BROWN MEDICINE

Volume 24 | Number 2 | Spring 2018

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Who says computational biology can't be fun?

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LETTER FROM THE DEAN

Giant Steps Forward

Two remarkable things have happened since the last issue of *Brown Medicine*. Both involve the *BrownTogether* campaign, and both will forever change research at Brown.

In February, the Warren Alpert Medical School received a $50 million gift to support the Brown Institute for Translational Science (BITS) from Brown Chancellor Samuel Mencoff '78, P'11, '15 and his wife, Ann S. Mencoff P'11, '15. As you know, we established BITS in 2015 to create an infrastructure for translational science at Brown. We've had success building integrated teams in areas that affect millions of people around the world including respiratory disease, autism, the biology of aging, and bioinformatics. We also kickstarted the MD/PhD training program to augment the education of physician-scientists who play critical roles in this type of research, and recruited researchers and master clinicians who complement the talent that was already here.

But this gift from the Mencoffs is truly a game changer! It will allow us to recruit a director of BITS who will help expand our research teams. We will also be able to expand our research foci to include Alzheimer's, neurodegenerative diseases, and vaccine biology, and recruit more translationally focused physician-scientists and PhDs who will add impressively to our research enterprise. These researchers also will participate in all levels of training at the Medical School and affiliated hospitals. This will enhance the translational focus of the education that we provide while improving health care for Rhode Islanders. We are incredibly grateful to the Mencoffs for this transformational gift and their belief in our vision for disease-focused science at Brown.

In April, Trustee Robert J. Carney '61 and his wife, Nancy D. Carney, gave $100 million to the Brown Institute for Brain Science. The gift positions the institute, which has been renamed the Robert J. and Nancy D. Carney Institute for Brain Science, to build upon years of important work by our faculty and students, to establish greater understanding of the brain, and develop treatments for brain-related disease and injury. The Carneys' gift will bring extraordinary new opportunities to advance knowledge and discovery that will translate into therapies for patients in need.

You'll read more about these exciting developments in this issue of *Brown Medicine*. This is a great time for research at Brown, and I appreciate your interest and support.

Sincerely,

Jack A. Elias, M.D.

Jack A. Elias, MD
Senior Vice President for Health Affairs
Dean of Medicine and Biological Sciences

SCOTT KINGSLEY

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"Only looking for diagnosable PTSD or another mental illness is a mistake. Trauma manifests itself in many different ways."

—Karen Johnson, ***Page 18***

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COVER

Members of the Ramachandran Lab, photographed by David DelPoio.

DAVID DELPOIO; JORDAN EMONT MD'20; EDEL RODRIGUEZ

LETTER FROM THE EDITOR

#Enough

Can you stand to read one more thing about gun violence? I hope so.

In this issue of *Brown Medicine*, Associate Professor of Emergency Medicine Megan Ranney writes about a new organization of physicians who, citing the lack of federal funding, have come together to sponsor research on gun violence prevention. Ranney and others have written volumes on the prohibition of using federal dollars to research gun safety. But she's also the director of the digital health initiative in the Department of Emergency Medicine, and been voted one of the "top docs to follow on Twitter" (@meganranney). It was natural that she turned to Twitter after the Parkland, FL, high school shooting in February to ask fellow physicians to share their stories of how gun violence had affected them.

Tagging their anecdotes with #docs4gunsense, all types of health professionals told the "story they will never forget": informing a parent their child had died from a gunshot wound; caring for a patient paralyzed or in a permanent vegetative state after a gun injury; mourning a colleague who had taken his or her own life with a firearm. Added to these traumas was the impact on health care workers themselves, who carry what Ranney calls "the burden of lives lost." Is it any wonder that our doctors, nurses, and first responders are burning out when faced with so much violent, preventable death?

Ranney is part of a new research consortium funded by the National Institute on Child Health and Development that will provide $5 million to build research capacity to study firearm injuries among children and teens. As she points out, given the dearth of research, it's hard to make evidence-based policy decisions. And as her Twitter experiment shows, this research is important not only for the patients who are in the literal crossfire—but also for the physicians and caregivers and others who are caught by the ricochet.

The last time I published an opinion piece by Megan Ranney, I received a letter to the editor that told me why she was wrong about guns. I encouraged the writer to flesh out his thoughts in his own piece, which I would publish in the next issue. He declined, saying he didn't want to deal with the backlash his opinions, which he knew "would be unpopular at Brown," would cause.

If you read Ranney's opinion piece (which would mean you've read two more things about gun violence, sorry) and you have a differing opinion, be brave and submit your own. There is space in this magazine for different viewpoints.

Kris Cambra

WHAT SAY YOU?

Please send letters, which may be edited for length and clarity, to:

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- Tweet us @BrownMedicine

BROWN MEDICINE

Volume 24 | Number 2 | Spring 2018

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RESEARCH

DEEP BREATH Daphne Koinis-Mitchell (left) and Beth McQuaid are building an NIH-funded pediatric asthma center.

KAREN PHILIPPI

Air Apparent

Pediatric asthma researchers are scaling up successful local programs to create a national model.

For more than two decades researchers at Brown have honed their approach to preventing and reducing asthma symptoms among children in Rhode Island. Now, with an $8 million grant from the National Heart, Lung, and Blood Institute, they can expand their pilot programs to reach 1,500 city kids and their families.

Elizabeth McQuaid, PhD, and Daphne Koinis-Mitchell, PhD, who are coprincipal investigators of the six-year project, have developed evidence-based programs that improve outcomes, including better asthma control, fewer emergency department visits, lower incidence of complications like allergies and poor sleep, and fewer missed school days. They're building on the success of these initiatives to establish the Rhode Island Asthma Integrated Response Program (RI-AIR).

"We're not testing whether these interventions work. We know they work," says McQuaid, a professor of psychiatry and human behavior and of pediatrics (research). Instead, they're evaluating potential barriers, sustainability, and cost effectiveness, to ensure they reach as many kids as possible. RI-AIR is one of just four centers in the country to receive the NHLBI grant, which aims to reduce childhood asthma disparities.

Asthma is more prevalent in cities, and further exacerbated in low-income housing, which is more likely to harbor triggers like mold and pests. Furthermore, a disproportionately high number of minority children live in such housing. Beyond immediate health impacts, asthma is linked to lower educational achievement, physical activity, even social engagement.

"It's not just about asthma. It's about all the other outcomes," says Koinis-Mitchell, associate professor of psychiatry and human behavior and of pediatrics (research). Helping families to play an active role in their children's care, from removing triggers to partnering with

their kids' health care providers, has been critical to the success of their pilot programs.

One long-running intervention is the Community Asthma Program at Hasbro Children's Hospital, of which Koinis-Mitchell is director. Since 1997, it's educated children with asthma as well as their families and school staff about how to identify symptoms, avoid triggers, and use their medications through partnerships with Providence-area schools and at Hasbro Children's Hospital.

For kids with severe, poorly controlled asthma, the Home Asthma Response Program, founded in 2010, offers a more tailored approach. "Our staff go out to the homes and work with the families directly," McQuaid says, going over physicians' action plans "step by step," spotting potential triggers, and giving families "actual strategies" so they're empowered to take action.

> "We're not testing whether these interventions work. We know they work."

These programs reached about 1,000 families annually, resulting in fewer ED visits and inpatient stays. Then, two years ago, McQuaid and Koinis-Mitchell got a key boost: seed funding from the Hassenfeld Child Health Innovation Institute, which helped them establish a community advisory board that includes health care workers and parents to identify gaps in asthma care and the best way to deliver services. The institute gave them access to mapping and informatics expertise, so they could target areas with the highest asthma prevalence and match each child with the most effective intervention.

"The innovative integration of technology and thoughtfully reimagined clinical care, combined with a strong focus on partnering with our community, apparent in RI-AIR is exactly the kind of groundbreaking research on behalf of children's health that we imagined when the Hassenfeld institute was created," says Phyllis Dennery, MD, Sylvia Kay Hassenfeld Professor of Pediatrics, chair of pediatrics, and an executive committee member of the institute.

RI-AIR will go into 16 urban communities that have high rates of pediatric asthma and emergency department use; identify 1,500 children with asthma that's not well controlled or poorly controlled; and provide either school- or home-based care. "The high-risk areas are randomly assigned to receive our programs in a specific year, and the year prior to that will be our baseline year, so everyone will receive the treatment," Koinis-Mitchell says.

The ultimate goal of the NHLBI grant is finding effective models that can be shared with the rest of the country. That opportunity, to help not just thousands but millions of kids struggling with asthma, is rare validation for the researchers. "All the work we have done over the past 20, 25 years, in the research and in the community," McQuaid says, "has in many ways been building toward this." ***—Phoebe Hall***

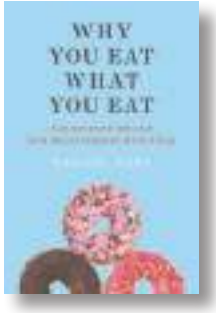
OVER HEARD

"Paying women less hurts working families and perpetuates the structural sexism and racism that has advantaged men and white people across occupations and industries for generations. Men who accept this gap in compensation for their female colleagues are complicit in prolonging these inequities."

— **KATHERINE SHARKEY**, *MD, PhD, associate professor of medicine and of psychiatry and human behavior and assistant dean for women in medicine and science, on the gender pay gap in medicine,* Providence Journal, *March 21, 2018.*

BOOKSHELF

Why You Eat What You Eat: The Science Behind Our Relationship With Food



By **Rachel Herz, PhD**, W.W. Norton & Company, 2018, $25.95

"Food porn is more than semantics. ... The fact that we are wired to desire food and sex is evolutionary theory 101—if we didn't like them so much we wouldn't be here."

—from *Why You Eat What You Eat*

For most people (Soylent diehards excepted), eating is so much more than calories in. It's a full-blown sensory experience: from the color, size, and weight of a plate, to our proximity to serving dishes, to the volume and frequency of the sounds around us, the factors that influence how much we eat, and how much we like it, far exceed taste and aroma.

Herz, an adjunct assistant professor of psychiatry and human behavior at the Warren Alpert Medical School and an expert on the psychology of smell, digests hundreds of academic studies into bite-sized portions to explain the interplay of psychology, physiology, and neuroscience behind our food choices and our appetites. Along the way she dishes on food myths and controversies: Is umami a taste? Can grapefruit help you lose weight? Do "organic" and "fair trade" labels prompt unhealthy eating? Like an all-you-can-eat buffet, Herz's book will satiate any reader. ***—P.H.***

Got a new book? *If you'd like to see it featured in* Brown Medicine, *have your publisher send us a copy at Box G-P, Providence, RI 02912.*

COOL TOOL

$1 Could Save a Life

Low-cost, low-tech test strips effectively detect fentanyl in street drugs.

Fentanyl, a synthetic opioid that's up to 100 times more potent than morphine, is implicated in the recent spike in overdose deaths in the US. Because it can be mixed with drugs like heroin or pressed into counterfeit prescription pills, people often don't know they've taken fentanyl until it's too late.

But inexpensive, easy-to-use test strips could save their lives. Traci Green, PhD, an adjunct associate professor of emergency medicine and of epidemiology, was a coprincipal investigator of a study, conducted with the Johns Hopkins Bloomberg School of Public Health, that confirmed the paper-based strips, made by the Canadian company BTNX, can detect the presence of fentanyl in drug samples as accurately as more expensive technologies that require trained specialists.

The researchers pitted the test strips—which were originally intended to detect fentanyl in urine—against two different spectrometers for their ability to detect when fentanyl was present (sensitivity) and when it was not (specificity) in street drug samples. They found the test strips had the lowest detection limit and the highest rates of sensitivity and specificity.

Furthermore, in surveys of people who use drugs in Providence, Baltimore, and Boston, the vast majority said they'd use the test strips, which cost about $1 apiece and deliver results in a few minutes. Most people also said if they knew their drugs contained fentanyl they'd change their behavior, including not using the drugs.

"When people can ... see themselves in the solution is where we have greater success," Green says. ***—P.H.***

CHEAP AND EASY Fentanyl test strips could help users avoid overdose.

COURTESY W.W. NORTON & COMPANY; JESSE COSTA

ASK the Experts

How do we evaluate scientific journals?

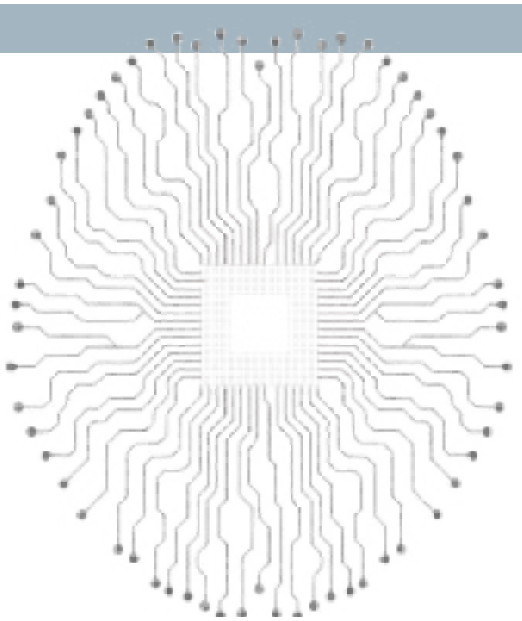
Open-access online scientific journals are a valid way for researchers to reach the public, but up to a quarter of such publications may be fake. Brown University Library's Erika Sevetson, MS, head of health and science information services, and Andrew Creamer, MEd, MSLIS, research data management librarian, provide some guidance on vetting medical journals.

Predatory journals containing non-peer reviewed research are a growing concern in the biomedical research community. Last fall the National Institutes of Health released a notice reminding researchers of their obligation to publish articles in reputable journals, and the Federal Trade Commission (FTC) filed suit against a biomedical publisher, labeling it as predatory and charging it with multiple violations of laws prohibiting deceptive practices. The FTC has warning signs of predatory publishers on ftc.gov. If you are invited to submit an article or serve on an editorial board for an open access (OA) journal, a good place to start your evaluation is by reviewing the journal against the checklist at thinkchecksubmit.org.

OTHER TIPS:

- Is the journal indexed? If so, where? Look for journals indexed in MEDLINE, EMBASE, Web of Science, and/or Scopus. (There's no such thing as being "indexed in PubMed" and GoogleScholar does not vet the journals that it indexes.)
- If the journal isn't indexed, is the content included in PubMed Central?
- Avoid publishers that aggressively email and solicit articles or make false statements about their impact factor and reputation and the rigor of their peer review.

Most OA publishers will charge a publication fee, known as an article processing charge (APC). Beware of publishers that charge exorbitant APCs, are not transparent about their APCs on their website, or inform authors of fees only after their manuscripts have been submitted or accepted. If you've been approached or deceived by a predatory publisher, report it to the FTC. Still unsure? Check with the librarians at your own institution if you need help evaluating a title.



ISTOCK

GOOD NEWS

A Smart Investment

$100 million gift will advance research into the brain.

A new $100 million gift to Brown University's brain science institute from Robert J. Carney, MBA '61 and Nancy D. Carney will drive an ambitious agenda to quicken the pace of scientific discovery and help find cures to some of the world's most persistent and devastating diseases, such as ALS and Alzheimer's.

The gift changes the name of the Brown Institute for Brain Science to the Robert J. and Nancy D. Carney Institute for Brain Science, and establishes the institute as one of the best-endowed university brain institutes in the country.

"This is a transformative moment that is going to catapult Brown and our brain science institute," says Diane Lipscombe, PhD, the director of the institute, professor of neuroscience, and the Thomas J. Watson, Sr., Professor of Science. "We will be able to crack the neural codes, push discoveries forward,

and address some of the largest challenges facing humanity, at the same time training the next generation of brain scientists."

The Carney Institute had its start as the Brain Science Program in 1999, later becoming the Brown Institute for Brain Science. The scope of its work has increased dramatically in recent years, and the institute now has affiliated faculty spanning 19 academic departments, including clinical departments in the Warren Alpert Medical School.

The Carneys' gift will help support the study of neurodegenerative diseases and the growing research field of computational neuroscience, as well as a signature program of the institute: cutting-edge efforts to help those who, through paralysis, have lost the ability to move and communicate, to regain those abilities. Research into brain-computer interfaces, part of the BrainGate project, uses tiny micro-electrode arrays implanted into the brain.

"This is the area of research that said to us, 'Look what can be done if you pull groups together from a wide range of academic disciplines within and beyond the life sciences to take an integrative approach to big, challenging questions,'" Lipscombe says. "The breakthroughs we have seen in confronting paralysis could not have happened without the integrative approach that is distinctive to the way Brown approaches brain science."

> "We will be able to crack the neural codes, push discoveries forward, and address some of the largest challenges facing humanity."

The Carneys, of Houston, are longtime supporters of Brown; this spring Robert Carney will finish his third term as a trustee on the Corporation. He is the founder and chairman of Vacation Publications Inc., and also founded Jet Capital Corp., a financial advisory firm, and Texas Air Corp., which owned Continental Airlines and several other airlines. Nancy Doerr Carney is a former television news producer.

They say they were inspired to make their gift by many previous positive experiences with Brown, as well as the opportunities they saw for the University in brain science.

"Nancy and I have long been impressed by the phenomenal research and education of bright young minds that we see at Brown," Robert Carney says. "We are excited to see the brain institute continue to grow and serve society in ways that are vitally important."

Special Guest

Marc K. Siegel, MD '78, Fox News medical correspondent and associate professor of medicine at NYU Langone Medical Center, moderated "The Opioid Crisis: Brown's Approach to Prevention and Treatment," a panel discussion held at the Warren Alpert Medical School on February 8. Four faculty members described efforts to educate medical students on opioid prescribing and referral to treatment for patients abusing opioids, treating different populations such as veterans and people who are incarcerated, and expanding access to the overdose-reversal drug naloxone.

JORDAN EMONT MD'20

ANATOMY OF A RESEARCHER

Big Fish

Jessica Plavicki, PhD, assistant professor of pathology and laboratory medicine, studies the development of vasculature and the blood-brain barrier to understand the impacts of chemical exposures and genetic mutations. To do that, she uses fish. Teeny, tiny, transparent, embryonic fish. "They're the size of Lincoln's nose on a penny," she says. Her lab houses hundreds of tanks and thousands of zebrafish, the model of choice: "Within a week, you have all your major organ systems online and functioning, so we can see changes in embryonic cardiac output and then ask how that's impacting vasculature development." Plavicki's focus on blood vessels, and the connections between the heart, brain, and other organ systems, is unusual in neuroscience—but, she notes, "when people look at kidney failure, one of the things that they see is actually neurological complications." She teaches undergrads to consider these links in her Environmental Health and Human Disease course, where along with learning toxicology and epidemiology concepts, students make podcasts about Superfund sites. Using storytelling to teach science exemplifies why Plavicki came to Providence, in 2016: "Brown seemed like a really creative, progressive place that … would be asking me to think about things in a different way," she says. "And so far, it's definitely met my needs in that." ***—P.H.***

CHEESEHEAD

Plavicki, who grew up in New York and Texas, completed her PhD and postgraduate work in Wisconsin, and she loves cheese like a native.

GREEN THUMB

Plavicki loves growing vegetables and perennials. She and her son Arlo, 3, collected milkweed seeds last fall for a butterfly garden they're planting.

ADAM MASTOON (4); ISTOCK

SMALL FRY

Plavicki's lab uses transparent zebrafish larvae (this is an adult) to observe and manipulate development. The fishes' rapid growth lets researchers quickly see the impact on vasculature.

