

yale medicine magazine

ad(vantage) points

Yale School of Medicine has continued to emphasize diversity across its research capabilities, curriculum, student body, faculty, and staff.

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autumn 2019 departments

Yale Medicine Magazine strives to cover the abundance of superlative work being done at the cutting edge of various fields. It relies on the willing participation of students, faculty, staff, and alumni. It pulls in thoughts and advice from medical writers and communicators, past magazine editors, scientists, leadership, and many others. Ultimately, a consensus about

which stories to explore, and which to run, coalesces around the framework of an idea or theme.

The magazine is an extension of the school—how YSM talks and thinks about itself. Unsurprisingly, many of the issues and stories describe scientific work that is done on the campus, as well as the education that enables that work.

Sometimes, as with the issue celebrating 100 years of women in medicine at Yale in Spring 2018, it becomes important to take a step back and evaluate the context in which the school's work happens.

This is why this issue is dedicated to the scientific and social concept of balance and representation: the various ways in which life is heterogeneous and prolifically varied. When the school reflects the multitudinous world of which it is a part, it becomes more complete; more effective, more resilient.

Not every relevant story will make it into print. One story about a student testifying before Congress thanks to a powerful *Washington Post* Op-Ed won't have happened by the time we go to press. Another, describing an exciting initiative that seeks to understand and address inequities faced by those with disabilities in athletics, the Sports Equity Lab, is still on the drawing board. There are more stories about our cultural and intellectual diversity than we have space to print; this issue represents the very tip of the iceberg.

Adrian Bonenberger
Editor, *Yale Medicine Magazine*

NOTE

As we transition to new mailing list software, we welcome any changes of name, address, or status at ymm@yale.edu.

SECOND OPINION BY SIDNEY HARRIS



"IF THE PHASE III CLINICAL TRIALS ARE SUCCESSFUL, WE'LL GO RIGHT INTO IIIA—RAISING THE PROJECT RETAIL PRICE."

Send letters and news items to

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Abbreviations used in *Yale Medicine Magazine* include HS to denote the final year of residency for house staff, FW for the final year of a fellowship, and YNHH for Yale New Haven Hospital.

Yale SCHOOL OF MEDICINE

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Balancing Yale School of Medicine

ROBERT ALPERN IS PROUD OF THE PROGRESS Yale School of Medicine (YSM) has made in diversifying both the types of science and research pursued in New Haven, and the people pursuing that science and research. Diversity is central to the mission of scientific excellence and leadership at YSM, from diverse socioeconomic backgrounds to variety in intellectual and academic pursuits, to variation when it comes to race, gender, creed, and nationality, YSM strives to be a national leader. *Yale Medicine Magazine* sat down with Robert J. Alpern, MD, dean and Ensign Professor of Medicine, to hear his thoughts on the subject, as well as why he favors a strong commitment to ongoing diversification.

Given that Yale is one of the oldest and best medical schools in the United States, how has diversity played a role in maintaining YSM's competitive edge? Diversity in medicine and in biomedical research is critical to both fields. A diverse scientific and medical workforce understands and appreciates the needs of a diverse patient population. In addition, patients frequently prefer physicians who are similar to them, and thus understand their issues. We serve a broad range of patients and require the medical and personal expertise needed to do so effectively.

How do we stack up against peer institutions in this department? Yale strives to be a leader, and we've put significant effort into creating a diverse faculty, but we still have a long way to go. The diversity of our faculty is increasing, but similar to other institutions, the higher you go in academic rank, the less diversity there is.

Is there an active push to diversify the faculty and administrative leadership, or has the recent diversification been the consequence of more qualified applicants—the pipeline beginning to deliver on its promise? There has been a dedicated effort to identify and recruit outstanding faculty and administrative leadership who also bring diversity to the medical school. The last two department chair hires, both of whom are women, have been exceptional physicians and leaders; and the incoming dean, the first woman at the School of Medicine to hold this position, is incredibly impressive. That still leaves us with 80% of department chairs who are fairly homogeneous in the way that they have been traditionally. Even today, women who want careers in medicine face more barriers in their careers as they move up the ladder to become professors or department chairs. The pipeline is producing outstanding women and minority faculty, but we need to be diligent in our efforts to identify them and develop their careers. We're living at a time when we are beginning to make progress.

It seems like every year, incoming classes of students are more diverse: economically, culturally, geographically, racially, and religiously. How has this changed since you were a medical student? When I was a medical student there was some, but very little diversity in the medical school classes. Women and underrepresented minorities were admitted to medical school but were few in number. Gender diversity has now been achieved with most medical school classes close to 50% women. Underrepresented minorities remain underrepresented, but the numbers have improved. There remains much work to be done.



Starting 2020 with an historic first

YALE SCHOOL OF MEDICINE is getting a new dean, and for the first time in its 209-year history, she will be a woman. Nancy J. Brown, MD, a graduate of Yale College (where she majored in molecular biophysics & biochemistry) in the Class of 1981, comes to YSM from Vanderbilt University. There, she is the Hugh Jackson Morgan Professor and chair of the Department of Medicine. She is expected to join Yale on February 1, 2020.

The latest in a long and storied line of deans, Brown comes to the position as successor to Robert J. Alpern, MD, dean and Ensign Professor of Medicine, having already established a standout reputation as an investigator, clinician, and leader.

“I am grateful to the search advisory committee and President Salovey for this opportunity,” said Brown. “Dean Alpern has already been very generous in ensuring a smooth transition. I very much look forward to meeting with and learning from the members of YSM and the broader Yale and New Haven communities as we chart our course.”

Alpern was enthusiastic about the incoming dean, and

the future of YSM. “Dr. Brown has a record of outstanding academic accomplishments and leadership. I am confident that she will have great success in furthering our efforts in research, education, patient care, and creating a diverse and inclusive environment.”

The universal enthusiasm on social media was clear as colleagues and past trainees chimed in with dozens of notes of congratulations, noting that Brown is also respected as an inclusive and inspiring

mentor and colleague. From the outpouring of responses on Facebook, LinkedIn, and Twitter, the following testimonials stood out:

“While we will miss her extraordinary contributions, I am excited for Nancy to assume this leadership role and wish her the very best on this exciting new stage in her career,” tweeted Jeff Balser, MD, PhD, dean of Vanderbilt University’s medical school.

“Congratulations to Nancy, who taught me a huge fraction of what I know about clinical investigation & about hypertension,” tweeted J. Brian Byrd, MD, MS, from the University of Michigan.

“I have personally witnessed Dr. Brown’s personal, deep, and unwavering commitment to trainees of all levels as a [member of Vanderbilt University’s medical community]. I will be forever grateful for her leadership, mentoring, and kindness. [YSM] is very lucky!” tweeted Brian Grieb, MD, PhD, chief resident at Vanderbilt University Medical Center’s Internal Medicine.

After finishing her studies at Yale, Brown graduated from Harvard Medical School, completed an internship and a residency program at Vanderbilt University, and has been a part of its faculty ever since.

