullivan, MD, Lindsey Surace, MD, Byron Vaughn, MD, and Elena Volozhanina, MD Awarded the Certificate for Excellence in Tutoring.

Mary Buss, MD

Received the Katherine Swan Ginsburg Faculty Award for Humanism in Medicine.

Alexander Carbo, MD Honored as Best Clinical Instructor at

BIDMC by the HMS Class of 2014. Alexander Carbo, MD, Eran

Metzger, MD, Jeremy Richards, MD, and Daniel Sullivan, MD Recognized with the Award for Excellence in Tutoring, given to those who have received the Certificate for Excellence in Tutoring three years consecutively.

Michael Donnino, MD

Presented with the Outstanding Faculty Teaching Award from the Department of Emergency Medicine.

Richard Doyle, MD

Received the Department of Medicine Excellence in Ambulatory Student Teaching in Subspecialty Medicine Award.

Michael Gavin, MD

Presented the Herrman Blumgart Award, given to the faculty member who has contributed most to both housestaff education and professional development during the past academic year.

Melanie Hoenig, MD, and J. Thomas Lamont, MD Received the S. Robert Stone Award for Excellence in Teaching and the S. Robert Stone Senior Award for Excellence in Teaching, respectively.

Gia Leddy, MD Earned the Preceptor of the Year Award.

Daniel Leffler, MD Earned the Mentorship Award for significantly contributing to the growth and development of the research skills and experiences of the housestaff.

Jakob McSparron, MD, and Laura Rock, MD Named Rabkin Fellows in Medical Education for the 2013-2014 academic year.

Monica Oliveira, RN Honored with the Nursing Excellence Award in recognition of a long tradition of exceptional nursing care and collegial nursehousestaff relationships.

Rod Rahimi, MD Honored by the HMS Class of 2014 with the Fellow Teaching Award.

Michael K. Rees, MD Presented the Affiliated Physicians Group Award for Excellence in Teaching.



Kristin Remus, DO

Earned the Department of Medicine Excellence in Ambulatory Student Teaching in Primary Care Award.

Jeremy Richards, MD

Earned the Charles McCabe Faculty Prize for Excellence in Teaching and the Junior Faculty Award for Excellence in Mentoring and Advising.

David Roberts, MD

Awarded the Teacher of the Year Award by the American Thoracic Society's Clinical Problems Assembly, in recognition of outstanding clinical and educator expertise and significant contribution to clinical education in pulmonary/critical care medicine.

Richard Schwartzstein, MD

Honored as Best Preclinical Instructor at Harvard Medical School by the HMS Class of 2014.

Anjala Tess, MD

Earned the BIDMC Academy of Medical Educators award for distinguished participation, contribution and commitment to educational excellence and promotion of best teaching practice.

Katherine Troy, MD

Honored by the outgoing Chief Medical Residents with the Teaching Award for Non-medical Specialties.

Jeffrey William, MD Received the Fellow Teaching Award from the 2014 class of residents.

Mark Zeidel, MD

Presented the Robert C. Moellering Teaching Award by the outgoing Chief Medical Residents, recognizing a faculty member who is an outstanding teacher, clinician and researcher.

MEDICAL EDUCATION

Katherine Clifton, MD

Gabriel Cohen, MD

Matthew Cohen, MD

Avraham Cooper, MD

Kristen Corey, MD

Jeffrey Dewey, MD

Jennifer Faig, MD

Monica Fung, MD

Hani Hazani, MD

Sarah Horn, MD

Grace Hsieh, MD

Lily Huang, MD

Joshua Kiss, MD

Rahul Ganatra, MD

Lauren Glassmover, MD

Hsi-en (John) Ho, MD

Katherine Joyce, MD

Tristan Kooistra, MD

Whitney Kress, MD

Carol Lai, MD

David Lam, MD

Kristi Larned, MD

Kristina Liu, MD

Ian McCoy, MD

Susan McGirr, MD

Elliot Naidus, MD

Jessica Meisner, MD

Shimontini Mitra, MD

Andrew Locke, MD

James Taylor Lloyd, MD

Jake Decker, MD

RESIDENCY LEADERSHIP

Residency Program Director C. Christopher Smith, MD

Primary Care **Program Director** Howard Libman, MD

Associate Program Directors

Grace Huang, MD Ken Mukamal, MD Anjala Tess, MD Anita Vanka, MD Julius Yang, MD

Education Manager Ruth Colman

INTERNS

Jose Anguiano, MD Maki Aoki, MD Mackenzie Asel, MD Omar Baber, MD Daniel Bach, MD Leah Biller, MD Rebecca Brown, MD Brian Carney, MD Erin Chen, MD, PhD Sarah Chen, MD



Christopher Perrone, MD, with patient Carol Love.

Asongu (Josephine) Ncho, MD Erin Nuzzo, MD Joseph Palatinus, MD, PhD Patrick Reeves, MD, PhD Alaina Ritter, MD Megan Ritter, MD Alexandra Rose, MD Erika Runge, MD Carolyn Shammas, MD Daphna Spiegel, MD Elizabeth Targan, MD Alok Tewari, MD Sheeja Thomas, MD Javier Villafuerte Galves, MD Christopher Whitcomb, MD Forrest White, MD Erin Wilmer, MD Manida Wungjiranirun, MD Fangfang Xing, MD

JUNIOR RESIDENTS

Kathleen Abalos, MD Kevin Bauerle, MD, PhD Neal Biddick MD Jessica Camacho, MD Paige Comstock, MD Ogechi Dike, MD Jessica Donato, MD Katherine Dunne, MD, MPH Nasser EL-Okdi, MD Stephen Gannon, MD Randal Goldberg, MD Alimer Gonzalez, MD Joseph Grossman, MD Angela Higgins, MD Lindsay Hintz, MD Sarah Housman, MD Adelina Hung, MD Natasha Hunter, MD Vladimir Kaplinskiv, MD Colleen Kershaw, MD Saikiran Kilaru, MD Jenna Koliani, MD Mengyao Liang, MD Sarah Lieber, MD Sharukh Lokhandwala, MD Jinyu Lu, MD Jessica Lynch, MD Lucian Marts, MD

Jason Matos, MD Erina Matsumoto, MD Jason Moran, MD Christopher Morris, MD Joseph Paonessa, MD Andrew Parker, MD Yesenia Risech-Neyman, MD Daniel Roberts, MD Liana Schweiger, MD Masih Shinwa, MD Conor Stack, MD Aaron Stupple, MD Jazmine Sutton, MD Robert Tavares, MD Jessica Taylor, MD Adarsh Thaker, MD Mark Tuttle, MD David Zisa, MD, PhD