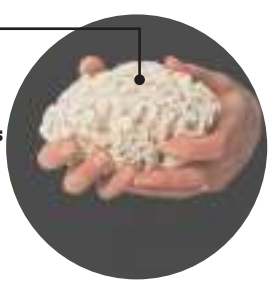
LIKE MOTHER, LIKE SON

Love of art and the outdoors runs in the family: Plavicki's son Lennon drew this fire-breathing bunny robot when he was 6. Now 22, he's an environmentalist and rock climber in Colorado.

THE ART OF SCIENCE

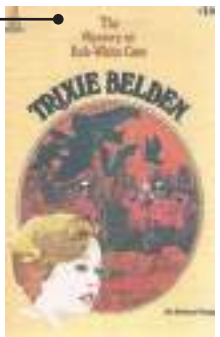
Plavicki went to college planning to study art. Now she gets her creative fix with biological imaging; her award-winning confocal micrographs have graced journal covers and art exhibits.

GROOVY



This brain coral was a serendipitous find for Plavicki's mom, who picked it up on a beach in Florida.

HOOKED

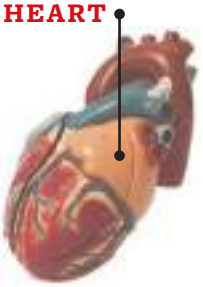


Reading about the blind cave fish in this mystery at age 9, "I was really excited by the fact that organisms would change based on their environment," Plavicki says. "I would still study blind cave fish if I had an opportunity."

IRON WOMAN

A runner and triathlete, Plavicki competes in grueling races like the Half Ironman, where she dons this wetsuit for the 1.2-mile swim.

FOLLOW THE HEART



Before Plavicki began studying cardiovasculature, she picked up this model when the University of Wisconsin medical school moved. "Who knew this was foreshadowing my career?" she says.

FULL CIRCLE

A childhood fascination with tadpoles morphed into a love of developmental genetics in college, and ultimately Plavicki's research career.

ISTOCK; ADAM MASTOON (7)

FINDINGS

Superbug Kryptonite?

Scientists identify compounds with the potential to stop MRSA.

By 2050, drug-resistant infections will kill more than 10 million people a year worldwide—more people than cancer—if no one takes action.

Eleftherios Mylonakis, MD, PhD, the Charles C. J. Carpenter Professor of Infectious Diseases, isn't standing by. "This is an emergency," he says. "It affects more than individuals in the hospital or the very ill or the very old. It affects everybody."

Mylonakis, who is also chief of infectious diseases at Rhode Island Hospital and The Miriam Hospital, led a research team that identified two synthetic retinoid antibiotics that could one day help combat MRSA (methicillin-resistant *Staphylococcus aureus*), one of the most pervasive superbugs. They published their findings in *Nature* in March.

In addition to infectious disease experts and engineers at Brown, Mylonakis collaborated with researchers from Massachusetts Eye and Ear, Massachusetts General Hospital, Emory University, and Northwestern University. He says teams like his are filling a void left by the major pharmaceutical companies, which haven't invested in the development of new antibiotics for many years.

"In a simplistic way, it's a math problem," Mylonakis says. "It takes the bugs an average of two years to

develop resistance to antibiotics. It takes more than 10 to 15 years of work to get an antibiotic into clinical practice."

The research team screened 82,000 synthetic compounds for their potential as antibiotics that were not toxic to humans. They ultimately identified 85 that decreased the ability of MRSA to kill laboratory roundworms; of those, two synthetic retinoids emerged as the best candidates for further study.

> "It takes more than 10 to 15 years of work to get an antibiotic into clinical practice."

Sophisticated computer modeling and other studies showed that the retinoids impair bacterial membranes and kill MRSA persister cells—drug-resistant dormant cells that aren't susceptible to current antibiotic therapies. The retinoids' ability to make bacterial membranes more permeable appeared to enable them to work in tandem with an existing antibiotic, gentamicin.

Chemists at Emory modified the retinoids to retain maximum potency against MRSA, while minimizing toxicity to humans. Huajian Gao, PhD, the Walter H. Annenberg Professor of Engineering at Brown, oversaw computer simulations that demonstrated a route toward understanding the molecular interactions between the screened compounds and bacteria membrane, and determining the energy barriers for their penetration and embedment inside the membrane.

"We are extremely optimistic," Mylonakis says. But "this is still years away from coming to clinical trial."

—Kevin Stacey

INNOVATION

Translational Education

Student group helps researchers bring their therapies to market.

In the exploding world of health care technology, entrepreneurship, and venture capital, Warren Alpert medical students are helping to fill the gap between preliminary research and product design.

The Brown Medical Venture Group (BMVG) has two core missions: to educate students about health innovation and to work with companies and investors to help them identify and validate their ideas, says Anshul Parulkar MD'18, who cofounded the group in 2016.

"I wanted to find a way to allow medical students to get real-world education in the innovation process that they weren't getting in the curriculum," he says.

FAB FOUR: Jonathan Vu, Pete Mattson, Anshul Parulkar, and Nathan Pertsch (left to right) are the Brown Medical Venture Group.

ILEXX; JORDAN EMONT MD'20

"Taking things we've learned in class and seeing how this sort of insight can be helpful in developing real-world therapeutics and therapies is really great," cofounder Jonathan Vu '15 MD'20 says.

The BMVG works with a variety of

clients, ranging from local venture capitalists trying to build out their portfolios to health care entrepreneurs who want to validate their products. That means students spend a lot of time drawing upon their curriculum, clinical experiences, and research skills.

"In medicine, there are a bunch of pain points, but you don't know what they are until you see them or you treat a patient. That sort of clinical experience gives you intuition whether something is valuable or not," Vu says. Companies often lack this experience, which can lead to a less-than-ideal, ineffective product. The BMVG can help change that.

"Medical students are hungry to take on these challenges," Peter Mattson MD'20 says. By providing the opportunity to develop a unique set of skills directly applicable to what students are learning, the group has fostered a lot of enthusiasm, he says.

The group began by partnering with administrators, researchers, and local investors and entrepreneurial ventures; now word of mouth is bringing in more clients. One recent project was a collaboration with Jack A. Elias, MD, senior vice president for health affairs and dean of medicine and biological sciences.

"I met the Brown Medical Venture Group in my activities as dean, where they were bringing new ideas to the Medical School," Elias says. "I realized that they might help with some of the translational research in my laboratory. They were immensely helpful in augmenting our understanding of a small molecule inhibitor of an enzyme called chitotriosidase that we discovered was also an inhibitor of tissue fibrosis. Their work helped us position the inhibitor as a therapeutic. Working with them was a lot of fun for me and, I hope, for them as well."

Each project looks different, based on the needs of the client. For a recent consult on an agricultural antibiotic, they conducted an intensive research process. "We looked at patent information and toxicology reports to come up with a consult for commercial viability," Parulkar says. "It involved diving deep into the literature, going all the way back to the 1960s to review commercial viability for the new drug." The project helped him gain a meaningful new perspective when evaluating clinical research, a powerful tool for a physician.

> "We're positioned at that last step of translational medicine: helping to move great ideas from the research laboratory into clinical practice."

Being a part of the group is a "form of empowerment for medical students," Vu says. "It's a way to give some really smart people a skill set that allows them to change the world in the way they see fit."

The translational nature of the BMVG's work is really what sets them apart, Nathan Pertsch MD'20 adds. "We're positioned at that last step of translational medicine: helping to move great ideas from the research laboratory into clinical practice," he says.

"The role of the physician is changing," Vu says. "The world is moving toward a broader definition of health care. And we're here to bridge that gap."

—Aneeqah Naeem '20 MD'24

ERIC MCCANDLESS/DISNEY ABC TELEVISION GROUP

STUDENTS

The Comfort of Your Living Room

TV shows allow premed students to ponder ethical dilemmas.

PRIVATE PRACTICE: TV doctor Addison Montgomery counsels a patient.

Is it ethically permissible for parents to refuse vaccinations for their children? The question prompted a heated debate after students in the course Primetime Bioethics watched an episode of the ABC show *Private Practice* in which a mother rejects a vaccine—and her son gets the measles (and, spoiler alert, ultimately dies). While some of the undergraduates argued that individual choice must always be prioritized, others said the safety of all should come before anything else.

The argument was just a taste of what many of these students will face as they continue their education. Their Program in Liberal Medical Education (PLME) course covers a wide variety of medical ethics questions, using TV shows as a jumping-

off point. Topics include everything from designer babies to physician-assisted death. Every class period is focused on one issue, which centers the student-led presentation and theory-based class discussion.

"I've always liked philosophy. In medical school, I was the one who was excited whenever we did ethics," says Deirdre Fearon MD'96 F'02 AM'04, an associate professor of emergency medicine and of pediatrics, who teaches the course. "I always wanted to do something like this, because I like to teach, I like medical ethics, and I watch these shows and the ethical dilemmas are usually not subtle in them. I thought it would be a fun way to teach and learn."

Fearon got the chance to kick-start the idea in 2012 when Hailey Roumimper '15 approached her to collaborate on an Undergraduate Teaching and Research Award (UTRA). Fearon didn't have any ongoing research, so she and Roumimper created a basic curriculum for a course. When it was first offered two years later, it was an instant hit.

"It's a great class," Kevin Chen '19 MD'23 says. "I like that we incorporate papers, articles, and fun TV shows in a more applied way."

Each week, students watch one show around the given topic, read a few articles or papers, and write a response. A group of students creates that week's presentation and leads the discussion. One week, when discussing vaccine refusal, students created a Mafia-like game for the entire class to demonstrate the concept of herd immunity.

"I love that each class is student run," Sabrina Saeed '19 says, because it makes it more exciting and engaging.

The subject matter is increasingly relevant for physicians, Fearon says. "I deal with ethics problems every day," she says. "Every shift, something comes up." She began including a "case of the week" in each class to get students thinking about real-world problems.

Students say they love getting to consider deeper topics in medicine. "Most premed classes are hard science," Natasha Richmond '20 says. "We can't think about the bigger picture. This class gives us access to think about those ideas in a more relaxed setting."

> "Some people criticize bioethics because there is sometimes no single right answer."

Fearon lets them make tough calls, in the safety of the classroom. "In medicine, we have to make hard decisions. Some people criticize bioethics because there is sometimes no single right answer. But we still have to thoughtfully choose a right answer for a given case," she says. "We have to act. And we want to feel good about our decisions and be able to defend our choices." ***—A.N.***

ORAL HISTORY Jeff Borkan (left) and Dean Aronson.

For the Record

A video archive preserves the history of the Medical School.

When Jeffrey Borkan, MD, PhD, chair of the Department of Family Medicine, first came to Brown's Medical School in 2001, he tried to get a sense of the history of his new academic home. One problem: no such written history existed.

Borkan saw an opportunity. All of the Medical School's previous deans were still living and able to give a firsthand account of their time in the deanship. Borkan approached Brown President Ruth J. Simmons, who agreed to commit some resources to the project.

"And that's how we made sure history was saved," Borkan says. It took about three years to record video interviews with deans Stanley Aronson, David Greer, Donald Marsh, Richard Besdine, Eli Y. Adashi, and Edward Wing. "Some of them were reluctant at first," Borkan says, "but once they sat down and began talking, their stories flowed."

Brown's contributions came in the form of technological expertise from Giovanna Roz Gastaldi, manager of instructional media and production. All of the videos—"the complete boxed set of deans," Borkan says—are available thanks to Gastaldi in a playlist on youtube.com/AlpertMed.

Borkan says when the time is right he hopes to get Dean Jack A. Elias in front of the camera. ***—Kris Cambra***

VIDEO STILL

5 Things You Should Know

1 ARS MEDICA

Students who devote more time to the arts during medical school showed more empathy, wisdom, and tolerance of ambiguity, and fewer symptoms of burnout, according to a study conducted at the Warren Alpert Medical School and four other US medical schools. In surveys the students reported their exposure to literature and performing and visual arts, and answered questions about personal qualities that correlate to good bedside manner, as well as signs of burnout like physical and emotional fatigue. While the results show correlation, not causation, the authors, including Brown's Associate Dean for Medical Education Allan R. Tunkel, MD, PhD, recommend changes to curriculum design and professional development. "If we wish to create wiser, more tolerant, empathetic, and resilient physicians, we might want to reintegrate the humanities in medical education," they wrote.

2 NO MORE EXCUSES

Women over 50 who walk regularly can cut their risk of heart failure by 20 percent or more. That's according to research by Somwail Rasla, MD RES'17, who as an internal medicine resident at Memorial Hospital of Rhode Island examined the frequency, duration, and speed with which 89,270 postmenopausal women walked over 10 years. The results, which Rasla presented at the American College of Cardiology annual session in March, showed that women who walked 40 minutes or more at an average pace could lower their risk of heart failure by up to 25 percent. "We already know that physical activity lowers the risk of heart failure, but there may be a misconception that simply walking isn't enough," Rasla says. His study suggests it may very well be.

3 ADAPTIVE VARIATION

A new machine learning technique described in *Nature Communications* allows researchers to sift through genomic data in search of genetic variants that have helped populations adapt to their environments. Dubbed SWIF(r), it could help piece together the evolutionary history of people around the world, and shed light on the evolutionary roots of certain diseases and medical conditions. SWIF(r) uses machine learning and a combination of four established statistical tests measuring different signatures of adaptation to look for the statistical signatures of selective sweeps in genomic datasets. But it stands out from similar composite techniques because it can identify a specific adaptive mutation, and its output is easy to interpret, says Lauren Alpert Sugden ScM'10 PhD'14, a postdoctoral researcher in Brown's Center for Computational Molecular Biology who led the development of SWIF(r).

4 CHANGEMAKERS

Thirty-two medical schools that are part of the American Medical Association's Accelerating Change in Medical Education initiative convened at the Warren Alpert Medical School in April. Schools presented the latest developments of their new curriculum models, which support training for an estimated 19,000 medical students. An AMA Accelerating Change grant of $1 million helped establish the Primary Care-Population Medicine Program at the Medical School in 2013. Susan Skochelak, MD, MPH, the AMA's group vice president for medical education, says that the meeting was a success: "We debated important issues. People felt like it was energizing [and] we have a list of next steps, so I see that as a very successful event."

5 FRESH LOOK AT ALS

Two studies shed new light on the formation and early stages of amyotrophic lateral sclerosis (ALS). The first, published in *Molecular Cell* in January, described atomic-level physical interactions and chemical changes of proteins linked to the disease. "These interactions are more dynamic and less specific than previously thought," says senior author Nicolas Fawzi, PhD, assistant professor of medical science. "A molecule does not take just one shape and bind to one shape, but a molecule is flexible and interacts in flexible ways." Meanwhile another team including Justin Fallon, PhD, professor of medical science and of psychiatry and human behavior, reported in *Nature Neuroscience* in March that behavioral, cognitive, and structural dysfunctions occur long before neuronal degradation in mice carrying a gene for a mutant protein. These findings could help scientists develop new early-stage therapies, when they're most likely to be effective, Fallon says.

BY MEGAN L. RANNEY, MD RES'08 F'10 MPH'10

The AFFIRM Mission

If the federal government won't fund gun injury prevention research, a new coalition of physicians and scientists will.

At Brown we have a strong history of practice and advocacy on behalf of vulnerable patients. Our researchers use cutting-edge theory and methodologies to reduce morbidity and mortality from a variety of preventable conditions, from opioid addiction to HIV to child abuse. We train medical students and residents in harm reduction: how to screen and counsel patients on these and other sensitive issues, to reduce risk and death. We advocate for the incorporation of evidence into policy and practice.

But there is one issue on which our profession and our school have had little impact: guns.

Approximately 38,000 Americans die each year—and another 80,000 are injured—from guns. Firearm injuries touch every segment of society, and the toll of gun deaths is similar to that of opioids or car crashes. Many of us, at and outside of Brown, have been advocating for decades for attention to this unaddressed epidemic. We have gone to Capitol Hill, written editorials, and worked within our professional societies. The reason we've had no impact is not a lack of rigorous research questions, nor a lack of rigorous scientific underpinnings for the field. The reason is, rather, a lack of federal funding.

Since the Dickey Amendment was passed in 1996, Congress has appropriated exactly $0 to the Centers for Disease Control and Prevention for firearm injury prevention research. The National Institutes of Health have allocated some funds to this topic, most notably in a request for applications issued after the Sandy Hook tragedy, when President Obama called for the NIH and CDC to reinvigorate their research agendas. We have had some small successes: the newly passed 2018 Omnibus Bill clarifies that the Dickey Amendment does not prohibit research, per se. The NIH currently has 14 grants focused on firearm injury prevention (I am a co-investigator on two of them).

But 14 grants is insufficient for a crisis of this magnitude. Indeed, the overall federal funding for firearm injury research remains at less than 2 percent of what would be predicted based on the mortality rate (and less than 0.2 percent of that for sepsis, a disease process with a similar mortality burden). As clinicians and researchers, we know that adequate funding is a prerequisite for high-quality research. We also know that without science, policies are unlikely to be impactful or to be based on anything other than emotion.

> We know that without science, policies are unlikely to be impactful or to be based on anything other than emotion.

TIME TO ACT

Because we are tired of waiting for change, while our communities and our colleagues suffer—and because we recognize that sometimes, we need money to fix a problem—I, in conjunction with two dozen other firearm injury prevention researchers, founded the American Foundation for Firearm Injury Reduction in Medicine (AFFIRM) earlier this year.

AFFIRM's vision is to reduce gun injuries through knowledge and action. We want to unite clinicians and researchers across specialties, disciplines, and the 50 states to create the highest-quality, most-actionable research. Thanks to our medical society partners (including the American College of Surgeons, the American College of Emergency Physicians, and the Massachusetts Medical Society), we have the potential to not only conduct research, but also to disseminate it across the country.

Megan Ranney *is* AFFIRM's *chief research officer, associate professor of emergency medicine at the Warren Alpert Medical School, and an emergency physician at The Miriam Hospital and Rhode Island Hospital. In April, Rhode Island Governor Gina Raimondo appointed Ranney co-chair of a statewide gun-safety working group. Learn more about AFFIRM at www.affirmresearch.org.*

EDEL RODRIGUEZ

ESSAY

BY ALICE TIN, MPH MD'18

All for One

Beyond the bonds of companionship, humans and animals are inextricably linked.

JOYCE HESSELBERTH

A woman brought her two cats to the veterinarian, worried about their lethargy, vomiting, and anorexia. The initial workup didn't reveal much aside from anemia. The veterinarian ordered a few more rounds of tests, which eventually revealed that the cats had extremely elevated blood lead levels. Unfortunately, one of them died from the toxic levels of lead.

For most veterinarians, their responsibilities end there: they aren't required to report elevated blood lead levels in animals to public health authorities. Even in pediatric patients, the lead level reporting requirements vary from state to state. But in this case, when the cats' owner learned the test results, she was able to get tested as well. It came back as five times above normal.

This was all the more alarming because she was pregnant. It turned out that in preparation for her baby's arrival, the woman had been stripping old paint to redecorate the nursery. The lead-laden dust likely settled on the cats' fur, and as they groomed themselves, lethal levels of lead accumulated in their blood stream. Sadly, the felines were a sentinel for the environmental toxin, but the early detection prevented further tragedy.

This is merely one example of how human, animal, and environmental health are intricately linked, forming the basis for One Health.

One Health is infused into many medical issues: from changing land use that brings wild animals and humans in closer proximity, creating opportunities for zoonotic disease spillover; to government policy around use of antimicrobials as growth promoters in animal husbandry, and its potential to increase antibiotic drug resistance in humans; to companion animals and how they can assist in mental health and wellness.