Brown’s specialty and interests revolve around cardiovascular pharmacology, pharmacogenomics, and using drugs to understand pathophysiology. She has led National

Institutes of Health (NIH)-funded research since 1993 and has defined the molecular mechanisms by which drugs for blood pressure and diabetes affect kidney or cardiovascular disease. Brown commented that the strength of discovery and science at Yale, as well as the opportunity to collaborate across campus, was one of the attractions that led to her return. Meanwhile, she remains dedicated to providing care for patients with resistant and secondary forms of hypertension.

The positive and immediate public testimonials on Brown's behalf speak to another of her passions: helping faculty, students, and trainees flourish in a diverse and balanced work environment. Her sterling leadership of Vanderbilt's Department of Medicine, which began in 2010, corresponded with increases in women and underrepresented groups in medicine in faculty and other positions of authority. The team of doctors, staff, and students assembled by Brown has been remarkably effective. Research funding was boosted by 56%, including a 47% boost in grant funding from NIH. Citations increased, and people working in her department were more likely to be recognized by national professional medical organizations and associations.

Brown was recommended to Yale University President Peter Salovey, PhD, by a search advisory committee chaired by Lynn Cooley, PhD, dean of the



The incoming dean of Yale School of Medicine, Nancy Brown, MD, carries with her a strong reputation as a leader, researcher, and clinician.

Graduate School of Arts and Sciences, who said of the committee's work: "In 14 listening sessions and numerous informal meetings, they carefully collected feedback, suggestions, and viewpoints about the current state and future of the school." President Salovey also expressed gratitude for Alpern's longtime service and successful efforts to strengthen Yale School of Medicine's research, clinical, and educational potential.

—Adrian Bonenberger



A legacy of leadership in hepatology

Among the many reasons the VA Connecticut Healthcare System in West Haven is regarded as one of the best in the country is its expertise in treating liver disease. This legacy extends back over decades and is the result of many illustrious physicians and researchers building on the work of their predecessors. These same individuals are recognized for having played a role in developing Yale School of Medicine's reputation as a leader in the field.

Guadalupe Garcia-Tsao, MD, chief of digestive diseases at the VA Connecticut Healthcare System; professor of medicine (digestive diseases); and director of the Clinical and Translational Core of the Yale Liver Center, highlights one aspect of the VA CT's success: the superlative doctors and the longstanding reciprocal relationship between the Yale School of Medicine and the VA. Another is the strong history of liver research. "From Gerald Klatskin, MD—a veteran himself—to Harold Conn, MD, and Roberto Groszmann, MD, there has been a legacy of excellence here at the VA," said Garcia-Tsao.

Klatskin performed the first liver biopsy at Yale in 1947. Conn's studies resulted in the West Haven Criteria, a globally adopted grading system for hepatic encephalopathy (altered level of consciousness resulting from liver failure). Groszmann focused on cirrhosis and portal hypertension. Each researcher's



ONLINE EXCLUSIVE

Kathryn Nagel, MD, has been using her expertise and experience as a Yale School of Medicine resident with type 1 diabetes to advocate for improved accessibility to insulin.

For more on insulin, visit ymm.yale.edu/insulin

Liver research at Yale was brought into the modern era with a successful biopsy by Gerald Klatskin, MD, in 1947.

work overlapped and assisted with those of the others. Garcia-Tsao led the VA CT Hepatitis C Resource Center, one of four centers nationally funded for over 10 years for the treatment and research of hepatitis C. During this time, VA CT developed an enduring reputation for excellence in liver education, research, and innovations in health care delivery.

James Boyer, MD, Ensign Professor of Medicine (digestive diseases), who founded the Yale Liver Center in 1984 after his mentor Klatskin retired, noted that liver research at YSM and the VA were for many years inextricably intertwined. “For many years, Dr. Klatskin would give a talk every week at the VA. It was where he’d buy the Edgeworth tobacco he’d smoke in his pipe, at the commissary,” said Boyer. “Klatskin’s efforts here and in West Haven laid the groundwork, along with Conn and Groszmann, for the work we do today.”

Boyer remembers Klatskin with great respect, and wrote a compelling tribute to the man who hired him into his laboratory—a speech published by the American Gastroenterological Association in the December 1983 issue of *Gastroenterology* on the occasion of Klatskin’s receipt of the Julius Friedenwald Medal.

That great legacy is carried on by current faculty appointed primarily or exclusively to the VA. Garcia-Tsao, who spends much of her time tending to patients,



has many positive things to say about them as individuals and as a population. “Veterans are incredibly generous as patients and as research subjects,” said Garcia-Tsao. “They are used to service, and when offered opportunities to participate in research, veterans are almost always excited to help.”

Doctors enjoy the sense of purpose derived from caring for veterans and from the benefits of a nationwide health care system focused entirely on caring for this population. “The patients here are extraordinary, and it’s a privilege to work for them,” said Tamar Taddei, MD, associate professor of medicine (digestive diseases).

One patient of Taddei’s, James Cochrane, credits her with saving his life. Discharged from the Navy in 1974 after a three-year stint, he waited until 2010 to seek treatment. “A lot of guys don’t think about the VA when they’re getting out. All they want to do is move on from

the service,” he said. It was good that he came when he did; he was diagnosed with end-stage liver disease in 2011. “They told me in March of 2012 that it was over if I didn’t get a transplant, ‘say goodbye.’” Cochrane said. “Once I said I was onboard with receiving a transplant and doing everything I needed to to make that happen, including getting 100% sober, Dr. Taddei moved heaven and earth for me.” Cochrane received a transplant at the Mayo Clinic in Jacksonville, Florida, in 2014. Taddei “fought to get me listed for a transplant,” Cochrane said, “I owe her my life.”

Some wish to discontinue government funding for veterans’ health care under the assumption that private health care will better serve this population. Taddei is unreservedly set against privatization initiatives targeting the VA. Apart from the longer waits for “care in the community”—two to three months, as opposed to 14–30 days in the VA—Taddei thinks that providers who spend their careers working with veterans come to know more about efficient health care delivery for

this population than private-sector practitioners.

“Take hepatitis C,” Taddei said. “The incidence of this in the general population is 1.4%. But it’s as high as 12–20% among veterans born between 1945–65, especially those who served in Vietnam. The odds are pretty slim of receiving better treatment anywhere else than you can find here.” Recent efforts to cure all veterans with hepatitis C infection have met with success, according to an article posted on Military.com by Patricia Kime on June 4, 2019. Nearly 100,000 of the 126,000 veterans infected with hepatitis C have been cured to date.

Despite the great success in curing hepatitis C, the prevalence of cirrhosis is increasing in the VA, and VA CT is focused on improving care of patients with advanced liver disease. Patients who suffer from cirrhosis are at high risk of developing liver cancer. VA CT is a regional center for liver cancer care, harnessing telehealth technology to manage patients diagnosed with hepatic cancer through a weekly multidisciplinary liver tumor board attended by providers in Connecticut, Massachusetts, Vermont, and Rhode Island.

