

Tufts

MEDICINE

MAGAZINE OF THE TUFTS UNIVERSITY MEDICAL
AND SACKLER ALUMNI ASSOCIATION
SUMMER 2014 VOL. 73 NO. 1



THE GREATER GOOD

Making a difference beyond our doors

PLUS: CAP AND GOWN • LOUIS WEINSTEIN REMEMBERED • A FAMILY LEGACY



Left to right:
Moran-Guiati,
Cardullo, Hanna,
Pelzman, Levitsky

ROCK ON

Matthew Levitsky, '17, has always been in bands, going way back. So within a few months of arriving at Tufts, he had put together Stank Hands, a five-piece cover band with the simple goal of having fun.

The band, all members of the class of 2017, includes Levitsky on electric bass; Craig Hanna, vocals; Adam Cardullo, guitar; Joe Moran-Guiati, guitar; and Daniel Pelzman, keyboard and drums.

Stank Hands plays songs that everyone around them knows and can sing along to—primarily music of the 1980s, 1990s and 2000s. “We’ve tried to come up with songs that our classmates would like,” Hanna volunteers.

The band has mastered about 30 songs by rehearsing seven or eight times in a practice room on the Medford/Somerville campus and getting together occasionally at Levitsky’s South End apartment.

In early April, at their first real gig, Stank Hands played Hennessey’s, a club near Boston’s Faneuil Hall, to benefit the student-run Sharewood health-care clinic; they raised \$1,400 for the cause. But they are just getting warmed up. There’s much more merriment to come.

—BRUCE MORGAN

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He could be brusque and opinionated, but Louis Weinstein ranked as a founding father of the field of infectious diseases. *By Barron H. Lerner*

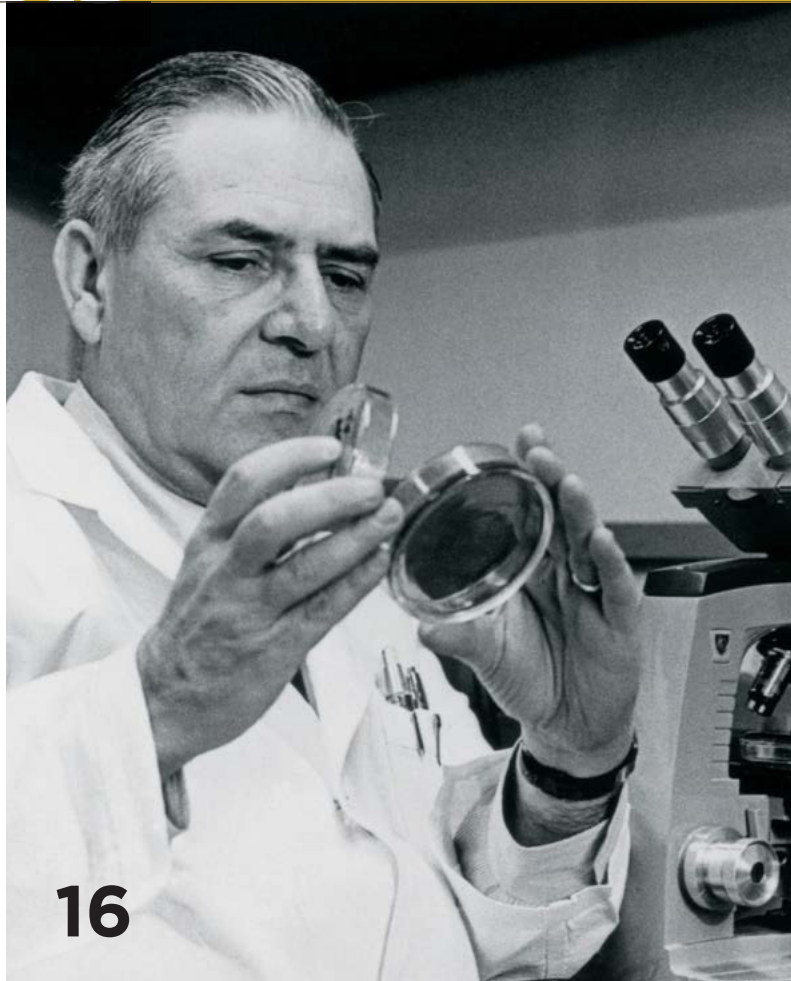
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STAYING CONNECTED

Cover photo by Alonso Nichols

A DAUGHTER'S PATH

I read with great interest your piece about Dr. Jane Desforges ("Remembering Jane," Spring 2014). I knew of her but never met her.

My grandmother, Elizabeth White, was born in 1891, and Dr. Desforges' father, Joseph Fay, who graduated from Tufts Medical School in 1908, was her nearly life-long physician. My grandmother once told me that in her opinion, there was no other physician in the world like Dr. Fay. She absolutely trusted him with her life.

It sounds as though his daughter quite naturally followed in his footsteps in clinical expertise, as well as in kindness, caring and humility.

It was a pleasure to read about her life. Our daughter, Katherine, received her undergraduate degree in mechanical engineering from Tufts in 2012 and is now pursuing her master's in human factors from Tufts School of Engineering. We're always pleased to read about Tufts graduates of the past. Many thanks!

JANE DARVEAU, E12P, G15P
READING, MASSACHUSETTS

HOW TO LISTEN

I appreciated the article about the importance of doctors listening to their patients ("Tell Me More," Spring 2014), which emphasized an area of medicine that has been sadly increasingly neglected over my lifetime as a physician.

Your article did not at all note the effect of new technologies on this process. I would remind you that the vast majority of histories obtained, whether it be the initial visit or subsequent visits, occur with the physician/nurse practitioner/physician's assistant sitting at a computer and filling out a template. Innumerable patients have complained that "the practitioner never once looked at me."

I am still in practice, and I feel fortunate that I have allowed certain aspects of the new technologies to pass me by. A mindless recording of the facts does not take into consideration that the vast majority of histories are replete with omissions, exaggerations, misinterpretations and, at times, prevarication. We all "listen," but that does not occur solely through verbal communication but also, more importantly, through tone, eye contact, hesitations and body language. That allows us to sift through the information to come to a final adjudication of the issues involved.

I would quibble with the tenor of your article, which lauded an attempt to make student's "more sensitive." I would argue that the priorities are to train them to be rigorous, thorough and discerning; the history is a veiled inquisition, not an informal chat.

STEPHEN NAGY, JR, '64, M940
SACRAMENTO, CALIF.

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Our China Connection



WHEN A SMALL CONTINGENT OF PEOPLE FROM TUFTS—including Phil Hinds, chair of our Department of Developmental, Molecular and Chemical Biology; Rebecca Scott, head of medical development; Jack Erban, '81, clinical director of the Tufts Cancer Center; Olivia Cheng, a trustee at Tufts Medical Center, and my wife and I—ventured to Asia for three weeks in March, we were eager to explore possible relationships we might forge between their institutions and ours. We went with some natural advantages.

First was our geography. We are probably the only medical school in the U.S. located in a Chinatown, and we have a long history of positive interaction with our immediate neighbors. Tufts Medical Center, in fact, functions as the community hospital for Chinatown.

A second advantage lay in the trip's mission. We wanted to learn from our Asian hosts, and visited Singapore, China and Taiwan in that spirit. Our hosts were flattered by our interest.

Third, and more personally, although I am Jewish, I have a strong Chinese contingent in my family. Two of my four children are married to Chinese spouses. Another daughter has worked in China for seven years, and her husband, Evan Osnos, is a prominent China correspondent for *The New Yorker* and the author of a new much-acclaimed book, *The Age of Ambition: Chasing Fortune, Truth and Faith in the New China*. I have grandchildren in London who take both Chinese and Hebrew lessons. And I've traveled to all these countries multiple times over the years, starting in the mid-1960s.

An overriding goal of our trip was to learn about how to take care of Chinese and American patients more effectively in the 21st century. Many Chinese doctors and hospitals have done a great deal to integrate traditional Chinese medicine with Western medicine, and we wanted to learn from them about the effectiveness of using the two approaches in concert. Many places we visited are conducting extensive and sophisticated research along these lines.

A secondary goal of our journey was to investigate potential partnerships in breast cancer research that would draw on the enormous patient population in China. This initiative reflects our special strengths at the medical school in this area. On both fronts, we went to China as seekers and explorers, gathering initial information and making first connections that stand a good chance of growing into collaborations in the coming years.

Everywhere we went, we were greeted enthusiastically. Every few hours we ventured to a new place, and the cumulative effect was like drinking from a fire hose. I visited three institutions in Singapore, and the whole group visited eight in China and 14 more in Taiwan. Almost every institution we visited wanted to collaborate with us in some way.

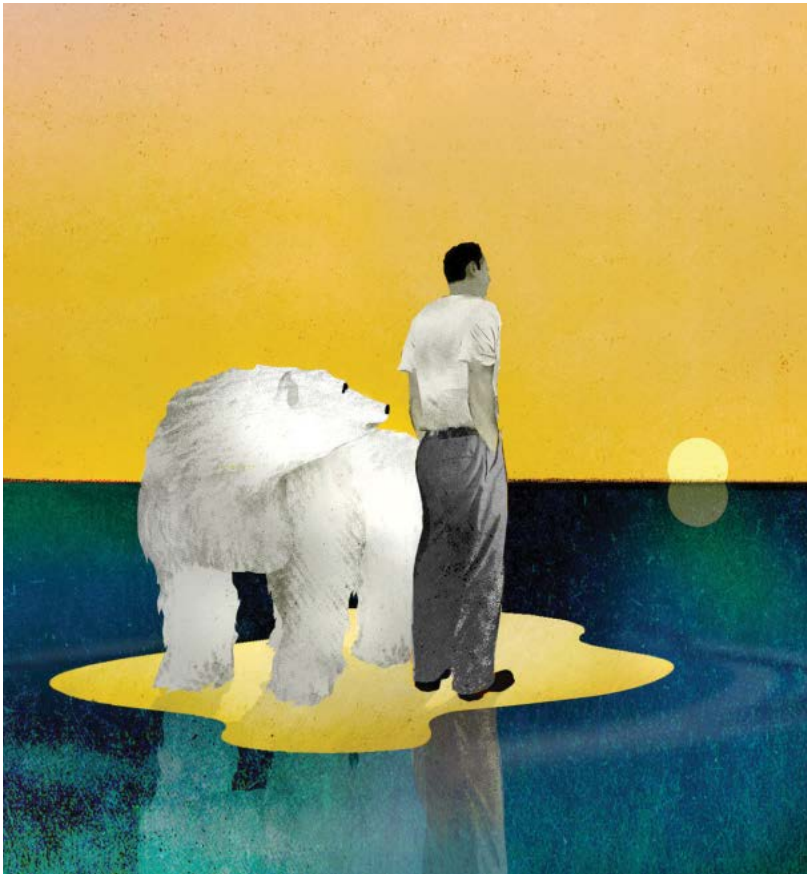
Fudan University, in Shanghai, is a good example. One of the oldest and best modern universities in China, Fudan has 50,000 students. We paid a courtesy call there, and the people we met were eager to do business with us. It didn't hurt our cause that a number of scientists recognized Phil Hinds as being on the editorial board of *Cancer Research*. They knew him as a name on a masthead; now they had the chance to meet him in person and think about partnering with him.

The details of any collaboration between Fudan and Tufts Medical School are tentative at this point, of course, but it's easy to imagine how an affiliation might help advance our medical school's own research interests. The Fudan University Cancer Center treats many more breast cancer patients each year than any hospital in Massachusetts. They are set up to track and assess large numbers of study results on a scale that surpasses our capability here.

Potential further advantages to our collaborations abound. Another prominent medical school in Taiwan wants to send its top M.D.s to Tufts to pursue Ph.D.s—a potential source of tuition revenue for our school.

Our Asia trip was an exciting way to open new channels between our two cultures. If my own family history is any indication, some great things will arise from the initiative.

HARRIS A. BERMAN, M.D.
DEAN, TUFTS UNIVERSITY
SCHOOL OF MEDICINE



Just Warming Up

Climate change is already affecting human health—and it's early yet

MELTING GLACIERS AND RISING SEA LEVELS ARE JUST THE start of the trouble; climate change is going to be bad for your health, too. That's one of the many hard findings contained in the National Climate Assessment Report released in May. It was based on the work of more than 300 experts and reviewed by a panel of the National Academy of Sciences.

Human health effects linked to a generally warmer climate include elevated risks of respiratory and cardiovascular disease, in addition to the innumerable deaths and injuries brought on by extreme weather. And this dire

talk is something more than conjecture. These projected impacts “are happening now,” one of the lead authors of the report told the *Boston Globe*.

Take the case of allergies. Allergens become more active in warmer air. Carbon dioxide levels also tend to rise, heightening pollen counts and making it harder for asthma sufferers to breathe. The number of Americans with asthma rose enough between 2001 and 2010 to challenge the resources of the U.S. health-care system, according to the report.

Jeffrey Griffiths, professor of public health and community medicine, and an expert on the relationship between stomach viruses and summer heat whose research was cited in the report, isn't much impressed with the hedged language of the findings. “I think this report is understated, because the wealth of information known about health effects has really snowballed in the last few years,” he told the *Globe*. “Lyme disease or other tick-borne diseases are going through the roof. People's predictions about how extensive Lyme disease would be are really low compared to what we're actually seeing.”

Children, the elderly, impoverished populations and communities of color are apt to be most acutely affected by a degraded natural environment. Air quality is one example. “For someone on the edge, the increasing air pollution could be enough to put them into an asthma attack, or if they have emphysema, it might be enough to hospitalize them, reduce their lung function, and then the chance for infections becomes more common,” Griffiths explained. Rates of heart attack and stroke have indeed risen historically after spikes in air pollution.

Griffiths has his eye on a deeper history. “Parasites need a certain temperature to live in a mosquito,” he told the *Globe* reporter. “There was malaria in Boston until 1900, so we certainly have the right kind of mosquitoes, and if we have a lot more and one gets here carrying the right kind of parasite, we could see things like malaria transmission again.”

BUZZ CUTS FOR CANCER

A BUNCH OF TOUGH-GUY HOCKEY PLAYERS, HOSPITAL executives and fathers of children undergoing cancer treatment at Floating Hospital for Children had their heads shaved this spring at the seventh annual Cuts for a Cause charity event, held at the Boston Park Plaza Hotel.

Craig T. Williams, the former chief operating officer at Tufts Medical Center (TMC), was one of the participants, along with Nate Hartwell, a pediatric hematology/oncology pharmacist at TMC, the fathers of three Floating Hospital patients, and a score of Boston Bruins players, including Shawn Thornton—celebrity sponsor of the event each year—who had volunteered to support pediatric cancer care at the Floating, among other charitable causes.

This was the first time that TMC employees had actively

participated in the head-shaving. “I’m fortunate to have three healthy kids and a healthy head of hair,” Williams told the newspaper *Sampan*. “If I can help kids battling cancer by raising money from those who would love to see me bald, it’s something I’m more than happy to do.”

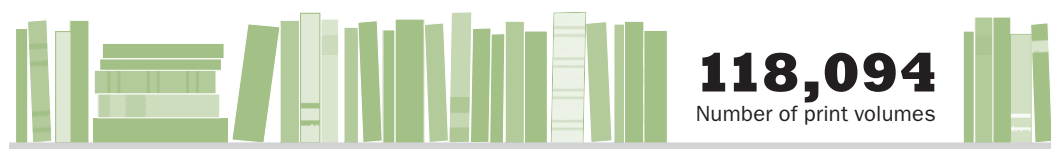
Hartwell felt much the same way. A Haverhill resident, he and his wife, Kacey, were expecting their first child in July. “I am so proud to work with these patients and their families,” he said. “It’s inspiring to see them overcome the incredible challenges that they face on a daily basis. Shaving my head for Cuts for a Cause is a great way to raise money and give back to these amazing kids.”

Fans bid online for the chance to shave their favorite hockey player. The event raised more than \$118,000.

PUMPED UP FOR LIFE

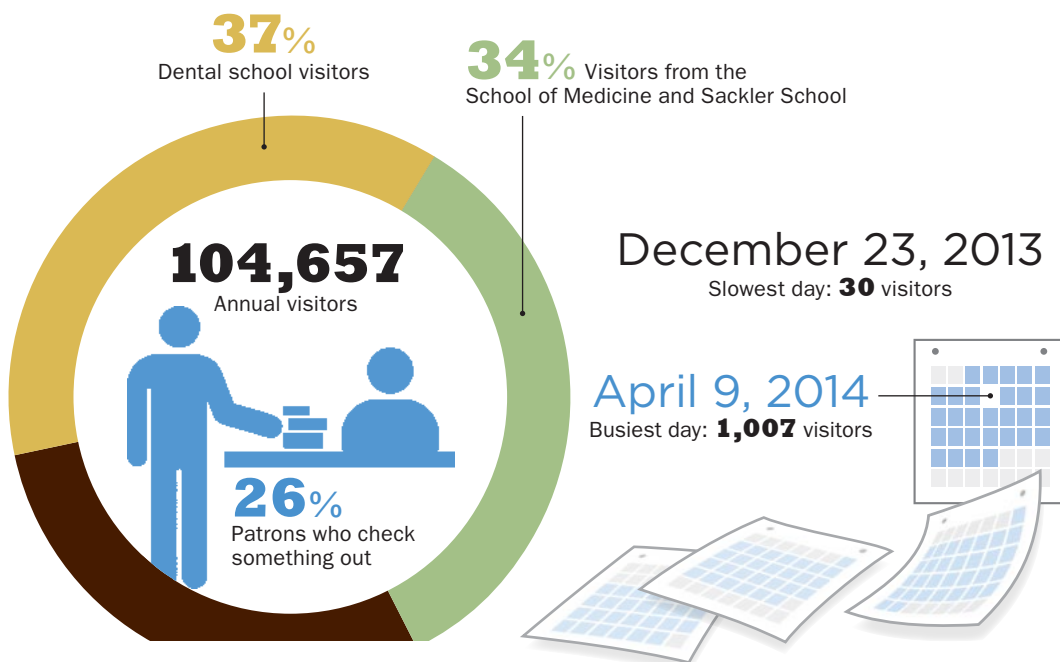
With age, our skeletal muscles tend to lose mass and strength in a phenomenon known as sarcopenia.

Roger Fielding, director of the Nutrition, Exercise Physiology and Sarcopenia Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts, points out that in aging populations, physical activity has been shown to retard muscle loss and maintain the ability to function. He recommends including one or two sessions of strength or resistance training per week, in addition to a regular daily regimen of aerobic activities such as walking, biking or swimming. “We really think exercise is a way to preserve independence in older adults,” he told the *Boston Globe* recently.



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Stats on the Stacks





Ode to Filth

A woman named Whitney Barthel recently described her attitude toward dirt by writing candidly on the “Baby Center” blog: “I hate filth. I live on a farm, and I hate getting dirty. How ironic is that?”

Barthel admits, though, that her attitude is changing. She cites a statement from the National Wildlife Federation to the effect that “a growing body of research suggests the exact things we do in the name of protecting [kids] from dirt and germs, such as not letting them get too messy and frequently using hand sanitizers and antibacterial products, can inhibit their mental and physical health and resilience.”

Joel Weinstock, a professor of gastroenterology and immunology at Tufts, has been arguing this point for years (see “The Good Worms,” *Tufts Medicine*, Winter 2007). Barthel quotes him on her blog as saying, “Some children raised in ultra-clean environments may be missing exposures to organisms that help them develop appropriate immune regulatory circuits,” Weinstock says. “This lack of exposure could promote some immune-mediated diseases. While we do not know what types of exposures are best for children, in our modern day society it should be OK for children to go barefoot and play in the dirt.”

LICENSE TO CURE

As a Bay State driver, you may not know it, but every car you see with a specialized Massachusetts license plate bearing a pink ribbon and a “Cure Breast Cancer” tagline benefits the Diane Connolly-Zaniboni Breast Cancer Research Fund at the Tufts Cancer Center.