I fell headlong into One Health while completing my Master of Public Health at Tufts in 2011. Infectious Disease Epidemiology, co-taught by a physician and a veterinarian, was one of my favorite

ESSAY

courses. For my final paper I wrote about Nipah virus, a pathogen discovered in Malaysia in 1998. Fruit bats are a natural reservoir for the virus, and new pig farms encroaching on bat habitat brought human, livestock, and wild animals into closer proximity, inciting a spillover event. The epidemic had local and international economic consequences: 1 million pigs were culled with no financial compensation to farmers, and importation of Malaysian pigs was temporarily banned. One Health provided a framework to weave infectious diseases, virology, animal behavior, ecology, climate change, international trade, and economics together into a cohesive narrative about the emergence of Nipah virus. I was enthralled by this new paradigm, and eager to seek out other examples of One Health in practice.

In medical school I was selected to be the human health domain student representative to the executive board of the One Health Commission, a nonprofit that creates networking opportunities between professionals in various fields. I also founded the student group One Health at Brown, the first One Health group at any medical school. We hosted lectures on non-verbal communication by the Roger Williams Park Zoo vet, and joint animal vaccination and preventive health clinics with the Providence Animal Rescue League in low-income housing complexes. We piloted a program with community organizations that matched formerly homeless individuals with companion animals to promote housing stability.

In my fourth year I worked with Peter Rabinowitz, MD, MPH, at the University of Washington's Center for One Health, to create a clinical One Health elective in Seattle to explore its relevance in everyday practice. I observed surgery on a gorilla, with both veterinarian and physician consultants; developed an animal exposure history tool and tested it in an occupational health clinic; and discussed compassion fatigue with animal lab workers.

I had some of my most poignant experiences as an observing medical student in a free veterinary clinic. One woman brought her dog for a trauma evaluation, as she suspected that her daughter's boyfriend was abusing it. As the veterinarian began her exam, I had many additional questions: did her daughter feel safe in the relationship? Did they all live together? Were there children involved? Studies have shown that interpersonal violence can first manifest as animal abuse—and in fact, medical students are taught that animal abuse can be a sign of conduct disorder. Yet veterinarians are not mandatory reporters of interpersonal violence.

> Studies have shown that interpersonal violence can first manifest as animal abuse.

There were no social workers or human health professionals at the clinic who might have addressed these concerns. Furthermore, there is no platform for physicians and veterinarians to communicate about shared health hazards or ailments for their respective patients, or to collaborate with urban planners or ecologists to address the effects of the environment on these populations' health. But there is much to be gained by creating those connections.

I'm excited to head back to Seattle to train as a family physician at Swedish Cherry Hill. I plan to carry the One Health approach with me—like taking a thorough animal exposure history for all my patients, whether at home, work, or play. A similar history-taking checklist could easily be incorporated into Doctoring courses. In fact, many of us already apply One Health without labeling it as such. For example, during my pediatrics and infectious disease rotations, physicians would ask about animal exposures, particularly outdoor pets, who could carry ticks inside and expose their owners to Lyme disease. Not only can asking about Rover be a great way to establish rapport with a patient, it can give clues to disease exposures or even be a way to broach more sensitive issues such as mental health.

During my last session at the free vet clinic, the line snaked around the block as people waited patiently for the clinic to open. I tagged along as the veterinarian triaged and identified sicker (animal) patients. As we walked along she asked, "Anyone sick?" A few people teasingly yelled out, "Yeah, me!"

Perhaps someday soon, we'll be able to address both patients' ailments together.

Alice Tin *completed an internship at the CDC's One Health Office this year, and will present on her experiences at the 2018 International One Health Congress in June before beginning her family medicine residency at the University of Washington School of Medicine.*

BLAIR THORNLEY

RESIDENT EXPERT

BY MINOO D'CRUZ '11 MD'16 RES'19

Medicine Without Borders

Compassion and respect for patients are universal practices.

In an overlooked corner room of Webuye County Hospital in western Kenya, I am seeing patients with Dr. Hussein Elias in clinic as part of his third-year residency outpatient rotation. A fifth-generation Kenyan who completed medical school in Russia (after only a few months of intensive Russian classes), he maintains an infectious enthusiasm for his work despite the many anxious and ill-appearing patients waiting to see him.

As is common in Kenya, Hussein worked for several years as a general practitioner in various settings around the country after his internship year, before he decided his career was "stagnating" and chose to pursue his family medicine residency (Master of Medicine degree) at Moi University. As the only residency based at this rural community hospital, Hussein and his co-residents manage complex cases every day across the clinics, wards, and operating rooms using limited and unpredictable resources.

I am privileged to be in Webuye working with my Kenyan family medicine resident counterparts as part of the AMPATH (Academic Model Providing Access to Healthcare) consortium—an almost-three-decade-old partnership among Moi University School of Medicine, Brown University, and several other North American institutions that work together to deliver health services, conduct health research, and develop health care leaders in North America and Africa. This collaboration has provided a transformative experience for Brown trainees. Despite the confidence gained in my clinical skills back home with each year of residency, seeing patients with Hussein in his clinic is a humbling opportunity to reflect on my own practice.

Our next patient is a 53-year-old female with stage III cervical cancer here for follow-up. Her prognosis is poor, despite several rounds of chemotherapy in neighboring Uganda, made possible by selling her only piece of land. With low rates of cervical cancer screening and awareness, the disease ranks as the most frequent cancer among women in Kenya, and survival rates are generally low because by the time many women see a doctor, the disease has advanced. Hussein is acutely aware of her dire situation, yet his eyes light up in anticipation when her paper chart is handed to him.

Earlier this year, Hussein's program director chose him to head the hospital's fledgling hospice and palliative care program. With no hospice facility in the county and only one dedicated staff nurse, this was not an easy task. He quickly realized the significant need for palliative care in the hospital's catchment, and through his own initiative he applied for and received a grant to train health care workers across the county to improve awareness and create linkage to care.

Hussein steps out to invite the patient, accompanied by several family members, into his office. She appears frail but smiles warmly as she takes a seat. He greets her affectionately in Swahili. At the last visit, she had learned for the first time about the terminal nature of her illness. Hussein tells me she was upset but also relieved to find out she could choose to continue aggressive treatment or not. She returned today with her family to meet the doctor who was honest with her and helped bring some happiness to her life again.

Many thousands of miles away from my own clinic, I am reminded how some moments in medicine seem to transcend all borders.

Minoo D'Cruz *is a family medicine resident at Brown. She grew up in Oman, and was a human biology concentrator as an undergraduate. She is interested in global maternal and child health and plans to practice full-spectrum family medicine, including obstetrics.*

PROTECTING PATIENTS

Sadie Elisseou '06 MD'10 calls her next patient's name into the primary care waiting room on the first floor at the Providence VA Medical Center on a cold, clear morning last December. As he approaches, she greets him with a broad smile and a warm "Good morning! So great to see you."

The patient is a burly, broad-shouldered, middle-aged man who served in Korea, Afghanistan, and Iraq and has diagnoses of depression, anxiety, a traumatic brain injury, alcohol use disorder, and symptoms of post-traumatic stress disorder. For the next 40 minutes, Elisseou, an internist at the VA and assistant professor of medicine at the Warren Alpert Medical School, takes the patient's history, gives him a high five to congratulate his sobriety, performs a physical exam to identify the source of the persistent pain in his lower back, and works with him to develop a treatment plan that takes into account his wariness of medications and the changes in VA coverage for a massage therapist he's found particularly effective.

Elisseou asks each question, performs each maneuver, and gives each directive with professional precision and compassion. As she explains later, she considers every aspect of the encounter an opportunity to maximize her patient's feeling of autonomy and safety. "I am going to reach behind you to get the otoscope," she says, while maintaining a firm hand on his shoulder to establish her presence. After discussing his options for medication, massage therapy, and yoga, Elisseou walks him to the checkout desk, thanks him, and wishes him happy holidays.

Her carefully executed patient interactions fit into a named set of practices that are gaining recognition in the medical community. In September 2017, Elisseou introduced the trauma-informed physical exam framework, upon which these exam maneuvers are based, to the MD Class of 2021. She says there have been no published reports of curricular incorporation of trauma-informed practices at other medical schools—meaning the Warren Alpert Medical School may be the first in the country to include them in an undergraduate medical curriculum.

FAMILY VALUES

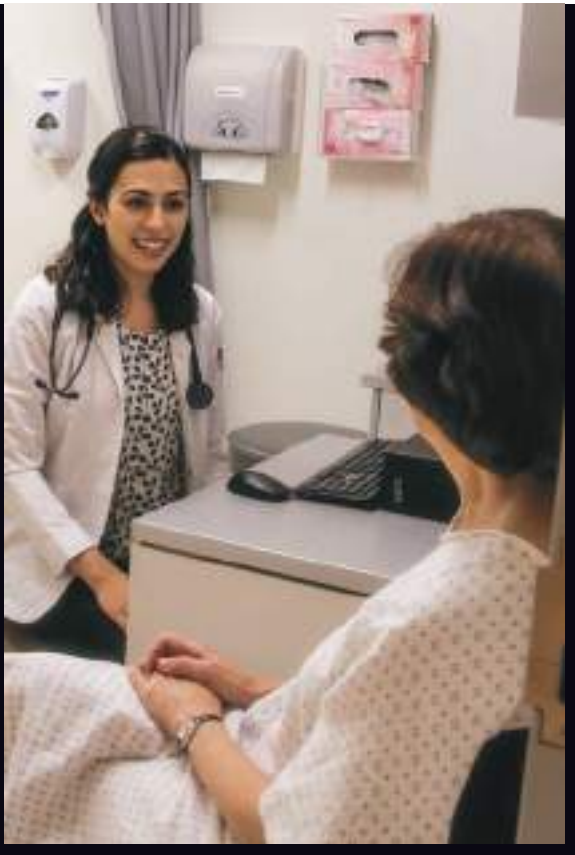
The concept of trauma-informed practice emerged in the late 1980s and early 1990s as providers began to observe the association between mental illness and previous trauma, particularly among women receiving public mental health services. At the same time, researchers were beginning to understand the biological effects of trauma and stress. Trauma-informed practices initially gained traction in the fields of education, psychology, and behavioral health, but the concept is now taking hold in the broader medical community. Both the National Council for Behavioral Health and the Substance Abuse and Mental Health Services Administration (SAMHSA) have invested significant resources in trauma-informed care

BY ANNA DELAMERCED '16 MD'20
AND JOHN SANDERSON MD'21
PHOTOGRAPHS BY JARED DICHIARA

The Warren Alpert Medical School leads the country in training students to provide trauma-informed care.

programs, and the Centers for Disease Control and Prevention has a web page devoted to trauma and trauma-related care. The National Council consults with health care organizations around the country to help improve trauma-informed practices, by ensuring that all staff can screen for and identify trauma in a patient's history, understand and respond to trauma, and avoid re-traumatization. SAMHSA refers to this paradigm as the four Rs: realization, recognition, response, and resistance to re-traumatization.

Elisseou didn't know all of this when she began incorporating trauma-informed care into her practice. Maybe it came naturally to her; her father has an internal medicine practice in Connecticut, and her mother manages the office. She says her parents taught her and her brother and sister the importance of love and affection for one another and for others, making them kiss each other good night—"something which we despised at the time, but are now grateful for it, since we're best friends," she says—and to greet adults "with eye contact and a firm handshake." As an undergrad and then a medical student in Brown's Program in Liberal Medical Education, Elisseou began to see how she could apply these values of kindness and communication in her interactions with patients. "I made it a priority to do everything I could to make my patients feel as comfortable as possible in the interview and, particularly, during the physical exam," she says.



A FRIENDLY CONNECTION: Sadie Elisseou, left, with standardized patient Paula Goldberg in the Medical School's clinical suite.

DON'T: Elisseou demonstrates a traditional thyroid exam, where the physician comes from behind the patient and wraps her hands completely around the neck, which can trigger sensations of violent choking.

DO: Instead, Elisseou stands within Goldberg's line of sight, extends her fingers with her thumbs away from the neck, and explains what she's doing and why.

DON'T: In a typical pulmonary exam, the physician stands out of the patient's view, behind her back.

DO: Elisseou stands at Goldberg's side to perform the pulmonary exam, keeping a reassuring hand on her shoulder.

As Elisseou gained appreciation for the patient interaction and information-gathering components of the physical exam during her internal medicine residency at Yale, so did her understanding of the hazards it posed to people who had previously experienced trauma. "It has the potential to expose patients to shame and vulnerability and triggers of previous trauma," she says. Now, working with veterans, she sees patients daily who have experienced combat-related trauma, military sexual trauma, homelessness, adverse childhood experiences, and other challenging backgrounds. She recalls performing a cardiac exam on one of her first patients at the Providence VA: "I brought my stethoscope from behind my neck to in front of my face, I kind of swung it around, and the patient jumped. He almost jumped off of the exam table."

Her work with a patient population suffering from PTSD, anxiety, and depression helped Elisseou understand the possible benefits of a trauma-sensitive approach. "[The physical exam] has the potential to reinforce the sentiment of care and establish rapport between physician and patient," she says. "I wanted to create a safe space in the examination room where all patients felt comfortable, so we could establish a therapeutic alliance and work toward healing." When she began teaching a small group section in the first-year Doctoring course in 2014, she incorporated many of the techniques she had developed.

Though she worked hard to use exam techniques specifically tailored to avoid re-traumatization of patients in her practice, Elisseou didn't hear the term "trauma informed" until last year, when Meghna Nandi MD'20 and Srav Puranam MD'20 approached her after she led a workshop about the physical exam in trauma survivors. They explained to Elisseou that many of her clinical techniques fit into the formal conception of trauma-informed care: fostering feelings of safety, autonomy, and trust in the patient-physician relationship. "There was so much alignment," Puranam says.

SHARED GOALS

Nandi and Puranam had discovered their mutual interest several weeks before that workshop, as they discussed one of their classes in the anatomy lab locker room. "In our Health Systems Science course, we were learning about a lot of really difficult topics like elder abuse, child abuse, intimate partner violence," Nandi says. She felt the course often didn't acknowledge that these issues may have affected people in the room. "Providers and health practitioners are also humans who are just as susceptible to experiencing all these things," she says.

Puranam agreed, and they began to look for more places in the first-year curriculum that could better prepare students to care for patients affected by trauma and cope with the widespread phenomenon of vicarious trauma among physicians and trainees. Ultimately they decided a preclinical elective about trauma-informed care would be the most comprehensive way to introduce these concepts, and they asked Elisseou to be their faculty adviser as they developed the course.

While trauma often conjures images of extreme violence and physical injury, the range of events that can trigger adverse biological reactions and avoidance behaviors is much broader. A 2013 study published in the *Journal of Traumatic Stress* defined a traumatic event as one that produced physical injury, one that elicited fear of physical injury or death, or "any [other] extraordinarily stressful event or situation." Using these criteria, plus follow-up questions to determine the context and severity of any such event, the authors concluded that 89.7 percent of participants had experienced at least one trauma. However, fewer than 10 percent of these participants showed signs of PTSD, which is a hurdle that Karen Johnson, MSW, LCSW, the senior director of Trauma-Informed Services at the National Council for Behavioral Health, sees in medical practice. "Only looking for diagnos-

able PTSD or another mental illness is a mistake," Johnson says. "Trauma manifests itself in many different ways."

Evidence points to an association between adverse childhood events and poor health outcomes later in life. In a survey-based study of 9,500 respondents from a single HMO group, published in the *American Journal of Preventative Medicine* in 1998, people exposed to traumatic events during childhood were found to have a tremendously increased risk for smoking, alcoholism, drug abuse, depression, suicide attempts, sexually transmitted disease, obesity, heart disease, cancer, lung disease, liver disease, and fractures.

So-called "high-risk behaviors" and their associated negative health effects only tell half of the story, however. Fears of re-traumatization during medical encounters, such as the physical exam, can cause traumatized patients to avoid the health care system altogether, compounding the effects of their physical ailments. Empowering patients by reestablishing feelings of safety, autonomy, and trust could help them overcome these fears. "When you experience something traumatic, you lose your sense of control over what's happening," Nandi says. Ideally, a trauma-informed approach restores these feelings to the patient in the medical environment, mitigating the cause of some of these negative health outcomes.

> "When you experience something traumatic, you lose your sense of control over what's happening."

A NEW FRAMEWORK

After Nandi and Puranam introduced her to the field of trauma-informed care, Elisseou began to assemble her physical exam maneuvers into the standardized framework she would ultimately teach in the Doctoring course. Though the concept of trauma-informed care has been around for decades, such a specific framework, focused on its application to the physical exam, did not exist. Elisseou's framework includes specific language and behaviors to employ before, during, and after a routine medical exam in order create a safe environment and avoid triggers of prior trauma.

For example, in a traditional thyroid exam a physician will stand behind the patient, outside of the patient's field of vision, and wrap their hands completely around the patient's neck. Such a maneuver can trigger sensations of violent choking, she says. "This instead can be done with the practitioner standing at the patient's side, within their eyesight, with the fingers extended, the thumbs away from the neck, and saying to the patient: 'I am going to place my hands on the neck in order to examine the thyroid. When you can, please swallow,'" Elisseou says. "This lets the patient know exactly what you're doing and why, and it avoids the sensation of choking."

Elisseou's thyroid exam highlights some of trauma-informed care's basic tenets: remaining in the patient's field of vision; explaining the procedure and its purpose clearly; and employing maneuvers that are intentional and sensitive to the feelings they cause. Similarly, Elisseou says having patients sit slightly upright during a pelvic exam both minimizes the patient's physical vulnerability and allows them to maintain visual contact with the provider.

She also emphasizes the deliberate use of language in creating a trauma-informed atmosphere during the examination. "We hear physicians and trainees say 'for me' all the time when they're giving patients instructions," Elisseou says. "Sometimes this phrase can enhance the power differential between physician and patient, and can even, in certain cases, be sexually suggestive and inappropriate. For example: 'swallow for me,' 'bend over for me,' 'lower your gown for me,' 'take off your shirt for me.'" She instead refers to parts of the patient's body using the article "the," rather than the more personalizing "your." "It feels different to hear, 'I'm going to look at your vagina,' versus 'I will now inspect the vagina,'" she says. She gives clear explanations and instructions as another way to enhance the patient's feelings of safety, autonomy, and trust.

In spring 2017, Elisseou introduced her framework to students in an optional workshop, with hands-on practice. Student feedback was overwhelmingly positive. Sukrit Jain

'16 MD'20 says the workshop made him aware of his body positioning and language choice during patient encounters. "I always place myself in the patient's line of sight now, and I try to inform my patients of the reasons behind my physical exam maneuvers," he says.

Nandi, Puranam, and Elisseou were moved by such responses. "We've been so humbled by our peers, our colleagues," Puranam says. "People we respect and look up to are finding value in this. It shows that our medical community is seeking a framework like this."

BABY STEPS

Elisseou's framework fits into a wider scope of practices that create a trauma-informed environment within an organization, many of which occur outside of the exam room. "In a trauma-informed primary care setting, we know that all staff are equipped to identify and address trauma among the people they're working with. They understand, recognize, and respond to all types of trauma and they always avoid re-traumatizing anyone," the National Council's Karen Johnson says. "People understand and embrace cultural competence and humility." But this requires buy-in from all employees at a care center: custodians, receptionists, medical assistants, nurses, case managers, and physicians. The criteria for and implementation of these practices is not yet uniform, which has hindered their widespread adoption. The National Council is assembling a "change package" to guide primary care organizations seeking to become trauma informed, Johnson says, and she's considering including Elisseou's physical exam guidelines. "The goal is to create this tool that is actionable, usable, and consumable that primary care providers and everyone working in that setting will be able to take and use to move forward trauma-informed primary care," she says.