“West Haven is great,” said Cochrane. “Everyone there has looked out for me from day one, and I still see Dr. Taddei and her team once every three months. It’s a wonderful place. I don’t know where I’d be without it.”

—Adrian Bonenberger



Social media use at Yale School of Medicine

Social media has revolutionized the way people communicate and share information. The information bottlenecks of old print and broadcast media have closed or had their influence diminished, for better and for

knowledge and connect like-minded scientists and doctors to one another while simultaneously combatting misinformation.

Naftali Kaminski, MD, the Boehringer Ingelheim Pharmaceuticals, Inc. Professor of Medicine (pulmonary), (@KaminskiMed) got into social media early, and is a big believer in its utility. “I’m usually an early adopter,” he wrote via email, “I use Twitter for medicine, research, and activism. I use Facebook



Some YSM scientists and physicians are very active on social media, using it to highlight their own research and work, and that of others. In spite of its rough reputation, Twitter has a surprisingly robust and respectful medical and scientific community that actively shares information.

worse, while a world of expertise and information lies at the fingertips of individuals. The new world is filled with people connecting with each other, from high school students like climate activist Greta Thunberg to protest movements in cities to the world over.

Many Yale School of Medicine (YSM) faculty members have accounts on social media. They do their part to spread their

for family and my eclectic interests (music, cinema, art) and sometimes activism.” Kaminski has almost 3,000 Twitter followers, and posts frequently on various issues throughout the day. “For too long, physicians and scientists have hidden from



ONLINE EXCLUSIVE

Offering medical evaluations and advice, Yale Center for Asylum Medicine helps asylum seekers clear legal hurdles in entering the country, raising the odds of a successful application by almost 50%.

For more on asylum seekers, visit ymm.yale.edu/asylum

the public eye,” he wrote. “It is our responsibility to be present in the public domain, to share our work, our values, and our views.”

Another YSM faculty member who is active on social media is Akiko Iwasaki, PhD, the Waldemar Von Zedtwitz Professor of Immunobiology, professor of molecular, cellular and developmental biology, and of dermatology, and a Howard Hughes Medical Institute investigator. Iwasaki is relatively new to Twitter—she created her account there in 2017, and credits a former colleague, Kellie Jurado, PhD, with helping to coach and mentor her in good habits of use. Now at over 11,000 followers, her handle, @VirusesImmunity, is considered highly influential in her communities of virology and immunology, and she has issued several tweets that have, in contemporary parlance, “gone viral.” She does not use Facebook or LinkedIn frequently, though she maintains accounts there, preferring to focus on Twitter engagements.

Howard Forman, MD, MBA, professor of radiology and biomedical imaging and director of the MD/MBA Program at Yale, is another avid user of social media. His experience is akin to Kaminski’s; a self-described early adopter, he joined Twitter in 2008 but did not become active on it until 2016 (his handle, @thehowie, has over 11,000 followers). “Timewise,

I would say that Twitter is the only account that I attend to daily, for between five minutes and two hours of my time,” he wrote in an email.

Forman values Twitter for helping him “hone my positions,” as well as giving him an opportunity to evaluate viewpoints different from his own. He said, “I have developed better skills at expressing my opinions. My skin is much thicker, both on social media and in real life, where I believe I take criticism more easily, particularly when it is offered in good faith.”

He cautions that social media can be dangerous for young professionals. “I think you need to be very wary,” he wrote. “Earlier in one’s career, social media can be risky. If you have direct patient care responsibilities, you have to choose between having a truly public profile on social media or one that is more anonymous. If you choose to be public, which I think is generally preferable, you should consider how patients might respond to you if you are particularly aggressive in your political stances.”

Iwasaki’s advice to faculty interested in creating social media accounts but unfamiliar with the terrain is more optimistic. “Jump in!” she wrote. “Keep in mind that these posts are read by everyone. So, do be careful about the content, and make sure you are not inadvertently leaving out some people or being hurtful to others. The downside of social media is that there are always

people who post negative or toxic comments (trolls). The upside is that you can reach thousands of people with words of encouragement and support instantaneously. The pros far outweigh the cons of being on social media. You will reach an audience you never thought possible!”

Other YSM faculty with extensive followings on Twitter include Harlan Krumholz, MD, the Harold H. Hines, Jr. Professor of Medicine (cardiology) and director of the Center for Outcomes Research and Evaluation (CORE), (@hmkyale) who has over 15,000 followers there; and Roy S. Herbst, MD, PhD, the Ensign Professor of Medicine (medical oncology) and professor of pharmacology, (@DrRoyHerbstYale) with over 2,500 followers. Some students and residents have outsize followings on various social media platforms. And many YSM alumni are influential on social media, with some accounts, such as Esther Choo’s, MD ’01 (@choo_ek), boasting nearly 100 thousand followers.

Social media is entrenched in most people’s personal lives, and plays an increasing role in how professionals talk with each other. Many of YSM’s faculty, students, and alumni are involved with the various platforms. Depending on whether one prefers the advice of Iwasaki or Forman, one might decide to “jump in,” or hold off until later in one’s career. There’s no wrong answer.

—Adrian Bonenberger

round up

a collection of recent scientific findings



PROTEIN COULD BE KEY TO UNLOCKING IMMUNE DISORDERS

Carrie L. Lucas, PhD, assistant professor of immunobiology, led a team of researchers at Yale and at the National Institute of Health in sequencing the genome of a 9-year-old girl with a variety of unresolved health complications. Lucas and her colleagues discovered that the girl lacks a key protein—PI3Ky—which also figures in certain types of cancer.



MEDICAID MISSES MARK ON MUSCULOSKELETAL CARE

Only four of Connecticut's 29 orthopaedic-specific urgent care centers accepted patients for treatment regardless of the patient's insurance type, according to a study by Yale researchers, including Mary O'Connor, MD, director of YSM's Center for Musculoskeletal Care, Daniel H. Wiznia, MD, assistant professor of orthopaedics and rehabilitation, and Christopher A. Schneble, MD, a second-year resident.

This restrictive policy results in more patients looking for treatment in emergency departments. "Cherry-picking patients leads to systemic health care disparities," said Wiznia.



STUDIES EXAMINE MENTAL HEALTH AFTER NATURAL DISASTERS

A total of 160 studies were published between 1981 and 2001 on the topic of psychiatric disorders in the wake of environmental disaster, at the rate of eight per year. According to a recent Yale School of Public Health study, in 2018, 178 articles were published on the subject, many in Asia. As worries about climate change increase, so too will research into what happens to individuals and populations affected by such natural catastrophes as hurricanes, tornados, floods, earthquakes, or fires.