Robin Allister, MD Bracken Babula, MD Philip Brondon, MD James Brush, MD Kristin Burke, MD Suzanne Chan, MD Jonah Cohen, MD Lucas Donovan, MD Jason Freed, MD Laurie Gashin, MD Robert Gaudet, MD Brian Gaudino, MD Rebecca Glassman, MD Mark Gromski, MD Douglas Grunwald, MD Brian Halbert, MD Andrew Hale, MD Glenn Hanna, MD Jennifer Kleinman, MD Isabel Lamour, MD Alison Lennox, MD David Lucier, MD Shannon McGinty, MD Alexandra Migdal, MD Ari Moskowitz, MD Asa Oxner, MD Patrica Peter, MD Mary Linton Peters, MD Colin Phillips, MD

SENIOR RESIDENTS

Julia Pleet, MD Kenneth Ralto, MD Eveleen Randall, MD Sheela Reddy, MD Erin Reigh, MD Jennifer Reske-Nielsen, MD Christopher Richards, MD Daniel Ricotta, MD Roy Sriwattanakomen, MD Nidhi Sukul, MD David Suskin, MD Ara Tachjian, MD Xiao Tan, MD, PhD Alexis Tumolo, MD Haider Warraich, MD Nicole White, MD Anna Wolfson, MD Xiaoyu Yang, MD MFDICINF-DERMATOLOGY

RESIDENTS

Steven Chen, MD, MPH Kudakwashe Maloney, MD Anar Mikailov, MD Philip Song, MD

CHIEF MEDICAL RESIDENTS

Mariam Ayub, MD Marie Brubacher, MD John Mafi, MD Amber Moore, MD Luke Strnad, MD Eliott Tapper, MD

CLINICAL FELLOWS

Cardiovascular Medicine

Yaw Adjei-Poku, MD Anuj Basil, MD Craig Benson, MD, MS D. Marshall Brinkley, MD Barry Bui, MD Sara Carroll, MD Stuart Chen, MD Fernando Contreras-Valdes, MD Shweta Motiwala, MD Apranta Deka Patel, MBBS, MD Gene Quinn, MD Sudip Saha, MD Christopher Song, MD Aferdita Spahillari, MD Daniel Steinhaus, MD Hector Tamez Aquilar, MD, MPH

Cardiology - Non-invasive

Ricardo Esquitin, MD, MSc Lisa Fleming, MD Katie Hawthorne, MD Rupal Parekh, MD Jason Roh, MD, MPH

Cardiology - Interventional Anian Chakrabarti, MD Christopher Meduri, MD, MPH Brian Potter, MD

Anand Singla, MD **Cardiology - Research**

Eric Osborn, MD, PhD

Cardiac Electrophysiology Ethan Ellis, MD Adan Fein, MD Henry Huang, MD Yehoshua Levine, MD Jianging Li, MD Yonathan Melman, MD, PhD Patricia Tung, MD Jonathan Waks, MD

Clinical Informatics

Adarsha Bajracharya, MD Shira H. Fischer, MD

Endocrinology, Diabetes and Metabolism

David Baidal, MD Anna Feldman, MD Zhiheng He, MD, PhD Natasha Kasid, MD Roeland Middelbeek, MD, MSc Giulio Romeo, MD Elena Toschi, MD

Gastroenterology

Mona Akbari, MD M. Andreea Catana, MD Ivana Dzeletovic, MD Joseph Feuerstein, MD Katherine Germansky, MD

HOME «|»



Shimontini Mitra, MD.

Robert Gianotti, MD Dusanka Grbic, MD Z. Gordon Jiang, MD, PhD Gyanaprakash Ketwaroo, MD, MSc Darshan Kothari, MD Jose Mella, MD Jeffrey Mosko, MD Christopher Packey, MD, PhD Ishan Patel, MD Vilas Patwardhan, MD Nikhiel Rau, MD Neil Sengupta, MD

Saurabh Sethi, MD, MPH Sveta Shah, MD Lindsey Surace, MD Elliot Tapper, MD Sumeet Tewani, MD Thimmaiah Theethira, MD Rohini Vanga, MD

General Medicine and Primary Care John Mafi, MD Melissa Wei, MD

MEDICAL EDUCATION (continued)

Gerontology

Naresh Dasari, MD Lauren Gleason, MD Stephen Gordon, MD Caroline Kim, MD Perla Macip Rodriguez, MD Ariela Orkaby, MD Nakeisha Rodgers, MD



Steven Chen, MD, MPH.

Aaditya Singhal, MD Rotem Tellem, MD Anthony Zizza, MD

Hematology/Oncology

Allison Ackerman, MD Alexandra Bailey, MD Elizabeth Brem, MD

Anasuya Gunturi, MD Rebecca Karp, MD Xiuning Le, MD, PhD Brittany Lee, MD Kathleen Mahoney, MD, PhD Aparna Mani, MD, PhD Lourdes Mendez, MD, PhD Myrna Nahas, MD Eirini Pectasides, MD Ioannis Politikos, MD Benjamin Schlechter, MD Anish Sharda, MBBS Neeharika Srivastava, MD Matthew Weinstock, MD Jessica Zerillo, MD

Infectious Diseases

Roger Araujo Castillo, MD Abdullah Chahin, MD Spyridon Chalkias, MD Yehuda Cohen, MD Apara Dave, MD Brian Hollenbeck, MD Sachin Jain, MD, MPH Sarah Moore, MD Ruvandhi Nathavitharana, MD, MPH Payal Patel, MD Radha Rajasingham, MD Elana Rosenthal, MD John Winters, MD Rebecca Zash, MD

<u>Nephrology</u>

Christina Chen, MD Peter Czarnecki, MD Neetika Garg, MD Arvid Goel, MD Joseph Kupferman, MD Katherine Lynch, MD Matthew Niemi, MD Ali Poyan Mehr, MD Cristian Riella, MD Rupam Ruchi, MD Khuloud Shukha, MD Joseph Tremaglio, MD Jeffrey William, MD

Pulmonary, Critical Care and Sleep Medicine Neil Ahluwalia, MD Lisa Bebell, MD Jeremy Beitler, MD Laura Brenner, MD Robert Busch, MD George Cheng, MD Jessica Cooksey, MD Joshua Davis, MD Paul Dieffenbach, MD Katherine Dudley, MD Adel El Boueiz, MD Adam Gaffney, MD Brian Hobbs, MD Douglas Hsu, MD Puja Kohli, MD Daniela Lamas, MD Sean Levy, MD Sydney Montesi, MD Crystal North, MD Rachel Putman, MD Farbod Rahaghi, MD Rod Rahimi, MD, PHD Krishna Reddy, MD Elisabeth Riviello, MD Jennifer Stevens, MD

Renal Transplant

Eliyahu Khankin, MD

Hilary Womble DuBrock, MD **Sleep Medicine Fellows**

Mihaela Hristova Bazalakova, MD, PHD Pankaj Mehta, MD Joel Reiter, MD

Rheumatology

Alison Witkin, MD

Amy Devlin, MD Irina Gavanescu-Stockton, MD, PhD Jonathan Hausmann, MD Christine Konya, MD Ziv Paz, MD, MPH



Sarah Housman, MD, with patient Leila May Pascual at Fenway Health, a BIDMC-affiliated community health center.