Connolly-Zaniboni was a Tufts Medical Center patient and South Boston wife, mother and attorney who lost her battle with breast cancer in 2000. She had envisioned a specialized license plate to benefit breast cancer research, and after her death, a group of her friends made it happen in her



memory. The first such plate, created with the backing of the state’s Registry of Motor Vehicles, came out in 2006.

The initial registration fee for the plate is \$60, and the special plate fee is \$40—of which \$12 goes to the Registry for plate production and \$28 benefits the cancer research fund. The plate is renewable every two years, with the full \$100 renewal fee going to the Connolly-Zaniboni fund. For details on pricing and procedures, go to massrmv.com and look under the “online services” tab.

CAN YOU HEAR ME NOW?

ALTHOUGH STILL IN ITS EARLY STAGES, THE AFFORDABLE CARE ACT (AKA OBAMACARE) IS poised to shake up the delivery and practice of medicine in many ways as it unfolds, and people who struggle with hearing loss may be among the beneficiaries, says Mark Parker, director of audiology at Steward St. Elizabeth’s Medical Center and an assistant professor of otolaryngology at Tufts.

“Although it is difficult to predict the future, the changes [under the ACA] could have a drastic effect on our current methods of delivering hearing health care,” he observed recently in *The Hearing Journal*, an online publication. The enrollment of more people into the health insurance system, together with expanded Medicaid coverage in a number of states, have laid the groundwork for many patients who need help to seek it out and find it at an affordable price.

Details of which health insurance exchange plans will cover hearing aids and on what terms are still up in the air. But the audiologist notes that what he saw under “Romneycare,” the Massachusetts health-care model, portends a two-way shift for the national program. “In my experience,” Parker writes, “the increase in coverage has resulted not only in people purchasing hearing aids at a lower out-of-pocket cost, but also in decreased reimbursement from some insurance providers to our clinics.”

The size, shape and form of audiology practices may need to be altered, he believes.

OVERHEARD

“Respect the patient. Do not treat him/her as ignorant or unable to understand your approach. Your patient understands the illness in a way that you, the physician, cannot.”

—STUART LEVY, PROFESSOR OF MOLECULAR BIOLOGY AND MICROBIOLOGY, ON THE WEBSITE MEDPAGE TODAY, OFFERING HIS ADVICE TO MEDICAL STUDENTS AND DOCTORS JUST STARTING OUT

Teen Angst on Moving Day

LOTS OF KIDS GET ANXIOUS WHEN parents start talking about securing moving vans and packing things up for a big family move. But a recent analysis of more than 500,000 children who underwent the experience found that the chances an adolescent might need mental health care rose by as much as 20 percent after a move, according to a report in *Reuters Health*.

“Knowing how moves affect psychological health issues in children is important so families and health-care providers can anticipate those challenges and prepare accordingly,” said Jeffrey Millegan, lead author of the study and a psychiatrist based at Naval Medical Center in San Diego, Calif. Millegan noted that while relocations have long been a hallmark of military life, more civilian families are moving from place to place “as our economy becomes more dynamic.”

Thirty-five million Americans, representing more than 10 percent of the country’s population, had a geographic move in 2010, according to a report on Millegan’s study in the *Journal of Adolescent Health*. The research used medical records for children of active-duty service personnel between 2006 and 2009. All children were between ages 6 and 17, and about 25 percent of them had moved over the past year. Researchers divided the children into two age groups, ages 6 to 11



and 12 to 17, and then tracked their respective health-care visits during 2009.

The study found that older kids needed more help adjusting to their new locale. Compared to peers who had not moved, the teenagers showed a 20 percent higher likelihood of visiting the emergency room for a psychiatric issue. Younger children saw only a 3 percent increase in the need for mental-health care.

“It shouldn’t come as a surprise to us that adolescents have a difficult time making

adjustments,” Christopher Bellonci, a child and adolescent psychiatrist at the Floating Hospital for Children at Tufts Medical Center, told *Reuters*. “The job of adolescents is to find a peer group and an identity outside the home, and that is harder when your peer group and school are disrupted by a move.”

“Change is stressful,” said Bellonci, an associate professor of psychiatry at Tufts. He recommends that parents talk with their kids at length about any upcoming transitions planned for the family.

CAPLAN HONORED BY MEDICAL SOCIETY

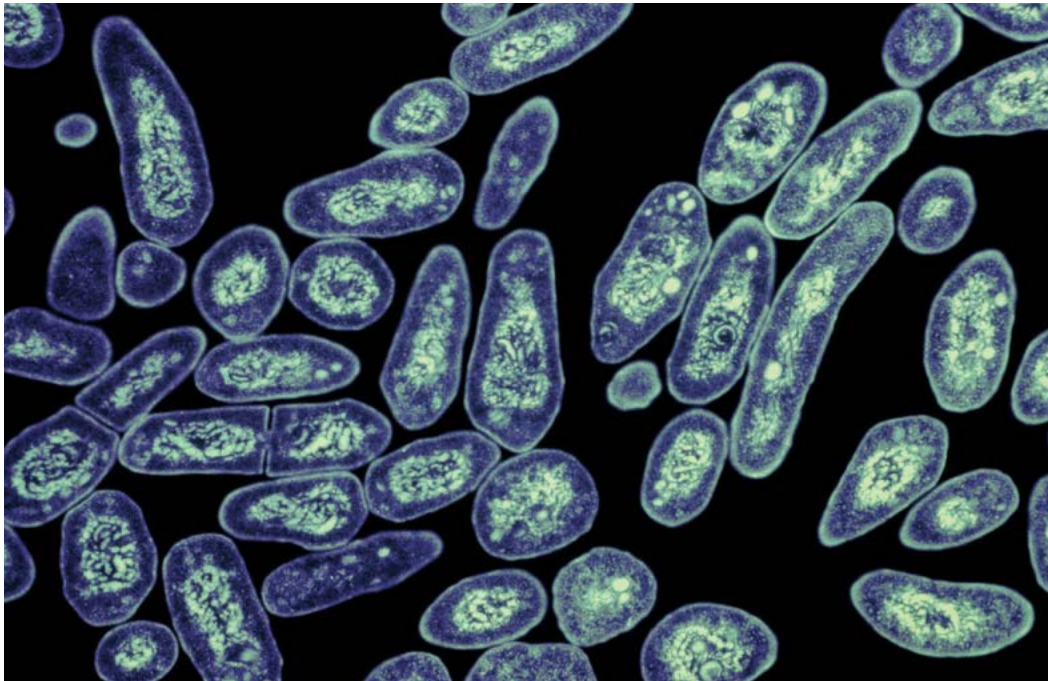
Hubert Caplan, '55, a rheumatologist and resident of Wellesley, Mass., was honored this spring by the Massachusetts Medical Society as the 2014 recipient of its Award for Distinguished Service to the Society. The award, one of the organization's most prestigious, recognizes a member physician who has demonstrated a strong commitment to the goals of the society through leadership and committee work.

The award cites Caplan for his “remarkable dedication and commitment to organized medicine,” and for being a “passionate, principled advocate and spokesperson on numerous and innovative issues.” A member of the medical society for 54 years, Caplan has served on more than a dozen of its committees



and is currently a member of its board of trustees, the House of Delegates and the committees on Administration and Management, Professional Liability, Professional Liability, Men's Health and Bylaws.

A member of the medical staff of Newton-Wellesley Hospital since 1967, he served as the hospital's chief of rheumatology from 1977 to 1987 and coordinator of medical mortality review for almost 30 years. In 2007, he joined the Marino Center for Integrative Health in Wellesley, where he practiced until 2012. He has been a member of the faculty of Tufts Medical School since 1958 and was promoted to clinical professor of medicine in 2006.



Despite its prevalence in the world, TB remains a bit of a mystery.

is working to deepen our understanding of TB. She received an NIH Director's New Innovators Award to support her research; she is one of 41 researchers to receive the five-year, \$1.5 million awards. Aldridge is conducting her research in the university's new Biosafety Level 3 laboratory, located in the medical school's Biomedical Research and Public Health Building. The laboratory's primary focus is tuberculosis.

Already, Aldridge and her colleagues' initial findings about how the bacteria grow could lead to new, more effective treatments for drug-resistant TB infections.

TB ON THE COMEBACK TRAIL

Microbiologist works to decipher the defenses of the centuries-old bacteria by Jacqueline Mitchell

TUBERCULOSIS IS BACK.

In 2011, almost 9 million people contracted it, and 1.4 million of them died, making TB the second deadliest infectious disease after HIV/AIDS, according to the World Health Organization.

The resurgence of TB is being fueled by antibiotic-resistant strains of the organism that causes the infection, *Mycobacterium tuberculosis*, and scientists are scrambling to find new treatments.

But even before drug resistance became such a problem, *Mycobacterium tuberculosis*, which has killed up to one

billion people over the last two centuries, was a particularly recalcitrant foe. Because it's difficult and dangerous to study in the lab, scientists didn't know much about the bug itself. Instead, they made a lot of assumptions about the tuberculosis-causing bacteria, using its more harmless relatives as models—assumptions about the way it reproduces and the way it responds to drugs.

"It's kind of amazing to me that there are so many basic facts we don't understand about this bacteria," says Bree Aldridge, an assistant professor of molecular biology and microbiology at the School of Medicine. Aldridge, who also holds appointments at the Sackler School of Graduate Biomedical Sciences and the School of Engineering,

TOUGH BUG TO STUDY

Once known as consumption, because it appears to destroy its victims from the inside out, tuberculosis primarily attacks the lungs, but can do extensive damage in almost any part of the body.

With the advent of antibiotics in the 1940s and '50s, TB typically is no longer the death sentence it once was. But unlike many infections,

THE THICK, IMPENETRABLE CELL WALL MAKES IT DIFFICULT TO HANDLE.
"IT IS LIKE IT'S COVERED IN EARWAX."

it won't go away with a week or 10-day course of medicine. Some of the bacteria linger for months. That's why TB patients have to take several different kinds of antibiotics for as long as two years.

"The question is, Why do we need such a long drug treatment?" asks Aldridge. "What's different between the bacteria that persist for a long time in the lungs versus the bacteria that die off right away?"

M. tuberculosis is notoriously hard to study. Mycobacteria—the family of bacteria to which it belongs—are named for the mycolic acid that coats each cell. The thick, impenetrable cell wall makes it difficult to handle in the lab.

"It is like it's covered in earwax," says Aldridge. "It makes it not only hard for drugs to get in, it also makes it hard to grow in a petri dish."

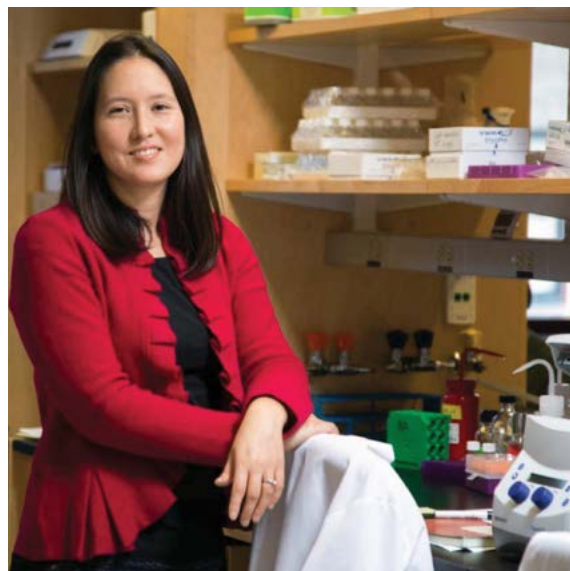
For years, scientists gleaned what they could about the TB bacteria by studying its more malleable relatives, like *E. coli*. When *E. coli* divide, one cell—known as the mother cell—splits into two identical daughter cells. They are the same size and shape; they behave the same, and—most important to Aldridge—they grow at the same rate.

"That's largely true for rod-shaped bacteria, the scientific classification into which both *E. coli* and mycobacteria fall," she says, "but it turns out not to be true at all for mycobacteria."

Working as a postdoctoral

fellow in the lab of Sarah Fortune at the Harvard School of Public Health, Aldridge collaborated with Mehmet Toner's laboratory at Massachusetts General Hospital to design a small video device that attaches to a microscope and gives researchers an unprecedented glimpse into the daily life of mycobacteria, recording the cells' activity over several days.

The video shows mycobac-



"It's kind of amazing to me that there are so many basic facts we don't understand about this bacteria," says Bree Aldridge.

teria dividing, something few scientists had ever seen. When the mother cells split into two, the daughter cells aren't the same size or shape at all. They look like sticks and rocks strewn haphazardly on the forest floor.

"Look at how drastically different their sizes are," says Aldridge, pointing at the video on her computer

monitor. "Other microbiologists thought our cells were ugly because they're not normal-looking like *E. coli*," says Aldridge. "After they got over that, they thought it was pretty astonishing."

The findings not only overturned a long-held assumption about mycobacteria, but also gave scientists a glimpse at the potential for new and more effective treatments for TB.

different classes of drugs.

Not surprisingly, accelerators succumb more quickly to antibiotics that interfere with their growth. The slower-growing alternators have a different Achilles' heel—they are susceptible to drugs that interfere with more internal cellular processes. This information alone could help redefine the way TB is treated.

Aldridge's lab continues to search for other physiological differences among mycobacteria cells. Using microscopy, she and her colleagues are getting up close and personal with individual bacteria to figure out other reasons why some cells are more or less susceptible to certain antibiotics than others.

The team will use mathematical models to make sense of all the information their hunt for physiological differences will generate. Aldridge, who holds bachelor's degrees in computer engineering and molecular and cellular biology and a Ph.D. in biological engineering, says applying engineering principles to a biological problem is the best approach she knows for finding ways to target drug therapies to bacteria that are harder to kill.

"We'll use mathematical models to help us resolve all those different parameters," says Aldridge. "It's too much data to make sense of without the models."

Jacqueline Mitchell can be reached at jacqueline.mitchell@tufts.edu.

GROWING PAINS

When Aldridge and her colleagues took a closer look at mycobacteria daughter cells, they found they could assign them to two distinct categories based on their growth rates. They named the faster growers "accelerators" and the slower ones "alternators." It turns out that accelerators and alternators respond to

NEW HOPE FOR DEADLY BREAST CANCERS

Researchers find promising target in battle against tough-to-treat tumors
by Taylor McNeil

TUFTS RESEARCHERS have identified a new target for treating particularly aggressive forms of breast cancer that could potentially save thousands of lives each year.

Gail Sonenshein, a professor of developmental, molecular and chemical biology at the School of Medicine, and her research team found that when they injected antibodies to a protein called ADAM8—essentially turning the protein off—in mice with triple-negative breast cancers, the tumors stopped growing and did not metastasize. The research, which was funded by the National Institutes of Health among other sources, was published in January in *EMBO Molecular Medicine*.

Scientists have identified three specific receptors that drive the growth of a large percentage of breast cancers. Treatments that interrupt the activity of these receptors

have proven effective, but triple-negative breast cancers lack these three receptors. “Triple-negative breast cancers are incredibly aggressive,” Sonenshein says. “They tend to appear in younger women and in African-American women, and have a higher mortality rate, accounting for 25 percent of breast cancer deaths. There are chemotherapy and radiation treatments, which can have quite serious side effects and are not highly effective, but there are no targeted therapies.”

Over the last two decades, Sonenshein and her team have been trying to identify molecular factors that drive invasive breast cancers and could be used to develop more specific treatments. A few years ago, her lab identified ADAM8 in a screen for proteins that promote cell properties of aggressive breast cancers. Consistently,

ADAM8 expression levels correlated with the severity of the disease and poor patient outcomes. ADAM8 was present in one third of triple-negative breast tumors and half of all breast cancer metastases.

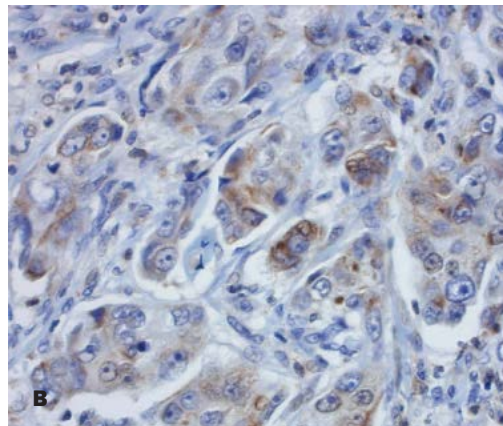
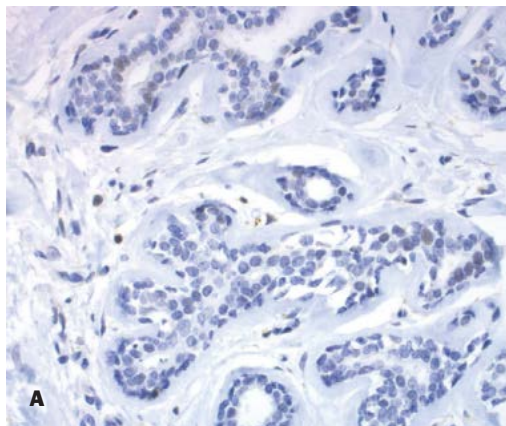
When the Sonenshein group reduced the amount of ADAM8 in breast cancer cells, they became less invasive but were still able to grow normally on plastic. Mathilde Romagnoli and Nora Mineva, postdoctoral research associates in Sonenshein’s lab, then set up a series of experiments in which triple-negative breast cancer cells were implanted in the mammary glands of mice. In the first experiment, they permanently removed ADAM8 from the triple-negative breast cancer cells. Tumors lacking ADAM8 grew only to a very small size, and no metastasis occurred. “It was a total surprise. We had expected only

effects on tumor spread,” Sonenshein says.

Their studies have found that ADAM8 plays two roles. Once tumors start to grow and reach a critical mass, they stop growing if they don’t have adequate access to nutrients or oxygen. ADAM8 sends signals that help recruit new blood vessels to the tumor, a process called angiogenesis. The blood vessels then feed the tumor with the nutrients and oxygen required for its growth.

In addition, ADAM8 is necessary to activate proteins on the surface of the cancer cells that allow them to interact with the blood vessels. This gives them the means to enter and exit blood vessels, essentially promoting metastasis. When Irene Georgakoudi, Sonenshein’s collaborator in Tufts’ Department of Biomedical Engineering, and her colleagues tested the blood from the mice with tumors lacking ADAM8, there were very few tumor cells in circulation.

TARGET PRACTICE
To test whether ADAM8 would respond to antibody therapy, Romagnoli and Mineva used commercially available antibodies specific



Work done in the Sonenshein lab shows that the presence of ADAM8 protein is linked to the growth of the most aggressive breast cancers. Brown staining in image B marks ADAM8 in triple-negative tumor tissue, compared with image A, normal breast tissue.

for the outside active portions of ADAM8. In animals that received antibodies to ADAM8, the tumors grew much more slowly, and most animals had no metastasis. The results “validate ADAM8 as one of the first targets for triple-negative breast cancers,” Sonenshein says.

Sonenshein is now investigating various means to produce human ADAM8 antibodies that can be used to treat patients. Once these antibodies are developed, her group will need to test their effectiveness on the mouse models they have established, as well as on patient tumor samples transplanted into mice, a procedure called patient xenografting.

Sonenshein will collaborate with a researcher at Baylor University for this work. Toxicity tests to make sure that turning off ADAM8 wouldn't have any negative consequences would also need to be done before moving any antibody to clinical trials in humans.

“If we can make an effective human ADAM8 antibody, and if all of the testing goes well, women with triple-negative ADAM8-positive tumors could be treated with this antibody and would have a more effective and less-toxic option than high-dose chemotherapy or radiation,” says Sonenshein.

“At this point, ADAM8 is one of the best targets you could actually look for, because it appears to have no essential function” that would be missed if it were removed, Sonenshein says.