> "As long as we approach our patients with love, the outcome will usually be OK."

The team is also excited about the potential of this framework to help providers cope with some of the insidious challenges of practicing medicine. A 2011 meta-analysis published in *Academic Medicine* found that students enter medical school with, on average, more empathy than the general population. Four years later, after completing undergraduate medical training, they are less empathetic than their peers outside of the medical world. More than ever, physicians identify the broad notion of "burnout" as the enemy of empathy. Elisseou sees a framework for trauma-informed care as a potential antidote. "I think that burnout inhibits our function on many levels," she says. "However, when empathy is hard to call up and compassion is hard to find, we can rely on learned skills in the form of a trusty framework or a checklist that can still get the message across." Puranam and Nandi add that helping providers better understand the contexts, histories, and environments of their patients could enable tired and frustrated students, residents, and physicians to harness empathy.

Last year Elisseou, by then the course leader for first-year Doctoring, decided to integrate trauma-informed care into the standard curriculum. She says the response has been positive: "I have gotten feedback from first-year medical students that this is an exciting subject that they look forward to practicing with patients at their mentor sites." Vivian Chan MD'21 says that she has employed the skills she learned from that lecture during her weekly mentor sessions at the Providence VA. "It is a more empowering, and more comfortable, kind of approach," she says.

Such comprehensive organizational change is not without its challenges. In primary care settings, "staff are often overwhelmed, and may feel ill equipped to meet the needs of people with long-term complex health issues," Johnson says. "How do we create a tool that people can take and use and not put on the shelf? That's our biggest challenge. We want it to be as usable as and as relevant as possible." In her mind, a major component of overcoming this obstacle is the collection and analysis of data that prove that this slow and complicated process can lead to tangible impacts on patient health outcomes.

DON'T: To measure blood pressure, the physician stands in front of her, pressing against her knees, while the patient leans to keep her arm extended around the physician's body.

DO: Elisseou stands at Goldberg's side and fully supports the patient's arm under her own.

Recently, small studies have shown such benefits. In December 2016, the McSilver Institute for Poverty Policy and Research released their evaluation of the Trauma-Informed Primary Care Initiative (TIPCI), a small pilot program sponsored by Kaiser Permanente and the National Council. TIPCI tested the implementation of comprehensive trauma-informed practices at 14 federally qualified health centers using small Core Implementation Teams, each composed of employees in various positions at each site. After 10 months of on-site implementation, the 10 sites that responded to organizational self-assessment questionnaires at the beginning and end of the trial period all showed improvement, with the greatest progress associated with the largest time investments in data collection, patient screening, and workforce development. Critically, patients who received care at the centers participating in this brief trial showed some improvements in health outcomes, most impressively in management of diabetes. In one clinic, 75 percent of people categorized as having "high-risk" diabetes at the beginning of the trial were classified as having it "controlled" by the end.

"It's very difficult for organizations to take the long view, to understand this is baby steps. This is years in the making—I would argue decades in the making," Johnson says. "Some of the work is about making sure we do have the data to prove that this is what providers need to invest in."

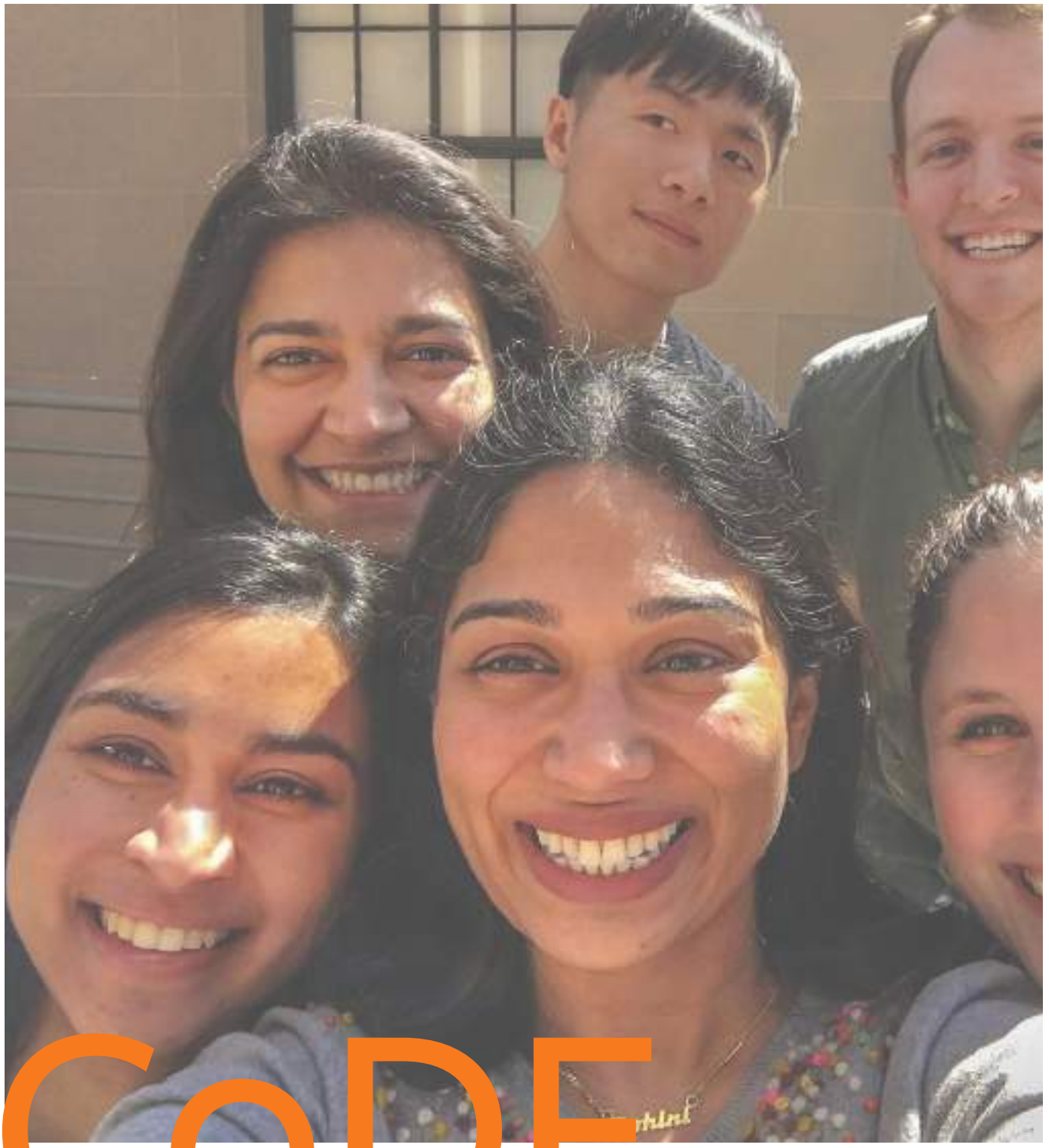
RIPPLE EFFECT

Elisseou will continue to refine the framework and, with Puranam and Nandi, collect data on its effectiveness in the medical education and patient care settings. They will publish a description of their workshop this month in *Medical Education* as part of the journal's series on innovation in medical education. The team also will present the data they've collected at internal medicine grand rounds at the Providence VA; run a webinar for the SAMHSA-HRSA Center for Integrated Health Services; and plan to publish their findings in a peer-reviewed academic journal in the near future.

Already, Nandi and Puranam have noticed a cultural shift at school. They say their peers regularly share observations of the impact that the new practices have on their interactions with patients. Ultimately they envision trauma-informed care becoming an integral part of medical education beyond a single lecture or workshop. Nandi hopes it will be "the lens through which the Doctoring curriculum looks."

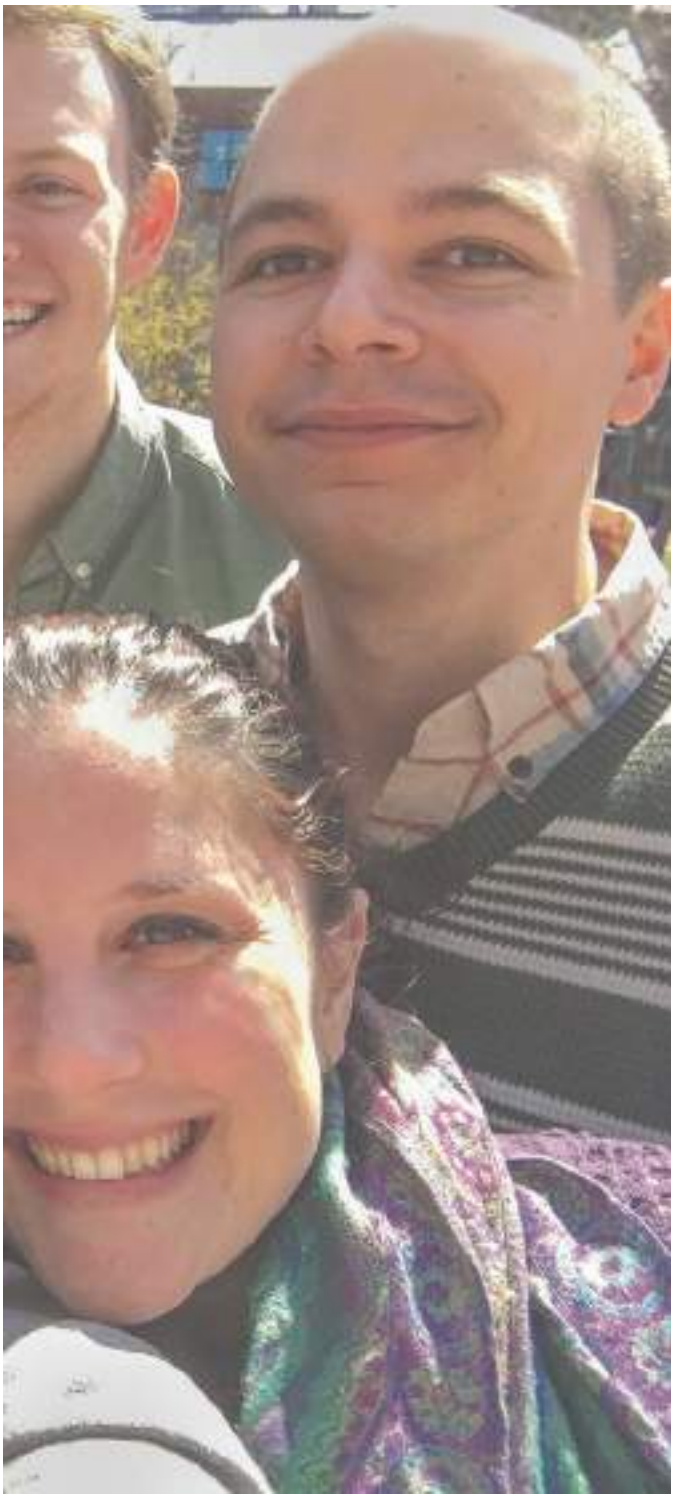
Elisseou echoes that hope, finding inspiration in a potential ripple effect across the medical field. "That's what makes me wake up early and go to bed late working on this—knowing that this can have an impact on real patients," she says. The development, refinement, and integration of the trauma-informed physical exam framework will achieve a much simpler mission, she adds. "As long as we approach our patients with love, the outcome will usually be OK," Elisseou says. "My hope in teaching the trauma-informed physical exam is to promote skills that communicate compassion, to have an impact on the way our patients feel when they are with us—I want them to feel safe, to feel loved. The mission of my life is love."

Anna Delamerced *was a public health concentrator at Brown and is a third-year medical student in the Primary Care-Population Medicine Program. She is interested in the crossroads of medicine and journalism, and the power of people's stories to raise awareness and spur change.* **John Sanderson** *majored in biology and English at Williams College. Before starting medical school, he researched Parkinson's disease at Brigham and Women's Hospital.*



CODETAL

SELFIE TIME: The Ramachandran Lab, from left, front row: Priyanka Nakka, Sohini Ramachandran, and Lauren Alpert Sugden; back row: Sahar Shahamatdar, Wei Cheng, Sam Smith, and Michael Turchin. (Not pictured: Kaileigh Ahlquist, Kate Brunson, and Elijah Carrel.)



_KER

BY PHOEBE HALL

PHOTOGRAPH BY SOHINI RAMACHANDRAN

Computational biologist Sohini Ramachandran and her team are mining human genetic data to understand the impact of our ancestry on our health.

Not long after Sohini Ramachandran, PhD, joined the Department of Ecology and Evolutionary Biology, in 2010, Brown's undergraduates were buzzing about the new assistant professor.

"Even though I never took a class with her, I knew who she was," says Sahar Shahamatdar '13 MD'22 PhD'23, who was then an engineering concentrator. "She was well known ... for being an amazing professor and mentor."

Aaron Behr '15, who was studying biology and computer science, heard similar talk. "Dr. Ramachandran was consistently recommended as a really great person to work with, a really great adviser doing really interesting research," he says.

It was the kind of recognition Ramachandran had hoped for when, as a postdoc at Harvard, she was mulling offers for her first faculty appointment. "I really wanted to be in a campus like Brown where I had access to undergraduates and could mentor them," she says.

That's because mentors played a big role in the shaping of her academic career, beginning when she was just 15 years old. In the lab of Stanford biology professor Marcus Feldman, PhD, the high school student found what seemed to her an uncommon degree of acceptance and encouragement. "Not only did he give me my own project and treat me like a researcher, but his whole lab did. That was the culture that he created," she says.

Last year Ramachandran was granted tenure as well as the directorship of Brown's Center for Computational

Molecular Biology (CCMB). Now an associate professor with joint appointments in biology and computer science, she is fulfilling her goal to "pay it forward," regularly welcoming budding young scientists into her lab with equal measures of support and autonomy.

For Behr, now a software developer at Oracle, completing his undergraduate thesis with Ramachandran literally changed his life. "It ended up being such a cool project that I really got to feel like I owned, and she worked really hard to make that feasible," he says. "No doubt I was a candidate of interest to [Oracle] because of my experience."

HEAD START

Ramachandran's path to science began with role models at home. She grew up near Sacramento, where her parents were statistics professors in the California State University system; her sister, Raga, who is seven years older, told one of her biology professors at Stanford about Sohini.

"Raga was very smart herself, and she said, oh, my sister is much smarter," recalls Feldman, a mathematician, theoretical biologist, and pioneer in the field of cultural evolution. Intrigued, he invited Sohini's parents to bring the teenager to his lab. "We started working on our genetic evolution problems, which she picked up how to do very, very quickly," he says. "It staggered me because, you know, you don't often see high school students that smart." He adds: "When people came to my group and they met her, they didn't know she was a high school student. They thought she was a PhD student."

Feldman made a huge impression on Ramachandran, too. "He had students who did their degrees in math and physics and biology, and everyone came together in a really collegial way," she says. "That group showed me at a very young age how wonderful it can be to do collaborative work … and to have this perspective that you can learn from anyone, no matter what their background is."

In 1998 Ramachandran enlisted Feldman to advise her research project for the Westinghouse Science Talent Search, a science competition for high school seniors. She placed fourth in the country, and was the top female finisher. "Of the 40 of us [in the talent search that year], more than 30 have PhDs now, and many of us are professors," she says. "That's really a testament to the fact that mentoring … has a huge influence on young people."

Ramachandran stayed at Stanford, but decided to major in mathematical and computational sciences as an undergrad. By then, her sister was in the MD/PhD program at the University of Pennsylvania. "I didn't really want to compete with her," Ramachandran says. "I thought, I have to do something different from her. And I was still drawn back to biology." As she considered PhD programs, she consulted with Feldman, who was thrilled to welcome her back to the department. And her timing couldn't have been more perfect.

The draft sequence of the human genome was released in 2001; evolutionary and medical geneticists thought they'd struck gold. "The idea was, this is going to unlock all the answers to human health," Ramachandran says. She began working with Feldman to characterize the distribution of human genetic diversity throughout the world. "One genomic sequence doesn't fully capture how human genetic variation, which is quite low compared to other species, is distributed and may contribute to disease," she says. But by using the human genome as a "historical text" for her dissertation, she proposed the serial founder effect model that showed that our genetic diversity today decreases with geographic distance from Africa, where humans originally evolved.

"Those data I analyzed in graduate school pale in comparison to the data we have now, in terms of numbers of individuals and number of genomic sites sequenced," Ramachandran says. But "even with new samples, it's still pretty clear that when humans crossed large continental barriers, they didn't go back, and that is one of the things that's hugely limiting genetic diversity or constraining it in different parts of the world. So the robustness of that pattern is a contribution I feel really excited about."

Ramachandran and Feldman have continued to collaborate since she graduated, in 2007. They just published a paper together in the *Philosophical Transactions of the Royal Society B*; at his 75th birthday celebration last year, she delivered a talk on novel statistical approaches for identifying adaptive mutations. "I don't regard her as a student anymore; I regard her as a friend and colleague," Feldman says. "And she's a very valued colleague."

A COMMON GOAL

After Stanford, Ramachandran was elected to the Harvard Society of Fellows, where for three years she studied coalescent theory, a statistical approach modeling genetic divergence from a common ancestor, with John Wakeley, PhD, a professor of biology.

Around that same time, Brown was building on the success of its undergraduate computational biology concentration to found an interdisciplinary center that would bring together expertise in biology, math, and computer science to mine genetic data for answers to questions about evolution, ecology, and disease. The new Center for Computational Molecular Biology needed faculty, and Ramachandran took note.

"The center is really one of the things that drew me to Brown," she says. "The fact that I was going to … have close colleagues in computer science and applied mathematics and biostatistics was a huge decider for me."

Ramachandran chose Ecology and Evolutionary Biology as her home department even though, she jokes, "I never took a biology class." But this was a "huge bonus for EEB," says department chair David Rand, PhD, the Stephen T. Olney Professor of Natural History, who helped establish CCMB and hire its founding faculty.

"A lot of the best people doing genomics, population genetics, and computational biology were trained in mathematics, statistics, or physics, because the models and data are really statistically complicated," Rand says. Furthermore, her skills met important needs in EEB and University wide. "She's certainly brought expertise in human population genetics and evolution that was missing at Brown," he says. "And her course on biostatistics using R as a programming language has been a huge contribution to the biology curriculum."

Location played a role in Ramachandran's success, too. EEB had no available office or lab space in its buildings, so she wound up in the Center for Information Technology instead. "That's been a real blessing, because being physically so close to [computer science] and to applied math has made collaborating a lot easier," she says.

Rand says "some very exciting papers" have resulted from that proximity. "That's exactly the kind of synergy you look for," he says.

"Often in academia it's thought that interdisciplinary research is the luxury of the senior professor, and as a junior faculty member you really have to build depth and strength in one recognizable discipline," Ramachandran says. "But I think Brown offers an infrastructure for young researchers to do interdisciplinary research that doesn't make those two things mutually exclusive."

Now, as director of CCMB, she says she's excited to grow the center's collaborations further, and "strengthen the interdisciplinary community that's focused on molecular genetics and genomics." And again, it's all about location: next spring the center will move a few blocks north to the newly renovated Brown Office Building, which will also house the Data Science Initiative and the Carney Institute for Brain Science. CCMB is hiring a new computational biologist, as well as a geneticist who specializes in ancient DNA with whom Ramachandran will advise an archaeology postdoc.