SELECTED PUBLICATIONS

Allergy and Inflammation

Akuthota P, Capron K, Weller PF. Eosinophil purification from peripheral blood. Methods Mol Biol 2014; 1178:13-20.

Dias FF, Amaral KB, Carmo LA, Shamri R, Dvorak AM, Weller PF, Melo RC. Human eosinophil leukocytes express protein disulfide isomerase in secretory granules and vesicles: ultrastructural studies. *J Histochem Cytochem* 2014; 62:450-9.



Melo RC, Paganoti GF, Dvorak AM, Weller PF. The internal architecture of leukocyte lipid body organelles captured by three-dimensional electron microscopy tomography. PLoS One 2013; 8:e59578.

All animal cells contain tiny droplets of fat called lipid bodies. In immune cells such as neutrophils and eosinophils, lipid bodies are formed in response to infection or inflammation and serve as the site for synthesis of prostaglandins and related eicosanoids in response to infection. In this study, advanced microscopic techniques including three-dimensional electron tomography and immunogold electron microscopy were used to investigate the fine structure of lipid bodies at high resolution (4 nm). With intricate membrane systems in their cores, the lipid bodies of leukocytes resemble endoplasmic reticulum (ER), and may well arise by incorporation of cytoplasmic membranes into ER.

Melo RC, Liu L, Xenakis JJ, Spencer LA. Eosinophil-derived cytokines in health and disease: unraveling novel mechanisms of selective secretion. *Allergy* 2013; 68:274-84

Muroya T, Kannan L, Ghiran IC, Shevkoplyas SS, Paz Z, Tsokos M, Dalle Lucca JJ, Shapiro NI, Tsokos GC. C4d deposits on the surface of RBCs in trauma patients and interferes with their function. *Crit Care Med* 2014; 42:e364-72.

Cardiovascular Medicine

Bae S, Singh SS, Yu H, Lee JY, Cho BR, Kang PM. Vitamin D signaling pathway plays an important role in the development of heart failure after myocardial infarction. *JAppl Physiol* 2013; 114:979-87.

Lerchenmuller C, Rosenzweig A. Mechanisms of exercise-induced cardiac growth. Drug Discov Today 2014; 19:1003-9.

Melman Y, Shah RV, Das S. microRNA in heart failure: Is the picture less miRky? *Circ Heart Fail* 2014; 7:203-14.

Rayatzadeh H, Tan A, Hauser TH, Shaw JL, Patel SJ, Hong SN, Chan RH, Zimetbaum P, Buxton AE, Josephson ME, Manning WJ, Nezafat R. Scar heterogeneity on cardiovascular magnetic resonance is a predictor of appropriate implantable cardioverter defibrillator therapy. *J Cardiovasc Magn Reson* 2014; 15:31.

Sawada N, Jiang A, Takizawa F, Safdar A, Manika A, Tesmenitsky Y, Kang KT, Bischoff J, Kalwa H, Sartoretto JL, Kamei Y, Benjamin LE, Watada H, Ogawa Y, Higashikuni Y, Kessinger CW, Jaffer FA, Michel T, Sata M, Croce K, Tanaka R, Arany A. Endothelial PGC-1alpha mediates vascular dysfunction in diabetes. *Cell Metab* 2014; 19:246-58.

Center for Virology and Vaccine Research

Barouch DH. The quest for an HIV vaccine—moving forward. *N Engl J Med* 2013; 369:2073-6.

Barouch DH, Stephenson KE, Borducchi EN, Smith K, Stanley K, McNally AG, Liu J, Abbink P, Maxfield LF, Seaman MS, Dugast AS, Alter G, Ferguson M, Li W, Earl PL, Moss B, Giorgi EE, Szinger JJ, Eller LA, Billings EA, Rao M, Tovanabutra S, Sanders-Buell E, Weijtens M, Pau MG, Schuitemaker H, Robb ML, Kim JH, Korber BT, Michael NL. Protective efficacy of a global HIV-1 mosaic vaccine against heterologous SHIV challenges in rhesus monkeys. *Cell* 2013; 155:531-9. Barouch DH, Whitney JB, Moldt B, Klein F, Oliveira TY, Liu J, Stephenson KE, Chang HW, Shekhar K, Gupta S, Nkolola JP, Seaman MS, Smith KM, Borducchi EN, Cabral C, Smith JY, Blackmore S, Sanisetty S, Perry JR, Beck M, Lewis MG, Rinaldi W, Chakraborty AK, Poignard P, Nussenzweig MC, Burton DR. Therapeutic efficacy of potent neutralizing HIV-1-specific monoclonal antibodies in SHIV-infected rhesus monkeys. *Nature* 2013; 503:224-8.

Giorgi EE, Balachandran H, Muldoon M, Letvin NL, Haynes BF, Korber BT, Santra S. Cross-reactive potential of human T-lymphocyte responses in HIV-1 infection. *Vaccine* 2014; 32:3995-4000.

Khoury MN, Gheuens S, Ngo L, Wang X, Alsop DC, Koralnik IJ. Hyperperfusion in progressive multifocal leukoencephalopathy is associated with disease progression and absence of immune reconstitution inflammatory syndrome. *Brain* 2013; 136:3441-50.

Clinical Informatics

Feldman HJ, Somai M, Dweck E. A cannonball through the chest: disseminated tuberculosis, threatening the aortic arch. *Tunis Med* 2014; 92:34-7.

Fischer SH, David D, Crotty B, Dierks M, Safran C. Acceptance and use of health information technology by community dwelling elders. *Int J Med Inform* 2014; 83:624-35.

Gardner RM, Safran C. Clinical Informatics Subspecialty: Certification and Training (chapter), Informatics Education in Healthcare: Lessons Learned. Berner ES, ed. New York: Springer-Verlag, 2014; 43-58.

McCray AT, Trevvett P, Frost HR. Modeling the autism spectrum disorder phenotype. *Neuroinformatics* 2014; 12:291-305.

Clinical Nutrition

A.S.P.E.N. Intravenous Fat Emulsion National Shortage Task Force, Vanek VW, Allen P, Harvey Banchik LP, Bistrian B, Collier S, Driscoll DF, Gura K, Houston DR, Miles J, Mirtallo J, Mogensen KM, Seidner D. Parenteral nutrition intravenous fat emulsions product shortage considerations. *Nutr Clin Pract* 2013; 28:528-9.

Hoffer LJ, Bistrian BR. Why critically ill patients are protein deprived. JPEN J Parenter Enteral Nutr 2013; 37:441.

Kris-Etherton PM, Akabas SR, Bales CW, Bistrian B, Braun L, Edwards MS, Laur C, Lenders, Levy MD, Palmer CA, Pratt CA, Ray S, Rock CL, Saltzman E, Seidner DL, Van Horn L. The need to advance nutrition education in the training of health care professionals and recommended research to evaluate implementation and effectiveness. *Am J Clin Nutr* 2014; 99(5 Suppl):1153S-665.