AI PREFERS OUTPATIENT TREATMENT FOR GI INFECTIONS

A form of automated intelligence (AI) may be better at distinguishing patients suffering from gastrointestinal difficulties who can safely receive treatment at home from those requiring hospitalization, according to a recent study led by Dennis Shung, MD. Researchers looked at six medical centers around the world while creating their machine-learning model. In the future, it's possible that this type of program will enhance physicians' diagnostic capabilities.

ad(vantage) points

DIVERSITY IS IN THE DNA OF SCIENCE. From such observers as Newton, whose attempts to understand the physical world around him gave rise to a world of testable hypotheses, to university researchers in the scientific revolution in every country and culture that has practiced it, scientists' discoveries are built upon conflicting information, different inputs, and varying perspectives. Countries and cultures that historically lacked a diverse approach to science fared poorly compared to those with robust mechanisms for bringing in different perspectives.

The evidence of this benefit both anecdotally and scientifically, is overwhelming. One well-known study published in 2014—"Collaborating With People Like Me: Ethnic Co-authorship Within the U.S."—drew on over 2.5 million research papers to determine that when scientists worked with people from different areas and ethnic backgrounds, and sourced their research more widely, the quality of their research was better. From a different vantage, a study conducted in 2018 by the Boston Consulting Group demonstrated that businesses with greater diversity across "gender, age, nation of origin (meaning employees born in a country other than the one in which the company is headquartered), career path, industry background, and education" were 19% more profitable than homogenous competitors.

Given this and other evidence that diversity goes hand in hand with better outcomes, the stories in this issue look at some of the ways in which Yale School of Medicine has continued to emphasize diversity across its research capabilities, curriculum, student body, faculty, and staff.

ABOUT THE PHOTOGRAPHS

In an effort to visualize this diversity, Robert A. Lisak visited and photographed many familiar spaces around the medical campus. Long camera exposures cause moving figures to blur and nearly detach from the very traits that usually enable us to identify and categorize people, allowing viewers to focus more on the work that happens across Yale School of Medicine.

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Examining distinction

Yale School of Medicine's students and faculty are a more varied group with each passing year, making for a more balanced place to study medicine.

BY ADRIAN BONENBERGER

Yale School of Medicine's first Black graduate was Cortlandt Van Rensselaer Creed, MD '57, who matriculated in 1853. The son of a New Haven bootmaker, Creed overcame poverty and prejudice to serve as a surgeon with the Union Army during the Civil War. He corresponded with Frederick Douglass, and ran successful medical practices in New Haven and Brooklyn. An energetic and accomplished member of New Haven's society and medical community, Creed more than justified his admission to Yale.

According to the thesis of another far more recent Black graduate, U.S. Navy Captain Daryl K. Daniels, MD '91, it took nearly 20 years for YSM to graduate its second and third Black doctors, and 12 more before it graduated its fourth. From then until 1960, when Captain Daniels' study stops, the school graduated Black doctors sporadically and in small numbers. The first Black woman to graduate from YSM, Beatrix McCleary Hamburg, did not do so until 1948.

In the Civil Rights era, allowing and then facilitating equal access to medical education to all people became a major priority for Yale. Thus began the process of creating a truly egalitarian learning experience; one that is far closer to reality in theory and practice today than at any time before.

"We put a lot of effort into making sure each class is as balanced and diverse as possible given the pool of applicants," said Ayaska Fernando, director of admissions. "We are fortunate to have the luxury of drawing on an incredibly diverse applicant pool, so each student can uniquely add to the School of Medicine; holistically, the class is strongest when those unique attributes are complementary to each other and collectively demonstrate diversity across multiple fronts."

YSM is dedicated to the education of students, first and foremost, and it's unsurprising therefore that diversification efforts started in earnest with scholars matriculating at the institution. At the same time that YSM and peer institutions were beginning to vary their class compositions, they began efforts to do the same with faculty. Those initiatives gathered speed in the 1970s and 80s.

When it comes to the diversification of faculty gender, several groups provided powerful advocacy over the years. The first formal standing committees dedicated to the task were YSM's Committee on the Status of Women in Medicine or SWIM, which celebrated its 40th anniversary in 2019; and the Office for Women in Medicine or OWM (also begun in the late 1970s and the first such office in the United States). These groups secured important advances for women specifically and underrepresented minorities more broadly, especially in the last few years.

Nina Stachenfeld, PhD, senior research scientist in obstetrics, gynecology, and reproductive sciences, said "SWIM members as well as faculty and students in other organizations have been lobbying for our constituents for years. We're thrilled by recent wins, but a lot of hard work remains to be done."

When SWIM started out in 1979, said Stachenfeld, the culture in medicine was aggressively patriarchal. This unfair system was perpetuated by a lack of women in leadership positions. And while female students were admitted to elite medical schools like YSM in more approximately equal numbers, that did not translate into positions for senior faculty or other leaders.

“What we’re talking about now, which we have been talking about for some years, is how to fix ‘the pipeline,’” Stachenfeld said. “This is the phenomenon where one has parity with female and male medical students, parity with junior faculty, and then, when it comes to chairs and deans, not much parity at all. We hope that status quo is changing.”

Other groups have organized to participate in driving parity beyond a balance between two genders; the Faculty Advisory Committee (FAC) and Minority Organization for Retention & Expansion (MORE) both examine areas in which historical or present-day minorities are underrepresented, and bring greater attention to them. This work is coordinated by and run through the Office of Diversity, Equity, and Inclusion. The head of the office, Darin Latimore, MD, is deputy dean and chief diversity officer.

“It said a lot about Yale School of Medicine that they would create this role and empower it. Change can be difficult, but change is necessary for growth,” Latimore said.

Three of the many events that Latimore oversaw in 2019 included: “Q-Med: Building LGBTQI+ Leaders in Health Care,” held on March 30-31, believed to among the first of its kind; the Respect Retreat held on May 24, also believed to be the first of its kind at a U.S. medical school; and a panel held on October 30, “De-stigmatizing Disability: Tribulations and Triumphs of Disability at Yale.” The Respect Retreat featured Esther Choo, MPH, MD ’01, as well as the organization she helped co-found, TIME’S UP Healthcare.

“Diversity and inclusion should be part of our everyday practices,” said Latimore. “My hope is that someday this office is obsolete, that people understand how to respect each other and that our institution reflects those fundamental personal values.”

“We talk about it, but do we do it? That’s the question I hope everyone is asking themselves,” said Latimore. In the meantime, he plans to continue assisting the various allied groups and individuals on campus who are working to achieve equal representation.

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Adrian Bonenberger is editor of Yale Medicine Magazine.





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Discovery potluck

Laboratories and departments increasingly seek intellectual and scientific breakthroughs through diversification.

BY JOHN CURTIS

Among the perks of working in the lab of Akiko Iwasaki, PhD, are the potluck meals at weekly lab parties. The dishes, which range from Japanese sushi to Korean barbecue to empanadas, reflect the diversity of her lab team.

“Not only do they come from different racial and cultural backgrounds, but science backgrounds as well,” said Iwasaki, the Waldemar Von Zedtwitz Professor of Immunobiology and professor of molecular, cellular, and developmental biology and of dermatology, and a Howard Hughes Medical Institute investigator. “I have medical doctors, biologists, and people who are working in the computational side. When they get together, the kinds of things they can achieve together is much more than if I only have people of the same background.”