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GUMS UNDER ATTACK

Stress may cause periodontal disease
by Michael Blanding

WE ALL KNOW what contributes to gum disease—poor brushing, forgetting to floss, avoiding checkups, smoking. But what about a tough day at the office or dire financial straits? Surprisingly, the stress brought on by emotional struggles might have just as much to do with the disease, according to a review of the literature by three researchers at Tufts University.

“It's been shown there is a significant association between emotional stress and periodontal disease,” says Evangelos Papathanasiou, an assistant professor of periodontology at Tufts School of Dental Medicine.

Before he came to Tufts, Papathanasiou was a dentist in the Greek air force and saw a number of soldiers under high

stress who developed mouth ulcers and bleeding gums. Closer to home, he recently experienced bleeding while brushing his own teeth. “I realize that when I am under stress, my gums tend to bleed more when I am brushing,” he says. Papathanasiou was aware of previous studies that showed that financial strain and academic stress can lead to more plaque and gum inflammation.

That led him and two pathobiologists from the Sackler School of Graduate Biomedical Sciences, Theoharis Theoharides and Iro Palaska, to investigate further. In the review they published in the *Journal of Biological Regulators & Homeostatic Agents*, they propose a novel theory for how stress can regulate gum

Cortisol, released by the body during times of stress, can play a role in gum disease.

inflammation—a phenomenon whereby the body, in an effort to protect itself from mouth bacteria, essentially attacks its own gums.

The accepted cause of gum disease is this: When people fail to brush adequately, bacteria build up on teeth and gums, eventually leading to decay and disease. And that's exactly what happens—up to a point, says Papathanasiou. “When bacteria build up, they begin to release toxins. Those are like their weapons,” he says. “Their goal is to create more space so more bacteria can form.” The pockets that toxins create in the gums help anaerobic mouth bacteria thrive and cause gingivitis, the early stages of gum disease.

AN INFLAMMATORY RESPONSE

But that's only half the story. At the same time these bacteria are attacking the teeth and gums, the body is producing immune cells to fight them off. In a perfect world, immune cells and bacteria are in balance and thus protect the teeth and gums. At a certain point, however, immune cells become so numerous that they begin to inflame tissue and hasten disease rather than prevent it—the same way an allergic reaction can cause the body more harm than good. At this point, gingivitis, which is reversible, gives way to bone loss around teeth and full-blown periodontitis, which is not.

“For many years, the theory was that bacteria were mainly

responsible, which is why most therapies have targeted bacteria,” says Papathanasiou. “But the more modern concept is that the inflammatory response from the immune cells plays a significant role.” The intensity of this immune response seems to be modified by a number of factors, including genetics, diabetes and smoking.

The researchers’ literature review found that emotional stress was also associated with accelerated periodontal disease, Papathanasiou says. There are two theories about that. The first is behavioral. When people are under emotional stress, they tend to abandon healthy behaviors and eat sugary foods, smoke, drink more alcohol and brush and floss less—all of which promote bacteria growth.

The second, and more surprising, theory is biological. When the body is under stress, it produces more of the hormone cortisol, which usually acts as an anti-inflammatory agent. But when cortisol is produced in the gums, it seems to stimulate mast cells to produce more proteins, increasing inflammation and therefore increasing the progression of gum disease.

Papathanasiou emphasizes that this biological cause-and-effect has not yet been fully explored in relation to gum disease, and that he and Theoharides are planning to test the hypothesis in the lab.

“The future of periodontal therapy is not only to target the bacteria, but to try to control the inflammation, too,” he says.

Michael Blanding is a freelance writer in Brookline, Mass.



ANTIDEPRESSANTS AND EARLY BIRTHS

Study shows that pregnant women and their doctors should carefully consider potential effects of medication by Jacqueline Mitchell

PRETERM BIRTH, when babies arrive three or more weeks early, is the leading cause of infant mortality and can have serious long-term effects for the infants who do survive, says Adam Urato, a specialist in maternal-fetal medicine and assistant professor at Tufts School of Medicine. Caring for these babies is complex and expensive, costing the United States more than \$26 billion annually, according to a 2007

report from the Institute of Medicine.

That’s why obstetricians and public health officials make every effort to educate women about factors that contribute to preterm birth, including smoking, drinking and using drugs or chronic illnesses such as diabetes, high blood pressure and even gum disease.

In a new research paper, Urato and his colleagues make the case for adding

antidepressants to that list of risk factors. The use of these medications during pregnancy has increased dramatically over the last two decades. Meanwhile, rates of preterm birth in the U.S. have also been climbing. (While the overall rate is about 11 percent, it varies widely across demographics.)

Urato doesn’t think that’s a coincidence. He and his colleagues combed through research conducted between 1993 and 2012, looking for answers. Their meta-analysis of the data showed a clear increase in the risk for preterm birth among women who took antidepressants during their pregnancies. The paper, published in the online journal PLOS One on March 26, is a follow-up to a 2012 study by Urato and his colleagues that found that pregnant women on antidepressants were at increased risk for a number of complications, including miscarriage, pregnancy-related high blood pressure, birth defects and premature delivery.

We talked with Urato, who also practices maternal-fetal medicine in the ob/gyn department at the MetroWest Medical Center, about his latest findings.

Antidepressants like Prozac hit the market in the 1980s. Aren’t they well studied by now?

ADAM URATO: You’d think there must be a lot of studies looking at the use of these drugs during pregnancy. But since the drugs were released more than 25 years ago, there are only 41 studies that we found that addressed this important issue of preterm

URATO COMBED THROUGH RESEARCH DONE BETWEEN 1993 AND 2012. HIS ANALYSIS SHOWED AN INCREASE IN RISK FOR PRE-TERM BIRTH AMONG ANTIDEPRESSANT USERS.

birth. However, when you look at all of them, as we did in our meta-analysis, they are really quite definitive.

If you look at the raw data, 39 out of the 41 studies show an increased risk of preterm birth in the women on antidepressants, but not all were statistically significant. When you look at statistical significance and put it all together in a meta-analysis, what you find is roughly a doubling of the risk of preterm birth in women who are on these medications into the third trimester.

What's more, several of the studies are showing very high rates of preterm birth. Ten percent is considered a high rate. But some of these studies are showing rates as high as 25 percent—and one was even as high as 30.8 percent in the women who took antidepressants.

How can you tell that it's the medication—not the depression—causing problems with the pregnancy?

That's the other important thing that came out of this study: it's not the depression itself causing preterm birth. In many of the studies that looked at a depressed group of women who were not on antidepressants, we're not finding that the depression causes preterm births. This really looks like a chemical effect, an effect of the antidepressants themselves.

This corresponds to the animal studies, which clearly show the effects of these

drugs on pregnancy. It's a little frustrating. People argue that we may try to control for depression, but the women who decide to stay on medication during pregnancy must have a different severity of depression from the women who decide to stay off of it. But truth is, in animal studies we are clearly seeing the same effects. We see pregnancy losses; we see early deliveries with antidepressant exposure.

If these effects show up in animal studies, how did these drugs get approved for use by pregnant women?

These drugs are not FDA-approved for use in pregnant women. The FDA label on these drugs contains a section on pregnancy. It warns about possible cardiac defects, persistent pulmonary hypertension and newborn behavioral syndrome, but the label doesn't warn about preterm birth, which it should. One of my next projects will be to get the FDA to pay attention to these clear scientific findings. The evidence now is very compelling that we can make a very strong argument that the FDA needs to strengthen its warning to pregnant women.

Why is it so important for the FDA labeling to be updated?

I take care of pregnant women daily, and I counsel many women on these medications. The message that a lot of pregnant women and women

of child-bearing age and their doctors are getting is that these drugs are basically safe in pregnancy. That's absolutely not what the science is showing.

One piece of misinformation that's out there is that people continue to compare giving these drugs to pregnant women to giving insulin to women with diabetes. It's actually not like that at all. When you treat pregnant patients who are diabetic with insulin, they get much better outcomes. They have fewer complications. They have fewer miscarriages. By controlling their diabetes with insulin, their pregnancies do better.

But we are not seeing that with antidepressants. We consistently see worse outcomes in the treated group. The science is showing clearly that these drugs, when used during pregnancy, are associated with miscarriages, birth defects, preterm births, newborn problems and possible long-term effects. That message is really not getting out to women of child-bearing age and the doctors who take care of them.

How did you first become interested in this issue? Is it something you observed in your practice?

I went to medical school in the 1990s and did my training in the late '90s. We've seen this explosion of antidepressant use during pregnancy since that time. I needed to be able to counsel the patients I take

care of, and the way I approach questions like this is through research. I wanted to be able to provide the best counseling possible. When you look into the scientific studies available, the findings about the effects of these chemicals are really concerning.

So do you advise your patients not to take antidepressants during their pregnancies?

Doesn't that have risks, too?

People always ask me, What about a woman who says, "I will kill myself if I go off my Zoloft"? That's not a difficult question. She needs to stay on her Zoloft. But the truth is, most women aren't in that category, and we need to get out accurate information to pregnant women and the public so that everyone can make the choice that's best for them.

Our point is not to ignore depressed pregnant women. They need good treatment and care. The issue is how to care for them. We know now from the scientific evidence that antidepressants do not provide a significant clinical benefit for many patients with depression, and in fact, other modalities such as exercise or psychotherapy provide as good or better outcomes in the long term for many patients. Given that, and given that we know there are all these pregnancy complications, it's just common sense to address depression in pregnant women—and arguably depression in anyone—with a non-drug approach first.



Father, Brother, Son

Tufts Medical School has touched three generations of this writer's family

WITH A PHOTOGRAPHIC MEMORY AND ALMOST SURREAL DIAGNOSTIC skills, my father was a physician with few equals. Born in 1911, when the physician's chief concerns were to figure out what was wrong and whether you would live or die, Maurice Kamm Lurensky was the second of four children of Polish immigrants. He grew up in Charlestown, Mass., helping his father run a small grocery store.

As a toddler, my father contracted diphtheria, a life-threatening disease caused by bacteria and the toxins they produce. The toxins cause membranes to form in the throat, and patients can suffocate.

Apparently, my grandmother reached into his throat with her fingers to destroy the membrane, thus helping my father breathe. At that time, diphtheria was common: In Boston, in the early 1900s, there were 144 cases in a single week—just one measure of how

much medicine has changed in 100 years!

My father graduated from the University of Wisconsin in 1933, with plans to enroll at Harvard Business School and join the family business. Then, a week before classes were to start, he was accepted by Tufts Medical School, and he gleefully abandoned his original plans. In his second year at Tufts, he anglicized his last name to “Laurence.” He received his M.D. in 1937 and began a residency at Boston City Hospital. Many patients there had tuberculosis. Indeed, in 1936, one in 20 deaths was due to TB, making it the most deadly of contagious diseases; my father was in the midst of this daily.

Thankfully, he never got the disease, but neither did he forget what he saw on those wards. Years later, in the 1980s, young doctors at a famed Boston hospital struggled and scratched their

BY CONSTANCE E. BRINCKERHOFF

ILLUSTRATION BY LEIGH WELLS

heads, trying to diagnose strange symptoms in an 8-year-old girl. My father examined her, asked a few pertinent questions about the household and concluded that the girl had TB, infected by a nanny who had come from Jamaica, where the disease still persisted. This was but one example of his legendary diagnostic skill.

While at The City, he met my mother, Elizabeth Zimmerman, a social worker. They eloped and were married in Brattleboro, Vt., in 1940 with \$25 that my father got for giving blood. He bought her a simple gold band for \$7; she eventually wore it out. Together, they raised five children. I was the oldest—his “experimental model,” as he called me. They settled in Swampscott, Mass, living in a wood-frame house with a broad front porch. At first, my father’s office was in the house; a separate entrance was created, turning what would have been the living room into a waiting room, examining room and office. I remember patients coming and going, and on occasion my trying to sell them lemonade from the porch. My father was clearly devoted to his family, but medicine was the dominant force in his life, and it sustained him after my mother died in 1982.

With his office in Swampscott, my father was among the first internists to establish a practice outside the urban environs of Boston. He also started a 23-year stint as the company physician for General Electric in Lynn. His practice spanned more than 50 years. During his long career, he established the intensive care unit at Lynn Hospital, served as president of the northeast chapter of the American Heart Association and chief of medicine at Lynn Hospital. He embodied the changing roles of physicians as their ability to treat and to cure increased exponentially.

My father’s final chapter began in 1995, when he suffered a major stroke. He could not return home and reluctantly chose to come to a nursing home in Hanover, N.H., to be close to me. He made friends with a few other residents and with most of the staff. In general, though, he kept to himself, a proud and dignified gentleman who won the hearts and earned the respect of all those who cared for him. He did suffer several bouts of serious illness, which he characteristically shrugged off with the proud pronouncement that he “had cheated the undertaker.” He died early on a Saturday morning, October 28, 2000.

BLOODLINES

His genes are in us, and we are his legacy. While each of us carries some of his characteristics, one son, Robert Laurence, M.D., and one grandson, Laurence Brinckerhoff, M.D., are the direct bearers of this extraordinary medical torch. My brother Bob received his degree from Tufts in 1975, and after a residency at Newton-Wellesley Hospital, he settled in the Camden-Rockport area of Maine, joining the staff of Pen Bay Medical Center as a primary-care doctor in 1978. Thirty-six years later, the medical center has

a staff of more than 100 physicians and is a full-service community hospital with 99 beds, overlooking the lovely Penobscot Bay.

I know from the fact that my brother’s office phone is constantly ringing that he is, indeed, his father’s son, and that the gift has been passed to him. He has cared for such notables as Dr. Benjamin Spock and historian David McCullough, as well as our fifth-grade teacher from the Stanley School in Swampscott, Clara Waterman, after she retired to Maine. He has his own list of achievements, including a fellow of the American College of Physicians and chief of medicine and head of the Credentials Committee at Pen Bay.

As his older sister, none of this surprises me. Late one summer afternoon in Swampscott, when he was only 3 or 4 years old, we were walking home from the beach, and we crossed the railroad tracks. Steam engines powered trains back then, always dripping water, and as we crossed the tracks, “Bobby” proclaimed that the train had already come by because the tracks were wet. His astute powers of observation were already fully operational.

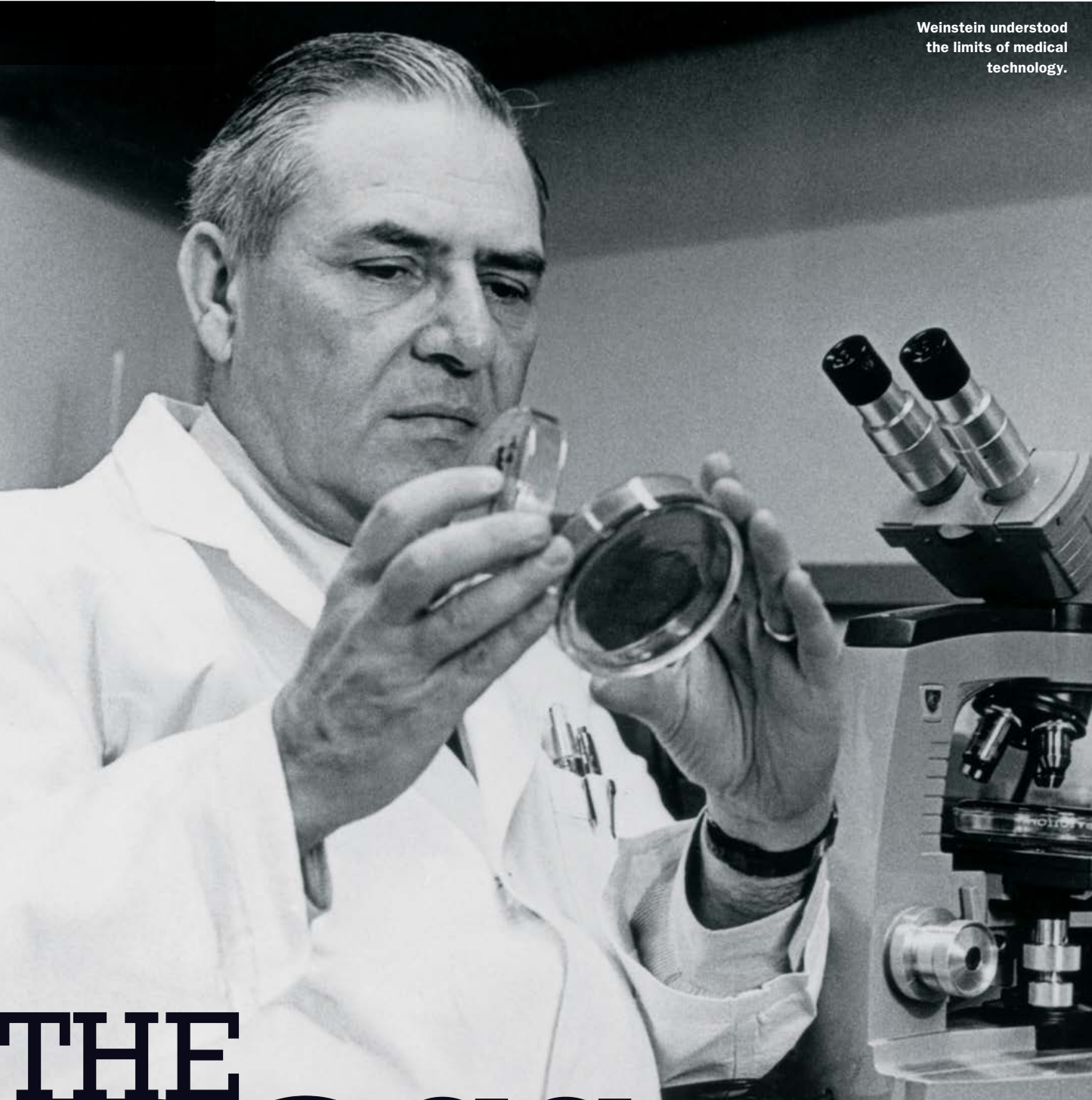
Larry, my son, may have missed the first step on the Tufts pathway, but he ended up there eventually. Larry chose to attend medical school at Dartmouth, graduating in 1994. After a residency in surgery at the University of Virginia and a fellowship in cardiothoracic surgery at the University of Colorado, Denver, he was appointed chief of thoracic surgery at Tufts Medical Center in 2004. He was always able to visualize in 3-D, quickly assembling complex equipment (such as barbecue grills), a

skill that serves him well, as he tells me he will often “see” an operation in his mind the night before it is scheduled.

It is not just motherly pride when I say that my son is also an outstanding and dedicated teacher. As an assistant professor, he runs the surgical clerkship for the third-year medical students and has won nearly every teaching award given by the school. Most recently, Larry was the inaugural recipient of the Outstanding Core Clerkship Director Award, given to a faculty member recognized by students as a great teacher and role model.

My father would be proud of this legacy. He was honest and worked hard. Sometimes he appeared autocratic and demanding, but these stemmed from his incredible sense of commitment to his profession and to his family. Although only 5 feet, 5 inches tall, his commanding persona belied his height. He was often blunt, but his messages were always motivated by what he believed was fair and right. He instilled in all of his children (and grandchildren) an unrelenting sense of integrity and eschewed self-aggrandizement. As Larry says of his grandfather, “Bubba always told me: ‘Never strut.’” TM

Constance E. Brinckerhoff, Ph.D., is the Nathan Smith Professor of Medicine and of Biochemistry Emerita at the Geisel School of Medicine at Dartmouth College.



Weinstein understood
the limits of medical
technology.