Le Coutre J, Mattson MP, Dillin A, Friedman J, Bistrian B. Nutrition and the biology of human ageing: cognitive decline/food intake and caloric restriction. J Nutr Health Aging 2013; 17:717-20.

It is predicted that by 2050 there will be twice as many people over the age of 65, and therefore a greater number of people at risk

for degenerative nervous diseases like Alzheimer's and Parkinson's. Because current understandings of these diseases indicate that damage is irreversible once a patient is symptomatic, a focus on prevention is necessary. It has long been known that calorie restriction increases longevity. Recent studies, using mouse models of Alzheimer's disease, show that feeding mice a calorie-restricted diet can also protect against cognitive impairment. Understanding optimal nutrition will be important to prevent neurodegenerative diseases. Lenders CM, Deen DD, Bistrian B, Edwards MS, Seidner DL, McMahon MM, Kohlmeier M, Krebs NF. Residency and specialties training in nutrition: a call for action. *Am J Clin Nutr* 2014; 99(5 Suppl):1174S-83S.

Endocrinology, Diabetes and Metabolism

Astapova I, Ramadoss P, Costa-e-Sousa RH, Ye F, Holtz KA, Li Y, Niepel MW, Cohe DE, Hollenberg AN. Hepatic nuclear corepressor 1 regulates cholesterol absorptio through a TRβ1-governed pathway. *J Clin Invest* 2014; 124:1976-86.

Kraus D, Yang Q, Kong D, Banks AS, Zhang L, Rodgers JT, Pirinen E, Pulinilkunnil TC, Gong F, Wang YC, Cen Y, Sauve AA, Asara JM, Peroni OD, Monia BP, Bhanot S, Alhonen L, Puigserver P, Kahn BB. Nicotinamide N-methyltransferase (NNMT) knockdown protects against diet-induced obesity. *Nature* 2014; 508:258-62.

Krashes MJ, Shah BP, Madara JC, Olson DP, Strochlic DE, Garfield AS, Vong L, Pei Watabe-Uchida M, Uchida N, Liberles SD, Lowell BB. An excitatory paraventricula nucleus to AgRP neuron circuit that drives hunger. *Nature* 2014; 507:238-42.

Pissios P, Hong S, Kennedy AR, Prasad D, Liu FF, Maratos-Flier E. Methionine and choline regulate the metabolic phenotype of a ketogenic diet. *Mol Metab* 2013; 2:306-13.

Rosen HN, Malabanan AO, Vokes TJ, Deal CL, Alele JD, Olenginski TP, Schousboe TJ. The Official Positions of the International Society for Clinical Densitometry: vertebra fracture assessment. *J Clin Densitom* 2013; 16:482.

Experimental Medicine

Birrane G, Bhyravbhatla B, Navia MA. Synthesis of aspartame by thermolysin: An x-ray structural study. *ACS Med Chem Lett* 2014; 5:706-10.

Choy WW, Datta D, Geiger CA, Birrane G, Grant MA. Crystallization and prelimina x-ray analysis of a complex of the FOXO1 and Ets1 DNA-binding domains and Di Acta Crystallogr F Struct Biol Commun 2014; 70:44-8.

Xue J, Yang S, Seng S. Mechanisms of cancer induction by tobacco-specific NNK NNN. *Cancers (Basel)* 2014; 6:1138-56.

Yang S, Long M, Seng S. Cigarette smoke modulates migration by altering adhesi molecules and the extracellular matrix in PC3 prostate cancer cells. *Mol Med Rep* 2014; [In press].

Yu J, Zhang X, Kuzontkoski PM, Jiang S, Zhu W, Li DY, Groopma JE. Slit2N and Robo4 regulate lymphangiogenesis through the VEGF-C/VEGFR-3 pathway. Cell Commun Signal 2014; 12:25.



In early development of lymphatic channels, vascular endothelial growth factor C (VEGF-C) must bind to receptor VEGFR-3. However, this same mechanism has also been shown to promote the spread of cancer through the lymphatic system. In this study, treatment

of lung-derived lymphatic endothelial cells (L-LECs) with the guidance protein Slit2N inhibited the VEGF-C/VEGFR-3 pathway, blocking L-LEC growth and migration though the Slit receptor Robo4. This suggests that Slit2N/Robo4 play key roles in the development of certain lymphatic vessels and could potentially be used to inhibit cancer metastasis via the lymphatic system.

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<u>en</u> on	Afdhal N, Reddy KR, Nelson DR, Lawitz E, Gordon SC, Schiff E, Nahass R, Ghalib R, Gitlin N, Herring R, Lalezari J, Younes ZH, Pockros PJ, Di Bisceglie AM, Arora S, Subramanian GM, Zhu Y, Dvory-Sobol H, Yang JC, Pang PS, Symonds WT, McHutchison JG, Muir AJ, Sulkowski M, Kwo P; ION-2 Investigators. Ledipasvir and sofosbuvir for previously treated HCV genotype 1 infection. <i>N Engl J Med</i> 2014; 370:1483-93.
	Afdhal N, Zeuzem S, Kwo P, Chojkier M, Gitlin N, Puoti M, Romero-Gomez M, Zarski JP, Agarwal K, Buggisch P, Foster GR, Bräu N, Buti M, Jacobson IM, Subramanian GM, Ding X, Mo H, Yang JC, Pang PS, Symonds WT, McHutchison JG, Muir AJ, Mangia A, Marcellin P; ION-1 Investigators. Ledipasvir and sofosbuvir for untreated HCV genotype 1 Infection. N Engl J Med 2014; 370:1889-98.
<u>H,</u> ar	Ferreira J, Akbari M, Gashin L, Cullen G, Moss A, Leffler DA, Aronson M, Cheifetz AS. Prevalence and lifetime risk of endoscopy-related complications among patients with inflammatory bowel disease. <i>Clin Gastroenterol Hepatol</i> 2013; 11:1288-93.
-	Ketwaroo G, Brown A, Young B, Kheraj R, Sawhney M, Mortele KJ, Najarian R, Tewani S, Dasilva D, Freedman S, Sheth S. Defining the accuracy of secretin pancreatic function testing in patients with suspected early chronic pancreatitis. <i>Am J Gastroenterol</i> 2013; 108:1360-6.
<u>al</u>	Leffler D, Schuppan D, Pallav K, Najarian R, Goldsmith JD, Hansen J, Kabbani T, Dennis M, Kelly CP. Kinetics of the histological, serological and symptomatic responses to gluten challenge in adults with coeliac disease. <i>Gut</i> 2013; 62:996-1004.
- arv	General Medicine and Primary Care Graham KL, Marcantonio ER, Huang GC, Yang J, Davis RB, Smith CC. Effect of a systems intervention on the quality and safety of patient handoffs in an internal medicine residency program. J Gen Intern Med 2013; 28:986-93.
<u>ary</u> NA.	Mafi JN, McCarthy EP, Davis RB, Landon BE. Worsening trends in the management and treatment of back pain. <i>JAMA Intern Med</i> 2013; 173:1573-818.
<u>and</u>	Mattison ML, Catic A, Davis RB, Olveczky D, Moran J, Yang J, Aronson M, Zeidel M, Lipsitz L, Marcantonio ER. A standardized, bundled approach to providing geriatric- focused acute care. J Am Geriatr Soc 2014; 62:936-42.
05	Schonberg MA, Hamel MB, Davis RB, Griggs MC, Wee CC, Fagerlin A, Marcantonio ER. Development and evaluation of a decision aid on mammography screening for women 75 years and older. JAMA Intern Med 2014; 174:417-24.
<u>n</u>	Walker J, Darer JD, Elmore JG, Delbanco T. The road toward fully transparent medical records. N Engl J Med 2014; 370:6-8.
	Genetics Lunardi A, Ala U, Epping MT, Salmena L, Clohessy JG, Webster KA, Wang G, Maxxucchelli R, Bianconi M, Stack EC, Lis R, Patnaik A, Cantley LC, Bubley G, Cordon- Cardo C, Gerald WL, Montironi R, Signoretti S, Loda M, Nardella C, Pandolfi PP. A co-clinical approach identifies mechanisms and potential therapies for androgen deprivation resistance in prostate cancer. <i>Nat Genet</i> 2013; 45:747-55.
	Papa A, Wan L, Bonora M, Salmena L, Song MS, Hobbs RM, Lunardi A, Webster K, Ng C, Knoblauch N, Newton RH, Guarneria J, Ito K, Turka LA, Beck AH, Pinton P, Bronson R, Wei W, Pandolfi PP. Cancer-associated PTEN mutants act in a dominant negative manner to suppress PTEN protein function. <i>Cell</i> 2014; 157:595-610.
	Song SJ, Poliseno L, Song MS, Ala U, Kats L, Beringer G, Webster K, Yuan X, Brock JE, Richardson AL, Cantley LC, Pandolfi PP. MicroRNA-antagonism regulates breast cancer stemness and metastasis via TET-family-dependent chromatin remodeling. <i>Cell</i> 2013; 154:311-24.