"Now with [the Carney Institute] and the Data Science Initiative," she says, "I think that our center is getting rejuvenated … and also is an example of a successful way to bridge so many different disciplines in working on a common goal together."

METHOD WOMAN

Before she came to Brown, Ramachandran's research mined human genomes for clues about our ancestry. But over the past several years her focus has changed "in ways I hadn't anticipated," she says. "We're shifting from studying the causes of human genetic variation to the consequences of it."

> "Medical genomics and genomic evolution are fields where we're just awash in a sea of data."

As Ramachandran developed tools for detecting selection and improving genome-wide association studies (known as GWAS), her work became more relevant to clinical researchers who were gathering huge amounts of patient data and needed to interpret it. "Medical genomics and genomic evolution are fields where we're just awash in a sea of data," she says. "But because gathering that data and sequencing it properly and doing quality control is so complicated, the focus of many papers is not usually on new methods, and methodologically extracting the most that they can from that data. And I think right now there's a real space for people who do methods development."

A recent project with St. Jude's Children's Research Hospital exemplifies this. Researchers there wanted to understand why Hispanic-American children with acute lymphoblastic leukemia seemed more likely than kids of European

descent to relapse following the same treatment protocol. To analyze the genetic data, Ramachandran; Ben Raphael, PhD, a former associate professor of computer science at Brown who's now at Princeton; and her graduate student Priyanka Nakka PhD'18 developed PEGASUS, an open-source software package that analyzes gene associations by phenotype. They found multiple pathways to leukemogenesis.

"There are different interacting genes that are producing the same disease in different ancestries," Ramachandran says. The researchers are gathering more samples now, from affected children and their parents, to further test their findings. "We really want to push on it more quantitatively," she says.

Another potential collaboration arose after she gave a talk about PEGASUS to the lab of Abrar Qureshi, MD, MPH, the chair of dermatology. He mentioned that he'd observed an association in his patients between severe psoriasis and type 2 diabetes, both autoimmune diseases. "Is there a chicken and egg? Does one precede the other?" she says. His lab has a lot of data, she says; if she wants to take on this question, her lab has to figure out the best way to analyze it.

"Sometimes I think the view people have about data science or machine learning is a very oversimplified one," Ramachandran says, where there's one tool that can be applied in any data context. But in truth you need a whole toolbox, and her lab is devoted to building the right tool for the right job. There's PEGASUS; and pong, which she devised with Aaron Behr to rapidly visualize and analyze population structure; and SWIF(r), a technique her postdoc Lauren Alpert Sugden ScM'10 PhD'14 developed to identify adaptive mutations in human genomes.

"You have to get pretty enamored with the data. And instead of having a hammer, you actually end up developing a screwdriver, and it has to fit in really well with the data. You have to understand the nuances of the data—the errors that might be generated in the data, the fickle nature of the data," Ramachandran says. To do what she does, she adds, you also have to get excited about the context. "For anyone who is in computational biology, I think the complexities of organisms and the diversity of life are what really draw them and keep them in the field," she says.

As energized as she is by the questions she wants to answer, and the methods she develops to answer them, Ramachandran says the key to her research success has actually been the people she's worked with. "I was once given the advice of starting a collaboration based on the person, not based on the problem," she says. "When you find people that you get along with well, where you learn a lot from each other in conversation, where you have some shared interest that keeps you talking to each other, over time you will find the ideas, and you will do the projects."

She met her future St. Jude's collaborators in 2009 when she gave a talk there, and they knew they wanted to work together. Yet it took years for them to find a project; they finally published their first paper last year. She similarly found collaborators among her colleagues at Brown, and that pushed her to delve into fields she'd never explored before, like epidemiology. "That's what draws me to science, is collaboration," she says. "Letting the personal interaction produce the ideas has been really fruitful for me."

LEADING THE WAY

The importance of people to Ramachandran is evident with a glance around her office. Photos of students, family, and colleagues decorate doors, shelves, her desk, even the lab homepage. When talking about her research she always credits collaborators, including students. She says her work on PEGASUS with Raphael and Nakka took her "whole lab in this new direction." Of a chance meeting with Alpert Sugden when she was an applied math grad student, which turned into a productive postdoctoral fellowship, Ramachandran says, "Those kinds of accidents are really influential in one's career."

> "I didn't appreciate until I became a professor how much my mother made an impression on me."

As a woman in science, Ramachandran is conscious of the role she can play in other women's careers. She says her own path was relatively frictionless, but it took her awhile to see what she'd taken for granted. "I didn't appreciate until really I became a professor how much my mother made an impression on me," she says. Even though she had only two female professors in college, "it really didn't occur

GLOBAL VIEW: Sam Smith PhD'23 (left) is a graduate student in Ramachandran's lab.

COURTESY RAMACHANDRAN LAB

to me that I was in a minority somehow, or to think, oh, I couldn't … be the person teaching. I just thought I could do it because I'd seen it."

Now Ramachandran tries to be that inspiration. She's been a faculty speaker for the Artemis Project, a free computer science camp for ninth-grade girls that's run by Brown undergrads. "I wish they had had that kind of camp when I was little," she says, "just to be in that environment and have it be all female." When her 9-year-old niece recently participated in a summer coding camp, Ramachandran recalls, "She said, there's just one other girl besides me. And I said, well, you can think about me and my lab. There are a bunch of women who do this. And she said, I wish there were more girls. She really enjoyed it, but it was sad to hear her remark on that. I wish that would've been different."

Sahar Shahamatdar says she was lucky: even though her science and technology magnet high school and the undergraduate engineering program at Brown were heavily male, "I always felt I had strong mentors I could rely on." Joining Ramachandran's lab last year was another stroke of luck. "Everything just clicked. She was extremely helpful in helping me set up and learn about genomics," Shahamatdar says. "She was more than willing to meet with me at any time to talk about research, to talk about what I envision my MD/PhD to look like." She adds, "It's really inspiring to have her as a role model."

Ramachandran is universally admired, Aaron Behr says. "Something that's really special about her as an adviser—she really takes the time to think about the needs and learning styles and skills of everyone in her lab, and her students as well," he says. "I think it shows in that she's very adored by all of her students and her lab members."

And they genuinely have fun together. They go on weekend retreats to Ramachandran's in-laws' house in Mid-Coast Maine, to cook and hike and share downtime. They've done Escape the Room puzzles, and they play trivia games in the lab. When most of the group gathered on a cold day in early April to take a selfie in front of the CIT building for this story, they were crying with laughter.

That cohesiveness, both Shahamatdar and Behr say, is thanks to Ramachandran's open, engaged leadership style. "It always really impressed me how much Sohini was thinking about other ways to improve, even though she does such a good job," Behr says. Her husband, Assistant Professor of History Jeremy Mumford, PhD, and their daughters, ages 5 and 1, come to Maine with them, but the retreats aren't all recreation. "We each prepared three talks throughout the weekend, which was really intense," Behr says of one retreat. But he got to learn more about his labmates' research, and "it was a great way to practice giving a lot of talks on the fly."

Besides team building and professional development, Ramachandran looks forward to the retreats as a chance to discuss the direction the lab's going and plan the year ahead. "It helps solidify the themes that we're focusing on," she says.

Shahamatdar says she respects how openly Ramachandran shares her vision and takes feedback. "She fosters a very collaborative environment," she says. "We're expected to come in every day, and that's not so that we sit there so that she can just see us do work, but it's so that … we can interact with each other and we can interact with her."

Feldman, whose inclusive, cooperative lab culture is a model for Ramachandran's, says ever since his mentee was in high school, she was "always upbeat, always easy to interact with other people, generous with her time." It's been a "treat," he says, to watch her become a consummate scientist, wife, and mother. "I don't think I've ever met anybody who is as personally accomplished in every dimension of life," he says.

And now she's paying that forward, to the next generation of scientists. "I hope that one day I could follow in Sohini's footsteps," Shahamatdar says. If she someday has her own lab, she says, "I would definitely think back on what the lab culture was here, and the types of things that Sohini did, and try to emulate that."

DESTIN

CUT UPS: Meredith Adamo MD'18, Nicole Negbenebor MD'18, Alicia Lu MD'18, and Alice Tin MD'18 (left to right) share some laughs before the big reveal.

PHOTOGRAPHY BY DAVID DELPOIO

ED TO BE

Students in the MD Class of 2018 receive their residency matches.

Residency placement has always been a big deal. But Associate Dean for Medical Education Allan R. Tunkel, MD, PhD, whose own Match Day was 35 years ago, says it wasn't always a party.

"They just handed me an envelope and there was really no celebration after it," he says. "But I think it's appropriate to celebrate—they've worked very hard for almost four years, and this really is the culmination of that process."

And celebrate the MD Class of 2018 did. On March 16, when a record 118 Warren Alpert medical students matched into residency, most of them gathered at the Medical School to sip champagne in their finery with significant others and family members. As the band played and the balloons dropped at exactly noon, they opened the red envelopes that foretold their futures.

Most of this year's graduates will stay in the Northeast, including 12 in Rhode Island; a strong contingent will head to California, and one will go north to Canada. Primary care specialties—family medicine, internal medicine, and pediatrics—accounted for more than a third of placements.

Turn the page to find out where this year's class is going, and for in-depth interviews with three of our newest MDs. ***—Jill Kimball***

ANTICI .... PATION: Ali Rae MD'18 waits patiently for the red envelope that holds his fate.

See more Match Day photos at flickr.com/photos/alpertmedicalschool.

THE LIST

THANKS, MOM AND DAD: Hans Gao '14 MD'18 celebrates with his mother, Xia Qu, left, and father, Baoxi Gao, right.

• *Anesthesiology*

SUSANNAH CREPET
Wake Forest Baptist Medical Center, Wake Forest School of Medicine (*Surgery-Prelim*); Rhode Island Hospital, Warren Alpert Medical School

SEAN CURRAN
University of California, San Francisco-East Bay, UCSF School of Medicine (*Surgery-Prelim*); Rhode Island Hospital, Warren Alpert Medical School

REBECCA HIMMELWRIGHT
Duke University Medical Center, Duke University School of Medicine

JONATHAN NIKNAM
NewYork-Presbyterian Hospital, Weill Cornell Medicine

• *Dermatology*

JOSE GONZALEZ
Stony Brook Medicine, Stony Brook University School of Medicine (*Medicine-Prelim*); Zucker School of Medicine at Hofstra/Northwell

NATALIE MATTHEWS
Beth Israel Deaconess Medical Center, Harvard Medical School (*Transitional*); Michigan Medicine, University of Michigan Medical School

MORAL SUPPORT: Meeka Gandhi MD'17, left, came back to Providence for friends like Ryan Clodfelter MD'18.

NICOLE NEGBENEBOR
Rhode Island Hospital, Warren Alpert Medical School (*Medicine-Prelim*); Rhode Island Hospital, Warren Alpert Medical School

RACHEL THAKORE
Johns Hopkins Hospital, Johns Hopkins School of Medicine (*Medicine-Prelim*); Howard University Hospital, Howard University College of Medicine

• *Emergency Medicine*

ARMON AYANDEH
Boston Medical Center, Boston University School of Medicine

LAURA DEAN
Massachusetts General Hospital, Harvard Medical School

CRISTINA FLORES MONCKEBERG
Emory University School of Medicine

MAURICE HAJJAR
Northwestern Memorial Hospital, Northwestern University Feinberg School of Medicine

DAMILOLA IDOWU
New York University School of Medicine

JEFFREY JULIAN
Icahn School of Medicine at Mount Sinai

GARY KHAMMAHAVONG
Allegheny General Hospital, Drexel University College of Medicine

ALICIA LU
Icahn School of Medicine at Mount Sinai

SHANE PETRITES
Highland Hospital, Alameda Health System

JOSHUA RODRIGUEZ
New York University School of Medicine

GAGANDEEP SINGH
Montefiore Medical Center, Albert Einstein College of Medicine

• *ENT*

JAMES ENG
Baylor College of Medicine

TIAN RAN ZHU
University of California, San Francisco School of Medicine

• *Family Medicine*

REUBEN BAKER
Family Medicine Residency of Idaho

STACY BARTLETT
UPMC Presbyterian/ Shadyside, University of Pittsburgh School of Medicine

MICHAEL DANIELEWICZ
Thomas Jefferson University Family Medicine

RACHEL ELLENBOGEN
Strong Memorial Hospital, University of Rochester School of Medicine and Dentistry

ANDREA HAYNES
College of Community Health Sciences, University of Alabama School of Medicine

PATRICK KELLEY
Strong Memorial Hospital, University

NYC, BABY! Josh Johnson MD'18 is headed to Weill Cornell for a surgery residency.

SOFIA ARONSON '14 MD'18

PUTTING HERSELF OUT THERE

JORDAN EMONT MD'20

HOMETOWN: Born in Latvia; grew up in St. Louis
UNDERGRAD: Brown; biochemistry (PLME)
SPECIALTY: Plastic surgery
RESIDENCY: Northwestern Memorial Hospital/ Jesse Brown VA Medical Center, Northwestern University Feinberg School of Medicine

PATH TO MEDICINE: "My grandma was a paramedic in Siberia for four decades. I was 3 when I decided to be a doctor."

CHOOSING HER SPECIALTY: "When I found plastic surgery, I was really impressed that we give patients multiple decades of a good outcome. We get to follow them throughout their course, we get to build that relationship, and give them back what they lost—give them back whatever made them feel like a person."

BEST ADVICE: "My first-year Doctoring mentor, Doreen Wiggins, told me, never take yourself out of the running. You should always put yourself out there, and go after something that you might secretly feel is bigger than you."

RESIDENCY PROGRAM CRITERIA: "I want to be a baller surgeon, so I need autonomy, I need volume, and I need to see a lot of different things to feel confident dealing with anything that comes through my door when I'm an attending. The second thing I wanted was extracurricular stuff, leadership and research opportunities to jumpstart an academic career, and have the support and infrastructure in place for that. And the last thing, which is nonnegotiable, is the culture, the people, the energy of a place. Because six years is longer than some marriages, so it better be good."

MED SCHOOL EXPERIENCE: "Traveling around meeting people from other schools, you realize how lucky you are to have the people here who support you, who have your back. It's been a really wonderful experience. Like, I actually liked medical school and it can be good! I'm a really happy medical student."

—edited by Phoebe Hall

WATCH videos about Sofia and her classmates at brownmedicinemagazine.org.

RASHAUD SENIOR MD'18

A 'ROCK' FOR FAMILIES

HOMETOWN: Mt. Vernon, NY
UNDERGRAD: Harvard; molecular and cellular biology; premed
SPECIALTY: Family medicine
RESIDENCY: Montefiore Medical Center, Albert Einstein College of Medicine

BE THE CHANGE: "A lot of the work that I did before medical school, as a quality data analyst in a health care company, informed the opportunities available to transform primary care and population health into something that can really change health care as we know it. Rein in those costs and really help people. I'm talking specifically about the poor people, the people who need this kind of work, who need these kinds of solutions."

CHOOSING HIS SPECIALTY: "My grandma passed away in second year, from cancer. It really gave me a lot of insight into the patient perspective. I want to go into family medicine because I want to treat families and help people and be there for them. I may not be the hem-onc doc who's directly involved, but I will be their primary, I will be the one who's their rock as they go through things like this. I think it's powerful to be able to do that for somebody."

RESIDENCY PROGRAM CRITERIA: "Fit: can I be around these people? Do they suck or not? The quality of the training, of course: I'm thankful to God that the programs I was able to interview at were really solid family medicine programs, so that was less of a thing for me to freak out about. It really came down to how close I am to family. If I'm not going to be close, how's the weather? How's quality of life? If I can't be close to family, then everything else needs to be on point. But if it's not on point, then I'm going to want to be a little bit closer to family and have that support network, because residency is going to be tough."

READY FOR ACTION: "The thing I'm most excited about will be finally having a job again, and going back to being a semi-adult, who has a paycheck and has health insurance and can build a life again, and not have the rest of his life being on pause."

ON MATCH DAY: "As we all know, med school is hard. But we fight, and we dig deep, and we fight, and we fall many times, then we try to get up. But then you get up the one last time, and look, I made it. It's Match Day. This is where I find out where I'm going to spend the next however many years. And it's out of your hands, for better or for worse." ***—edited by P.H.***

WATCH videos about Rashaud and his classmates at brownmedicinemagazine.org.

JORDAN EMONT MD'20

of Rochester School of of Medicine and Dentistry
CHRISTOPHER LAM
Ventura County Medical Center, David Geffen School of Medicine
ALLEGRA PARRILLO
Middlesex Hospital, Mayo Clinic Care Network
ELLEN RICHARDSON
Family Medicine Residency of Idaho
KATRINA ROI
Memorial Hospital of Rhode Island, Warren Alpert Medical School
RASHAUD SENIOR
Montefiore Medical Center, Albert Einstein College of Medicine
SUPRIYA SHAH
Greenville Health System, University of South Carolina School of Medicine
ALICE TIN
Swedish Medical Center, University of Washington School of Medicine

- ***Interventional Radiology***

JOSEPH ALBRIGHT
Michigan Medicine,

University of Michigan Medical School

MATTHEW POUW
Newton-Wellesley Hospital, Tufts University School of Medicine (*Transitional*); Rhode Island Hospital, Warren Alpert Medical School

ADAM TUOMI
Rhode Island Hospital, Warren Alpert Medical School (*Medicine-Prelim*); Rhode Island Hospital, Warren Alpert Medical School

• *Medicine*

AILEEN BUI
Ronald Reagan UCLA Medical Center, David Geffen School of Medicine

RYAN CLODFELTER
University of Washington Affiliated Hospitals, UW School of Medicine

CASSANDRA DUARTE
University of Colorado School of Medicine

ERICA DUH
University of California, Irvine Medical Center, UC Irvine School of Medicine

HANS GAO
University of California, San Francisco School of Medicine

NATALIE HALL
Cedars-Sinai Medical Center, David Geffen School of Medicine

NICOLE HEINL
Kaiser Permanente Oakland Medical Center

ISAAC LOPEZ
University of California, San Francisco School of Medicine

JEREMY MUDD
NewYork-Presbyterian Hospital, Columbia University Medical Center

BRING THE KIDS: Natalie Locci-Molina MD'18 (right) and John Molina '08 MD'14 RES'18 made Match Day a family affair.

RACHEL OCCHIOGROSSO
Brigham and Women's Hospital, Harvard Medical School

ANSHUL PARULKAR
Rhode Island Hospital, Warren Alpert Medical School

EIAN PROHL
Ronald Reagan UCLA Medical Center, David Geffen School of Medicine

JACOB RAMOS
Tufts Medical Center, Tufts University School of Medicine

ELISABETH WONG
Yale-New Haven Hospital, Yale School of Medicine

HUZZAH: Jennifer Gutierrez '12 MD'18 is off to the University of North Carolina for pediatrics.

• *Medicine-Pediatrics*

BRYAN LEYVA
University of Minnesota Medical School

TIMOTHY PIAN
Ohio State University Wexner Medical Center, OSU College of Medicine

• *Medicine-Prelim*

JEFFERSON CHEN
Lenox Hill Hospital, Zucker School of Medicine at Hofstra/Northwell

• *Medicine-Primary*

MEREDITH ADAMO
San Francisco General

PRECIOUS CARGO: Alex Morang, director of career development, delivers the news.