THE BOSS WHO BARRICKED

**HE COULD BE BRUSQUE AND OPINIONATED. BUT HOWEVER
HE CARRIED HIMSELF, TUFTS PROFESSOR
LOUIS WEINSTEIN RANKED AS A FOUNDING FATHER OF
THE FIELD OF INFECTIOUS DISEASES**

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BY BARRON H. LERNER

MY FATHER'S MEDICAL CAREER TOOK AN abrupt turn one day in the spring of 1960 at the New England Medical Center. He was a medical resident doing an elective in hematology but decided to attend a talk on an infection, meningococemia, given by Tufts professor Louis Weinstein, an expert in infectious diseases. Transfixed during the lecture, my father, Phillip Lerner, had the audacity to approach Weinstein afterwards and ask if he had an opening for an infectious-diseases fellow two summers later, when my father, a graduate of Case Western Reserve School of Medicine, would complete his residency in internal medicine at Boston's Beth Israel Hospital. After some inquiries about my father's performance, Weinstein offered him the position. For my father, my family and me, the rest, as they say, is history.

Just what had made Weinstein so compelling for my father? It turns out that Weinstein was one of the founding fathers of the specialty of infectious diseases, and he had used his position at Tufts to popularize the field across the country. During Weinstein's time at the school and the New England Medical Center [now Tufts Medical Center] from 1957 to 1975, he trained several dozen infectious-diseases fellows, many of whom became luminaries in the field. Even more important for me, as I wrote a book on my father's career, was Weinstein's legacy as a master clinician, one who could not only make spectacular diagnoses and cure "incurable"

diseases, but one who also understood the limits of medical technology and the importance of keeping the patient front and center.

To understand the historical impact of Weinstein's years at Tufts, it helps to know about the history of infectious diseases. Prior to the 1930s, there were no antibiotics, and so physicians largely treated infections like tuberculosis, pneumonia and diphtheria with supportive care. Mortality rates for these diseases approached 25 to 50 percent. Most devastating of all was endocarditis, an infection of the heart valve. Patients with this condition—often young people who had earlier contracted rheumatic fever—often died a slow death as their heart failure worsened.

It was nothing short of miraculous when the first agents that could cure bacterial infections, the sulfa drugs, appeared in the mid-1930s. Even better was penicillin, which was introduced during World War II and became widely available in the late 1940s. Another great success was the introduction in 1947 of the first drug that could treat tuberculosis, streptomycin. Physicians practicing medicine in this era all had stories of moribund patients seemingly rising from the dead when they were fortunate enough to receive these new drugs.

Weinstein was "a bridge between the eras before and after the introduction of antibiotics," according to one of his longtime Boston infectious-diseases colleagues, the late Morton N. Swartz, A38, former chief of infectious diseases at Massachusetts General Hospital. Weinstein trained initially at Yale University as a microbiologist, a background that

gave him particular insight into the behavior of bacteria. After graduating from Boston University School of Medicine in 1943, Weinstein joined the faculty there. His mentor was the internist Chester Keefer, who had served as America's informal "Penicillin Czar" during World War II, allocating the small amounts of the precious antibiotic.

Weinstein also was the medical director of the John C. Haynes Memorial Hospital, an isolation hospital in Brighton, Mass., that quarantined patients with potentially contagious infectious diseases. At the Haynes, Weinstein saw a vast number of infectious diseases, including scarlet fever, diphtheria and whooping cough, many of which would largely disappear in the coming years. Perhaps Weinstein's finest moments at the Haynes occurred when, after local obstetricians refused to come to an infectious-diseases hospital, he delivered babies of several women with polio who were tightly encased in iron lungs.

By the late 1950s, with the diffusion of antibiotics, the rates of contagious diseases were declining, as was the census at the Haynes. It was time for Weinstein to move on. He was recruited to become the head of infectious diseases at Tufts in 1957 and would spend the next 18 years running a laboratory, treating patients and teaching fellows, house officers and medical students.

As my father learned, Weinstein's teaching rounds were, in the words of another Weinstein trainee, Tufts professor of medicine Sherwood L. Gorbach, '62, a "supreme inspiration" and full of powerful clinical stories. Typically, a resident or fellow would present a recent case of an infectious disease, allowing Weinstein to speak for 60 to 90 minutes—without audiovisual aids or notes—on the history of the disease in question, its diagnosis and its treatment. Weinstein's drew on his vast clinical experience to recount memorable cases of diseases such as haemophilus meningitis or gram-negative endocarditis, sharing both pearls and pitfalls. It was his sheer command of the material that so amazed those in attendance. Weinstein, my dad later wrote, was a "mesmerizing,

dynamic teacher" who was "fanatic, encyclopedic, opinionated, scholarly and demanding of his specialty and all those who aspired to it or intersected its vast boundaries." When Weinstein instituted an extra Saturday morning teaching rounds, as well as a citywide infectious-diseases conference that met on Friday afternoons at either Tufts or Massachusetts General Hospital, the lecture halls were packed.

SMOKE IN THE BASEMENT

Weinstein was equally adept at the bedside. Decades later, trainees and colleagues remembered him making spectacular diagnoses on cases that had stumped other doctors. Former Weinstein fellow John Bruschi, A65, M69, recalls a case in which Weinstein asked to see a child with supposed encephalitis and correctly changed the diagnosis to tuberculous meningitis when he picked up a facial nerve paralysis that the other doctors had all missed. The late Harvard virologist Bernard N. Fields saw Weinstein diagnose mononucleosis in a patient with a neck mass previously assumed to have been cancer. Weinstein had "medical intuition," Gorbach has written.

The doctor's commitment to his patients was legendary. He reminded his fellows that infections behaved differently in different patients. Prescribing an antibiotic was only part of patient care. Weinstein insisted that his fellows see their patients twice daily, both in the morning and in the late afternoon. After returning home for dinner, Weinstein would travel to nearby hospitals that lacked infectious diseases specialists to see hard cases—something he clearly did not need to do. His wife, Ethel, drove her husband—who never enjoyed driving—and patiently waited for him in the hospital lobbies. Although Weinstein admitted that such consults brought him prestige, he wanted to make sure that these patients were receiving appropriate care of their infections. "There's no one else out there," he once told Bruschi.

Weinstein's fellows also carried out research, much of it focused



Weinstein's influence extended far and wide, largely through the lives of specialists he trained. This photo from the late 1960s shows him with his fellows, including standing, from left, Andrew Plaut, Martin Plaut, unknown man, Sherwood Gorbach, A. Gordon Dalton, unknown, Boris Reisman, Taylor Dickinson, Albert Klainer. The woman is Leila Nahas. Seated, from left, James Rahal, Phillip Lerner, Weinstein, Richard "Hardy" Meade III, Te-Wen Chang.

WEINSTEIN WAS A MASTER CLINICIAN WHO COULD NOT ONLY MAKE SPECTACULAR DIAGNOSES AND CURE “INCURABLE” DISEASES, BUT WHO ALSO UNDERSTOOD THE LIMITS OF MEDICAL TECHNOLOGY AND THE IMPORTANCE OF KEEPING THE PATIENT FRONT AND CENTER.

on the growing number of antibiotics that were available by the 1960s. My father was fortunate enough to participate in one of his mentor's most important projects, a comprehensive review of what they called “infective endocarditis” at the New England Medical Center, which wound up as a four-part article in the *New England Journal of Medicine* in 1966. To Weinstein's credit, he let my father be the first author, something that he—and most other senior physicians—rarely did. Other well-known infectious-diseases specialists who trained with Weinstein at Tufts include Michel G. Bergeron, an award-winning basic sciences researcher at Laval University in Quebec City; global health expert Gerald T. Keusch, a former professor of medicine at Tufts and now associate provost and associate dean for global health at Boston University; and the late James J. Rahal, '59, a longtime infectious diseases specialist in New York City.

Perhaps the most memorable activity for Weinstein's fellows was the mandatory Monday evening journal club, held at his home in West Newton. The fellows would sit around the ping-pong table in Weinstein's basement and discuss cutting-edge research in infectious diseases. To my father, this was the crux of medicine—gaining the best scientific information and then using it to help one's patients. Not all of the emerging scientific literature got absorbed, though. Despite the growing number of studies indicating the hazards of cigarette smoking, almost everyone smoked. The only break in the evening would come toward the middle, when Ethel Weinstein would call from the top of the stairs for her husband to come and get the plate of cookies or brownies that she had prepared. “I do miss those old journal clubs on the ping-pong table,” former Weinstein fellow Kenneth Kaplan wrote to my dad in 1977, “with the paralyzing clouds of smoke, while Hardy [Meade] nodded in the corner and the dog barked upstairs and the boss barked downstairs.”

At times, Weinstein's showmanship rubbed people the wrong way. Even a huge fan like Bruschi admitted his old boss could be “brusque and mercurial.” Rounds with Weinstein were not occasions for friendly debate or questioning of the chief. When Weinstein believed he was right—and that was most of the time—he let others know it.

Weinstein was even immortalized in 1970 in the best-selling satirical novel *Heartsblood*, written (under a pseudonym) by his fellow Martin Plaut, '62. Although based on several professors that Plaut had encountered whose brilliance took a huge toll on their trainees, the book's main character, a cardiologist, shared many characteristics with Weinstein: an ability to make brilliant diagnoses, a tendency to one-up his colleagues, a propensity for smoking and, finally, a younger colleague who drove him to and from work. “Gods do not have associates,” Plaut told me recently.

My father stayed on at Tufts for a few years after his fellowship, but academic life was not for him. In 1966, my family moved to Cleveland, where my dad had grown up. He joined the faculty of Case Western Reserve University, seeing patients first at the local V.A. hospital and then at Mount

Sinai Hospital. My dad emulated many of the teachings of his mentor, whom he affectionately called “Uncle Louie.” He made sure to round on his patients twice daily; he did infectious-diseases consults at other hospitals; he set up a citywide medical conference; and, like Weinstein, he relentlessly warned his colleagues about the dangers of drug resistance and superinfection, both of which result from the careless prescribing of antibiotics. But mostly, he lived and breathed medicine and saw patient care as his highest calling. My father was in constant touch with the house staff when we went on vacation. Indeed, he refused to go on vacation until the end of the month, when he was certain that his house officers and fellows would be up to snuff. Ethel Weinstein once said of her husband, “His work is his hobby.” I know what she meant.

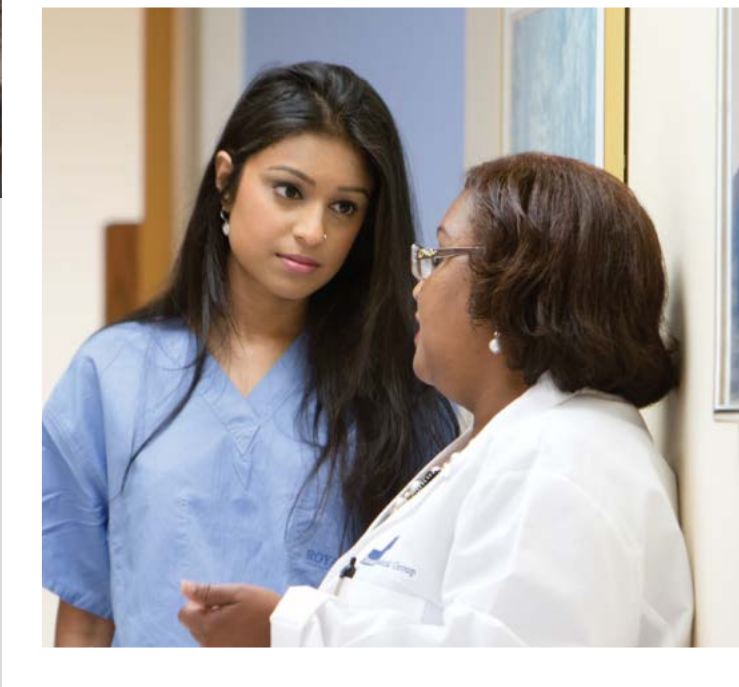
I never attended Tufts, but I, too, tried to carry on in the Weinstein and Lerner traditions. True, I did not read anywhere close to 12 medical journals, which my father did in his prime. But after completing medical school and a residency in internal medicine at Columbia, I went back to school and earned advanced degrees in the history of medicine and bioethics, two fields that also try to put the patient front and center by promoting concepts such as autonomy, informed consent and improved communication.

I did have the opportunity of seeing Louis Weinstein one more time. When I was applying to medical school, I visited Harvard, where Weinstein, then 73, had moved after leaving Tufts. At my father's urging, I made an appointment to see him before joining the activities for prospective students. We had an amicable chat about my career. I promised to send my father his regards and then headed over to the admissions office for a tour and interview. I'm not sure why, but I decided to mention to my tour guide that I had visited Weinstein. To my disappointment and surprise, he rolled his eyes. “He just goes on and on about those old diseases like tuberculosis,” the student sighed. In later years, I did take some pleasure in realizing that as we spoke, the tuberculosis bacterium was quietly planning a major resurgence, which took place in the 1990s. Weinstein died in 2000 at the age of 92 after a series of small strokes.

Renowned physicians often get called to see famous patients, and Weinstein was no exception. In 1973, he flew to Paris to consult on the Greek shipping magnate Aristotle Onassis. Numerous specialists had been unable to diagnose Onassis' illness. Weinstein ultimately helped diagnose a form of pneumonia, from which the patient fully recovered.

When Weinstein returned, his fellow, Michael Barza, asked what had happened. Weinstein paused for a moment and then responded in his distinctively gruff fashion: “All he needed,” he told his trainee, “was a doctor.” **TM**

*Barron H. Lerner is a professor of medicine and population health at the New York University School of Medicine. This piece draws on his new book *The Good Doctor: A Father, a Son and the Evolution of Medical Ethics*, published this spring by Beacon Press.*



A WIDER RANGE
From top, Rebecca Lee, '16, and David Munson, '09, talk with a homeless mom in Boston; Marcus Sublette, '14, in front of the center where he taught computer skills; Semonti Hossain, '16, with Gaby Bercy, a Dorchester physician who mentored her in Haiti.

Prompted by a new curricular requirement,
more medical students than ever are
volunteering in the community

BY BRUCE MORGAN

the greater good

THE GALVANIZING NOTION FIRST TOOK HOLD AGAINST SALT air and cotton fields. In 1965, visionary Tufts Medical School professors Count Gibson and Jack Geiger conspired to create the nation's first public health clinic, located in a simple structure adjacent to the harbor at Columbia Point in Boston. They followed this up two years later by launching the Delta Health Center in Mound Bayou, Mississippi, deep at the heart of an impoverished rural region beset by health problems typically seen in developing countries.

From those two seeds sprang the network of more than 1,000 public health clinics that Americans know today. So in late March at a reception on the Boston campus, when Alan Solomont glanced around a room filled with medical students eager to talk about their service-learning experiences in the community at large, he saw the past reframed in their faces.

Solomont, A70, the Pierre and Pamela Omidyar Dean of the Jonathan M. Tisch College of Citizenship and Public Service at Tufts, cited the legacy of Gibson and Geiger right at the top. "Your Community Service Learning programs are pillars of that [same] commitment," he said, calling the medical school "the repository of its DNA." The desire to address health disparities and work with the underserved provides a long, unwavering line at the medical school, he suggested, a line even more keenly drawn in recent years as a term of community engagement has entered the school's curriculum as a requirement for graduation.

Beginning with the Class of 2014, all Tufts medical students have been asked to fulfill a minimum of 50 hours of service to an established community-based organization in the Boston area, or, if they prefer, to

create an independent project of their own. The service may be rendered during any of the student's four years, but must be completed within a 12-month period. Finally, as part of the new Tisch College and Tufts University School of Medicine Community Service Learning (CSL) program—whose funding is shared between Tisch and the medical school—students must write a personal "reflection" on their experience, thereby crystallizing its lessons for them.

The Tisch CSL program is led by course co-directors Mark Pearlmutter, '84, and Laurel Leslie, professor of medicine, pediatrics and public health and community medicine, and a part-time CSL coordinator, Jennifer Greer-Morrissey.

A cultural shift of some kind has dramatically raised the allure of community service among current applicants to medical school, observers say. Pearlmutter recalls that 30 years ago, when he was enrolled at Tufts, "we used to have a handful of students" who would go off and volunteer at community sites independently. Now, he reports, when he addresses incoming medical classes and asks how many in the room have already done some form of community service, a huge percentage raise their hands.

Medical students stand to gain a great deal from exposure to the world beyond the clinic walls, Pearlmutter says. "It opens up their eyes. Volunteering like this involves working with a disenfranchised population, and students who do it have a healthier outlook on caring for the individual patient." Scott Epstein, '84, dean of educational affairs, says simply, "It makes them better doctors."

In this story, *Tufts Medicine* offers a sampling of recent student engagements with the community.

the upward path

ADAM CARDULLO, '17

IDEAS IN MEDICINE WAS BEGUN IN 2010 BY JONATHAN BROWER, '13, and Michael Kwak, '13, as an outreach between the medical school and the Eugene Wright Science and Technology Academy, a middle school in Chelsea, Massachusetts.

More than 88 percent of the students at Wright hope to attend college, but ultimately only 14 percent will do so, according to recent figures. Looking at this trend, the idea behind IDEAS was to integrate medical curriculum into a seventh-grade classroom and have Tufts medical students act as educators and mentors.

This past year, a bunch of us paid regular visits to the school. All

told, there were some 20 medical students involved (six from the class of 2017 and 14 from the class of '16) and between 25 and 30 seventh-graders, depending on the day. We showed the kids how to make their own ice cream, using a recipe to help teach them fractions. We held an egg-drop competition. We had a day where we demonstrated physical diagnosis tests with reflex hammers, penlights and tuning forks.

At the end of the year, we usually invite the students to Tufts to see what a medical school looks like. While they're here, we teach them basic life-saving skills, such as CPR. A lot of the kids tell us later that "it's the best field trip they've ever been on."

out on the street

REBECCA LEE, '16

ON THE NIGHT AFTER THANKSGIVING, THE night he died, I imagine Sam lying outside the Harvard Square subway station. He takes swigs from a pint of cheap vodka and makes friendly conversation with nobody in particular. It was one of the first bitterly cold nights of the winter, with temperatures dropping well below freezing.

In December, 7,255 homeless men, women and children were counted in Boston's homeless census—a 3.8 percent increase over the previous year. Although many had found a place to sleep in shelters and motels across the city, 180 of these individuals were living on the street—the so-called "rough sleepers." These are the patients the Boston Health Care for the Homeless Street Team cares for.

Since beginning medical school, I have been lucky to join the Street Team. I've worked with their physicians in the drop-in clinic for the homeless, done street outreach, participated in weekly team meetings and visited patients in their apartments. Sam was one of the first patients I met. I actually mistook him for another volunteer because of the gentleness with which he helped the other patients and how well groomed he was, with a white button-down shirt, rimless glasses and combed-back hair. He was well spoken and clearly intelligent; his life fell apart when he started drinking.

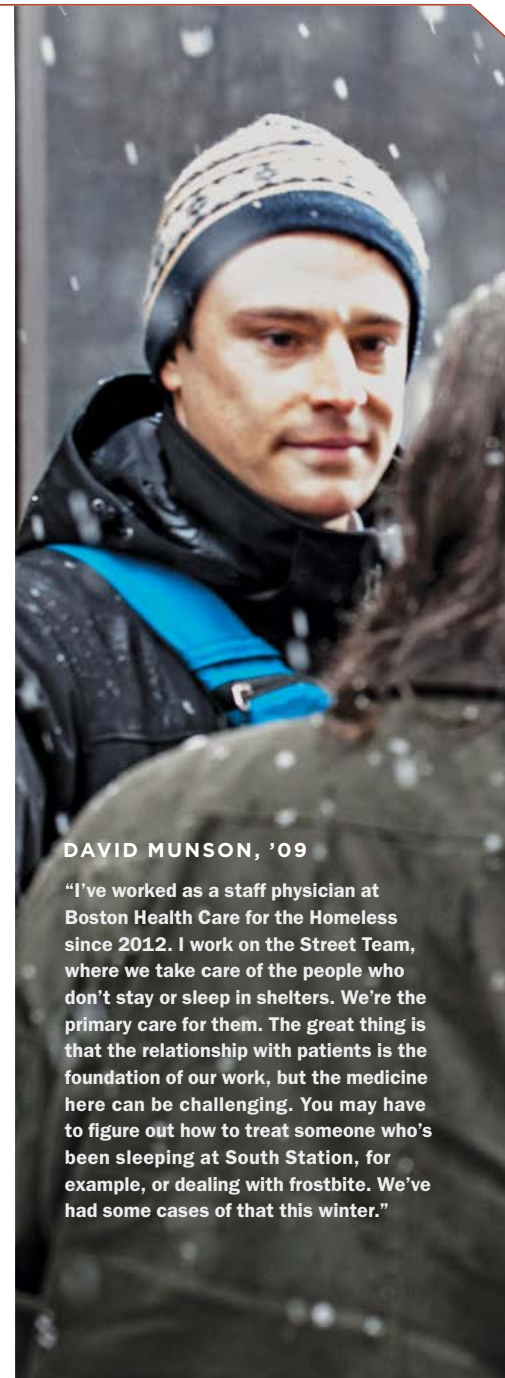
Gradually, I got to know Sam, in clinic, on the street and when he was an inpatient at a respite center in Boston that caters to the homeless. I began to piece together snippets of

his life. He was once married; he had children. He had emigrated to the U.S. from Pakistan as a young man. We frequently talked in a mix of Urdu and Hindi, languages I had been eager to learn for a long time. There were rumors of New York restaurants that he had owned.