SELECTED PUBLICATIONS (continued)

Gerontology

Inouye SK, Kosar CM, Tommet D, Schmitt EM, Puelle MR, Saczynski JS, Marcantonio ER, Jones RN. The CAM-S: development and validation of a new scoring system for delirium severity in 2 cohorts. *Ann Intern Med* 2014; 160:526-33.

Kim BM, You MH, Chen CH, Lee S, Hong Y, Hong Y, Kimchi A, Zhou XZ, Lee TH. Deathassociated protein kinase 1 plays a critical role in aberrant tau protein regulation and function. *Cell Death Dis* 2014; 5:e1237.

Kim CA, Rasania SP, Afilalo J, Popma JJ, Lipsitz LA, Kim DH. Functional status and guality of life after transcatheter aortic valve replacement: a systematic review. *Ann Intern Med* 2014; 160:243-54.

Kim DH, Newman AB, Lipsitz LA. Prediction of severe persistent activity of daily living disability in older adults. *Am J Epidemiol* 2013; 178:1085-93.

Lipsitz LA. The 3-night hospital stay and Medicare coverage for skilled nursing care. JAMA 2013; 310:1441-2.

Hematology/Oncology

Bailey A, McDermott DF. Immune checkpoint inhibitors as novel targets for renal cell carcinoma therapeutics. *Cancer J* 2013; 19:348-52.

Schnipper LE, Lyman GH, Blayney DW, Hoverman JR, Raghavan D, Wollins DS, Schilsky RL. American Society of Clinical Oncology 2013 top five list in oncology. *J Clin Oncol* 2013; 31:4362-70.

Stroopinsky D, Rosenblatt J, Ito K, Mills H, Yin L, Rajabi H, Vasir B, Kufe T, Luptakova K, Arnason J, Nardella C, Levine JD, Joyce R, Galinsky I, Reiter Y, Stone R, Pandolfi PP, Kufe D, Avigan D. MUC1 is a potential target for the treatment of acute myeloid leukemia stem cells. *Cancer Res* 2013; 73:5569-79.

Tung N, Gaughan E, Hacker MR, Lee LJ, Alexander B, Poles E, Schnitt SJ, Garber JE. Outcome of triple negative breast cancer: comparison of sporadic and BRCA1associated cancers. *Breast Cancer Res Treat* 2014; 146:175-82.

Zwicker J, Connolly G, Carrier M, Kamphuisen P, Lee A. Catheter-associated deep vein thrombosis of the upper extremity in cancer patients: guidance from the SSC of the ISTH. J Thromb Haemost 2014; 12:796-800.

Hemostasis and Thrombosis

Eurie B. Do pharmacogenetics have a role in the dosing of vitamin K antagonists? <u>N Engl J Med 2013; 369:2345-6.</u>

Eurie B, Flaumenhaft R. Thiol isomerases and their role in platelet activation. *Circulation Res* 2014; 114:1162-73.

Kolyada A, Porter A, Beglova N. Inhibition of thrombotic properties of persistent autoimmune anti- β 2GPI antibodies in the mouse model of antiphospholipid syndrome. Blood 2014; 123:1090-7.

Proulle V, Furie RA, Merrill-Skoloff G, Furie BC, Furie B. Platelets are required for enhanced activation of the endothelium and fibrinogen in a mouse thrombosis model of APS. *Blood* 2014; 124:611-22.



Zwicker JI, Rojan A, Campigotto F, Rehman N, Funches R, Connolly G, Webster J, Aggarwal A, Mobarek D, Faselis C, Neuberg D, Rickles FR, Wun T, Streiff MB, Khorana AA. Pattern of frequent but nontargeted pharmacologic thromboprophylaxis for hospitalized patients with cancer at academic medical centers: a prospective, cross-sectional, multicenter study. J Clin Oncol 2014; 32:1792-6. Previous studies have shown that hospital inpatients being treated for cancer are at high risk for venous thromboembolism. Numerous clinical guidelines recommend pharmacologic thromboprophylaxis to combat this risk, though further investigation shows this treatment is underutilized. This study enrolled 775 cancer patients across five academic medical centers, investigating the rates of prescription of thromboprophylaxis and factors influencing its use. The study found that while thromboprophylaxis is frequently administered to hospitalized cancer patients, nearly two-thirds of patients who received it were at low risk of venous thromboembolism, and nearly 60% of high-risk patients did not receive it.

IMBIO

Kahlon M, Yuan L, Daigre J, Meeks E, Nelson K, Piontkowski C, Reuter K, Sak R, Turner B, Weber GM, Chatterjee A. The use and significance of a research networking system. *J Med Internet Res* 2014; 16:e46.

Ren JG, Seth P, Clish CB, Lorkiewicz PK, Higashi RM, Lane AN, Fan TW, Sukhatme VP. Knockdown of malic enzyme 2 suppresses lung tumor growth, induces differentiation and impacts PI3K/AKT signaling. *Sci Rep* 2014; 4:5414.