A case in point is the transgenic mouse Takehiro Takahashi, MD, PhD, made. “I was expecting to have some sort of phenotype related to autoimmune disease,” said Takahashi, who came to the lab two years ago with clinical experience and a background in neurology. “What I actually noticed was the gait—they lose balance very easily. We never expected the mice to have a neurological problem.”

And Takahashi’s training in neurology is why Iwasaki celebrates the diversity of people from different fields working together. “There’s a lot of research done over the decades that shows that diverse teams produce more innovative discoveries in science,” she said. “In order to have synergy between team members you need to have diversity.”

That synergy has remained elusive in a university setting. The Society for Experimental Biology and Medicine was founded in 1903 to promote biomedical research across disciplines. More than a century later, in 2006, the society’s journal published this article,

“The Future of Interdisciplinary Research and Training: How to Conquer the Silo Guardians.”

Such barriers to cross-disciplinary diversity, said Gary Brudvig, PhD, the Benjamin Silliman Professor of Chemistry and professor of molecular biophysics and biochemistry, are embedded within the structure of academia.

“The sciences are typically departmentally organized and very siloed,” he said. “Chemistry is in one building and chemists see each other all the time, but they never interact with other people unless there is some reason to seek each other out. It’s not a very organic process of creating interdisciplinary research, which is becoming more and more important.”

About 15 years ago, Brudvig and colleagues created an institute that brought together scientists from different fields who shared an interest in climate and energy. The institute lasted about six years and was supplanted when Yale bought the West Campus in 2007 and created the Energy Sciences Institute (ESI), which Brudvig directs. “It created a very different environment,” he said. “It’s focused on a topic, not a discipline.”

Faculty at the institute come from applied physics, mechanical engineering, chemistry, and chemical and environmental engineering. Researchers from such fields as electrical engineering, geology and geophysics, and molecular biophysics and biochemistry are present on the institute’s advisory board.

The federal government, Brudvig noted, has encouraged interdisciplinary research over the last decade. “Grants may be on a particular topic, but the scope requires people with expertise in different areas,” he said.

At the ESI, the success of cross-disciplinary research is reflected in its publications, written by authors from different departments. And Brudvig points to the serendipity that comes from proximity.



Over lunch, he said, one of his postdocs chatted with a scientist from a lab that needed help making molecules to improve battery life. Brudvig's postdoc knew how to make those molecules.

"That collaboration got started without either principal investigator being aware of it, and it led to other projects," he said.

Bringing people together was the foremost goal of All Points West, a half-day symposium organized by graduate students this spring at Yale West Campus, where institutes are arranged according to theme rather than discipline.

"We wanted to get people across different disciplines talking to each other," said organizer Courtney Smith, a fifth-year student in the Cancer Biology Institute. "It's easy to chat with people within your own institute, but I hadn't seen many events on campus aimed at bringing the different institutes together."

"On occasions when I did hear from other institutes, it was normally at the faculty level," said Becky LaCroix,

a seventh-year student at the Systems Biology Institute, and co-organizer of the symposium. "This really felt like a space for everyone to learn what's going on."

Students from each of the seven institutes plus the Yale School of Nursing made five-minute research presentations at a level "scholars from all backgrounds could understand," Smith said. They also submitted proposals for mini-grants to fund a year of research. One of the three awarded was for a collaboration between postdocs Eileen Condon from the School of Nursing and Sylvie Estrela from the Microbial Sciences Institute to look at how maternal stress might be transmitted to a child via the gut microbiome.

LaCroix and Smith plan to repeat the symposium next year. "We wanted to provide trainees with some way to connect," Smith said. "That is the goal of this campus, to be collaborative." *yale medicine magazine*

John Curtis is a frequent contributor to Yale Medicine Magazine.

A system optimized for success

Why homogeneity in the lab can hinder progress.

Change is a constant, and it takes a wide variety of responses to best meet it. Within groups of people, diversity is the fertile ground from which fresh new ideas can spring. “Homogeneity minimizes adaptability,” said John Dovidio, PhD, the Carl I. Hovland Professor of Psychology and professor in the Institute for Social and Policy Studies and of epidemiology. “When you only have one way of doing something, you become a dinosaur. If conditions change—or if what you do well doesn’t have an audience or a group of people that want it—it’s over.”

By contrast, Dovidio said, “There is a lot of research that shows that groups that have more diversity are more creative; are more flexible; are more adaptable.” In diverse groups, the tensions that develop may be creative, forcing people to think more complexly, he said. That can lead to more adaptability and more empathy, as members must maintain a more nuanced worldview about everyone else in the group.

Ethnically diverse juries, for instance, think more deeply about the issues in trials involving race than all-white juries do. Similar phenomena has been found in academic organizations, industrial settings, and the legal system. There’s also evidence that intercultural experience correlates with a higher level of creativity.

It’s true in science, too, said immunobiology professor Akiko Iwasaki, whose lab includes researchers educated in China, Japan, and Korea. “I’m a strong believer in diversity, and I try to implement that in my own laboratory. Diverse teams produce more innovative discoveries,” Iwasaki said. Indeed, scientific papers with a more diverse author lineup tend to include more references and to have a greater effect on their fields than those with a more homogeneous group of authors.

There are undeniable downsides to maintaining a diverse group, however. “Socially, it’s difficult to manage,” Dovidio said. “You have more social tension. You may have some more, at least initially, misunderstandings. ... Diversity requires some management and cultivation and attention that homogeneity doesn’t.” That management could include encouraging people to think of themselves as members of the larger group rather than of subgroups, while simultaneously taking care not to gloss over important differences to create a “veneer of harmony,” he said.

For example, we can “get people to say that we are connected in a positive way with one another—we are Americans—but that we come in different flavors.” It can be difficult for groups to navigate that kind of discomfort. But a rich reward often awaits those that succeed. “The benefits of diversity are not simply about helping minorities,” Dovidio said. Rather, diversity “is also about helping majority group members—helping people who identify with the whole system—to be much better, more complex, more flexible.”

—Jenny Blair, MD '04





ROBERT A. LISAK PHOTO

Inclusion of women as a diversity measure

The changing ways in which women have been included and studied at Yale School of Medicine over the years is a useful gauge of progress.

BY CAROLYN M. MAZURE, PHD

When we think of diversity at an academic medical center, our focus tends toward reviewing the composition of our faculty, students, and staff, and ensuring that our academic community is broadly representative of our population at large. In addition to inclusion of “the many” being the right thing to do, diversity fosters a more creative and productive working environment.

To build diversity within our school, one goal has been to increase the number of faculty members who are women; and over many years, the school has considered how to make the environment more welcoming to women and supportive of their academic careers.

In 1988, for example, Dean Leon Rosenberg, MD, HS '63, formed a task force to design a plan for increasing the number of women at all faculty levels. The task force report indicates that as of 1988, “Many people in academia assume that discrimination against women has ended, since there has been a significant increase in the number of women students, house staff, and junior faculty in recent years.” As evidence of this at YSM, 1988 data are provided to show that 33% of our entering class of medical students were women. Yet, as this thoughtful report also points out, “women occupy only 7% of the total tenured faculty of 254 ...,” and the change in the number of women entering the medical community has been due “in part to the enactment of anti-discrimination legislation in 1964.” The report concludes that women remain underrepresented, and identifies a “perception bias” about how women perform as faculty that holds back their full inclusion.