The last time I saw Sam in the drop-in clinic, he was not well: in a wheelchair, inebriated, with damp clothing arranged haphazardly around his body. I helped him peel off the layers of second-hand sweatshirts, which had towels stuck into the pockets for additional insulation. I needed to take his vital signs. He started crying. "Everything hurts," he said. "I'm such a mess."

A little while later, I was in a rush to leave to get to class across town. I stopped by Sam's wheelchair to say goodbye. "Study hard," he told me. "I love you." I thought about the lectures I had had in the past year on not crossing boundaries in the patient-doctor relationship, about the importance of maintaining distance. But words can be healing, too. "We all love you too, Sam," I said. "I hope you feel better soon."

A police officer found Sam's body at 2 a.m. on a brick step outside the Harvard Square T station. He was one of three homeless patients I knew who died that week. Each one had numerous contributing factors leading to their deaths—histories of trauma and abuse, abandonment and bad luck, illness and addiction. All were rejected from their communities for reasons that were, to a degree, out of their control, and so they died on the street.



DAVID MUNSON, '09

"I've worked as a staff physician at Boston Health Care for the Homeless since 2012. I work on the Street Team, where we take care of the people who don't stay or sleep in shelters. We're the primary care for them. The great thing is that the relationship with patients is the foundation of our work, but the medicine here can be challenging. You may have to figure out how to treat someone who's been sleeping at South Station, for example, or dealing with frostbite. We've had some cases of that this winter."



Cardullo watches as his middle-school visitors from Chelsea practice CPR.



well cast CATHERINE LOGAN, '09

I LAUNCHED THE TEAM CATHEDRAL PROJECT BACK IN 2009 WHEN I SAW the need for better athletic screening at Cathedral High School, located in the South End, near the medical school. Pre-participation examinations, or PPEs, are required for student athletes, with the goal of identifying medical or orthopedic problems that may put them at risk for injury.

Historically, dozens of Cathedral students each year had trouble getting PPEs and so were missing out on sports. My first job was to set up a free PPE screening at the school at night, tapping the expertise of Tufts Medical Center doctors and residents who volunteered their time.

Since those early days, Tufts medical students have been essential to the growth and evolution of Team Cathedral. Our program now includes free medical coverage during athletic events, pre- and post-injury ImpACT concussion testing, a thriving mentoring initiative and educational events, such as a field trip when the junior class spends a day at our medical school.

The field trip has become a highlight for both Cathedral and Tufts students. While here on our campus, the high schoolers engage in career panels, fitness testing, a visit to the anatomy lab and the always popular casting session, where they learn how to put casts on one another.

As someone who's pursuing her residency in orthopedic surgery in the Boston area, I've been lucky enough to stay involved with Team Cathedral post-graduation. We've made a good start. The Team Cathedral project's success and sustainability relies on its devoted medical student volunteers, who now number 20, representing all four classes. My hope is that a network of Tufts alumni with an interest in musculoskeletal health and activity, as well as community service, will enable us to expand the scope of our services in the coming years.

Above, Logan laughs with a Cathedral student during his field trip to the medical campus last year.

my promise SEMONTI HOSSAIN, '16

MY LIFE IN BOSTON SEEMS LIKE A DREAM WHEN I COMPARE IT TO HOW I lived for a week on a medical mission in Haiti. The rush to wake up in the morning, speed-walking to class with coffee in hand...

I had to guide myself in a world of new customs, climates and cultures. And that was part of the promise I made to myself when I went. Aside from the clinical experience—the opportunity to conduct a public health project in maternal health and mortality and the chance to interact with Tufts medical staff—I just wanted to figure out what it meant to be me.

Unlike my colleagues from medical school, the poverty in Haiti never shocked me. If anything, I loved it. It reminded me of Bangladesh, a land where half my roots belong. The thick smog, the arrhythmic honks pulsating through the streets, the leaking sewage, the utter chaos of Cap-Haïtien, just like Dhaka city. The naked children dancing barefoot on the sidewalk, shouting “I love you! I love you!” to the bus full of Americans, a Dhaka déjà vu. Something about this devastatingly poor country brought me back to the essence of Bangladesh.



computer savvy MARCUS SUBLETTE, '14

FOR MY COMMUNITY SERVICE LEARNING project, I volunteered as a computer skills instructor at the New England Center for Homeless Veterans in downtown Boston, just off the Government Center T stop. Founded in 1990, the organization is one of the largest of its kind, serving several hundred veterans each day. The center assists veterans who are homeless or are at risk of becoming so in getting a long-term job and living independently.

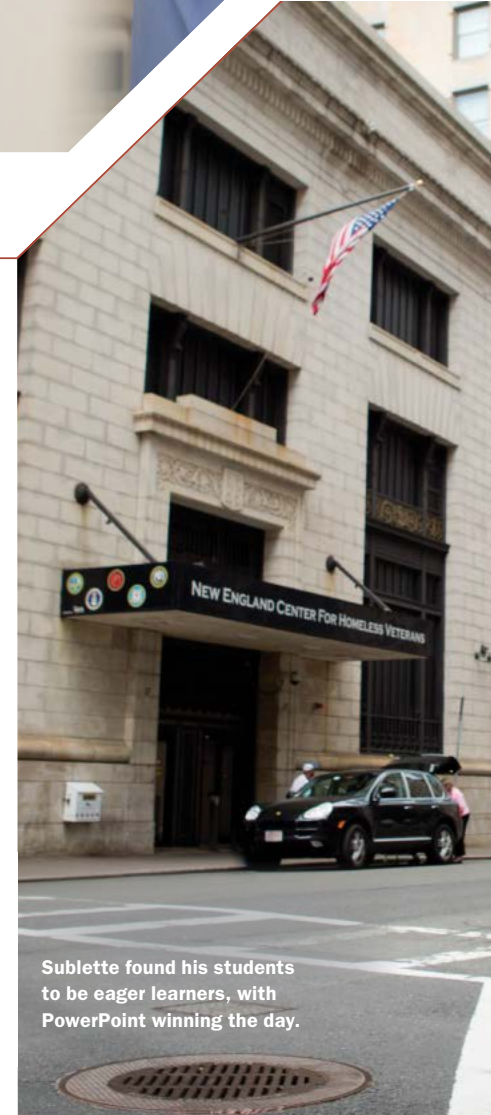
Most of my students were middle-aged, did not grow up using computers, and many had not had a job where computer use was required. Their lack of computer skills is a major barrier in applying for and obtaining employment.

I developed my own curriculum. Of the six students I had on the first day, two were very familiar with computers and wanted to learn Excel and PowerPoint. The other four didn't even know how to turn on a computer! They had never set up an email account and could barely use the Internet.

To teach all of them, I had to run the course like a one-room schoolhouse.

When I taught PowerPoint, I asked them to create a short presentation on a topic of their choice, something that they knew a lot about. One of my students had worked as a barber for 32 years, so he created a presentation on how to give a haircut. Another student had always wanted to run a restaurant, and he created a slide show menu of what meals he might serve. PowerPoint was very popular.

Teaching these men helped me to gain a better insight into homelessness. In one class, I taught a man how to use Google Maps. As I was explaining what the application could do, he asked to look up a home address in rural Georgia. As we looked at the picture of the house in “street view,” he quietly started crying. He explained to me that this was the house of his daughter, whom he had not seen in many years. Just seeing the house again brought all of his sadness, loneliness and isolation of years of homelessness to the surface.



Sublette found his students to be eager learners, with PowerPoint winning the day.



Hossain visits Gaby Bercy at Bercy's office in Dorchester, Mass. They delivered a baby together in Haiti.



jail time NATHAN POTTER, '17, AND JENNIFER MOREY, '17

NATHAN: Jenny and I started planning this together back in the early fall, once we found out we were both interested in health care within prison systems. We approached the South Bay House of Corrections in Boston, where the warden put us in touch with a deputy who was very enthusiastic about the idea. She said it filled a need there really well.

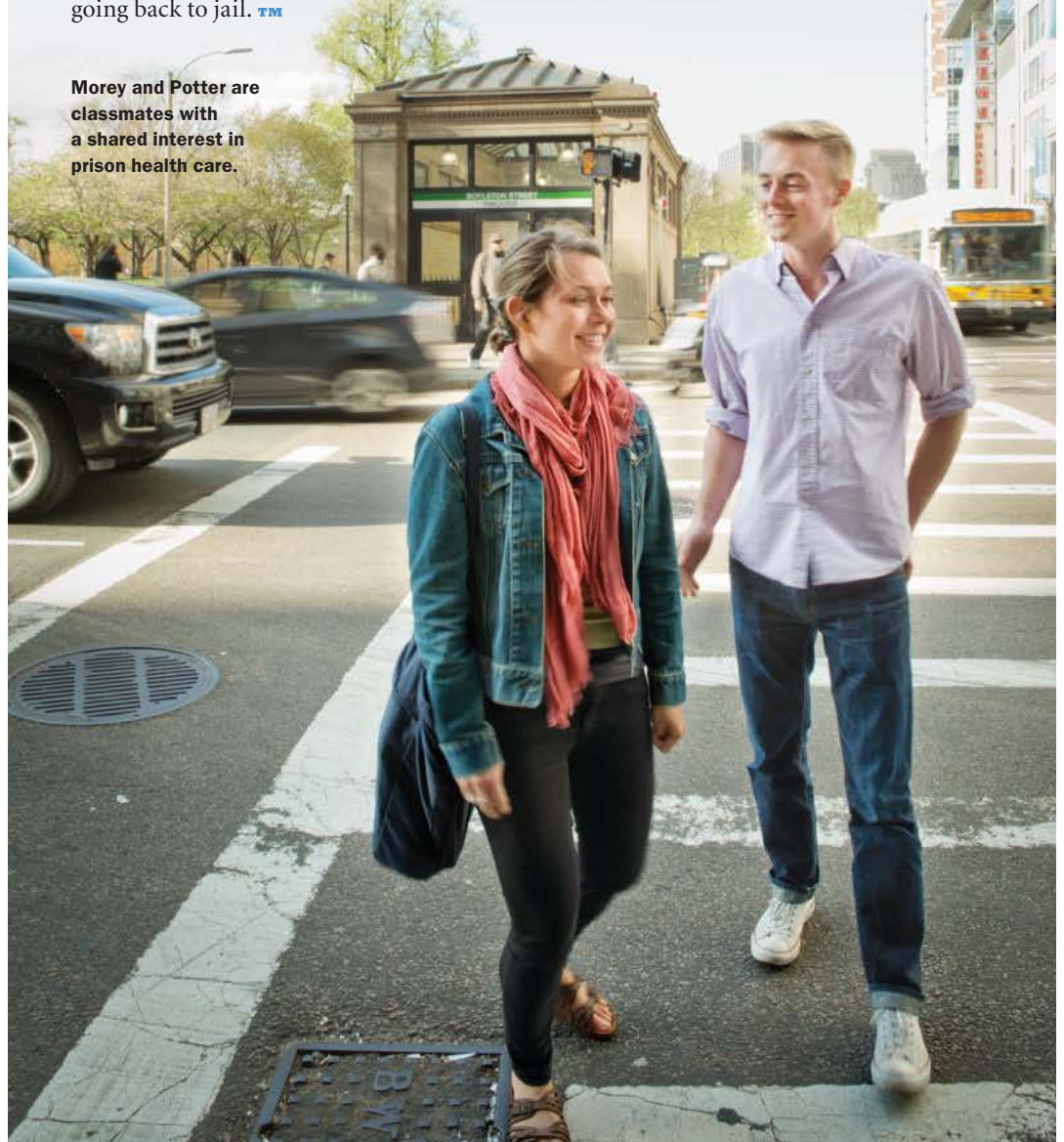
We've done one workshop so far, talking with a group of 30 men about ways of coping with and reducing stress. These are prisoners near release who are working in the community during the day and then coming back to the prison at night.

JENNY: We see health from a broad perspective. We tell the men that they have to eat, exercise and sleep in a good way, and also try to maintain healthy relationships so that when they leave, they have a healthier life in general.

NATHAN: Right now there are five medical students involved at the jail. Jenny and I got the ball rolling. Our hope is that next year, when the first-years start, we'll be able to get a new group of people involved so that the program is self-perpetuating.

JENNY: Our next step is to set something up where students can be matched with people released from prison for a kind of mentorship. The students could help ex-prisoners deal with their anxiety and mental-health issues to keep them from going back to jail. **TM**

Morey and Potter are classmates with a shared interest in prison health care.



Cherie Hendrickson left a high-flying Russian hockey career behind to enter Tufts' physician assistant program

home ice

BY BRUCE MORGAN PHOTOGRAPH BY KATHLEEN DOOHER

FIRST, SHE HAD TO SHOO HER TEAMMATES OUT OF THE room and tell them to please keep it down. Then she propped her laptop on the bed and waited for the Boston connection to be made to her modest apartment in Dmitrov, a medium-sized town 40 miles north of Moscow and eight time zones away. It was the fall of 2013, and at age 28, Cherie Hendrickson was at a turning point.

She had always played hockey at an elite level, from prep school to Providence College and beyond. At the time, she was one of two American members who had been recruited by a professional Russian women's team called the Moscow Region Tornado. The team was crushing its opponents and would win the European Cup later that year. But Hendrickson was, in fact, entering her last few weeks on the ice.

The call she was anticipating was from Richard Murphy, director of the physician assistant program at Tufts Medical School, who was set to interview her over Skype as a prospective late admission. Long story short, she made the cut. "I was impressed with the technology, but even more with the individual at the other end," Murphy says. To understand her path to this moment, you and I will have to skate back to Boxford, Mass., and the sight of 3-year-old Cherie strapping on a pair of skates for the first time and wobbling out onto the ice in her older brother's wake.

"I took to it right away," Hendrickson says. "I loved everything about it."

As a kid, she moved hungrily from rink to rink around town, playing with boys most of the time. "They were bigger and faster than me," she admits, "but as the girl, you never wanted to not be able to keep up." This rough-and-tumble immersion was all to the good, Paul Hendrickson, Cherie's dad, believes.

And he should know. The senior Hendrickson, a management consultant and ardent sports enthusiast, was instrumental in creating the Boston Blades, a local branch of the Canadian Women's Hockey League.

He appraises his daughter's skills respectfully. "She's not the fastest skater, and she's somewhat reserved, but she's very aware of anything that's happening on the ice," he says. "She's always in the right position."

After college, Hendrickson was determined to stick with the game. She moved to Canada, to the outskirts of Toronto, to coach the Burlington Barracudas for two years. This stint was followed by several years when she played for the Boston Blades while training and working as an EMT out of Lawrence, Mass. She found she loved medicine, with its life-saving teamwork and camaraderie.

It wasn't long before Russia came calling by email. A team there wanted to recruit her, along with a Blades teammate and friend, to play on a team near Moscow. After some hesitation, she moved to Dmitrov with her friend and learned to play a less-combative style of hockey—"classic European," she says—with its emphasis on smooth puck transitions and game flow. The quality of play was top-notch, with as many as a dozen of her teammates later skating on the Russian Olympic team.

The planned phone call from Boston signaled the end of Hendrickson's life on ice. She had built an option into her contract that if she got in at Tufts, she'd be free to hang up her skates. And so it went. "I'm really happy I went over there, but I'm also happy to be home," she says. These days Hendrickson has an apartment in Somerville, and she's settled into the rigors of the 25-month-long physician assistant program. Her new goal is to help people live healthy lives on solid ground. **TM**



Cherie Hendrickson in her
Moscow Region Tornado uniform

A Digital Version of You

Genetics pioneer J. Craig Venter says that synthetic biology and big data will revolutionize our understanding of aging **by Jacqueline Mitchell**

WHEN NASA'S MARS ROVER OPPORTUNITY SENDS A PHOTOGRAPH of the alien landscape back to Earth, it relays the information as digital data, a series of ones and zeros that computers assemble into images that we can see. What if the same thing could be done for an alien life form? What if a robot could quickly decode an alien's genome and stream the digitized information here?

"We'd get Martians back in as little as 3.4 minutes, instead of having them splash down in the ocean," said J. Craig Venter, one of the foremost geneticists in America.

For Venter, genetics and big data make everything possible. He delivered the President's Lecture at Tufts on March 10, speaking about his work and where he sees science heading.

Among the first to sequence the human genome, Venter is founder, chairman and CEO of the nonprofit J. Craig Venter Institute, and founder and CEO of the privately held Synthetic Genomics Inc. in La Jolla, Calif., which seeks to improve human health and develop new sources of energy and clean water.

Venter's latest endeavor is Human Longevity, a start-up company that will address the genetics of aging, which, he points out, is the single biggest risk factor for virtually every significant disease. Researchers at Human Longevity will use two state-of-the-art sequencing machines capable of processing 40,000

human genomes per year and generating vast amounts of data that may offer insights into how to slow aging and related disease.

"Genomics is not really the hard part of it now," Venter said. "The hard part is defining who you are, what you're made of." Teams of scientists at his company and elsewhere, including physiologists and psychiatrists, are working to match human traits with specific genomes. The massive quantities of data should give scientists clearer insight into age-related and chronic diseases, including cancer, cardiovascular disease and Alzheimer's.

"Everybody asks the same questions," Venter said. "Did I get my nose from my grandmother? Where did my child get that nasty temper—must be from my spouse's side. We can now start to answer them."

One of those questions, he said, will have to be who we are not. For instance, after you



"Genomics is not really the hard part of it now," J. Craig Venter said. "The hard part is defining who you are, what you're made of."

eat a meal, 10 percent of the chemicals that help you digest the food come from bacterial species known collectively as microbiota. These vast numbers of microbes colonize the human body and provide us with essential services such as extracting energy from food and protecting us from infection. Researchers have shown that changes in the microbiome are linked to cancer, chronic diseases such as diabetes and even obesity.

Venter's team, in collaboration with doctors at the Moores Cancer Center, is starting with cancer. Patients who come into the cancer clinic at the University of California at San Diego, where Venter received both his bachelor's and Ph.D., have agreed to have their genomes and their tumors sequenced. The personalized



“We can now make new proteins, new enzymes and new cells with new functions from scratch.”

—J. CRAIG VENTER

nature of this data has led to some medical breakthroughs. For example, Japanese researchers have discovered that 4 percent of lung cancer patients carry a genetic variant that makes their tumors quite treatable. Those patients could not have been saved without large-scale genomic sequencing.

SYNTHETIC BIOLOGY

Venter isn't just using computers to decode biology. He sees the relationship between biology and computing as reciprocal. Among his many distinctions, Venter led the research team that created the first synthetic bacterial cell.