Subramaniam B, Khabbaz K, Heldt T, Lerner AB, Mittleman MA, Davis RB, Goldberger AL, Costa MD. Blood pressure variability: can nonlinear dynamics enhance risk assessment during cardiovascular surgery? A feasibility study. J Cardiothorac Vasc Anesth 2014; 28:392-7.

Xie H, Hana J, Ren JG, Kats L, Burgess K, Bhargava P, Signoretti S, Billiard J, Duffy KJ, Grant A, Wang X, Lorkiewicz PK, Schatzman S, Bousamra M, Lane AN, Higashi RM, Fan TW, Pandolfi PP, Sukhatme VP, Seth P. Targeting lactate dehydrogenase-a inhibits tumorigenesis and tumor progression in mouse models of lung cancer and impacts tumor-initiating cells. *Cell Metab* 2014; 19:795-809.

Zerbini LF, Bhasin MK, de Vasconcellos JF, Paccez JD, Gu X, Kung AL, Libermann TA. Computational repositioning and preclinical validation of pentamidine for renal cell cancer. *Mol Cancer Ther* 2014; 13:1929-41.

Immunology

Chiang HS, Zhao Y, Song JH, Liu S, Wang N, Terhorst C, Sharpe AH, Basavappa M, Jeffrey KL, Reinecker HC. GEF-H1 controls microtubule-dependent sensing of nuclein acids for antiviral host defenses. *Nat Immunol* 2014; 15:63-71.

De Calisto J, Wang N, Wang G, Yigit B, Engel P, Terhorst C. SAP-dependent and -independent regulation of innate T cell development involving SLAMF receptors. Front Immunol 2014; 5:186.

De Salort J, Cuenca M, Terhorst C, Engel P, Romero X. Ly9 (CD229) cell surface receptor is crucial for the development of spontaneous autoantibody production to nuclear antigens. *Front Immunol* 2014; 4:225.

Liao G, O'Keeffe M, Wang G, van Driel B, de Waal Malefyt R, Reinecker HC, Herzog RW, Terhorst C. Glucocorticoid-induced TNF receptor family related protein ligand [GITR-L] is requisite for optimal functioning of regulatory CD4+ T cells. *Front* Immunol 2014; 5:3.



Liao G, van Driel B, Magelky E, O'Keeffe M, de Waal Malefyt R, Engel P, Herzog RW, Mizoguchi E, Bhan AK, Terhorst C. Glucocorticoid-induced TNF receptor family-related protein ligand regulates the migration of monocytes to the inflamed intestine. FASEB J 2014; 28:474-84.

The infiltration of inflammatory cells into the intestinal wall causes the inflammatory bowel diseases Crohn's disease and ulcerative colitis. To understand the mechanisms

of infiltration, two distinct forms of inflammatory bowel disease were created in m lacking the glucocorticoid-induced TNF receptor family-related protein ligand (GIT In both cases, mice without the protein had fewer inflammatory monocyte cells in the intestine, and reciprocally more in the spleen, where they are stored. Thus, GIT regulates the migration of monocytes to the inflamed intestine.

Infectious Diseases

Alonso CD, Marr KA. Clostridium difficile infection among hematopoietic stem of transplant recipients: beyond colitis. *Curr Opin Infect Dis* 2013; 26:326-31.

Pollock NR, McGray S, Colby DJ, Noubary F, Nguyen H, Nguyen TA, Khormaee S, S, Hawkins K, Kumar S, Rolland JP, Beattie PD, Chau NV, Quang VM, Barfield C, K, Steele M, Weigl BH. Field evaluation of a prototype paper-based point-of-care fingerstick transaminase test. *PLoS One* 2013; 8:e75616.



Shapiro RL, Kitch D, Ogwu A, Hughes M, Lockma S, Powis K, Souda S, Moffat C, Moyo S, McIntosh K, Widenfelt E, Zwerski S, Mazhani L, Makhema J Essex M. HIV transmission and 24-month surviva in a randomized trial of HAART to prevent MTCT during pregnancy and breastfeeding in Botswan. (the Mma Bana study). AIDS 2013; 27:1911-20.

Highly active antiretroviral therapy (HAART) has been shown to alleviate the symptoms of HIV/AIDS. This study in Botswana endeavored to show the efficacy of HAART in prevention of mother-to-child HIV transmission (MTCT) and its impa on the long-term survival of both the mothers and children. In a randomized clinical trial in which HIV-infected pregnant women received different HAART cocktails, investigators were able to maintain low rates of MTCT across the boar A disconcerting number of maternal and child deaths occurred after HAART was discontinued, however, pointing to the need for future investigations into improvious long-term maternal and child survival.

Sohn H, Aero AD, Menzies D, Behr M, Schwartzman K, Alvarez GG, Dan A, McInt F, Pai M, Denkinger CM. Xpert MTB/RIF testing in a low tuberculosis incidence, high-resource setting: limitations in accuracy and clinical impact. *Clin Infect Dis* 2014; 58:970-6.

Zash RM, Ajose-Popoola O, Stordal K, Souda S, Ogwu A, Dryden-Peterson S, Pow K, Lockman S, Makhema J, Essex M, Shapiro RL. Risk factors for mortality among HIV-exposed and HIV-unexposed infants admitted to a neonatal intensive care to in Botswana. *J Paediatr Child Health* 2014; 50:189-95.

Molecular and Vascular Medicine

Aird WC, Mosnier LO, Fairhurst RM. Plasmodium falciparum picks (on) EPCR. *Bloo* 2014; 123:163-7.



Dharaneeswaran H, Abid MR, Yuan L, Dupu D, Beeler D, Spokes KC, Janes L, Sciuto T, Kang PM, Jaminet SC, Dvorak A, Grant MA, Regan ER, Aird WC. FOXO1-mediated activation of Akt plays a critical role in vascu homeostasis. Circ Res 2014; 115:238-51.