Hospital, UCSF School of Medicine
DENNY KIM
New York University School of Medicine

• ***Neurological Surgery***
ABDUL-KAREEM AHMED
University of Maryland Medical Center, University of Maryland School of Medicine
BENJAMIN JOHNSTON
Brigham and Women's Hospital, Harvard Medical School
ALI RAE
Oregon Health & Science University
JUSTIN REMER
Westchester Medical Center, New York Medical College

• ***Neurology***
KWAME ADJEPONG
University of California, San Francisco School of Medicine
RICHARD BUESA
Santa Clara Valley Medical Center, Santa Clara Valley Health and Hospital System (*Medicine-Prelim*); Stanford University Medical Center, Stanford University School of Medicine
BENJAMIN DRAPCHO
Boston Medical Center, Boston University School of Medicine (*Medicine-Prelim*); Boston Medical Center, BUSM

• ***Obstetrics/ Gynecology***
NAOMI ADJEI
Yale-New Haven Hospital, Yale School of Medicine
ANA BERMUDEZ
Ronald Reagan UCLA Medical Center, David Geffen School of Medicine
CHRISTY GANDHI
Women & Infants Hospital, Warren Alpert Medical School
MEGAN GORMAN
Stony Brook University School of Medicine
QUETRELL HEYWARD
Hospital of the University of Pennsylvania, Perelman School of Medicine
NATALIE LOCCI-MOLINA
MedStar Washington Hospital Center, Georgetown University School of Medicine
IGNACIO SANTANA JR.
Kern Medical Center, David Geffen School of Medicine

• ***Ophthalmology***
MATTHEW SANTOS
Barnes-Jewish Hospital, Washington University School of Medicine (*Medicine-Prelim*); Barnes-Jewish Hospital, Washington University School of Medicine
J. YOUNG SEOL
Rhode Island Hospital, Warren Alpert Medical School (*Medicine-Prelim*); New York Eye and Ear Infirmary, Icahn School of Medicine at Mount Sinai
CLAUDINE YEE
Legacy Good Samaritan Medical Center, Legacy Health (*Medicine-Prelim*); Casey Eye Institute, Oregon Health & Science University

ICONS: Roy Ruttiman '12 ScM'15 MD'18 (left) and Noah Donoghue '12 MD'18 pose in front of the photo of them taken at their White Coat Ceremony in 2012. The 7-foot-by-5-foot image hangs in the Medical School's front window.

LAURA DEAN MD'18

FROM THE WEST WING TO MASS GENERAL

HOMETOWN: Bethesda, MD
UNDERGRAD: Harvard; women's studies major, government minor; premed
SPECIALTY: Emergency medicine
RESIDENCY: Massachusetts General Hospital, Harvard Medical School

JORDAN EMONT MD'20

PATH TO MEDICINE: "I did an internship at the White House, for the National Economic Council. I was planning to start med school when I got hired as one of Obama's speechwriters. And then I deferred, and I deferred, and I deferred, again and again. Until Brown said, your MCAT has expired, you haven't taken a science class in five years—are you coming to medical school? I'm coming! I promise, that's what I want to do."

WAIT. BACK UP. YOU WERE OBAMA'S SPEECHWRITER? "I was 22—I'm like, is this real life? I wrote Obama's speech when the statue of Rosa Parks was installed in Statuary Hall. It was particularly meaningful to him. He's really funny. He's just a guy—someone's father and husband. I'm lucky I did a 180 career-wise. If the coolest thing you do is at 25, what do you do next?"

CHOOSING HER SPECIALTY: "I went through every clerkship and I wanted to be every kind of doctor. It's like trying on wedding dresses where they all make you look beautiful and they're all great, and then you try on one, and it's like, oh, that one's just better than all the other ones for me. And so when I did my emergency medicine rotation, it was just clear."

RESIDENCY PROGRAM CRITERIA: "I expect over the next four years to get the clinical basis and exposure that I need to be a great doctor and practice in any setting. My number one goal in residency is not to get divorced. We're not couples matching, but we're couples matching because we're matching as a couple and that's the deal."

MED SCHOOL EXPERIENCE: "I am a total evangelist for medical school. I had the best time. I loved every rotation I went on because the residents and the attendings made that experience worthwhile and engaging for me, and I just feel really grateful to have been at a place that made medical school really fun instead of some terrible slog that it's mythologized to be." ***—edited by P.H.***

WATCH videos about Laura and her classmates at brownmedicinemagazine.org.

• *Orthopaedic Surgery*

ALEXANDRE BOULOS
Rhode Island Hospital, Warren Alpert Medical School

NICHOLAS LEMME
Rhode Island Hospital, Warren Alpert Medical School

NABIL MEHTA
Rush University Medical Center, Rush Medical College

NATHAN THOMAS JR.
Massachusetts General Hospital, Harvard Medical School

• *Pediatrics*

CARLEY GILMAN
St. Louis Children's Hospital, Washington University School of Medicine

RELIEF: Cassandra Duarte MD'18.

for Children, Drexel University College of Medicine

ANNALISE VAN MEURS
Oregon Health & Science University

• ***Pediatrics/Global Health***

ZACHARY TABB
Baylor College of Medicine

• ***Plastic Surgery***

SOFIA ARONSON
Northwestern Memorial Hospital/Jesse Brown VA Medical Center, Northwestern University Feinberg School of Medicine

• ***Physical Medicine and Rehabilitation***

HYUNWOO JUNE CHOO
California Pacific Medical Center, Sutter Health (*Medicine-Prelim*); Rehabilitation Institute of Chicago, Northwestern University Feinberg School of Medicine

• ***Psychiatry***

SAMIA KATE ARTHUR-BENTIL
University of Texas Southwestern Medical Center

UZOAMAKA STEPHANIE ASONYE
New York University School of Medicine

CHARLES FAGUNDES
Stanford University Medical Center, Stanford University School of Medicine

JEANNINE RIDER
Icahn School of Medicine at Mount Sinai

SHAWN VERMA
State University of New York Upstate Medical University

NIESHA VOIGT
NewYork-Presbyterian

JENNIFER GUTIERREZ
University of North Carolina Hospitals, UNC School of Medicine

ALLAN JOSEPH
UPMC Medical Education, University of Pittsburgh School of Medicine

AVIYA LANIS
Montefiore Medical Center, Albert Einstein College of Medicine

CIA PANICKER
Rhode Island Hospital, Warren Alpert Medical School

YESENIA SANCHEZ
Children's Hospital of Philadelphia, Perelman School of Medicine

DANIELLE SANCHO
St. Christopher's Hospital

GOOD TIMES: Gagandeep Singh MD'18 (second from left) flanked by his uncle Jaspal Singh (left) and father, Hardev Singh, pose with (left to right) Sanjiv Singal P'13MD'17, '18MD'22, Anshul Parulkar '10 MD'18, and Anshul's wife, Sanchita Singal '13 MD'17.

ON (THE) LINE: Patrick Kelley MD'18 (left) and Gary Khammahavong MD'18.

Hospital, Columbia University College of Physician and Surgeons

• *Psychiatry-Family Medicine*

EDUARDO GARZA
Boston Medical Center, Boston University School of Medicine

• *Radiation Oncology*

ROHAN KATIPALLY
University of Chicago Medical Center, Pritzker School of Medicine (*Medicine-Prelim*); University of Chicago Medical Center, Pritzker School of Medicine
INDU VORUGANTI
Princess Margaret Cancer Centre, University of Toronto Faculty of Medicine

• *Radiology*

STEPHANIE BLATCH
University of Vermont Medical Center, Larner College of Medicine (*Medicine-Prelim*); UVM Medical Center, Larner College of Medicine
NOAH DONOGHUE
Icahn School of Medicine at Mount Sinai (*Surgery-Prelim*); University of Massachusetts Medical School
CHEICKNA FOFANA
Loma Linda University (*Medicine-Prelim*); Jackson Memorial Hospital, Leonard M. Miller School of Medicine
STEFANO JOHNSON
Roger Williams Medical Center, Boston University School of Medicine (*Medicine- Prelim*); Virginia Mason Medical Center
AMANDA LIU
Tucson Hospitals Medical Education Program, University of Arizona College of Medicine (*Transitional*); University of California, San Francisco School of Medicine
ROY RUTTIMAN
NewYork-Presbyterian Hospital, Columbia University College of Physician & Surgeons, (*Surgery-Prelim*); Johns Hopkins Hospital, Johns Hopkins School of Medicine
ANDREW TAREILA
Rhode Island Hospital, Warren Alpert Medical School (*Medicine-Prelim*); Rhode Island Hospital, Warren Alpert Medical School

• *Surgery*

DANIEL EISENSON
Johns Hopkins Hospital, Johns Hopkins School of Medicine
JOSH JOHNSON
NewYork-Presbyterian Hospital, Weill Cornell Medicine
SEUNGJUN KIM
Rush University Medical Center, Rush Medical College
JAYSON MARWAHA
MedStar Georgetown University Hospital, Georgetown University School of Medicine
SAMUEL MILLER
Yale-New Haven Hospital, Yale School of Medicine
BRANDON NAKASHIMA
University of Southern California, Keck School of Medicine of USC
SAMANTHA ROCHE
Johns Hopkins Hospital, Johns Hopkins School of Medicine
DEWAHAR SENTHOOR
Rhode Island Hospital, Warren Alpert Medical School
JUSTIN YU
Zucker School of Medicine at Hofstra/Northwell
YUQI ZHANG
Yale-New Haven Hospital, Yale School of Medicine

• *Surgery-Prelim*

TOBY EMANUEL
Brigham and Women's Hospital, Harvard Medical School
VIVIAN HSIAO
Harbor-UCLA Medical Center, David Geffen School of Medicine

• *Triple Board*

JASON SARTE
Icahn School of Medicine at Mount Sinai

ALL SMILES: Jason Sarte MD'18 (left) made his sister, Julie, happy by matching in New York City, where she recently moved.

MOMENTUM

The Homestretch

Dear Brown medical community,


Madeline Johns

The cycle of the academic year is truly invigorating. As the spring flowers begin to bloom, we're reminded that we will soon welcome the next class of medical alumni to our community. I'm fortunate to have had the opportunity to meet so many students and hear them talk about the transformational experiences they have had at the Warren Alpert Medical School.

And, of course, to celebrate with them on Match Day. This year two generous Brown alumni, both Medical School parents and volunteer leaders, offered a $125,000 Match for Match Day where gifts to the Brown Medical Annual Fund (BMAF) were matched dollar for dollar. The Brown medical community made more than $134,000 in gifts—exceeding the $125,000 goal—for a total of $259,000. It was a record day for giving to the BMAF, and I am incredibly grateful to all of you who met the challenge. A special shout out to our Dean's Circle members who accounted for 64 percent of our total raised.

With just a couple months left in the fiscal year, I hope you will take a moment to think about your legacy at Brown and how you can continue to help us a build a stronger and brighter future for the generations to come. Whether you choose to join your classmates or fellow parents with a gift to the Brown Medical Annual Fund or to support groundbreaking research, your gift to the *BrownTogether* Campaign will make a difference.

Please visit brunonia.brown.edu to find out how.

With much appreciation,
Bethany solomon
Associate Dean for Biomedical Advancement

Progress to Goal

BROWN TOGETHER

Nick Dentamaro

INVESTING IN RESEARCH

Transforming Science at Brown

What does it take to become a world-class leader in research? First, you need vision. Then you need some capital to make that vision reality.

A new $50 million gift for the Warren Alpert Medical School will further efforts in translational research, transforming biomedical research and discovery into treatments and cures for disease.

Half of the gift, from Brown Chancellor Samuel M. Mencoff ’78 and his wife, Ann S. Mencoff, will be dedicated to establishing endowed professorships and supporting outstanding researchers—from laboratory scientists to physician-scientists—whose discoveries alleviate illness and disease. The remaining $25 million will support medical education and research initiatives.

The gift is a significant boost for the Brown Institute for Translational Science. BITS is establishing teams of scientists and clinicians who drive scientific discoveries that can be developed into medical breakthroughs.

“The groundbreaking research of Brown faculty in the lab can see clinical applications at the bedside of patients in hospitals affiliated with Brown, and then lead to commercial applications,” President Christina Paxson says. “The partnership between academic medicine and local health care providers is one of the essential ingredients for sustaining quality health care and propelling economic progress in Rhode Island.”

“The potential of medical research is almost limitless,” Samuel Mencoff says. “What can be more exciting or important than finding cures and treatments for diseases that burden the lives of patients in Rhode Island and globally?”

Investments like the Mencoff family gift are exciting because they allow faculty to focus their efforts on the next step, which is figuring out how the mechanisms underlying disease can be modulated to generate new treatments, says Jack A. Elias, MD, dean of medicine and biological sciences, professor of medicine, and senior vice president for health affairs. Philanthropic investment can give researchers the agility to pursue new studies or alter their design in response to new data, without the lengthy processes required to pursue federal or foundation grants.

“In recent years, major investments in research in areas like immunology, cell biology, and genetics have provided impressive insights into the basic biology of fundamental processes, such as injury, repair, and neoplasia,” Elias says. “Now we need translational investigations to move from these exciting bodies of new knowledge to understanding the mechanisms that underlie human disease.”

INVESTING IN FACULTY

A Boost for Alzheimer's Prevention

Brown has built a strong team of researchers and clinicians who are making advances in brain imaging, genetics, and pharmacology that have helped open the era of Alzheimer's prevention. A recent $6 million gift from a Brown alumnus and parent will further efforts to help the millions of people who are suffering from this devastating disease—and the millions who have yet to be diagnosed.

The gift established two professorships to help recruit physician-scientists with expertise in both foundational research related to disease development and the stark realities of treating patients with dementia and Alzheimer's. Bringing such translational research to Brown will help accelerate the progress the University has already made in Alzheimer's detection and treatment and will allow its clinicians to collaborate closely on innovative possibilities for prevention.

"This visionary gift will lead to new discoveries, placing Brown in the forefront of the fight against Alzheimer's disease," says Stephen Salloway, MD, professor of neurology and of psychiatry and human behavior, and director of the Memory and Aging Program at Butler Hospital.

With an estimated 125 million people worldwide predicted to have dementia by 2050, whoever develops a breakthrough treatment or cure will change the course of human history.

INVESTING IN STUDENTS

The Researcher's Apprentice

One aspect of the Brown Institute for Translational Science's vision is to expand research and educational opportunities for medical students. Pamela H. Sauber P'20 and Richard A. Sauber P'20 established the Ruth Sauber Research Scholars Fund to do just that.

Each year, interested students can propose either year-long or summer research projects. Natalie Matthews, MPhil MD'18 received a full-year stipend to conduct novel research on melanoma, which is the leading cause of cancer death in women ages 25 to 35. With her research faculty mentor, Abrar Qureshi, MD, MPH, chair of the Department of Dermatology, and epidemiology mentors Eunyoung Cho, ScD, and Wen-Qing Li, PhD, who both hold appointments in dermatology and epidemiology, Matthews is studying the pathology, mortality rate, and genetic factors in people at high risk of developing melanoma. The project also relates to her career path: Matthews will pursue residency training in dermatology at the University of Michigan.

Other students have studied methods for growth plate cartilage injury repair, used biomedical informatics methods to predict the costs of medical liability, and developed new uses for deep brain stimulation for people with Parkinson's disease. The Sauber fund has made it possible for these medical students to pursue their research interests.

Courtesy Matthews

Natalie Matthews

Peter Goldberg

The Hassenfeld Institute Executive Committee (left to right): Phyllis Dennery, Maureen Phipps, and Patrick Vivier.

INVESTING IN INNOVATION

Improving the Lives of Children

The Hassenfeld Child Health Innovation Institute has a bold mission: to make Rhode Island the healthiest place for kids to live. The institute, which was established in 2016 with a $12.5 million gift from Alan Hassenfeld and his family, aims to take advances in child health and bring them to the rest of the world. So far they've focused on three challenges: asthma; healthy weight and obesity; and autism.

These were chosen with three criteria in mind, institute director Patrick Vivier, PhD MD'89 RES'92 says. "One was that it had to be a critically important child health issue," he says. "It also had to be something that we were in a position to look at here in Rhode Island, and try to move the needle to make kids healthier, but also to do really cutting-edge research. And the third piece was we needed to have a team that already were national and international leaders."

The strength of the Hassenfeld institute is the core partnership among Brown, Lifespan, and Women & Infants Hospital, Vivier says. For example, in the asthma initiative (see page 3), faculty who practice at Hasbro Children's Hospital drew upon Brown's strengths in geospatial mapping and biomedical informatics to gather and analyze data that were essential for capturing an $8 million grant from the National Institutes of Health.

In a healthy weight team project, researchers are conducting a series of studies to determine how to prevent excess summer weight gain in children living in low-income communities. In conjunction with the Rhode Island Consortium for Autism Research and Treatment (RI-CART)—a statewide registry for families with children on the spectrum—institute funding supports the development of measures that researchers can use to delineate clinically important, individual differences among children with autism spectrum disorders to better test and target treatments in clinical trials.

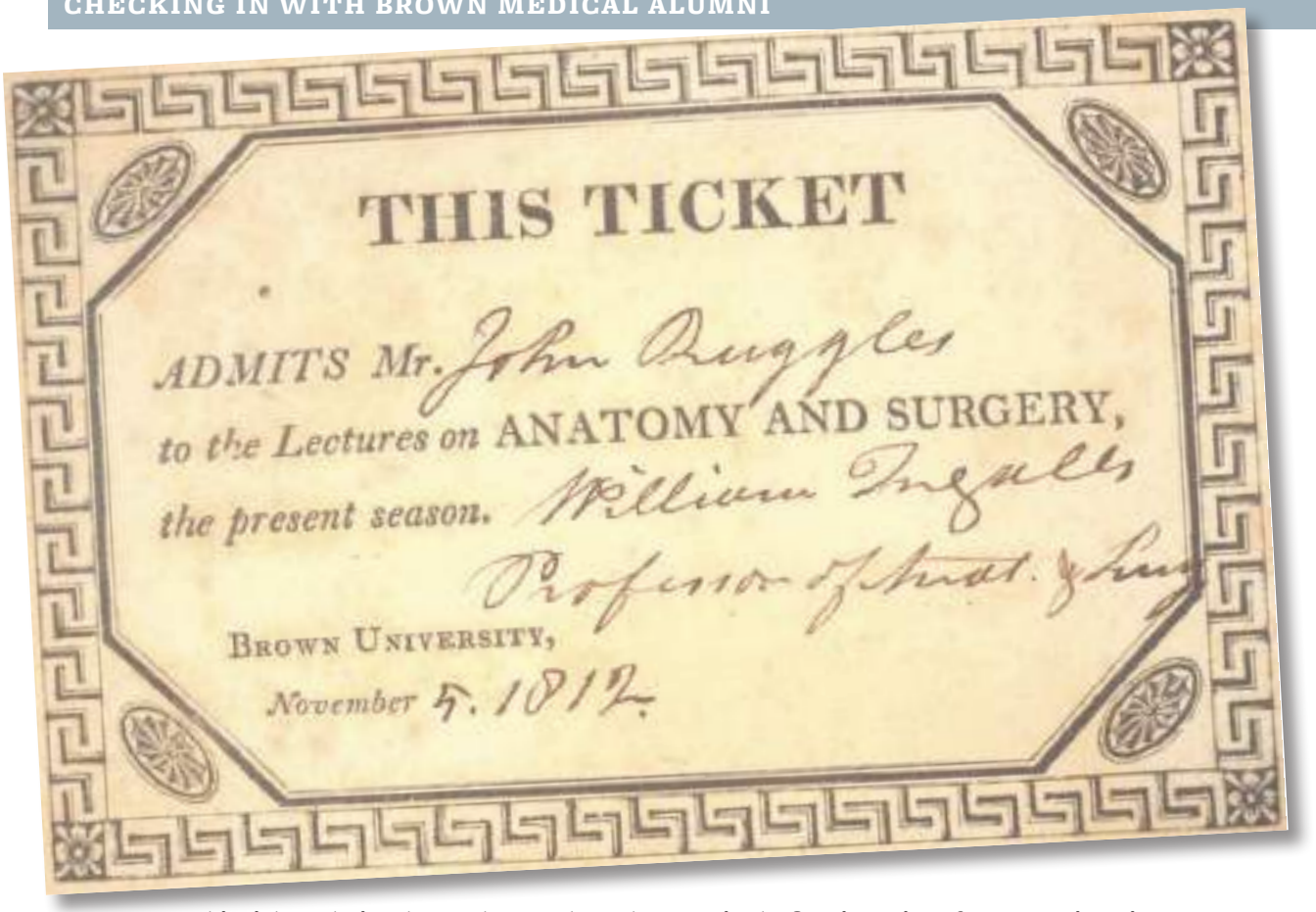
The institute is seeding other research projects, teaching students, and enrolling babies in a statewide birth cohort that will provide information on early determinants of child health and a framework to assess the impact of interventions.