“Part of the experiments we started to do in 1995 asked some fundamental questions about nature and the origins of life,” he said. “One of those questions was, Can we go the other way? Can we start with the ones and zeros and design and construct a genome?”

Venter and his team started small, inserting a short chain of synthetic DNA into common *E. coli* bacteria. The bacteria easily assimilated the foreign DNA—something bacteria do all the time in nature—and followed the DNA's encoded instructions to produce a specific set of proteins. In turn, those proteins killed their host and infected neighboring cells, repeating the process.

If that sounds familiar, it should. Venter's team had created a synthetic virus—a piece of “software that builds its

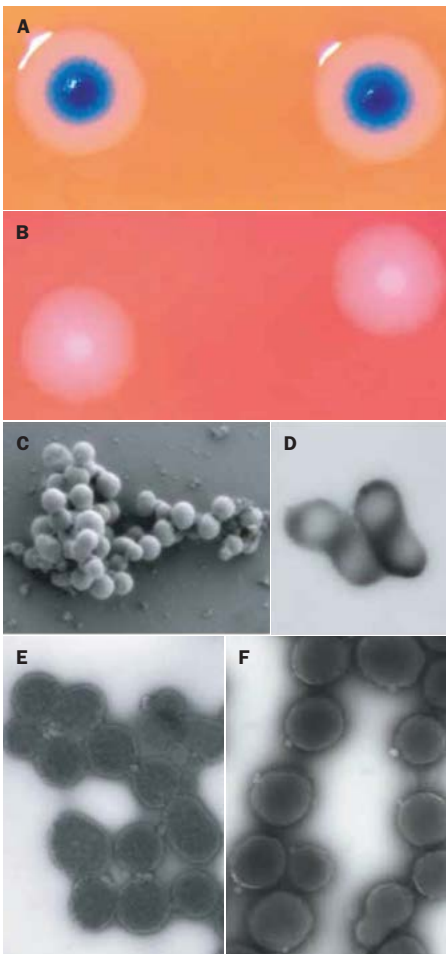
own hardware. That's how biology works,” he said. “We can now make new proteins, new enzymes and new cells with new functions from scratch.”

Using this approach, Venter's company has made disposable containers out of biodegradable sugars instead of the petroleum-based plastics that will hang around in landfills for centuries. They've also engineered algal cells that are three times more efficient at turning sunlight into energy than nature-made cells.

Venter spoke about how he and his colleagues used sequencing technology to design a new vaccine for the deadly meningitis B strain that was recently approved for use in Europe. Because the scientists sequenced various species of the meningitis virus, they were able to engineer a vaccine that protects against all of them. They're expanding the work to influenza viruses. Venter's team has already sequenced the H7N9 strain found in Mexico, allowing scientists to get a synthetic vaccine into clinical trials before the first infection hits the United States. “For the first time, the U.S. is ahead of this game,” Venter said.

If you're imagining heading to CVS for a dose of that vaccine, you're not thinking like Craig Venter. He envisions a time when we'll be able to download tailor-made vaccines—like that Martian DNA—in the comfort of our own homes, something that could help stop the spread of potentially deadly viruses. “We could stop a pandemic before it even starts,” he says.

Jacqueline Mitchell can be reached at jacqueline.mitchell@tufts.edu.



Venter's lab created a bacterial cell controlled by a chemically synthesized genome, as shown here in images first published in *Science* online in May 2010.



Veterinary cardiology resident Vicky Yang, V09, was the first Cummings School resident to shadow physician counterparts at Tufts Medical Center in Boston.

participate in hospital rounds and watch the physicians interact with patients and their families, work up diagnoses and perform surgery.

“The university considers all medicine to be one medicine,” says John Berg, a professor of soft-tissue surgery at Cummings School and a founder of the residency exchange program. “Our veterinary residents see that many of the challenges and diseases in veterinary medicine are present in human medicine as well.”

The exchanges “could be a very valuable experience,” says Douglas Payne, a former cardiothoracic surgeon and professor emeritus of surgery at Tufts. The only medical school faculty member on Cummings School’s Board of Advisors, Payne partnered with Berg to create more interaction between Tufts’ Boston and Grafton campuses.

They launched the exchange program in fall 2012, sending veterinary cardiology resident Vicky Yang, V09, to Tufts Medical Center for a week; three other veterinary residents followed. This year, six residents and two Cummings School faculty members participated.

“We thought it would be a nice opportunity not just for [Yang], but also for us to learn about the kind of work they’re doing at the veterinary school and about possibilities for research collaboration,” says Ayan Patel, a professor of medicine who hosted Yang during her rotation.

Yang, who studied engineering as an undergraduate, was eager to see the state-of-the-art imaging technology at Tufts Medical Center. She was particularly interested in the hospital’s 3-D echocardiogram machine, which provides a moving image of the beating heart that reveals its size and shape as well as how efficiently it is pumping.

Most veterinarians won’t get their hands on these machines any time soon. The latest technology generally debuts in human medicine because of the greater volume of patients and the insurance-payment model, Berg says. But many innovations in medical technology eventually end up in the veterinary clinic, so it behooves a young vet to get a jump on handling them.

But the veterinary residents say that not

One Medicine, Two Perspectives

Veterinary residents and their physician counterparts find they have a lot in common by **Jacqueline Mitchell**

NEARLY FORTY MILES SEPARATE the campuses of Cummings School of Veterinary Medicine in rural North Grafton, Mass., and Tufts School of Medicine in bustling downtown Boston. Leaders at both schools

are working to close that distance

For two years, veterinary residents from Cummings School have had the chance to observe their physician counterparts during weeklong rotations at Tufts Medical Center. The veterinary specialists-in-training

every lesson comes with a big price tag.

Tracy Sutton, V11, a neurology/neurosurgery resident who completed her rotation in March, says she appreciated learning more about human medicine because many owners' expectations about pet care come from their own experiences. Pet owners often ask her about spinal fusion, in which two or more vertebrae are bonded after disc surgery. That's not a standard procedure in dogs, but many of Sutton's human clients have had it. Before the Tufts Medical Center rotation, Sutton says she wasn't sure how to address their concerns about their dogs not getting the gold standard of care. Sutton learned that fusion helps stabilize humans' upright spines, but dogs' horizontal spines don't require as much support.

Yang says she learned a simpler way of calculating the size of an aortic stenosis—a narrowing of a major heart valve that can lead to cardiac damage—from her human medical colleagues.

Some of the rotations' more intangible lessons underscore the ways in which the two professions overlap. Physicians and veterinarians both grapple with families' grief and loss, notes Berg, and both professions encounter the occasional challenging personality.

Veterinarians often lament that their patients can't tell them where it hurts, says Melissa Bucknoff, a third-year veterinary resident in emergency and critical care who completed a hospital rotation last fall.

"After spending time with elderly, medicated postsurgical patients—many of whom did not speak English as their primary language—I saw the medical doctors cope with the exact same hurdles," she says. "Communication is the most important part of both of our jobs."

The veterinary and medical residents predict they will consult with each other and perhaps work together on cases or research projects. That kind of interdisciplinary collaboration was the goal of the resident exchange in the first place.

"Most of the flow historically has been from human to veterinary medicine," Berg says, "but that is starting to reverse. That's a good, healthy thing and what One Medicine is all about."

The Future at a Glance

Graduating class gravitates toward careers in primary care

On March 21, at high noon, the usual yelps and cries filled the air on the fourth floor of the Sackler Center as fourth-year students tore open their envelopes and learned at a glance where they will begin their residency training after graduation.

Among the most popular specialties this year were internal medicine, with 41 students; family medicine, 21 students; emergency medicine, 20 students; and pediatrics, 20 students.

The geographic distribution of residency placements followed the pattern of past years. Eighty-one students will remain in New England, including 43 who will stay in Massachusetts. Other popular destinations include New York (17 students) and California (21 students). Graduates will reside in 27 states plus the District of Columbia.

"We take great pride in how well our graduates do in their residency placements and in their clinical performance in these residencies," said Dean Harris Berman. "Producing competent, compassionate physicians is what Tufts University School of Medicine is all about."



Clockwise from top: Sean Hersey hugs a friend; Jessica Reader and Emily Samaha are all smiles; Edwin Oh gets the welcome news.

CLASS OF 2014 RESIDENCY PLACEMENTS

ALASKA

Corina Hopkins-Vacca, Family Medicine
Alaska Family Medicine Program/
Providence Hospital, Anchorage

CALIFORNIA

Nicholas Asakawa, Emergency Medicine
Kaiser Permanente, San Diego

Melissa Campos, Family Medicine
Scripps Mercy Hospital, Chula Vista

Clara Chan, Ob/Gyn Prelim.
UCLA Medical Center, Los Angeles

Jacquelyn Crane, Pediatrics
UCLA Medical Center, Los Angeles

Johnathan Cyr, Anesthesiology
University of California-Irvine Program,
Irvine

Jennifer Duong, Family Medicine
University of California-San Diego
Program, San Diego

Joanne Edquilang, General Surgery
University of California-San Francisco/
East Bay Program, San Francisco

Brent Hanson, Family Medicine
University of California-Davis Program,
Sacramento

Sarabdeep Mann, Internal Medicine
University of California-Davis Program,
Sacramento

Jessica Medina, Pediatrics
Loma Linda University Program,
Loma Linda

Timothy Moon, Internal Medicine
University of California-San Diego
Program, San Diego

Ali Naqvi, Internal Medicine
University of California-Irvine Program,
Irvine

Amudha Panneerselvam, Family Medicine
Kaiser Permanente, San Diego

Timothy Pasek, Internal Medicine
University of California-San Diego
Program, San Diego

Jacqueline Proudfoot, Family Medicine
Contra Costa Regional Medical Center,
Martinez

Augustine Pyo, Internal Medicine
Harbor-UCLA Medical Center,
Los Angeles

Junsung Rho, Diagnostic Radiology
University of California-San Diego
Program, San Diego

Medicine Prelim., University of
Massachusetts Medical School
Program, Worcester, Massachusetts

Sean Robinson, Orthopedic Surgery
St. Mary's Medical Center, San
Francisco

**Christopher Rombaaa, Internal
Medicine**
Santa Clara Valley Medical Center,
San Jose

Krista Weiss, Diagnostic Radiology
Stanford University School of Medicine
Program, Stanford

Surgery Prelim., Tufts Medical Center,
Boston, Massachusetts

Andrew Williamson, General Surgery
University of California-Irvine Program,
Irvine

COLORADO

Kelly Arnett, Family Medicine
University of Colorado School of
Medicine Program, Denver

Elisabeth Deeran, Ob/Gyn
University of Colorado School of
Medicine Program, Denver

David Douin, Anesthesiology
University of Colorado School of
Medicine Program, Denver

Alex Landy, Internal Medicine
University of Colorado School of
Medicine Program, Denver

Hayley Marcus, Family Medicine
University of Colorado School of
Medicine Program, Denver

Alison Shmerling, Family Medicine
University of Colorado School of
Medicine Program, Denver

Jennifer Weiskopf, Internal Medicine
University of Colorado School of
Medicine Program, Denver

CONNECTICUT

Xibei Jia, Ob/Gyn
Stamford Hospital/Columbia University
Program, Stamford

Angela Kang, Medicine/Primary Care
Yale-New Haven Hospital, New Haven

Lisa Picascia, Family Medicine
Middlesex Hospital Program, Middletown

Robert Qiu, Anesthesiology
Yale-New Haven Medical Center,
New Haven

Transitional, Carney Hospital/Steward
Health Care, Boston, Massachusetts

Andrew Rausch, Ob/Gyn
Stamford Hospital/Columbia University
Program, Stamford

Danielle Saly, Internal Medicine
Yale-New Haven Hospital, New Haven

Esther Shin, Medicine/Pediatrics
Yale-New Haven Hospital, New Haven

Eliezer Sternberg, Neurology
Yale-New Haven Medical Center,
New Haven

Medicine Prelim., Lahey Hospital
and Medical Center, Burlington,
Massachusetts

Adam Wright, Anesthesiology
University of Connecticut School of
Medicine Program, Farmington

Medicine Prelim., St. Elizabeth's Medical
Center/Steward Health Care, Boston,
Massachusetts

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Children's National Medical Center

Joseph Forgione, Internal Medicine
Georgetown University Medical Center

Arjun Kanuri, Plastic Surgery
Georgetown University Medical Center

Michael Kemmer, Family Medicine
Georgetown University School of
Medicine/Providence Hospital

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University of South Florida College of
Medicine Program, Tampa

Nimesh Patel, Ophthalmology

University of Miami/Bascom Palmer,
Miami

Medicine Prelim., Mt. Auburn Hospital,
Cambridge, Massachusetts

Kaitlin Ross, Family Medicine

West Kendall Baptist Hospital, Miami

HAWAII

Christopher Belyea, Orthopedic Surgery
Tripler Army Medical Center, Honolulu

Loni Belyea, Internal Medicine
University of Hawaii Program, Honolulu

Toritsetimiyn E-Nunu, Transitional
Tripler Army Medical Center, Honolulu

ILLINOIS

Eric Cantey, Internal Medicine
Northwestern University-McGaw Medical
Center, Chicago

Katherine Chang, Ob/Gyn
Northwestern University-McGaw Medical
Center, Chicago

Gillian Eastman, Family Medicine
University of Illinois School of Medicine
Program, Chicago

Shewit Giovanni, Internal Medicine
University of Chicago Medical Center,
Chicago

Grady Hedstrom, Internal Medicine
Rush University Medical Center, Chicago

David Kopelman, Internal Medicine
University of Chicago Medical Center,
Chicago

Neal Kumar, Dermatology
Rush University Medical Center, Chicago
Transitional, Henry Ford Hospital, Detroit,
Michigan

Danielle Larson, Neurology
Northwestern University-McGaw Medical
Center, Chicago

Katherine Nichols, Internal Medicine
Rush University Medical Center, Chicago

Jessica Reader, Family Medicine
Northwestern University-McGaw Medical
Center, Chicago

Marcus Sublette, Internal Medicine
Loyola University Medical Center,
Maywood

Eleonore Valencia, Pediatrics
Northwestern University-McGaw Medical
Center, Chicago

INDIANA

Ryan Harris, Pediatrics
Indiana University School of Medicine
Program, Indianapolis

MAINE

Nicholas Ashenburg, Emergency Medicine
Maine Medical Center, Portland

Evan Barnathan, Family Medicine
Maine Medical Center, Portland

Deirdre Burns, Pediatrics
Maine Medical Center, Portland

John Daggett, Internal Medicine
Maine Medical Center, Portland

**Daniel Hechavarria, Diagnostic
Radiology**
Maine Medical Center, Portland

Caitlin Hynes, Emergency Medicine
Maine Medical Center, Portland

Kevin Kelleher, Emergency Medicine
Maine Medical Center, Portland

Michael Neilson, General Surgery
Maine Medical Center, Portland

Sarah Sedney, Pediatrics

Maine Medical Center, Portland

Jamie Tung, General Surgery

Maine Medical Center, Portland

MARYLAND

Andrew Crouter, Emergency Medicine
University of Maryland Medical Center,
Baltimore

Anne Friedland, Internal Medicine
University of Maryland Medical Center,
Baltimore

Alan Hsu, Emergency Medicine
Johns Hopkins Hospital, Baltimore

Andrew Kelner, Anesthesiology
Johns Hopkins Hospital, Baltimore

Medicine Prelim., Carney Hospital/
Steward Health Care, Boston,
Massachusetts

Chelsea Kotch, Pediatrics
Johns Hopkins Hospital, Baltimore

Justin Li, Anesthesiology
University of Maryland Medical Center,
Baltimore

Medicine Prelim., Lahey Hospital
and Medical Center, Burlington,
Massachusetts

Helene Pinches, Pediatrics

Walter Reed National Military
Medical Center, Bethesda

MASSACHUSETTS

Bethany Bartley, Pediatrics
Massachusetts General Hospital,
Boston

Evan Bradley, Emergency Medicine
University of Massachusetts Medical
School Program, Worcester

Joseph Bravoco, Diagnostic Radiology
Beth Israel Deaconess Medical Center,
Boston

Medicine Prelim., Carney Hospital/
Steward Health Care, Boston

Jason Desmarais, Orthopedic Surgery
Tufts Medical Center, Boston

Jennifer Diakun, Family Medicine
Carney Hospital/Steward Health Care,
Boston

**Gwendolyn Downs, Emergency
Medicine**

Baystate Medical Center, Springfield

James Fidrocki, Emergency Medicine
University of Massachusetts Medical
School Program, Worcester

Erin Fitzgerald, General Surgery
Tufts Medical Center, Boston

Ruth Foss, Emergency Medicine
Boston Medical Center, Boston

Seth Greenbaum, Anesthesiology
Brigham & Women's Hospital, Boston

Medicine Prelim., St. Elizabeth's Medical
Center/Steward Health Care, Boston

Kiersten Gurley, Emergency Medicine
Beth Israel Deaconess Medical Center,
Boston

Jasmine Hanifi, Internal Medicine
Brigham & Women's Hospital, Boston

Colin Jackson, Ob/Gyn
Boston Medical Center, Boston

Alok Kanojia, Psychiatry
Massachusetts General Hospital,
Boston

Tanya Keverian, Anesthesiology
Beth Israel Deaconess Medical Center,
Boston

Transitional, Carney Hospital/Steward
Health Care, Boston

Sarah Ledbetter, Otolaryngology

Boston Medical Center, Boston

Christopher Lee, General Surgery

Lahay Hospital and Medical Center, Burlington

Amanda Macone, Neurology

Boston Medical Center, Boston

Christopher Maxwell, Diagnostic Radiology

Beth Israel Deaconess Medical Center, Boston

Transitional, Carney Hospital/Steward Health Care, Boston

Thatcher Newkirk, Psychiatry

St. Elizabeth's Medical Center/Steward Health Care, Boston

Erica Nicasio, Ob/Gyn

University of Massachusetts Medical School Program, Springfield

Edwin Oh, Anesthesiology

Tufts Medical Center, Boston

Transitional, Carney Hospital/Steward Health Care, Boston

Jacob Oyer, Psychiatry

Baystate Medical Center, Springfield

Neha Patel, Family Medicine

University of Massachusetts Medical School Program, Worcester

Whitney Perry, Internal Medicine

Tufts Medical Center, Boston

Pooja Phull, Internal Medicine

Boston Medical Center, Boston

Elizabeth Pisarik, Pediatrics

Massachusetts General Hospital, Boston

Spencer Rittner, Family Medicine

Tufts University Program/Cambridge Health Alliance, Cambridge

Benjamin Rohrer, Anesthesiology

Tufts Medical Center, Boston

Medicine Prelim., St. Vincent Hospital, Worcester

Emily Samaha, Family Medicine

Tufts University Program/Cambridge Health Alliance, Cambridge

Michael Schecht, Diagnostic Radiology

Tufts Medical Center, Boston

Transitional, Cambridge Health Alliance Program, Cambridge

Max Shutran, Neurological Surgery

Tufts Medical Center, Boston

Joshua St. Louis, Family Medicine

Greater Lawrence Family Health Center, Lawrence

Jeffrey Steinberg, Neurology

Tufts Medical Center, Boston

Medicine Prelim., St. Elizabeth's Medical Center/Steward Health Care, Boston

Alexander Stephan, Pediatrics

Massachusetts General Hospital, Boston

Lee Sullivan, Neurology

Tufts Medical Center, Boston

Medicine Prelim., St. Elizabeth's Medical Center/Steward Health Care, Boston

Renee Thibodeau, Ob/Gyn

Baystate Medical Center, Springfield

Michael Trautwein, Internal Medicine

Tufts Medical Center, Boston

Alexander Vaysburd, Anesthesiology

Tufts Medical Center, Boston

Medicine Prelim., St. Elizabeth's Medical Center/Steward Health Care, Boston

Eric Weber, Pediatrics

Baystate Medical Center, Springfield

Astrid Werner, Ophthalmology

Tufts Medical Center/New England Eye Center, Boston

Medicine Prelim., Brigham & Women's Hospital, Boston

Maggie Westfal, General Surgery

Massachusetts General Hospital, Boston

Kate Whalen, Emergency Medicine

University of Massachusetts Medical School Program, Worcester

MICHIGAN**Harrison Chine, Emergency Medicine**

Wayne State University/Detroit Medical Center, Detroit

Justin Oldfield, Family Medicine

University of Michigan Medical School Program, Ann Arbor

MINNESOTA**Thuy-Tien Le, Medicine/Pediatrics**

University of Minnesota Medical School Program, Minneapolis

MISSOURI**Alex Huh, Internal Medicine**

Washington University School of Medicine/Barnes-Jewish Hospital, St. Louis

Alon Neidich, General Surgery

St. Louis University School of Medicine Program, St. Louis

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Dartmouth-Hitchcock Medical Center, Lebanon

Rebecca Wood, Medicine/Primary Care

Dartmouth-Hitchcock Medical Center, Lebanon

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Cooper University Hospital, Camden

NEW YORK**Deanna Chieco, Pediatrics**

New York University School of Medicine Program, New York

Samit Datta, Internal Medicine

Lenox Hill Hospital/North Shore-LIJ Health System, New York

Cassandra Denefrio, Ob/Gyn

Albany Medical Center, Albany

Kenneth Fifer, Medicine/Primary Care

Icahn School of Medicine Program at Mount Sinai, New York

Lytia Fisher, Ob/Gyn Prelim.