Although the transcription factor FoxO1 can be found in the endothelium, its precis role in endothelial tissue remains enigmatic. This study used endothelial-specific knockout and overexpression of FoxO1 in mouse models to explore the effect of Fo on vascular homeostasis. The results show that removal of functional FoxO1 from

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nice R-L). R-L	the endothelium was lethal in embryonic life; additionally, overexpression of FoxO1 resulted in increased endothelial cell size, capillary obstruction, heart failure and death. FoxO1 regulates a specific pathway that governs cell size and metabolism. These findings suggest that in mice, expression of FoxO1 in the endothelium is necessary for embryonic development and endothelial homeostasis.
ell	Martinelli R, Zeiger AS, Whitfield M, Sciuto TE, Dvorak A, Van Vliet KJ, Greenwood J, Carman CV. Probing the biomechanical contribution of the endothelium to lymphocyte migration: diapedesis by the path of least resistance. <i>J Cell Sci</i> 2014; 127:3720-34.
<u>Jain</u> <u>Fietje</u> e	Zonneveld R, Martinelli R, Shapiro NI, Kuijpers TW, Plötz FB, Carman CV. Soluble adhesion molecules as markers for sepsis and the potential pathophysiological discrepancy in neonates, children and adults. <i>Crit Care</i> 2014; 18:204.
an 1 J, 1	Nephrology Forman DE, Daniels KM, Cahalin LP, Zavin A, Allsup K, Cao P, Santhanam M, Joseph J, Arena R, Lazzari A, Schulze PC, Lecker SH. Analysis of skeletal muscle gene expression patterns and the impact of functional capacity in patients with systolic heart failure. J Card Fail 2014; 20:422-30.
 ia	Lee J, de Louw E, Niemi M, Nelson R, Mark RG, Celi LA, Mukamal KJ, Danziger J. Association between fluid balance and survival in critically ill patients. <i>J Intern Med</i> 2014; [Epub ahead of print].
act	Nichols B, Jog P, Lee JH, Blackler D, Wilmot M, D'Agati V, Markowitz G, Kopp JB, Alper SL, Pollak MR, Friedman DJ. Innate immunity pathways regulate the nephropathy gene Apolipoprotein L1. <i>Kidney Int</i> 2014; [Epub ahead of print].
rd.	Shmukler BE, Reimold FR, Heneghan JF, Chen C, Zhao T, Paw BH, Alper SL. Molecular cloning and functional characterization of zebrafish Slc4a3/Ae3 anion exchanger. <i>Pflugers Arch</i> 2014; 466:1605-18.
ving 	Yu W, Ackert-Bicknell C, Larigakis JD, Maclver B, Steers WD, Churchill GA, Hill WG, Zeidel ML. Spontaneous voiding by mice reveals strain-specific lower urinary tract function to be a quantitative genetic trait. <i>Am J Physiol Renal Physiol</i> 2014; 306:F1296-307.
	Pulmonary, Critical Care and Sleep Medicine Akuthota P, Capron K, Weller PF. Eosinophil purification from peripheral blood. Methods Mol Biol 2014; 1178:13-20.
<u>vis</u> g_ unit_	Donnino MW, Salciccioli JD, Howell MD, Cocchi MN, Giberson B, Berg KM, Gautam S, Calloway C for the America Heart Association's Get With The Guidelines-Resuscitation Investigators. Time to administration of epinephrine and outcome after in-hospital cardiac arrest with non-shockable rhythms: retrospective analysis of large in-hospital data registry. <i>BMJ</i> 2014; 348:g3028.
<u>d</u>	Nelson B, Zhou X, White M, Hartshorn K, Takahashi K, Kinane TB, Anandaiah A, Koziel H. Recombinant human mannose-binding lectin dampens human alveolar macrophage inflammatory responses to influenza A virus in vitro. <i>J Leukoc Biol</i> 2014; 95:715-22.
<u>iis</u>	Schmidt M, Banzett RB, Raux M, Morelot-Panzini C, Dangers L, Similowski T, Demoule A. Unrecognized suffering in the ICU: addressing dyspnea in mechanically ventilated patients. Intensive Care Med 2014; 40:1-10.
ular ise	Thomas RJ, Mietus JE, Peng CK, Guo D, Gozal D, Montgomery-Downs H, Gottlieb DJ, Wang CY, Goldberger AL. Relationship between delta power and the electrocardiogram-derived cardiopulmonary spectrogram: possible implications for assessing the effectiveness of sleep. <i>Sleep Med</i> 2014; 15:125-31.
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SELECTED PUBLICATIONS (continued)

Rheumatology

Crispin JC, Hedrich CM, Tsokos GC. Gene-function approaches in SLE. Nat Rev. Rheumatol 2013; 9:476-84.

Kannan L, Kis-Toth K, Yoshiya K, Sehrawa S, Dalle Lucca JJ, Thai TH, Mayadas T, Tsokos GC. R-spondin3 prevents mesenteric ischemia/reperfusion-induced tissue damage by preventing vascular leakage. *Proc Natl Acad Sci U S A* 2013; 110:14348-14353.

Koga T, Hedrich C, Mizui M, Yoshida N, Lieberman LA, Rauen T, Crispín JC, Tsokos GC. CaMK4 promotes T₁₁17 related autoimmune pathology though Akt/mTOR and CREM-II. J Clin Invest 2014; 124:2234-45.

Muroya T, Kannan L, Ghiran IC, Shevkoplyas SS, Paz Z, Tsokos M, Dalle Lucca JJ, Shapiro NI, Tsokos GC. C4d deposits on the surface membrane of red blood cells in trauma patients and interferes with their function. *Crit Care Med* 2014; 42:e364-72.

Thai TH, Pham DH, Patterson HC, Kis-Toth K, Kamiski DA, Tsokos GC. Genetic ablation of mir155 reduces auto-antigen driven germinal center reactions and alleviates lupuslike disease in the Faslpr mouse. *Proc Natl Acad Sci U S A* 2013; 110:20194-9.

Translational Research

Dugas AF, Mackenhauer J, Salciccioli JD, Cocchi MN, Gautam S, Donnino MW. Prevalence and characteristics of non-lactate and lactate expressors in septic shock. J Crit Care 2012; 27:344-50.

Freedman SD, Martin CR, Aspinall M. Structuring the patient-physician encounter: joint creation of an actionable roadmap to health. *Healthcare* 2014; 2:94-98.

Ketwaroo G, Brown A, Young B, Kheraj R, Sawhney M, Mortele KJ, Najarian R, Tewani S, Dasilva D, Freedman S, Sheth S. Defining the accuracy of secretin pancreatic function testing in patients with suspected early chronic pancreatitis. *Am J Gastroenterol* 2013; 108:1360-6.

Martin CR, Zaman MM, Gilkey C, Salguero MV, Hasturk H, Kantarci A, Van Dyke TE, Freedman SD. Resolvine D1 and Lipoxin A4 improve alveolarization and normalize septal wall thickness in a neonatal murine model of hyperoxia-induced lung injury. *PLoS One* 2014; 9:e98773.

Stevens JP, Johansson AC, Schonberg MA, Howell MD. Elements of a high-quality_ inpatient consultation in the intensive care unit. A qualitative study. *Ann Am Thorac Soc* 2013; 10:220-7.

Transplant Immunology

Carlson AL, Fujisaki J, Wu J, Runnels JM, Turcotte R, Celso CL, Scadden DT, Strom TB, Lin CP. Tracking single cells in live animals using a photoconvertible near-infrared cell membrane label. *PLoS One* 2013; 8:e69257.

Chandraker A, Strom TB. Transplantation: a new molecular approach to the diagnosis of acute rejection. *Nat Rev Nephrol* 2013; 9:631-2.

Keslar KS, Lin M, Zmijewska AA, Sigdel TK, Tran TQ, Ma L, Bhasin M, Rao P, Ding R, Iklé DN, Mannon RB, Sarwal MM, Strom TB, Reed EF, Heeger PS, Suthanthiran M, Fairchild RL. Multicenter evaluation of a standardized protocol for noninvasive gene expression profiling. *Am J Transplant* 2013; 13:1891-7.