There is much more to this careful report and numerous subsequent reports, such as the 1994 Report of the Dean’s Task Force on Senior Women in the School of Medicine constituted by Dean Gerard Burrow, MD '58, HS '66; the 2003 Report from the Commission on Women Faculty, requested by Dean David Kessler, MD; the 2015 Ad Hoc Task Force on Gender Equity, and others focusing on various aspects of gender equity. Each has marked renewed effort in advancing the metrics of change, and these metrics now show that over half of our entering medical school class are women and a quarter of tenured faculty are women.

However, these more recent metrics do not obscure the significant challenges that remain. And here we turn to a common thread initially reported by the 1988 task force and reflected across subsequent reports. This thread is the notion of a perception bias about women, a bias which must be countered by gathering objective data that show the many and varied contributions of women faculty.

This struggle for inclusion of women extends to whom we study and for whom we develop our treatments and prevention strategies. In research, there has been a perception bias about the need to study women.

It was not until the 1993 NIH Revitalization Act was implemented that the National Institutes of Health required that women be included as study participants in NIH-funded studies. Prior to that time, the prevailing tradition was not to include women in clinical trials or analyze data by sex or gender, leaving

an enormous gap in our knowledge about the health of women.

Of the three main reasons for excluding women, one revolved around the commitment to protect women from experimental risk that could adversely affect childbearing. Though an important goal, this restriction for inclusion as a study participant became broadly applied to women. The Institute of Medicine's study on ethical and legal issues on the inclusion of women found that protectionist policies did not account for all inattention to the study of women's health and concluded that inattention also arises from biases that permeate society and science. The second reason women were generally not included was predicated on the misinformation that women are less affected by many health conditions and, if affected, syndromes and responses are the same across genders. Finally, women were often not included due to the "complexity" that hormonal variation brought to a scientific study. Yet, this raises the question—doesn't this variation, as well as other sex-specific factors, actually *require* the study of both women and men? To be sure, some studies included women if a condition is unique to women, such as reproductive cancers, or if a condition is highly prevalent in women, such as depression. However, in these latter studies, data were not analyzed for sex or gender differences, again leaving an important knowledge gap for women *and* men.

Women's Health Research at Yale (WHRY) was founded in 1998 to ensure a leadership role at YSM in remediating these gaps—knowing that, as indicated by the American College of Physicians, women are more likely to suffer from chronic diseases and disability as well as acute and chronic pain, die following a heart attack, develop depression and anxiety, have autoimmune diseases, and develop Alzheimer's disease.

Since its inception, WHRY's goals have been to ensure women's lives are advanced through research and its clinical translation; share new findings with the public to inform personal health decisions; and promote the study of difference between and *among* women and men to enhance the well-being of all. Moreover, WHRY's goals include setting the stage for important discovery in basic science by always including females in studies using vertebrate model systems,

as now required by the NIH. With these goals in mind, WHRY has initiated new studies and research collaborations, and funded over 100 faculty projects from 19 YSM departments, sparking innovation and productivity in uncovering new findings on pressing health concerns for women ranging from cancers to cardiovascular disease.

For example, WHRY-affiliated Yale investigators have uncovered metabolic and signaling pathways for a colon cancer prevalent in women, differential effects of stress on neurodevelopment in adolescent girls and boys, a new treatment for autism in girls, an innovative therapeutic "prime-and-pull" vaccination strategy to prevent sexually transmitted infections and cervical cancer, and a more effective taxonomy for identifying acute myocardial infarction in women—among many other useful and meaningful discoveries. Importantly, our funded investigators subsequently have generated over \$100 million of new research grants to pursue the research they have launched with WHRY support.

Maintaining the trajectory of progress in studying women and sex/gender differences requires believing there is value in diversity and retiring the notion that difference means better or worse. The metrics of diversity are important in assessing our progress, but fundamentally diversity is about perspective. Teaching the next generation of investigators and clinicians about the value of diversity and modeling inclusiveness is what will secure progress for human health and our scientific future. [*yale medicine magazine*](#)

Carolyn Mazure is the director of Women's Health Research at Yale.





ROBERT A. LISAK PHOTO

When one career isn't enough

Most people attend medical school to become physicians; some, however, use their degrees to pursue other goals.

BY ALISON MOSIER-MILLS

For some MDs, a commitment to medicine extends beyond the exam room or the lab bench. “I often advise students that the first career they choose isn’t necessarily what they’re going to be doing forever,” said Lisa Ide, MD ’89, MPH, the chief medical officer of Zipnosis, a virtual health care technology company. This mindset might not surprise millennials, who are increasingly likely to anticipate having a series of different careers rather than a single lifelong one. For most medical students, though, the standard postgraduate path is residency followed by academia or clinical practice. Some alumni of the Yale School of Medicine, however, have managed to use their MDs in unorthodox ways.

“I’m struck by the zigs and zags,” Rob Kolodner, MD ’74, vice president and chief medical officer of the telehealth company ViTel Net, said of his own journey after medical school. Neither Ide nor Kolodner, both of whom appeared on an alumni panel on career transitions in June, intended to pursue the work they ended up choosing. Ide recalls a pivotal moment during an overnight shift in the emergency department, when her patient—a mother with a young son in tow—waited hours to receive treatment for an uncomplicated ear infection. Ide’s frustration with clinical inefficiency shifted her focus from individual patient care to improving population-wide access to health care. She pursued an MPH degree and a second residency in occupational health, which equipped her for employee health leadership positions at General Mills and Fairview Health Services.

Yet another pivot brought her management expertise back to the problems she’d encountered in the emergency department: at Zipnosis, she and her team of software engineers strategize ways to streamline care delivery. “I love coming to work, knowing that my job is to prevent that mom and her son from sitting in the ED.”

Kolodner was also drawn to data that improve patient care and came to medicine with a basic understanding of computer programming. During his residency in the 1970s, he was one of the few psychiatrists who used a computer to manage research references. “Looking at this data made me realize that there was an awful lot coming out of the literature that the practitioner wasn’t using.” He accepted a position as the director of medical information resource management at the Department of Veterans Affairs (VA), and proposed providing each VA hospital with a computer. Despite initial bureaucratic pushback, Kolodner’s team implemented the world’s first large-scale electronic health system. As the national coordinator for health information technology, he continued advocating for health information systems. At ViTel Net, he now uses technology to empower individuals to control their own health care.

Connecting people from different disciplines has been a defining component of each role he’s occupied. “The type of innovating I do is combining existing things in new and exciting ways. It requires adaptability.”

The flexibility of Yale’s curriculum may prepare alumni for unconventional occupations, and for the



uncertainty that comes along with them. “The Yale system taught me how to learn and keep learning,” Ide said. “With each pivot, I felt comfortable jumping in and developing new skills.”