An executive committee that represents the key partners oversees the institute: Vivier, director of Interdisciplinary Education Programs at the Brown University School of Public Health; Phyllis Dennery, MD, the Sylvia Kay Hassenfeld Professor and chair of Pediatrics and medical director of Hasbro Children's Hospital; and Maureen G. Phipps, MD RES'98, the Chace-Joukowsky Professor and chair of Obstetrics and Gynecology and executive chief of obstetrics and gynecology for Care New England.

The Hassenfeld institute is a *BrownTogether* campaign priority. Additional funding is needed to strengthen the birth cohort study by adding follow-up visits to gather more information on development; foster engagement among families whose children are affected by health issues; and cultivate the next generation of child health problem-solvers by providing stipends and advising for students. •

ALUMNI ALBUM

CHECKING IN WITH BROWN MEDICAL ALUMNI


THIS TICKET

ADMITS Mr. John Ruggles
to the Lectures on ANATOMY AND SURGERY,
the present season. William Ingalls
Professor of Anat. & Surg.

BROWN UNIVERSITY,
November 5. 1812.

ADMIT ONE: This ticket admitted Mr. John Ruggles to lectures in the first iteration of Brown University's medical school, which ran from 1811 to 1828. Ruggles did not pursue medicine, ultimately; he studied law and served in the US Senate (D-ME). He was interested in inventions and patents, and is known as the "Father of the US Patent Office."

WARREN ALPERT MEDICAL SCHOOL ARCHIVES

CLASS NOTES

ALUMNI

1975

Glenn Mitchell '67 ScM'69 delivered a TEDx talk, "Medicine's Big Leap is Here" (https://youtu.be/v_GdwpUVW-A), in Harrisburg, PA, last fall. "I finally received the 15 minutes of fame that Andy Warhol promised," he writes. Previously the chief medical officer and chief medical information officer for the Sisters of Mercy Health System, he adds that he "failed at retirement and now I am professor and chair of health care informatics at Harrisburg University of Science and Technology." Contact Glenn at mitchellmd2012@gmail.com.

ANYTHING TO SHARE?

Career news, weddings, births—your classmates want to know. Go to **med.brown.edu/alumni** and click on "Updates and Class Notes."

1978

James Guanci '75 is a recently retired diagnostic radiologist now living with his wife of 39 years, Rosemary Guanci, in Hernando, FL. He also has a summer home in North Kingstown, RI. He has three adult children and two grandchildren with a third grandchild on the way. Jim writes that he's "thoroughly enjoying retirement with multiple activities and friends. Looking forward to the 40th reunion for the MD Class of '78. Hoping to see many of my old classmates there."

Gary Neidich '74 is section head for pediatric gastroenterology at the University of South Dakota Sanford School of Medicine and the recipient of the Department of Pediatrics Master Clini-

EYE
ON ALUMNI

The Messenger

Philip Chan is getting the word out about PrEP.

Pre-exposure prophylaxis (PrEP) is a daily pill that prevents HIV infection and transmission with up to 99 percent effectiveness. Tens of millions of people who are at high risk for contracting the virus that causes AIDS would benefit; yet worldwide only about 200,000 people are taking the preventive antiretrovirals.

Infectious diseases physician Philip Chan, MD, MS, RES'09 F'11 treats patients with HIV and prescribes PrEP at The Miriam Hospital Immunology Center, where he's the director of HIV/STD Testing and Prevention Services. But more and more, he's embracing his role as communicator and educator, bringing the message of PrEP to the community and his colleagues.

"PrEP was approved by the FDA in July 2012," says Chan, who's also an assistant professor of medicine at the Warren Alpert Medical School. "But whether it be primary care doctors or patients, a lot of people haven't heard about it."

Chan spreads the word at a myriad of venues. He talks to individual patients. He helps run the Brown University AIDS Program, which trains providers, community organizations, and laypeople. He's got undergraduate, medical, and other graduate students in the clinic. He shows up at LGBTQ events, including Pride and Trans Day of Remembrance. He sits on the boards of and collaborates with local health and outreach organizations. And he works part time for the state Department of Health as the consultant medical director for the Center for HIV, Hepatitis, STDs, and TB Epidemiology.

> "You can really treat the whole person, and not just the disease."

Community engagement has been central to Chan's practice since he arrived in Rhode Island for his internal medicine residency in 2006, and one of the reasons he stayed. "To really make a difference in your community, you really have to be part of the community," the Concord, NH, native says. "Through fellowship and through residency, I'd started to make these connections." By then he'd also grown family roots in the Ocean State: his wife, Juliette, is a Rhode Islander, and they live near her parents, in Lincoln, with their kids Aliza, 10, and Asher, 6.

Chan always wanted to follow in his doctor father's footsteps. At the University of Vermont he earned degrees in microbiology and molecular genetics as well as medicine. But he was equally attracted to the public health aspect of HIV. "A lot of different social determinants of health intersect … things like homelessness and poverty, a lot of other comorbid diseases—substance abuse, mental health," he says. "You can really treat the whole person, and not just the disease."

In Rhode Island, according to research Chan conducted during his infectious diseases fellowship, gay and bisexual men account for about 70 percent of new HIV diagnoses. PrEP

KAREN PHILIPPI

HEALTH CARE ACCESS: Philip Chan at the bus stop in front of the STD clinic on North Main Street. "Lack of transportation is an important barrier to accessing health care for some of our population," he says.

"really has the potential to disrupt that transmission, and really address HIV, especially among gay and bisexual men," Chan says.

He posits that because the people most at risk are young and otherwise healthy, they're not engaging with the health care system, so they're less likely to learn about PrEP. But even if they do go in for a checkup, their primary care physician may not know about it, or may be reluctant to talk about sexual health. Many who are taking PrEP are proactive about their health, he says.

"We do worry that we're not reaching the people that need it most, people who may not remember to take medicine every day, due to a multitude of reasons, whether it be mental health or substance abuse," Chan says. "Given that those intersect with HIV risk, those are really the people that we want to get this out to." New formulations of PrEP, including implants and long-acting injectables, are in the works.

Critics of PrEP note that it doesn't prevent other STDs, and it could encourage risky behavior like not using condoms if people aren't worried about HIV. "There is evidence starting to point to that," Chan says. And rates of syphilis, chlamydia, and gonorrhea seem to be on the rise. Chan weighs those diseases, many of which are curable, against HIV, which isn't. He also says observed increases may be due to more and better testing, which "would actually be a success."

Rhode Island, with its small size and compact health care and research community, is the perfect place to address challenges and figure out what works, Chan says. "We have some very strong collaborations across the country," he says. "We're trying to set up some models here [to address HIV and STDs] that we can replicate elsewhere."

—Phoebe Hall

cian Award and the Sanford School of Medicine Class of 1983 Annual Award for Excellence in Teaching and Service to the School of Medicine.

1986

Mara Coyle, P'15ScM'16, a professor of pediatrics at the Warren Alpert Medical School, was invited to serve as a scientific reviewer for the PCORI (Patient Centered Outcome Research Institute) Funding Announcement on Medication-Assisted Treatment (MAT) Delivery for Pregnant Women with Substance Use Disorder involving Prescription Opioids and/or Heroin. Mara is a staff neonatologist at Women & Infants Hospital.

Merrill Reuter, PhD MMS'86 celebrated the marriage of his eldest child, Seth, to Danica Samuels, in January, in Fort Lauderdale, FL. **Marlene Cutitar** '83 RES'92 and her husband, Donald, attended the nuptials. "It's hard to believe Merrill and I have known each other since the first day of medical school at Brown almost 36 years ago!" Marlene writes.

1989

Harry Duran, MPH, PhD, has been appointed medical director at the Las Vegas Recovery Center. Harry is board certified in occupational and environmental medicine and in the addiction medicine subspecialty of the American Board of Preventive Medicine. He previously served as the County Health Officer for Elko County, NV.

1990

Peter Baziotis was sworn in as president of the board of directors of the YMCA of Pawtucket in February. An anesthesiologist who completed his residency and fellowship at Yale, he previously served as vice president of the YMCA of Pawtucket.

1991

James Rost was appointed to the board of directors at Mary's Center, a community health center that provides health care, family literacy, and social services in the DC metro area. Jim is vice president and chief medical officer at Adventist HealthCare Washington Adventist Hospital and a neonatologist and pediatrician.

> "It's hard to believe Merrill and I have known each other since the first day of medical school at Brown ..."

1993

Navin Singh '90 writes to announce his marriage to Stephanie Kauffman. Navin is a plastic surgeon at Washingtonian Plastic Surgery and an assistant

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EYE
ON ALUMNI

Micropractice with a Difference

Is direct primary care the remedy to physician burnout?

Lauren Hedde and Mark Turshen

Hour-long office visits with your primary care provider. The ability to email or text your doctor 24/7. The occasional house call. They're the hallmarks of service at Direct Doctors, a North Kingstown, RI, family medicine practice coowned by Lauren Hedde, DO RES'14 and Mark Turshen, MD RES'15.

Direct Doctors is the only micropractice in the state that doesn't accept insurance. "Because we cut that whole thing out, we can see a lot fewer patients and spend much more time with each one," Hedde says. Taking insurance means more staff; "In order to pay for this extra staff you have to see more patients, and in order to see more patients you need more support staff. There's a snowball effect," she says.

Hedde and Turshen are the only staff at Direct Doctors, which operates on a subscription model: an affordable monthly fee set according to the age of the patient. Overhead is low: when you enter the waiting room, no receptionist checks you in. A sign directs patients to ring a bell and their own physician greets them.

The pair, who met as family medicine residents at Memorial Hospital of Rhode Island, wanted to practice direct primary care to focus their time and energies on caring for patients, rather than filling out checklists to satisfy insurance requirements. And, as occasional patients themselves, they understood that many patients find their interactions with providers unsatisfying.

"It takes a long time to get an appointment, and then you sit in the waiting room for an hour to see the doctor for 10 minutes, and the whole time they are typing on their computer so they can get ahead of their charting. It doesn't feel very personal," Turshen says. "When we were residents, it felt like we were doing a lot of things to help the insurance and the billing, rather than the patient. That didn't make sense."

Hedde started the practice in August 2014 and says she broke even by about four months. But "break even" doesn't necessarily equate to the six-figure salaries offered to doctors right out of residency. Hedde and Turshen each have between 400 and 500 patients, compared to perhaps 2,000 patients per primary care doctor in a typical practice. They could take more patients and earn as much as their conventional counterparts, Turshen says—"or you can make less, but you work the way you want to."

Instead they place a high value on having flexibility and control of their schedules. "Both of us have three children; my youngest is 6 months," Hedde says. "We want to be with our families, and we can schedule around that." And patients don't take advantage of the access. "We have rarely been called in the middle of the night, and when we have, it's been warranted," she says.

They say their model enables better medicine because they can spend more time with their patients. Turshen describes one patient who came to the practice with type 1 diabetes that had not been well controlled for 11 years. After nine months, the patient's blood glucose levels were in a healthy range. They also say their increased availability has saved patients money, like keeping a patient out of the emergency room, or helping another patient with a rare disease get a timely diagnosis instead of bouncing from one specialist to another.

Hedde says their approach isn't for everyone: "You have to like running a business and you have to accept business risk." But she says physicians frustrated by overbooked schedules and insurance demands might consider it as an alternative to quitting their profession.

> "We can see fewer patients and spend more time with each one."

"Doctors are burning out because they aren't getting those rewarding moments that keep us invested and enjoying what we are doing," she says. The Direct Doctors model might just be the antidote. ***—Mary Stuart***

COURTESY HEDDE/TURSHEN

professor of plastic surgery at the Johns Hopkins University School of Medicine.

1996

John Anastasatos '92 established a private practice in Beverly Hills focusing on operative and non-invasive cosmetic treatments. He's also an expert reviewer in plastic surgery for the Medical Board of California. Before moving to Southern California, John was an assistant professor of plastic surgery at the University of Alabama in Birmingham and an attending surgeon at UAB Hospital, the Children's Hospital of Alabama, and the Birmingham VA Medical Center. He enjoys sailing and cycling. You can reach him at drjohnanastasatos@gmail.com.

EYE ON ALUMNI

Health on the Hill

A Brown alumna returns to the fold.


Vanessa Britto

Vanessa Britto, MD RES'89 F'91 MMSc'96 says she "backed into" college health. Early in her career, she divided her time between her private internal medicine practice and duties as a college physician at Stonehill College in Easton, MA. Then she accompanied a group of undergraduate students on a service mission in Peru, and her passion for working with students deepened. She subsequently became director of health services at Wellesley College, a position she held for 16 years.

Now she's back on her old stomping ground. A graduate of Dartmouth and the University of Illinois College of Medicine, she completed the primary care internal medicine residency program, General Internal Medicine Fellowship, and a master's at Brown, and she met her husband, neurologist Galen Henderson MD'93, here. "We got married on Commencement Weekend—25 years ago," she says.

In January Britto returned to campus as assistant vice president of campus life and student services and executive director of health and wellness. She says her attraction to student health services aligns with her study of community health as a graduate student. "I got a taste of how to think about populations and population health and how to steward over a community; about the issues they grapple with, and social determinants of health," she says. For college health, this means the factors that support or challenge students in meeting their goals of academic success, a prosperous life, and staying healthy.

That mission goes well beyond sick visits. "This is the time to talk to people about issues such as the importance of sleep and not pulling all-nighters," Britto says. Stress reduction is also important, especially since the second decade is when many previously undiagnosed mental health issues emerge, exacerbated by stress.

"How can we help the student with a heavy work schedule and an emerging thyroid issue that keeps him up at night? And how can we teach that student to advocate for himself?" she says. University health and counseling services are not silos of care; they're deeply integrated into the life of the school and play a fundamental role in shaping how effectively students are supported and engage in their academics. "It's a unique type of medicine," she says.

Against the stereotype that college health revolves around sore throats, mono, and contraceptives, Britto says she's seen a greater variety of things than she would have in private practice, in part because of the diversity of college populations. One student presented with a rash, which turned out to be an African tick-borne disease; she had just returned from her home in Africa. "I have a saying," Britto says: "'This is not your grandmother's health service.'" ***—M.S.***

NICK DENTAMARO

1998

Adda Winkes '94 is a pediatrician at Pen Bay Medical Center in Rockport, ME. She and her husband, Tim, have three children. "I love the area and my colleagues!" she writes. "Hoping to see some of you at the reunion in May and please come visit if you're in Maine!"

1999

Gloria Browne '94 joined the Amelia Medical Plaza in Bainbridge, GA, where she practices family medicine. She completed residency at Martin Army Community Hospital in Ft. Benning, GA, and then was assigned to a community hospital in Stuttgart, Germany. She was deployed to Iraq, where she became a medical adviser to the battalion commander. After several other active duty posts, Gloria joined the reserves, where she now is a colonel at her base in Mobile, AL.

2012

Nilay Patel '08 and **Alisha Lakhani** '08 MD'14 RES'17 were married October 7, 2017, in Newport, RI. Nilay was a chief medical resident at Massachusetts General Hospital and will complete his cardiology fellowship in 2019. Alisha is a first-year rheumatology fellow at UMass Memorial Medical Center. More than 50 Brown and Warren Alpert Medical School alums attended the celebration.

2014

Heather Jones is a pediatrician at Canton-Potsdam Hospital in Potsdam, NY. She completed her pediatrics residency at the Children's Hospital at Dartmouth-Hitchcock.

Alisha Lakhani '08 RES'17. See **Nilay Patel** '08 MD'12.

2018

Annalise Van Meurs '14 and Melissa Warstadt '12 were married October 7, 2017, at Roger Williams Park Botanical Center in Providence. They met in 2011 as members of the Zeta Delta Xi coed fraternity. Attendees included **David Bercovici** '05 MD'10, **Eduardo Garza** '12 MD'18, **Sarah Dominguez** '14 MD'19, **Natalie Hall** '14 MD'18, **Rebecca Himmelwright** MD'18, **Jen Nykiel** '10 MD'14, and **Aaron Shapiro** MD'18. Annalise will enter the pediatrics residency program at Oregon Health & Science University this summer.

Timothy Murphy delivered the Society of Interventional Radiology's 2018 Dr. Charles T. Dotter Lecture.

2019

Nihaal Mehta '14 was named co-editor-in-chief of *in-Training*, the online magazine for medical students.

Anshu Vaish '12 is cofounder and CEO of Robin Health, a health tech startup that is partnering with CoBank, EveryoneOn, and Navicent Health to launch a pilot program to provide 100 handheld tablets that will allow diabetic patients in rural southwest Georgia to manage their diabetes from home through an app. Anshu is also a cofounder and director of the nonprofit WaterWalla, which works to improve access to clean water in India and Sierra Leone.

RESIDENTS

1992

Timothy Murphy, MD F'93 delivered the Society of Interventional Radiology's 2018 Dr. Charles T. Dotter Lecture at the society's Annual Scientific Meeting in Los Angeles in March. He is the founder and medical director of the Vascular Disease Research Center and an interventional radiologist at Rhode Island Hospital, and a professor of diagnostic imaging at the Warren Alpert Medical School. He's also a past president and former Executive Council member of SIR.

2005

Sean Uiterwyk, MD, a family physician, joined Mt. Ascutney Hospital and Health Center in Windsor, VT. He graduated from Loyola University Stritch School of Medicine and the family medicine residency at Brown, where he was a house staff officer and chief resident. Sean's interests include reducing missed or delayed diagnoses of cancer in primary care, team-based care, and effective use of data to drive improvement. He has served as a clinical assistant professor of family medicine at Brown and clinical assistant professor of community and family medicine at Dartmouth.

2006

Beth J. Plante, MD, was named a top Reproductive Endocrinologist on the 2017 list of Top Docs of Boston. She has worked at the Fertility Centers of New England since 2014, seeing patients in Boston, Reading, Braintree, and Westborough. A graduate of UMass Medical School, Beth completed her residency in obstetrics and gynecology at Brown and a fellowship in reproductive endocrinology and infertility at the University of North Carolina School of Medicine. Her clinical and research interests include infertility, diminished ovarian reserve,

primary ovarian insufficiency, and polycystic ovary syndrome.