Mascanfroni ID, Yeste A, Vieira SM, Burns EJ, Patel B, Sloma I, Wu Y, Mayo L, Ben-Hamo R, Efroni S, Kuchroo VK, Robson SC, Quintana FJ. IL-27 acts on DCs to suppress the T cell response and autoimmunity by inducing expression of the immunoregulatory molecule CD39. *Nat Immunol* 2013; 14:1054-63.

Medical Education

Resident

Donovan LM, Liu Y, Weiss JW. Effect of endothelin antagonism on apnea frequency following chronic intermittent hypoxia. *Respir Physiol Neurobiol* 2014; 194:6-8.

Edwards ST, Schermerhorn ML, O'Malley AJ, Bensley RP, Hurks R, Cotterill P, Landon BE. Comparative effectiveness of endovascular versus open repair of ruptured abdominal aortic aneurysm in the Medicare population. *J Vasc Surg* 2013; 59:575-82.

Moskowitz A, Lee J, Donnino MW, Mark R, Celi LA, Danziger J. The association between admission magnesium concentrations and lactic acidosis in critical illness. J Intensive Care Med 2014; [Epub ahead of print].

William JH, Huang GC. How we make nephrology easier to learn: computer-based modules at the point-of-care. *Med Teach* 2014; 36:13-8.

Wrenn KC, Mostofsky E, Tofler GH, Muller JE, Mittleman MA. Anxiety, anger, and mortality risk among survivors of myocardial infarction. *Am J Med* 2013; 126:1107-13.

Faculty

Graham KL, Marcantonio ER, Huang GC, Yang J, Davis RB, Smith CC. Effect of a systems intervention on the quality and safety of patient handoffs in an internal medicine residency program. *J Gen Intern Med* 2013; 28:986-93.

Papp KK, Huang GC, Lauzon Clabo LM, Delva D, Fischer M, Konopasek L, Schwartzstein RM, Gusic M. Milestones of critical thinking: a developmental model for medicine and nursing. *Acad Med* 2014; 89:715-20.

Smith CC, McCormick I, Huang GC. The clinician-educator track: training internal medicine residents as clinician-educators. *Acad Med* 2014; 89:888-91.

Weinstein DF, Arora V, Drolet B, Reynolds EE. Residency training—a decade of dutyhours regulations. N Engl J Med 2013; 369:e32.

William JH, Huang GC. How we make nephrology easier to learn: computer-based modules at the point-of-care. *Med Teach* 2014; 36:13-8.

Quality Improvement

Etchegaray JM, Ottosen MJ, Burress L, Sage WM, Bell SK, Gallagher TH, Thomas EJ. Structuring patient and family involvement in medical error event disclosure and analysis. *Health Aff (Millwood)* 2014; 33:46-52.

Eleming LM, Kociol RD. Interventions for heart failure readmissions: successes and failures. *Curr Heart Fail Rep* 2014; 11:178-87.

Feuerstein JD, Akbari M, Gifford AE, Hurley CM, Leffler DA, Sheth SG, Cheifetz AS. Systematic analysis underlying the quality of the scientific evidence and conflicts of interest in interventional medicine subspecialty guidelines. *Mayo Clin Proc* 2014; 89:16-24.

Ridge CA, Hobbs BD, Bukoye BA, Aronson MD, Boiselle PM, Leffler DA, Sternberg SB, Roberts DH. Incidentally detected lung nodules: clinical predictors of adherence to Fleischner Society surveillance guidelines. *J Comput Assist Tomogr* 2014; 38:89-95.

Shields HM, Stoffel EM, Chung DC, Sequist TD, Li JW, Pelletier SR, Spencer J, Silk JM, Austin BL, Diguette S, Furbish JE, Lederman R, Weingart SN. Disparities in evaluation of patients with rectal bleeding 40 years and older. *Clin Gastroenterol Hepatol* 2014; 12:669-75.

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RESEARCH FUNDING 2013-2014

Division	Funding Source	Direct Award	Indirect Award
Allergy and Inflammation	Federal	748,050	543,855
	Non-Federal	157,954	2,064
Cardiovascular Medicine	Federal	4,528,150	2,055,248
	Non-Federal	4,895,067	1,081,453
Clinical Informatics	Federal	447,671	47,062
	Non-Federal	17,826	2,674
Clinical Nutrition	Federal	-	-
	Non-Federal	58,435	-
Endocrinology,	Federal	5,843,999	3,620,525
Diabetes and Metabolism	Non-Federal	3,737,268	370,397
Experimental Medicine	Federal	435,752	229,294
	Non-Federal	815,932	80,674
Gastroenterology	Federal	1,079,008	416,445
	Non-Federal	2,528,015	841,580
General Medicine and	Federal	6,875,999	1,483,493
Primary Care	Non-Federal	5,520,674	415,918
Genetics	Federal	1,943,902	1,370,285
	Non-Federal	1,771,164	23,878
Gerontology	Federal	1,190,733	160,417
	Non-Federal	1,158,589	302,997
Gerontology/Hebrew SeniorLife	Federal	7,669,573	2,558,637
	Non-Federal	740,525	90,552
Hematology/Oncology	Federal	9,983,120	4,431,943
	Non-Federal	7,324,969	1,201,566
Hemostasis and Thrombosis	Federal Non-Federal	2,910,854 154,145	1,763,475
Immunology	Federal	1,174,199	599,271
	Non-Federal	57,519	—

Division	Funding Source	Direct Award	Indirect Award
Infectious Diseases	Federal	1,274,786	653,180
	Non-Federal	557,601	66,163
ІМВІО	Federal	1,431,643	713,204
	Non-Federal	1,965,200	226,419
Molecular and	Federal	1,717,854	969,799
Vascular Medicine	Non-Federal	894,490	50,237
Nephrology	Federal	3,552,572	2,256,864
	Non-Federal	4,878,677	689,045
Pulmonary, Critical Care	Federal	523,050	353,567
and Sleep Medicine	Non-Federal	184,576	
Rheumatology	Federal	2,288,011	1,578,003
	Non-Federal	454,594	75,351
Signal Transduction	Federal	280,539	203,452
	Non-Federal	231,039	126,396
Translational Research	Federal	3,613,571	_
	Non-Federal	14,852	1,868
Transplant Immunology	Federal	433,633	354,554
	Non-Federal	465,758	44,105
Virology and	Federal	31,739,521	3,761,852
Vaccine Research	Non-Federal	14,522,345	2,281,070
	Total Federal	91,686,188	30,124,425
	Total Non-Federal	53,107,214	7,974,406
	GRAND TOTAL	144,793,402	38,098,831
TOTAL RESEARCH FUNDING			

TOTAL RESEARCH FUNDING

182,892,233



Chris Riella, MD, nephrology fellow.

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HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

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

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