North Shore University Hospital Program/NSLIJ, Manhasset

Noa Fleiss, Pediatrics

New York Presbyterian Hospital-Columbia, New York

Carolyn Garcia, Internal Medicine

New York Presbyterian Hospital-Columbia, New York

Owen Harris, Emergency Medicine

New York Methodist Hospital, Brooklyn

Rachel Hilburg, Internal Medicine

Icahn School of Medicine Program at Mount Sinai, New York

Natasha Irving, Ob/Gyn

Albert Einstein College of Medicine-Montefiore Medical Center, Bronx

Mitchell Izower, Internal Medicine

North Shore-LIJ Health System, Manhasset

Anand Jagannath, Internal Medicine

Albert Einstein College of Medicine-Montefiore Medical Center, Bronx

Jessica Jou, Ob/Gyn

Albert Einstein College of Medicine-Montefiore Medical Center, Bronx

Chelsey Mitchell, Pediatrics

New York Presbyterian Hospital-Columbia, New York

Katlyn Nemani, Psychiatry/Neurology

New York University School of Medicine Program, New York

Michelle Perez, Pediatrics

Icahn School of Medicine Program at Mount Sinai, New York

Zachary Wilson, Emergency Medicine

Icahn School of Medicine Program at Mount Sinai, New York

NORTH CAROLINA**David Sermer, Internal Medicine**

Duke University Medical Center, Durham

OHIO**Alexander Barnes, Ophthalmology**

Cleveland Clinic/Cole Eye Institute, Cleveland

Medicine Prelim., Case Western Reserve University/MetroHealth Medical Center, Cleveland

Michael Berg, Anesthesiology

Case Western Reserve University/University Hospitals, Cleveland

Christopher Buttarazzi, Psychiatry

University of Cincinnati College of Medicine Program, Cincinnati

Theresa Fanelli, Anesthesiology

Cleveland Clinic, Cleveland

OREGON**Christina Binder, Radiation Oncology**

Oregon Health Sciences University Program, Portland

Medicine Prelim., Carney Hospital/Steward Health Care, Boston, Massachusetts

Bethany Roy, Internal Medicine

Oregon Health Sciences University Program, Portland

PENNSYLVANIA**Vanessa Ferla, Emergency Medicine**

Allegheny General Hospital Program, Pittsburgh

Angela Koenig, Ob/Gyn

Hospital of the University of Pennsylvania, Philadelphia

Katherine MacLean, Ob/Gyn

Abington Memorial Hospital, Abington

Harshal Mehdi, Internal Medicine

Thomas Jefferson University Hospital, Philadelphia

Saniya Merchant, Diagnostic Radiology

Thomas Jefferson University Hospital, Philadelphia

Medicine Prelim., Rutgers-Robert Wood Johnson Medical School Program, New Brunswick, New Jersey

Christian Pulcini, Pediatrics

University of Pittsburgh School of Medicine Program, Pittsburgh

University of Pittsburgh School of Medicine Program, Pittsburgh

RHODE ISLAND**Jeffrey Cumplido, Medicine/Primary Care**

Brown University Program-Rhode Island Hospital, Providence

Anuradha Ganapathy, Emergency Medicine

Brown University Program-Rhode Island Hospital, Providence

Gregory Goldstein, Pediatrics

Brown University Program-Rhode Island Hospital, Providence

Meredith Halsey, Pediatrics

Brown University Program-Rhode Island Hospital, Providence

Alejandra Hernandez, General Surgery

Brown University Program-Rhode Island Hospital, Providence

Sean Hersey, General Surgery

Brown University Program-Rhode Island Hospital, Providence

Ainsley Jones, Medicine/Primary Care

Brown University Program-Rhode Island Hospital, Providence

Laith Kadasi, Ophthalmology

Brown University Program-Rhode Island Hospital, Providence

Transitional, Beth Israel Deaconess Medical Center, Boston, Massachusetts

Anatoly Kazakin, Emergency Medicine

Brown University Program-Rhode Island Hospital, Providence

Vikram Raghunathan, Internal Medicine

Brown University Program-Rhode Island Hospital, Providence

Meena Theva, Ob/Gyn

Brown University Program-Women & Infants Hospital, Providence

Jennifer Zuar, Internal Medicine

Brown University Program-Rhode Island Hospital, Providence

SOUTH CAROLINA**Samuel Volin, Diagnostic Radiology**

Medical University of South Carolina Program, Charleston

Transitional, Lemuel Shattuck Hospital Program, Boston, Massachusetts

TEXAS**Jennifer Logan, Radiation Oncology**

University of Texas/M.D. Anderson Cancer Center, Houston

VERMONT**Ricardo Aulet, Otolaryngology**

University of Vermont College of Medicine Program, Burlington

Tess Jasinski, General Surgery

University of Vermont College of Medicine Program, Burlington

Mustafa Mohammad, Pathology

University of Vermont College of Medicine Program, Burlington

Alejandra Perez-Tamayo, General Surgery

University of Vermont School of Medicine Program, Burlington

David Sobel, Urology

University of Vermont College of Medicine Program, Burlington

VIRGINIA**Tyler Bernaiche, General Surgery**

Inova Fairfax Hospital, Falls Church

WASHINGTON**Caitlin Foley, Internal Medicine**

University of Washington Program, Seattle

Lauren Goli, Family Medicine

Swedish Medical Center, Seattle

Stephen Sanoja, Emergency Medicine

University of Washington Program, Seattle

What's Old Is New Again

Despite changes in medicine, good preparation will win out, graduates told by **Jacqueline Mitchell**

AT THE 122ND COMMENCEMENT ceremonies for the medical school, and the 34th for the Sackler School of Graduate Biomedical Sciences, the roster of speakers sounded uniformly hopeful notes in the face of marked flux in the nation's medical and research fields.

"It's an interesting time" to be graduating, Dean Harris Berman told the medical graduates during the ceremony on May 18. He reminded them that the reasons they entered medicine in the first place—the desire to care for their patients in compassionate and effective ways—had not gone anywhere. "There are new organizational models and payment systems, and you will be asked to do more with less," he said, "but patients will trust in you and confide in you, just like always." Acting responsibly throughout your career to make a difference in patients' lives constitutes "the final reward," he said.

The terms of the deal having shifted doesn't mar the perennial value of medical

practice, Berman suggested. "You are poised to have wonderful careers doing good," he told the graduates assembled before him in the Gantcher Center on Tufts' Medford/Somerville campus. "Go do it."

Angela Kang, the medical class president, struck a valiant tone in her remarks, recalling the class's long journey "that started with blood and brains" in first-year anatomy class. When a snowstorm threatened to halt studies one winter day, class members "strapped on our snowshoes, hitched up our husky dogs" and made it to class regardless, she said. "We weren't going to let a global-warming day stop us." Last year's Boston Marathon bombings raised serious issues for members of the class, Kang pointed out, eliciting fear and prompting questions about whether they could exhibit the same humility and courage they witnessed that day on the streets of Boston.

"We are proud and grateful," Kang declared. "My fellow graduates, we take an exhilarating step forward today."

Naomi Rosenberg, dean of the Sackler

School, exuded pride in her remarks. "I'm very pleased with your achievements" she told the graduates. "All of you have found challenges in your work, and you've met and mastered these challenges in wonderful ways." She cited a few of the regular milestones of attaining an advanced degree, a process often stretching over many years, including the first biochemistry exam and first thesis committee meeting—and the widespread anxieties surrounding these markers. "You are well prepared. You know how to struggle and persevere," Rosenberg said. "We wish you all the best in your future pursuits."

Holly Ponichtera, who gave the Sackler student address, had *The Wizard of Oz* on her mind as she thought back over her classmates' path to this day. A yellow brick road of sorts had brought everyone to a



Rachel Hilburg considers the moment.



moment where America still leads the world in biomedical research, a status that seems unthreatened despite ongoing NIH budget cuts. They were now prepared to enter this realm. “You may remember that in *The Wizard of Oz* everyone got what they wanted in the end. Well, congratulations, good luck, God bless,” Ponichtera told her classmates. “Our dreams really did come true.”

Earlier in the day, at the 158th university-wide commencement ceremony, Anne-Marie Slaughter, a scholar of international relations and law and the Bert G. Kerstetter ’66 University Professor Emerita of Politics and International Affairs at Princeton University, was the keynote speaker. The university awarded 1,509 undergraduate degrees and 1,961 graduate degrees. Slaughter received an honorary Doctor of Laws degree.

Tufts President Anthony P. Monaco also presented honorary degrees to James M. Lawson Jr., an architect of the American civil rights nonviolence movement; Jill Lepore, J87, the David Woods Kemper ’41 Professor of American History at Harvard University and a staff writer at *The New Yorker*; Haruki Murakami, the Japanese novelist who has been praised for his work as a writer and translator; and James A. Stern, E72, A07P, a financier and philanthropist who is chairman emeritus of the Tufts Board of Trustees.

Left, a family celebrates; below, Kelly Arnett in the arms of a family member.



Anna Henderson, age 114, congratulates her great-granddaughter, Lytia Fisher, on her medical commencement.

ON HER ANCESTORS' SHOULDERS

When Lytia Leanne Fisher crossed the stage to receive her Doctor of Medicine diploma in May, she completed a journey that began more than a century and a half ago. Her great-great-great-grandmother, Ann Thomas, was born a slave in 1850, and worked as a midwife on a plantation in northwest Georgia. In 1900 she helped deliver Anna Henderson, Fisher’s great-grandmother (shown here, with, from left, Fisher’s mother and grandmother, congratulating Fisher at commencement).

Henderson carries her own bright glow. She bore eight children, and with no more than a sixth-grade education, became the steadfast chronicler of her family’s history. “She always let us know about our past through storytelling,” says Fisher. “That became part of our everyday conversation.” Henderson lived in her own home in Philadelphia until she was 107. Now, at age 114, she is the fourth oldest person in the United States and sixth oldest in the world, by latest count.

Since she was a little girl, Fisher has wanted to be an obstetrician and carry on the work begun by Ann Thomas. “I think she was a wonderful midwife, and now I will be receiving the accolades she never got. She got paid with chickens,” Fisher notes. “It’s all of this”—the family’s enslavement, perennial struggles and enduring faith—“that’s allowed me to be who I am today, to be a doctor.”

A recent rotation in Ghana, where she visited slave castles near the embarkation point for the dreaded Middle Passage to America, gave Fisher an even deeper appreciation for her heritage and the personal mission that grows out of it. “I’m standing on the shoulders of some strong ancestors,” she says, with a slight lift of her chin, “and I strive every day to make them proud.” She has her cheering section already in place. To attend Fisher’s commencement, 40 members of her extended family rented a bus and drove up together from Philadelphia.

Fisher has begun her residency in obstetrics/gynecology at the North Shore University Hospital Program in Manhasset, New York.



Marie Rozan says she believes research is the future of medicine.



Devette Russo sees the value of investing in collaborative research.

The First Spark

Targeted philanthropy supports early stages of promising research into health challenges by **Kathy Hubbard**

THE BIG QUESTIONS HAVE A WAY OF STOPPING US IN OUR TRACKS sometimes. Can I actually help cure cancer? Or give the world a better understanding of something like post-traumatic stress?

When faced with a problem much bigger than ourselves, it's easy to think that one person can't make a difference. But the generosity of Devette Russo, M11P, SK11P, and Marie Rozan, M64, J93P, A95P, proves that isn't true. Independently, the two women support research at Tufts University School of Medicine and the Sackler School of Graduate Biomedical Sciences because they see the difference they make by helping scientists better understand, prevent and treat disease.

We often associate research funding with the government, corporations and foundations. However, seed money from individuals is becoming increasingly important as the first step to gaining more support from those larger, more richly funded entities. Individual gifts such as those from Rozan and Russo enable

researchers to conduct pilot research and produce competitive preliminary data that has become essential in many cases to winning more significant grants.

Seed money is difficult to find, especially for younger scientists who have not yet built a professional reputation. Funding for pilot research from individuals who support not just the science, but the development of scientists as well, is essential to the future of medicine and to maintaining a robust community of expertise, whether at a medical school or within a nation.

“Seed grants from philanthropic individuals allow our scientists the freedom to pursue bold ideas and collect the preliminary data that is essential to leveraging additional grants to move their research forward.” —NAOMI ROSENBERG

Just what kind of return on investment is possible? As one potent example, over the past 10 years, about \$450,000 in Russo Collaborative Research Grant funding has translated into nearly \$8 million in National Institutes of Health grants received by faculty at the Sackler School and the School of Medicine. Russo has pledged a total of \$750,000, some of it to endow future grants.

Even relatively small gifts to collaborative research can exert a tremendous multiplier effect.

“TRULY TRANSLATIONAL RESEARCH”

Consider one recent example of money amplified to great consequence. Tufts neuroscientists Rob Jackson and Yongjie Yang received the Russo Collaborative Research Grant in 2012. “The Russo funds were incredibly helpful in allowing us to start collecting data that strengthened our NIH grant application,” Jackson says. Ultimately, Jackson and Yang leveraged the Russo grant into nearly \$3 million in NIH funding to support their research on the development of astrocyte cells, which may play a role in both Alzheimer’s and Parkinson’s diseases.

The Russo and Rozan funding gives researchers the freedom to collaborate with colleagues from different areas of expertise. Receiving a grant from the Stephen and Marie Rozan Research Fund in 2013 allowed assistant professors of neuroscience Jamie Maguire, an expert on stress, and Leon Reijmers, an expert on learning and memory, to join forces. The grant brought them together to investigate how a subset of neurons in the hippocampus region of the brain may control the impact of stress for those with post-traumatic stress disorder. The pair recently submitted a proposal for NIH funding.

Maguire considers interdisciplinary collaboration of this kind to be the medical school’s greatest asset. “In this economic environment, where obtaining funding is difficult, and in the Boston area, where there are numerous research institutions, these highly productive collaborative efforts are going to be what sets Tufts apart,” she says.

Diana Bianchi, the Natalie V. Zucker Professor of Pediatrics and a professor of obstetrics and gynecology at Tufts School of Medicine, agrees wholeheartedly. She was part of an interdisciplinary team that received a Russo grant in 2010 for identifying babies in the womb with Down syndrome. The research team included members from the neuroscience and pediatrics departments at the medical school and

the computer science department at the School of Engineering. Based on her experience, Bianchi is delighted to be where she is. “The collaboration between the undergraduate campus and the medical school, along with clinical material coming from Tufts Medical Center, really highlights the best of all the worlds at Tufts,” she says. “It’s truly translational medical research.”

Money invested now is meant to pay off later. Rozan says she’s pleased to support Tufts researchers and their pilot projects, because, as she puts it, “I believe research is the future of medicine. New discoveries and treatments will be able to help hundreds of thousands—or more—patients.”

Russo sees the investment in pragmatic terms. “Supporting the scientific process at its earliest stages just makes sense, even more so when it’s in a collaborative environment,” she notes. “It’s so gratifying to know that the Russo grants have allowed small projects to grow into major research initiatives recognized by the NIH as worthy of major funding.”

Naomi Rosenberg, vice dean for research at the School of Medicine and dean of the Sackler School, takes the long view. She believes that individual support, now more than ever, can be game-changing in advancing medical breakthroughs and encouraging new generations of scientists.

“Devette Russo and Marie Rozan clearly see the opportunity that they, and others, have to be part of the solution, especially in these times of uncertain federal funding,” Rosenberg says. “Seed grants and pilot funding from philanthropic individuals allow our scientists the freedom to pursue bold ideas and collect the preliminary data that is essential to leveraging additional grants to move their research forward. The momentum begins and builds with the generosity and foresight of individuals like Ms. Russo and Dr. Rozan.”

HOW YOU CAN HELP

“Tufts’ pilot projects give direction to finding the most promising advances in treating our most challenging diseases as quickly as possible,” says Marie Rozan, M64. “In addition, Tufts’ recent refocus stressing collaborative projects enhances the probability of success in discovering causes and new and effective treatments of these diseases. More help is needed in funding these promising research projects. I hope you will join me in supporting these endeavors at our medical school.”

TO LEARN HOW YOU CAN SUPPORT COLLABORATIVE AND INNOVATIVE RESEARCH, CONTACT REBECCA SCOTT, SENIOR DIRECTOR OF DEVELOPMENT AND ALUMNI RELATIONS AT THE SCHOOL OF MEDICINE, AT 617.636.2777 OR REBECCA.SCOTT@TUFTS.EDU.



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Back Home

More than 300 alumni and friends celebrate their class reunions

DURING A LOVELY FIRST WEEKEND IN MAY, MORE THAN 300 medical alumni and friends streamed back to campus to celebrate reunions, ranging from the fifth to the 60th.

A variety of activities kept people entertained. Center stage were panel talks featuring members of the class of 1969 discussing their career paths and members of the class of 1964 looking at the ways in which their Tufts

education had prepared them not only for fulfilling careers but life post-medicine.

Dean Harris Berman, together with the Tufts Medical Alumni Association, awarded eight distinguished alumni with Dean's Awards for their achievements in medicine and within the community over the past 25 and 50 years. Recipients of these prizes included Scott Cohen, William Goodman, Marc Shapiro and Andrea Zuckerman, all '89, and Gerald DiBona, Deborah Gilman, Michael Gilman and John Paraskos, all from the class of 1964.



Alden Cockburn Jr., '74,
takes a spin on the dance floor.



Returning alums and their companions had lots of new developments on campus to explore, including classrooms, top, and street scenes, below.



Janet Seltzer, wife of Stephen Seltzer, '64,
embraces a friend.



A visitor searches for a familiar face
at the reunion cocktail party.

Together, We Have Done Some Good



THIS IS MY FINAL COLUMN AS PRESIDENT OF YOUR TUFTS Medical Alumni Association. Over the past two years I have had the opportunity to meet some truly remarkable medical school alumni, both here in Boston and across the country.

We recently got together for reunion weekend, celebrating the fifth to the 60th-reunion classes (see “Back Home,” page 39). We had a wonderful turnout. Among the highlights, your Alumni Association awarded several members of the 50th- and 25th-reunion classes with Dean’s Awards for their individual accomplishments and shared commitment to Tufts University School of Medicine.

We also installed new officers of the Tufts Medical Alumni Association. I am happy to report that Tom Hedges, ’75, Carole Allen, ’71, and Tejas Mehta, ’92, were installed as president, vice president and secretary/treasurer, respectively. All three are wonderful, committed alumni who will help strengthen and grow the association.