Erica Hardy, MD, MA, MMSc, is the director of the Women's Infectious Disease Consult Service at Women & Infants Hospital and an assistant professor of medicine, clinician educator, at the Warren Alpert Medical School. Erica completed her med/peds residency at Brown and an infectious disease fellowship at Beth Israel Deaconess Medical Center. She also holds a master's in medical science from Harvard and a master's in philosophy with a concentration in medical ethics from the University of Maryland. Her clinical and research interests include infectious disease issues as well as the medical care and follow-up of survivors of sexual assault.

Katina Robison, MD, was named research director for the Program in Women's Oncology at Women & Infants Hospital. An associate professor of obstetrics and gynecology at the Warren Alpert Medical School, she was elected to the steering committee for the Scientific Network on Female Sexual Health and Cancer, a global interdisciplinary network of clinicians, researchers, and health care professionals.

2008

Rachel Fowler, MD MPH'10 F'10 was appointed the Alpha Omega Alpha Honor Medical Society councilor at the Warren Alpert Medical School. She received her medical degree from Washington University School of Medicine, where she was inducted into Alpha Omega Alpha. She completed the emergency medicine residency at Brown, serving as chief resident, followed by the fellowship in international emergency medicine. She is an associate professor of emergency medicine, clinician educator, at the Medical School.

Jason Shapiro, MD, F'11, an assistant professor of pediatrics and of medicine, clinician educator, at the Warren Alpert Medical School, received the 2018 Rising Healthcare Leader in IBD award from the Crohn's and Colitis Foundation. Jason completed his residency in pediatrics and his fellowship in pediatric gastroenterology at Brown. He is very active in the Chapter Medical Advisory Committee of the foundation. The award will be presented in Boston in June.

2012

Theodore Bender, PhD, was appointed CEO at Turning Point in Southaven, part of the Addiction Campuses network based in Nashville, TN. Ted completed his clinical psychology internship at Brown and Butler Hospital. After obtaining his doctorate, he served as a postdoctoral fellow for the military suicide research consortium.

2013

Dario Roque, MD, has joined the Saint Anne's Hospital medical staff in Fall River, MA. He specializes in gynecologic cancer surgery, performing open, laparoscopic, and robotic procedures. A graduate of the University of Florida College of Medicine, Dario completed the obstetrics and gynecology residency at Brown/Women & Infants Hospital and a fellowship in gynecologic oncology at the University of North Carolina. He is an assistant professor of obstetrics and gynecology at the Warren Alpert Medical School.

2018

Eric Chow, MD, and Christopher Chambers were married April 7 at the Four Seasons Resort Hualalai in Kailua-Kona, HI. Eric is chief pediatrics resident at Hasbro Children's Hospital, where he completed the med/peds residency program. He earned his MD/MPH at Eastern Virginia Medical School. In July he will join the Epidemic Intelligence Service at the CDC.

FELLOWS

2001

Michael Ropacki, PhD, is the chief medical adviser to the Alzheimer's Blood Diagnostic Lymphocyte Proliferation Test program, overseeing the development of the blood biomarker test for Amarantus Bioscience Holdings. He is also the president and principal scientist of Strategic Global Research & Development and an adviser to the National Institute on Aging, National Institute of Neurologic Disorders and Stroke, and Eunice Kennedy Shriver National Institute of Child Health and Human Development. Michael completed a postdoc in psychiatry at Brown.

2005

Kristen A. Matteson, MD, MPH'06 is the director of the division of research in the Department of Obstetrics and Gynecology at the Warren Alpert Medical School, where she's also an associate professor, and at Women & Infants Hospital. Kristen completed the John Evrard Fellowship in Clinical Trials and Epidemiology at Women & Infants.

2013

Xiameng "Mona" Xu, PhD, was honored as a "Master Teacher" at Idaho State University, where she is an assistant professor in the Department of Psychology. Mona teaches a number of psychology courses for undergraduate and graduate students and advises psychology majors. She completed her PhD at Stony Brook University and a postdoctoral research fellowship sponsored by the Warren Alpert Medical School and The Miriam Hospital.

OBITUARIES

James Melius

COURTESY US SENATE COMMITTEE ON HEALTH, EDUCATION, LABOR, AND PENSIONS

ALUMNUS

JAMES M. MELIUS, MD, DrPH '70 MMSc'72

James Melius, 69, died of cardiac arrest January 1, 2018, at his home in Copake Falls, NY. An occupational physician who advocated for workers' health and safety, Dr. Melius drafted the James Zadroga 9/11 Health and Compensation Act, which authorized billions of dollars for the medical care of first responders. He testified repeatedly before Congress for the bill's passage, telling lawmakers in 2009, "The failure of the government to properly inform and protect these people from these exposures added substantially to their health risks."

Born June 16, 1948, Dr. Melius was raised in Copake Falls. He enrolled in the six-year medical science program at Brown and managed the varsity hockey team. In a 1972 letter to the *Brown Alumni Magazine*, he and fellow members of the Brown Medical Student Society argued that Brown should start a medical school, both to enhance the University and to improve health care in Rhode Island. He received his MD and doctorate of epidemiology from the University of Illinois.

Starting with a residency in occupational medicine at Cook County Hospital in Chicago, Dr. Melius focused on reducing the number of workers killed, injured, or exposed to dangerous substances on the job. In 1980, after an explosion and fire at the Chemical Control Corp. chemical storage site in Elizabeth, NJ, he got the National Institute of Occupational Safety and Health to do medical evaluations of the firefighters. "It was one of the first times that firefighters were evaluated after a major incident," a former official of the International Association of Fire Fighters told the *New York Times*. "And that continues today."

As an international expert on workplace medicine, Dr. Melius helped investigate the 1984 poisonous gas leak at the Union Carbide pesticide plant in Bhopal, India, one of the world's worst industrial disasters. In the late 1980s, as director of the New York State Department of Health's Center for Environmental Health, he led the cleanup of a Superfund site near Niagara Falls. He served the Laborers' International Union of North America from 1994 until his death. "Jim was a true working class warrior," the union's general president, Terry O'Sullivan, said in a tribute.

In 2012, Dr. Melius received the Collegium Ramazzini's Irving J. Selikoff Memorial Award in recognition of his "lifetime's work of protecting working men and women from occupational hazards and his heroic service on behalf of the 9/11 rescue workers." He is survived by his wife, Melanie, and two sons.

—Louise Sloan '88

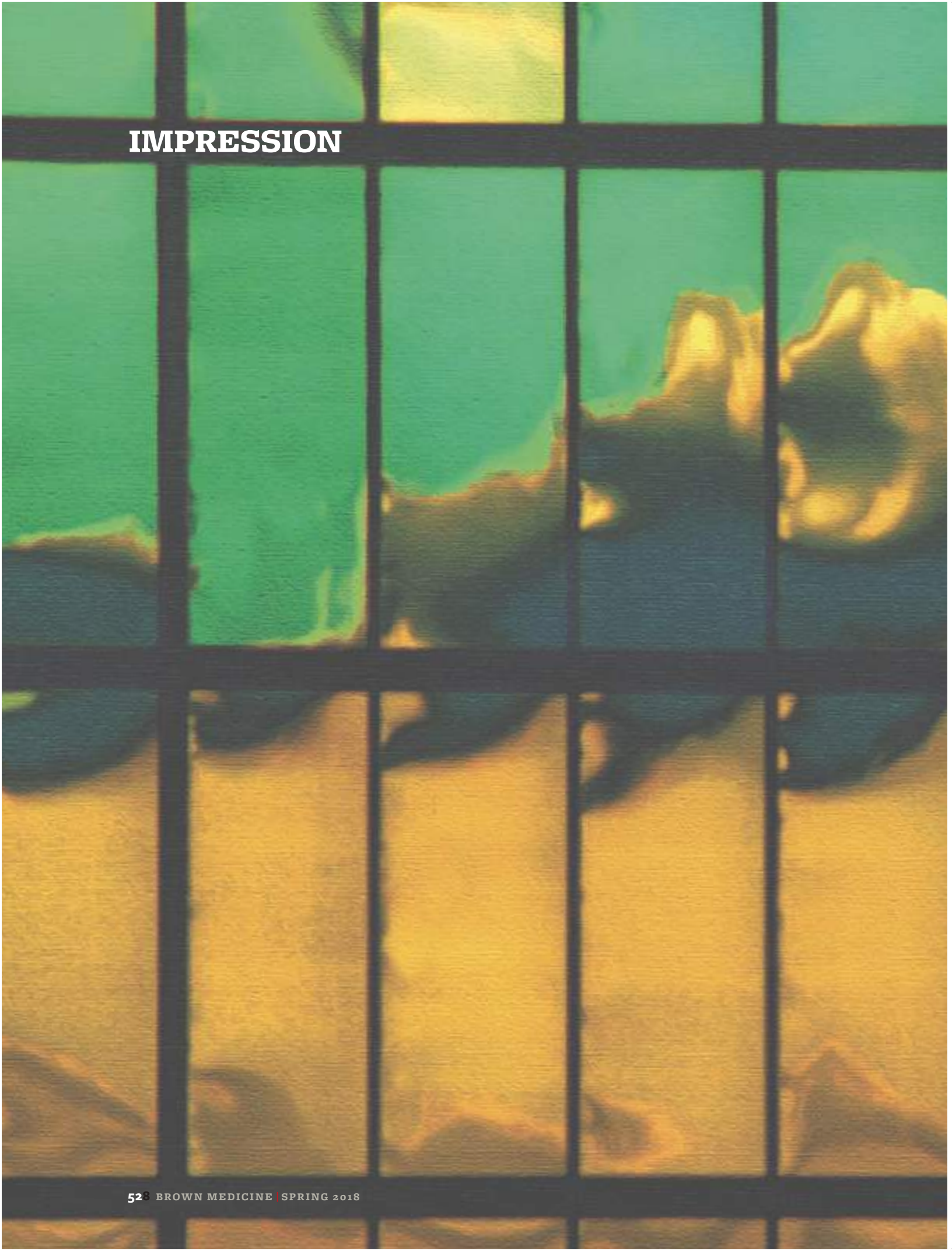
> Jim Melius was recognized for his lifetime's work of protecting working men and women from occupational hazards.

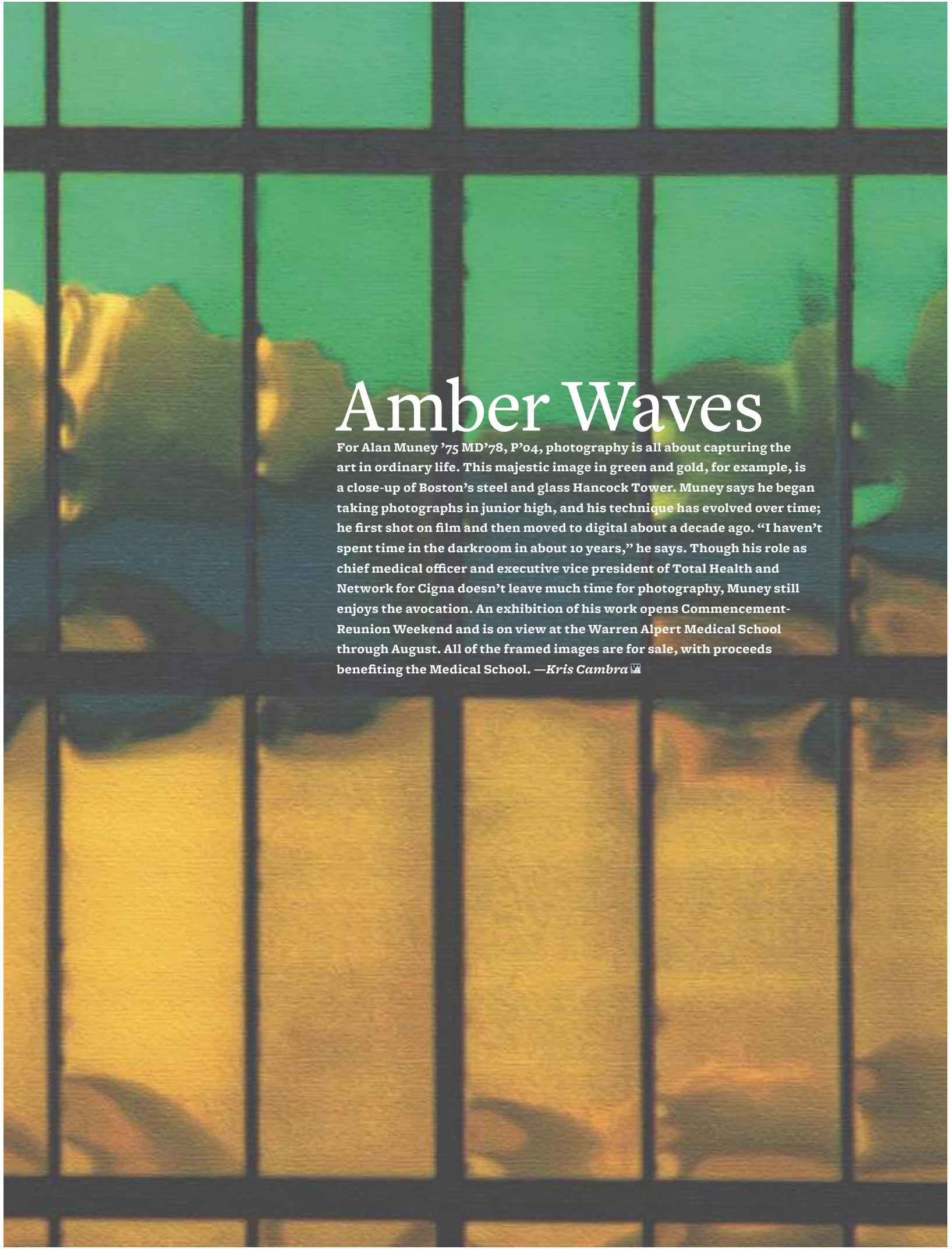
FACULTY

ARTHUR B. KERN, MD

Arthur Kern, 96, of Pawtucket, died March 6, 2018. A graduate of Harvard College and Boston University School of Medicine, Dr. Kern practiced dermatology in Providence and was a clinical professor emeritus of dermatology at Brown. He served honorably in the US Navy during both World War II and the Korean War. In the field of public affairs, Dr. Kern was actively interested in local and national politics, supporting a national single payer plan for health care, election reform, and conservation. Passionate about art, Dr. Kern exhibited his sculpture for many years. He loved skiing, tennis, and bird watching; and dragged his entire family to Block Island every fall for memorable viewings of the fall bird migration. Dr. Kern is survived by his children: Ronni Kern of Santa Monica, CA; David Grant Kern of Camden, ME; and Jonathan Kern of Carmichael, CA. He is also survived by many grandchildren and great-grandchildren. Donations in his memory may be made to either Doctors Without Borders, www.doctorswithoutborders.org, or the National Audubon Society, www.audubon.org.

IMPRESSION





Amber Waves

For Alan Muney '75 MD'78, P'04, photography is all about capturing the art in ordinary life. This majestic image in green and gold, for example, is a close-up of Boston's steel and glass Hancock Tower. Muney says he began taking photographs in junior high, and his technique has evolved over time; he first shot on film and then moved to digital about a decade ago. "I haven't spent time in the darkroom in about 10 years," he says. Though his role as chief medical officer and executive vice president of Total Health and Network for Cigna doesn't leave much time for photography, Muney still enjoys the avocation. An exhibition of his work opens Commencement-Reunion Weekend and is on view at the Warren Alpert Medical School through August. All of the framed images are for sale, with proceeds benefiting the Medical School. —*Kris Cambra* VA

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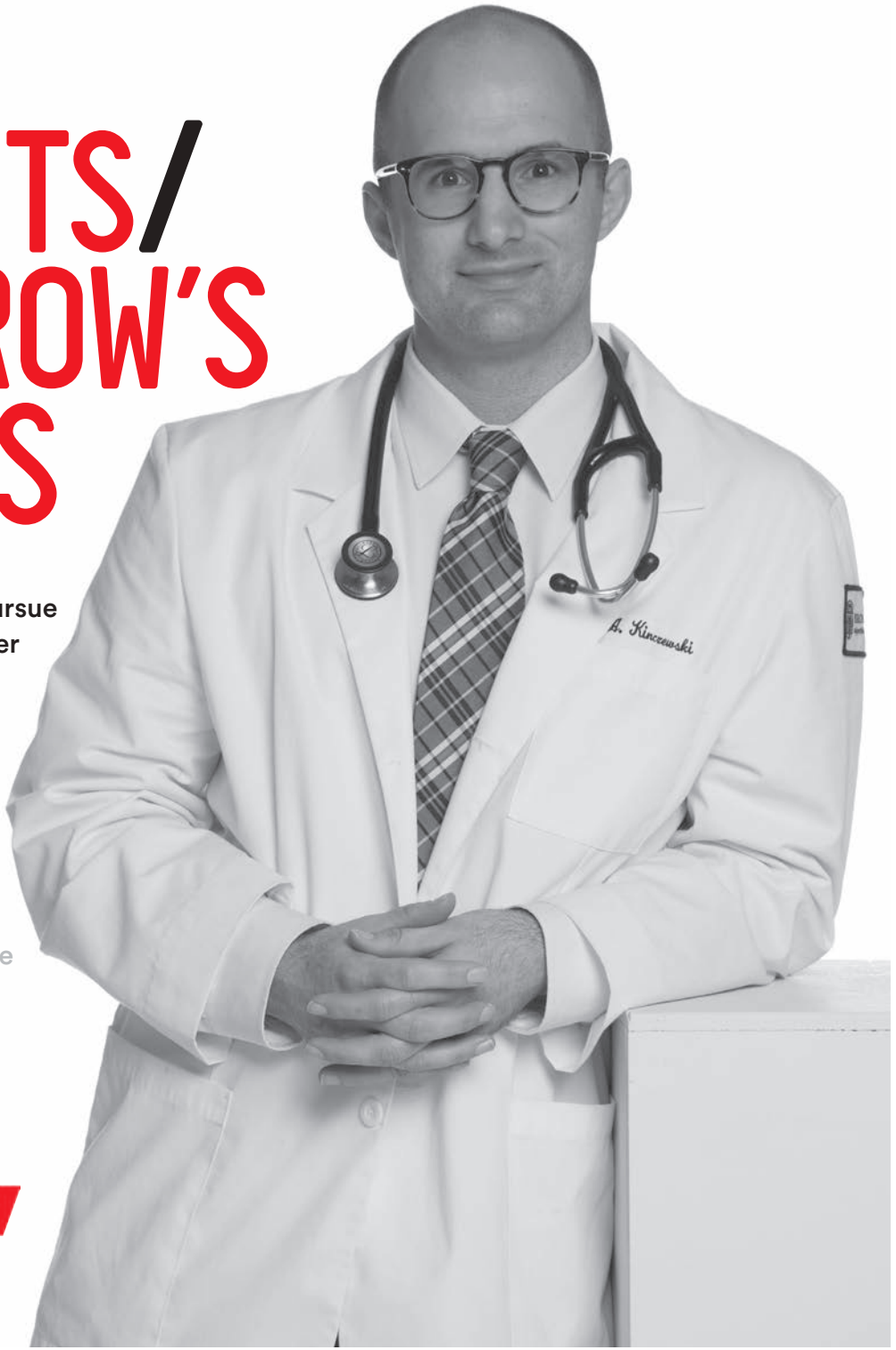

"In the Doctoring program, I was partnered with an oncologist to pursue my interest, and to become a better resource for patients coping with their diagnosis and, eventually, an expert healer. Thank you for the opportunity to develop into the physician I aspire to be."

—Alec Kinczewski MD'21

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BROWN TOGETHER