Alumni like Ide and Kolodner trained for their nonmedical pursuits on the job, but other students seek dual degrees in preparation for unconventional paths. Yale offers a number of joint degree programs in areas like policy, law, business, history, forestry, and theology, among others. Barbara Kazmierczak, MD, PhD, the director of Yale’s MD-PhD program, said that students pursuing nontraditional scholarship bring distinctive insights and goals. “Compared to other physician-scientists we’re training, these students are often drawn more explicitly to shaping the way in which medicine is practiced or perceived.”

Marco Ramos, MD ’18, PhD ’16, pursued a PhD in history of science and medicine alongside his medical training. His historical research, which focuses on health activism in the Global South, was informed by his clinical interests in psychiatry. His own engagement with social justice in medicine is bolstered by rigorous historical evidence. “It was an opportunity to deliberately blur the lines between the sciences, humanities, clinical work, and political action.”

While YSM offers and encourages interdisciplinary pursuits, it also emphasizes clinical leadership. “It makes a difference when health companies have a practicing physician on their team,” said Ide. “They understand what it’s actually like to be responsible for a whole panel of patients or struggle with electronic medical records.” Howard Forman, MD, MBA, the director of Yale’s MD/MBA program, said that the joint degree prepares students to work in a variety of fields—its graduates are leaders in politics, technology, and global health—but, only three students in the program’s 20-year history have opted out of matching into a residency. He’s proud of these numbers—in peer programs, the proportion of students leaving medicine is closer to one-third or one-half.

Preparing for an unconventional trajectory implies a willingness to pursue interdisciplinary work. Kolodner suspects that these alums will be surprised by their paths. “They’re laying a rich foundation and acquiring skills earlier on, but they’ll likely follow the same zigs and zags, the unanticipated things that push us in different and exciting directions.” *Yale medicine magazine*

Alison Mosier-Mills is a first-time contributor to Yale Medicine Magazine.



Yale Medicine



Balancing the curriculum

Yale School of Medicine administrators, faculty, and students work together to make sure the school's academic offerings minimize potentially harmful distractions.

BY JOHN CURTIS

For most of its history, the School of Medicine was a place where young white men learned from older white men. Those days are gone. Black men and women trickled into the medical school in the middle of the 20th century. By the 1990s, women made up half of each medical school class and the presence of minority students was increasing.

Still, attitudes, biases, and stereotypes have lingered in the curriculum. Across the country, medical schools are recognizing that lab tests and vital signs don't tell the whole story; and that to provide the best care, doctors must understand how race, gender, sexual orientation, poverty, and access to health care affect their patients' health—as well as their own inherent biases.

This concern is not just academic. Knowing about patients' lives has consequences for their care. "If we are ever going to get to the point of closing health care disparities, physicians of tomorrow must have a much better understanding of the people they are treating," said Darin Latimore, MD, deputy dean for diversity and inclusion.

A fourth-year MD-PhD student on the Committee for Diversity, Inclusion, and Social Justice put it more forcefully. "People are dying and suffering due to lack of appropriate care that can stem from providers' biases and false or inaccurate information from their medical training, like race-based medicine," said Sahana Kribakaran.

For years, students have been advocating for a curriculum that recognizes the importance of social determinants of health. Their efforts bore fruit at a town hall in November 2015 with Dean Robert J. Alpern, MD, Ensign Professor of Medicine, when led by the organization NextYSM, students voiced their concerns. In addition to changes in the curriculum, they highlighted the need for more support for minority students, more minority faculty, reporting on bias incidents, and recruitment of a diversity officer.

The Dean's Committee for Diversity, Inclusion, and Social Justice was created as a result, and the school's Educational Policy and Curriculum Committee (EPCC) began looking into the curriculum. In March 2018, an EPCC subcommittee recommended enhancing opportunities for health equity research, creating a certificate in health justice, promoting professional development, establishing a social mission statement, and showing a commitment to faculty diversity. Two key elements of the plan were weaving a health equity thread throughout all four years of medical school and creating a requirement for community service.

The subcommittee, chaired by Marcella Nuñez-Smith, MD, MHS '06, associate professor of medicine (general medicine), and of epidemiology (chronic diseases), and director of the Equity Research and Innovation Center, interviewed students, faculty, and representatives of community-based organizations.

"We reviewed the curriculum to see how it covered issues of social determinants of health, not only in terms of where they are covered, but the quality of that coverage," said student and committee member Ram Sundaresh. "There were some areas where it was covered adequately, but we identified a lot of areas for improvement."

"The concept of race in the curriculum and clinical care is raised all the time, but we don't really teach it in a rigorous way," said Nientara Anderson, a fourth-year medical student on the committee. "Race-related terms aren't talked about in ways that are up to speed with current scholarship."

Anderson said it's not just a matter of how patients are treated. People of color and varying sexual identities and orientations are present in today's classrooms. "Every time these issues are treated in an ignorant,

incorrect, insensitive, discriminatory, or biased way, there are people in the classroom experiencing discomfort, alienation of professional identity, a sense of not belonging in the classroom, a sense of being singled out or insulted by the way things are being taught," said Anderson.

Both the diversity thread and community engagement are works in progress. The medical school has hired a community-based experiential learning coordinator and is interviewing for the post of equity thread leader. The school is coordinating with community groups and neighboring universities whose students are also engaged in health projects in New Haven.

"Students from many colleges and universities volunteer in the greater New Haven community. It is unrealistic for us to assume that a local nonprofit would know which projects are best suited for an undergraduate versus a pharmacy student or medical student, for example. Part of our task is to create an effective method of pairing our students with community agencies that will benefit from the unique skills and knowledge that medical students bring to the table."

Latimore said that while the school is in the early stages of "figuring out what the curriculum should look like," the goals are clear.

"When a student takes a history, if they ask, 'Do you have food hunger?' and they hear 'yes,' I want them to say, 'Here are agencies that can help you,'" he said. "If the students only learn that African Americans experience certain diseases at a higher rate, or that the LGBTQ community faces certain diseases at a specific rate, but do not ask the deeper questions about the patient's 'lived experiences,' we will not have met the mark. We hope that our students will leave with a curiosity about and understanding of the complexity of the individual sitting before them, with the humility to learn, and with a knowledge of the resources that they can offer that person." */yale medicine magazine*

John Curtis is a frequent contributor to Yale Medicine Magazine.





Gaming the system

A board game to ease the stress of learning organic chemistry.

BY ADRIAN BONENBERGER

Most students hoping to enter medical school view organic chemistry, colloquially called “orgo,” with apprehension and fear; failure to excel in the course means risking one’s chances of admission to a good institution. Failure to pass the course means dooming one’s dreams of becoming a doctor entirely.

Prerak Juthani, however, a third-year student at Yale School of Medicine, loved his time in organic chemistry. He saw it as a game in which you had to use different chemicals to synthesize unique substances.