I am proud of what we have accomplished over the past two years. We have increased membership contributions, allowing us to direct more of our medical school contributions to scholarship funds and financial aid. We also continued to help sponsor the White Coat Ceremony for first-year students and the Senior Class Awards Dinner for the graduating class.

In the something-new category, we held a number of informal study

breaks—with pizza and desserts—for students during the year. I can tell you that they greatly appreciated the free food!

During my tenure, the alumni association continued to support student activities and provided funds for students to participate in global health initiatives. We also have continued to reach out to our alumni to mentor and advise current students. I urge you to consider signing up for the Tufts Career Advisory Network at www.tuftscan.org.

I greatly appreciate your support these past two years and look forward to seeing many of you at future school and alumni association events as we work together to make Tufts Medicine even better than it is.

LAURENCE S. BAILEN, ’93
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57 Barbara Rockett, M90P, M93P, J96P, of Brookline, Massachusetts, has been honored as the 2014 Community Clinician of the Year by the Norfolk District Medical Society. The Massachusetts Medical Society established its community clinician awards in 1998 to recognize a physician from each of the society's 20 district medical societies who has made significant contributions to his or her patients and the community and who stands out as a leading caregiver. Rockett was the first female president of the Massachusetts Medical Society, serving two terms in that role.

64 Donald Antonioli of Newton Centre, Massachusetts, congratulates his classmates on having reached their 50th reunion, which he terms "this major landmark." He is retired from a career in pathology, lately having fun traveling, gardening, spending time with family and friends and attending cultural events around Boston. He taught at Harvard Medical School as a professor of pathology and was senior pathologist at Beth Israel Deaconess Medical Center, as well as a consultant in GI pathology at Children's Hospital. Looking back, he takes pride in having taught and mentored medical students, residents and fellows and having lived to see the growing acceptance of treating GI disorders as a pathology specialty.

Fredrick Bachl of Salisbury, North Carolina, cites "riding the MTA on dates, walking to Durgin Park restaurant for Wednesday afternoon lunch our first year" as among his favorite memories of medical school. He says dating was his favorite hobby back



THE GREAT EIGHT

Rebecca Glassman, '11, of Boston attended a conference for incoming chief residents in internal medicine and was delighted to find seven of her classmates there. That makes eight members of the class of 2011 in chief resident positions at as many different sites. The chief resident alumni and their institutions include, back row, from left: Christopher Montgomery, University of Rochester/Strong Memorial Hospital; Julian Lei, Boston Medical Center; and Dorian Jones, Cleveland Clinic; front row, from left: Elizabeth Bolen, Rush University Medical Center; Julia Schervish Hughes, University of North Carolina Hospital; Morgan Soffler, Yale-New Haven Medical Center; Rebecca Glassman, Beth Israel Deaconess Medical Center; and Miriam Schwarz, University of Washington Program.

then, going so far as to claim "Dating—no time for anything else." He managed to put in 45 years of pediatric practice even so. He enjoys traveling, tennis, gardening and occasional volunteering. He and his wife, Carol, have seven children and 13 grandchildren between them.

Philip Bolton of Gilmanton, New Hampshire, retired from his career in orthopedic surgery, calls himself a "gentleman

farmer" these days. He's grateful to Tufts for having launched him on the road to a successful medical career. He and his wife, Linda, a minister, have five children and 11 grandchildren. "Stay humble," he tartly advises the current batch of Tufts medical students. "Love your patients; learn to keep your mouth shut!"

John Carroll of Winchester, Massachusetts, is still working

full time at his internal medicine practice based in Malden. His main suggestion for how to improve medical school is to make it three years instead of four. He and his wife, Donna, are the proud parents of four grown children and 10 grandchildren, all age 12 or under.

Richard Dorsay of Saratoga, California, thinking back across 50 years, has Dr. Alice Ettinger on his mind. She "taught me to love radiology and see the beauty in it," he writes. He has enjoyed a long career in diagnostic radiology, specializing in mammography and primary bone tumors, as well as radiographic manifestations of leprosy. He has been chief of radiology at the nearby Kaiser Permanente Hospital and chairman of the Chiefs of Radiology of Northern California. He's taught at more than one medical school in the region, winning awards for his teaching excellence all along the way—including the award for outstanding clinical faculty member in diagnostic radiology at the University of California, San Francisco. He is a trustee of Opera San Jose and a member of the Rotary Club. He and his wife, Dorothy, a social worker, help support a primary school in Victoria Falls, Zimbabwe. They have two children and three grandchildren ranging in age from 5 to 9.

Stephen Kramer of Billings, Montana, retains fond memories of Friday rounds at Jake Wirth's, among his other recollections of medical school a half century ago—including that business of playing hooky to learn to ski at Mt. Sunapee. He reports that he is still enjoying his practice as an otolaryngologist in Billings after 43 years. "I give Tufts credit for what I have accomplished professionally,"

he says simply. He enjoys traveling to visit family in Colorado and Australia and taking care of his 10-acre spread. He and his wife, Marilyn, have two children and three grandchildren. He offers a word of caution for today's medical students: "The processes will change more in the next 10 years than they have in the past 50. Don't forget the patients!"

Ralph Porter of West Harwich, Massachusetts, is retired after 40 years of day-to-day contact with his patients in primary care and enjoying his new life on the Cape, volunteering and savoring his free time. He writes that his favorite medical school memory was "Graduation!!!" Porter's wife, Nancy, died in 2003. He has three children and four grandchildren.

Roger Poulin, A60, of Durham, New Hampshire, is a retired pediatrician. He prides himself on being a "Double Jumbo" and especially treasures the memory of having spent eight straight years with his undergraduate companions who accompanied him to medical school. He cites anatomy professor Benjamin Spector as someone who influenced him deeply. He and his wife, Janice, have three children in their 40s. Among them, Poulin mentions that Alison, the middle child, was a gifted athlete who graduated summa cum laude from the University of New Hampshire and twice qualified for the Olympic Trials in track.

Marie Lalor Rozan of Morristown, New Jersey, is taking things easy after 47 years in private practice as a dermatologist. She also served as a clinical instructor at the College of Medicine and Dentistry in New

Jersey and Columbia University College of Physicians and Surgeons in New York. Now, she says, "having fulfilled my lifetime goals," she's got more time for movies, long walks, enjoying dinners and the company of friends. She and her husband, Steven, also a dermatologist, have two children, Laura and David.

66 Gary Tratt of Centerville, Massachusetts, has been caring for patients as a primary-care physician on Cape Cod for more than 40 years now, offering them heartfelt advice as well as effective care. "I enjoy what I do and the interaction with the patients," he told a reporter from the *Barnstable Patriot* who visited his Hyannis office recently. "This is what keeps me going." Tratt, a clinical instructor of medicine, received the Special Award for Excellence from the Massachusetts Medical Society in May. The award honors a physician who has provided exceptional care and is unusually dedicated to his or her patients and the general

public. He said he planned to happily accept the award on behalf of all primary-care physicians. "Frankly, we get no recognition," he told the reporter, adding that "the burnout is unbelievable" in the field. Primary-care physicians are under more pressure than ever, as changes in health-care laws demand ever larger support staffs to keep track of the paperwork, observed Tratt, whose wife, Ellen, assists him in the office. Despite being 72 years old and having had two knee replacements, Tratt says he has no plans to retire.

70 Timothy Lepore of Nantucket, Massachusetts, completed his 46th straight running of the Boston Marathon in April, earning him the honor of holding the second-longest Boston streak (after 64-year-old Ben Beach, who has 47). Lepore started running when he was in medical school. "I just kept showing up," he told *Runner's World*. "My plan is to keep running this as long as I can." Lepore, who has practiced on

Nantucket since 1983, is the medical director and chief of surgery at Nantucket Cottage Hospital. His research interests include thrombophlebitis and tick-borne diseases.

89 Paul Bettinger of Keene, New Hampshire, attended his 25th reunion in May. An orthopedic surgeon who specializes in hand surgery, he notes that *New Hampshire* magazine named him one of the state's top doctors in his field last year. He reports that he spends his off hours "going to heavy-metal concerts, Boston sports events, Broadway shows and spending time with my family." He and his wife, Alyse, have three children, Joshua, 20, Ethan, 19, and Tami, 17.

Brian DeBroff of Trumbull, Connecticut, is an associate clinical professor at Yale University School of Medicine. He has served as program director and vice chair of the Department of Ophthalmology there and has won multiple teaching awards along the way. He and his wife, Karen, a lawyer, have four children between the ages of 13 and 20.

Carlos Fernandez of Freehold, New Jersey, has no complaints about his time at Tufts. When asked what he would have changed, he says simply, "Nothing. It was perfect." He has a practice in obstetrics/gynecology based in Toms River, New Jersey, with an affiliation at Jersey Shore University Hospital. He takes pride in having opened his own practice in perinatal/maternal-fetal medicine and credits the medical school with having given him the knowledge to succeed. He and his wife, Carolyn, have two children, Nicholas, 16, and James, 6.

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Jane Freedman of Wellesley, Massachusetts, cites Jane Desforges at the top of her list of faculty who played an influential role in her student life. She works at UMass Medical Center, where she is a professor and director of translational research at the Heart and Vascular Center. She has been intimately involved in preparing and generating data for the Framingham Heart Study, among other efforts. Her husband, **Mark Iafrati**, '89, is chief of vascular surgery at Tufts Medical Center and an assistant professor at the medical school. They have three children.

Richard Mouchantat of Denver, Colorado, is a plastic surgeon based in Wheat Ridge, Colorado, who used to enjoy "getting out on Cape Cod Bay on my boat" back in the day. He writes that his practice is heavily focused on breast cancer reconstruction work. In his spare time he enjoys biking, skiing and the outdoors. He and his wife, Jennifer, have two children, Lila, 9, and Luke, 7.

David Mudd of North Easton, Massachusetts, an internal medicine specialist with a background in emergency medicine, reports that he volunteered in Milot, Haiti, for two weeks in January 2010, helping to set up and run a trauma hospital that saved the lives of more than 400 Haitians. He continues in that volunteer spirit nearer home, actively involved with his local YMCA, Lions Club, food pantry and school on wheels programs. "Give back to the community!" he urges current medical students.

Barbara Price of Morristown, New Jersey, a nephrologist, takes pleasure in her daily life in practice. "I enjoy teaching residents," she writes, "but mostly treasure 'teaching' my patients, earning their trust, establishing a lasting bond with them and usually ending the day with at least one hug or more from patients and their family members."

91 Lisa Kachnic of Chestnut Hill, Massachusetts,

became president of the American Board of Radiology on July 1. She is chair of the Department of Radiation Oncology at Boston Medical Center and a professor of radiation oncology at Boston University School of Medicine. She also serves on the radiation faculty at Massachusetts General Hospital. Her areas of interest include gastrointestinal malignancies, image-guided radiation delivery and outcomes/symptoms management research.

93 Christopher Gaynor of Seattle, Washington, writes: "After 24 years together,



and 20 years after our wedding in Boston, Christopher Cote and I have finally legally tied the knot in Seattle, where we live with our 13-year-old son, Josh! My work as a family physician is

as assistant director at Qliance Medical Group of Washington, a direct primary-care practice which seeks to bring concierge-level care to all, including Medicaid populations. I am currently the president-elect of the Washington Academy of Family Physicians. I send a shout-out to members of my class, and to all GLBT TUSM alumni." With more than 3,000 members, the Washington Academy of Family Physicians is the largest medical specialty professional organization in the state.

94 S. Abbas Shobeiri of Edmund, Oklahoma, writes to say he has just published a textbook about practical pelvic floor ultrasonography. He is chief of the section of female pelvic medicine and reconstructive surgery/urogynecology in the Department of Obstetrics & Gynecology at the University of Oklahoma College of Medicine.

WE WANT TO HEAR FROM YOU. Send your Class Notes information to Tufts Medical Alumni Relations, 136 Harrison Ave., Boston, MA 02111. Or email us at medicine-alumni@tufts.edu.

In Memoriam

Mathew Ross, A38, M42, of Laguna Woods, California, a retired psychiatrist and former medical director of the American Psychiatric Association, died on December 7, 2013, at age 96. He served in the U.S. Army during World War II, during which he met his wife, Brenda, who died in 2009. A career highlight for Ross came when he was living in The Hague on a Fulbright Fellowship studying the Dutch community mental health system. He is survived by four children and two grandchildren.

Stephen Donohue, '48 of Andover, Connecticut, died on March 25, 2014, at age 90. Born in Windsor, Connecticut, he returned to his hometown after serving as a U.S. Army medic during World War II and spent the next 40 years there practicing family medicine. In retirement he loved golf, gardening and summers at Old Lyme Shores. He is survived by five children, 13 grandchildren and four great-grandchildren.

Arthur Bickford Jr., '53, of East

Dennis, Massachusetts, died on March 10, 2014, at age 88. He was renowned on Cape Cod for his service as a medical examiner, Cape Cod Hospital physician and director of Pleasant Bay Nursing Home in Brewster. He was the quintessential town doctor who made house calls and treated a range of ailments, from fish hook removals and ice hockey stitches to every manner of internal medicine. He served as a medic in the Philippines in World War II before attending Harvard University on the GI

Bill. In later life he was active in expanding outreach to the Cape's homeless population. He is survived by his wife, Constance, a daughter, a son and six grandchildren.

Dudley Houle, '53, of Austin, Texas, died on February 19, 2014, at age 87. He was a surgeon and family practitioner until his retirement in 1997. He served in the U.S. Army during World War II, and later in the U.S. Air Force, where he had a special interest in surgery,

disaster medicine, aerospace medicine and respiratory physiology. He was hospital commander at Carswell Air Force Base in Texas, among other Air Force bases, and served as the flight surgeon for Neil Armstrong on the Apollo 11 mission. In later life he taught at the University of Texas Health Science Center, San Antonio. His hobbies included fishing, hunting, flying, travel and Civil War history. Houle is survived by his wife, Yvonne, six daughters, a son, 17 grandchildren and two great-grandchildren.

William Bassford, A50, M54, of Cromwell, Connecticut, died on February 19, 2014, at age 88. He was born in Watertown, Connecticut, in 1925 and served in the U.S. Army during World War II, enduring frontline combat in France, Belgium, Luxembourg, Germany and Czechoslovakia and earning numerous medals and commendations for his heroism. Bassford practiced internal medicine in Watertown from 1956 to 1991. He is survived by his wife, Frances, three children, four stepchildren, four grandchildren and four step-grandchildren.

James Hayward, A50, M54, of Beaufort, North Carolina, died on April 14, 2014, at age 86. He was professor and chair of the Department of Neurology at the University of North Carolina, Chapel Hill, for 19 years and was named the first H. Houston Merritt Distinguished Professor of Neurology at UNC in 1979. He published some 70 research papers, 20 book chapters and 90 abstracts. Sport-fishing and travel with his wife, Virginia, occupied his retirement years.

In addition to his wife, he is survived by three children and six grandchildren.

John Brogden, '55, of Guilford, Connecticut, died on April 7, 2014, at age 84. A Navy veteran, he was a practicing surgeon in Guilford for 35 years. He was born in Providence, Rhode Island, and attended Brown University. Brogden grew up sailing and duck hunting on Narragansett Bay and loved being on the water. He is survived by his wife, Mary, three children and three grandchildren.

John Shaw, '55, of Manchester, Maine, died on May 7, 2014, at age 84. He had a private practice in general, vascular and microsurgery at Kennebec Valley Medical Center in Augusta, beginning in 1962. He served on staff at a number of hospitals in the state, including Augusta General Hospital and Maine Medical Center. He became an adjunct associate professor in surgery at Maine-Dartmouth Family Practice in 1975. Shaw's hobbies included fishing, hunting, skiing and boating. He is survived by his wife, Sue, and two children.

Jerome Fielding, A53, M57, of Worcester, Massachusetts, died on May 6, 2014, at age 82. Born in Worcester in 1931, Fielding lived there for most of his life. He had a family practice in Worcester for 32 years, where he also served as medical examiner. A lover of the outdoors, he was an avid fisherman, hunter and gardener. He is survived by two sons, Jonathan and Michael, a granddaughter and a great-grandson.

Robert Libertini, '61, of Sudbury, Massachusetts,

died on March 26, 2014, at age 78. He was a well-known and respected physician in Framingham, Massachusetts, for many years, retiring in 2002. Born in Boston, he was a graduate of Boston College and a U.S. Army veteran who served in the Vietnam War. He is survived by his wife, Mariann, and four children.

Jerome Becker, '62, of Grass Valley, California, died on May 11, 2014, of late-stage Alzheimer's and Parkinson's disease. He spent his 50-year career with Kaiser Permanente, serving as chief of ophthalmology at several Kaiser hospitals in the San Francisco Bay area. After retiring from Kaiser, he trained as a Lasik surgeon and performed thousands of Lasik procedures. He is survived by his wife, Marlene, four children and seven grandchildren.

William Roche, '64, of Escondido, California, died on February 27, 2014, at age 75. He joined the U.S. Navy Medical Corps in 1962 and retired as a captain in 1994. During the last 20 years of his career he was stationed at the Naval Hospital in San Diego, where he was chair of obstetrics and gynecology and pathology. After retiring from the military, he worked as a temporary physician all over the U.S., as well as in Australia, Guam, American Samoa and Afghanistan. He is survived by his wife of 52 years, Anne, a daughter, a son and three grandchildren.

Charles Shamoian, G61, M66, of York, Pennsylvania, a geriatric psychiatrist, died on May 12, 2014, at age 82. He was a first-generation American, born

in Worcester, Massachusetts. After receiving his Ph.D. and M.D. from Tufts, he joined the faculty of Weill Cornell Medical College in New York City, where he was director of the Division of Geriatric Services; he also served as president of the American Association of Geriatric Psychiatry. He is survived by his wife, Paula, two children and three grandchildren.

Randolph Goodwin, '77, of Glastonbury, Connecticut, died on April 3, 2014, at age 63. Born in Fall River, Massachusetts, he moved to Waldoboro, Maine, as a child and later attended Dartmouth College. He attended Tufts on a naval scholarship and served four years as a lieutenant commander at the naval hospital at Camp Lejeune, North Carolina. Beginning in 1989, he was chief of infectious diseases at Middlesex Hospital in Middletown, Connecticut. He loved golf, singing in barbershop quartets and the Boston Red Sox. He is survived by his wife, Nancy, and three sons.

FACULTY

Thomas W. Murnane, A58, D62, DG65, G68, J97P, former senior vice president for development at Tufts University who taught at both the medical and dental schools, died on March 20, 2014. He obtained four degrees from the university, including a B.A., D.M.D., a postgraduate certificate in oral and maxillofacial surgery and a Ph.D. He was acting dean of the dental school for a time. From the 1970s through the 1990s, he led campaigns that raised \$1 billion dollars for the university. He is survived by his wife, Jan, a son, two daughters and five grandchildren.

Name: Angela Kang, A08,
M.D./M.P.H. '14

Hometown: Mahwah, New Jersey

Undergraduate degree:

International relations and
community health

Chose TUSM because: TUSM
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Favorite class: Addiction
Medicine taught me ways to treat the
whole patient, not just the disease.

Favorite instructor: Dr. Susan
Hadley has been an incredible role
model. She is an excellent teacher,
physician, and mentor.

Activities: As president of my
class, I serve as a liaison between the
student body and the administration
as well as my peers and medical
school alumni; I'm also the co-
founder of Health Horizons
International, an NGO dedicated to
local capacity building and improved
community health in the Dominican
Republic.

Matched at: the Yale Internal
Medicine Primary Care Program

Goal: I plan to be a primary-care
physician who also does work
in public and global health. This
means providing high-quality care
to my patients, working together
to improve their quality of life in
the clinic and on hospital wards,
and working to understand and
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THE TORNADO COMES HOME

Last fall, Cherie Hendrickson was playing hockey for a professional Russian team based near Moscow. Now she's enrolled at Tufts. For more, turn to page 26.