“I enjoyed that class, but I understand why people struggle,” said Juthani. While he is aware of the course’s dire reputation, he believes that the problem is not with the material so much as the context surrounding the course, and existing pedagogical approaches to it. “Organic chemistry is a very unusual class in the sciences, and people have to study for it differently, which throws them for a curve.”

That’s why Juthani co-founded REACT! with a University of California, Berkeley undergraduate while he was there. REACT! takes study aid to a whole new level, combining attributes of board games with attributes of a card game, all dedicated to helping students master organic chemistry.

“Because of my passion for it, I began to tutor struggling students, and in the process figured that I could turn the concepts of organic chemistry into a study aid,” said Juthani. “I got together with a couple friends, and the more we talked about it, the more we realized orgo could be gamified—turned into a competitive game.”

According to [statista.com](https://www.statista.com), a website dedicated to aggregating and analyzing market data, the global board game industry in 2019 is worth approximately \$8.5 billion. That makes a study aid that’s pitched in a board game format a good bet financially—and an excellent fit for the intellectually stimulated high-achieving undergraduates who must take the

daunting class in order to matriculate at medical or graduate school.

After raising money through a Kickstarter campaign—over \$15,000—the team was ready to take it live. Now, REACT! is available at \$40 per set. The game, played by two to four people, includes 212 cards, four reaction maps, four “lab benches,” four dry-erase markers, and one manual.

“The goal is to score as many points as possible,” said Juthani. “You can score many points by saving up and making one big compound, or score a few points many times with smaller reactions. That’s the element of strategy in the game, knowing what’s out there and seeing a viable path based on the reagent cards in your hand.”

According to the co-president of REACT!, Daniel Rosenthal, helping people learn science comes naturally to Juthani. “We met in 2015, a year before Prerak started REACT! He was an energetic student-leader, tutoring hundreds of UC Berkeley students in biology and chemistry at UC Berkeley’s Student Learning Center.”

Rosenthal believes great things are in store for REACT!, and also for his colleague: “Prerak is dynamic, driven, and innovative. Now that he’s at Yale School of Medicine, he’s encouraging me to guide our team and take REACT! to new heights.”

For Juthani’s part, he’s excited about ways to connect with people in and provide value to the New Haven community. Though it took a little while to adjust from his native San Francisco, Juthani said YSM feels like home. “There are so many things happening here at Yale School of Medicine, it can be overwhelming. But once I had spent a couple months here, I found my people and have been able to create a community that drives me to continually do bigger and better things. I’m hoping to continue pursuing my passion of entrepreneurship by doing an MBA here in the near future.” */yale medicine magazine*

Adrian Bonenberger is Editor of Yale Medicine Magazine.





A complex but enduring partnership

After two centuries of shared history, the School of Medicine and the city of New Haven continue to shape each other.

BY REBECCA J. FREY, PHD '99

Yale School of Medicine (YSM) in the 21st century is rightly considered a world-class institution, while the city that surrounds it is equally renowned for the excellence of its hospitals and biotechnology companies. Today, the relationship between YSM and New Haven is strong, but it wasn't always that way: the pair has weathered setbacks in their growth and their relationship.

YSM was founded during a period in which professional schools in law, medicine, and theology separated

from undergraduate colleges. The Medical Institution of Yale College, as it was then known, was not chartered until 1810. Its beginnings in a building on Prospect Street soon brought it into conflict with the townsfolk, then numbering fewer than 7,000 souls. A riot broke out in 1824 when the body of a young woman taken from the cemetery was discovered in the cellar of the Medical Institution. While New Haveners held general medical practice in high regard, dissection associated with grave robbing was taboo.

The Industrial Revolution brought many changes to city and school alike, not all of them positive. New Haven's 1830s investment in building a canal northward to Northampton squandered capital that could have been used to build a railroad. On the other hand, Eli Whitney's cotton gin and gun factory brought prosperity to the city and turned it into a manufacturing center for military equipment. As a result, New Haven's population grew from 20,000 in 1850 to 40,000 only 10 years later. The medical school made its own history in this period by graduating its first African American student in 1857 and by moving to York Street in 1860. It became the official medical school of the university in 1887.

YSM's stature declined after the 1890s, however. Abraham Flexner noted in his famous 1910 report on American medical education that although Yale compared favorably to medical schools that were not university-affiliated, its departments of anatomy, bacteriology, and pathology were deficient; its professors had to do routine work rather than research because they lacked assistants; and the study of obstetrics and gynecology was limited to the outpatient clinic in the hospital. World War I brought two important innovations: the establishment of the Department of Public Health (later to become a separate school) in 1915, and the admission of the first women students in 1916. But the school's four buildings were scattered across downtown New Haven, and it had to rely on the university to cover its debts.

It was Milton Winternitz, MD, who transformed YSM from the university's stepchild to a national leader in medical education. Winternitz, dean from 1920 to 1935, not only raised money to give the school financial stability, but also supervised its move to its present location next to what is now Yale New Haven Hospital. He added the Department of Psychiatry and the School of Nursing as well as recruited a stellar faculty that brought YSM into the front rank of American medical schools. Most importantly, he introduced the Yale system, an approach unique to YSM that deemphasizes grades and class ranking, and encourages medical students to become flexible and independent thinkers (as their varied postgraduate careers demonstrate). Winternitz's requirement of a thesis for the MD degree is one reason why a high number of YSM graduates still enter academic medicine.

The 1950s witnessed the impact of the automobile and the construction of interstate highways on both the city and its medical school. As the city's population grew to a postwar high of 160,000 and its medical center attracted increasing traffic, Mayor Richard C. Lee decided in 1957 to tear down a Jewish, Irish, and Italian immigrant neighborhood near the hospital to make room for an expressway and two frontage roads. In addition to destroying one of New Haven's most distinctive areas, the Oak Street Connector severed the medical center from the rest of the university and introduced numerous hazards for drivers and pedestrians alike. Downtown Crossing, a three-phase project to redesign the expressway is currently in Phase 2. Completion is scheduled in 2021. Planners hope it makes New Haven friendlier to people commuting by foot—after all, the city has a higher percentage of residents who walk to work than any other city in New England.

YSM contributes to the revitalization of downtown New Haven in several ways—first, by ensuring that all its new buildings meet Leadership in Energy and Environmental Design (LEED) certification standards. Second, the school is working with the city to make the medical campus more pedestrian-friendly. Most importantly, however, YSM is deeply involved with the surrounding community to meet its most pressing health care needs. Faculty and students provide care for people in a wide range of settings, from YSM's refugee clinic for adults and the student-run HAVEN Free Clinic in Fair Haven to the Neighborhood Health Project (which provides free diabetes and blood pressure screenings) and an expanded addiction medicine program. While many challenges remain in regard to human need as well as urban infrastructure, YSM and New Haven are committed to meet them as partners.

[/yale medicine magazine](#)

Rebecca Frey is a contributor to Yale Medicine Magazine.





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A disease deflector

Microbial biodiversity helps keep humans healthy by shielding them from fatal infections.

BY JENNY BLAIR, MD '04

The outside world teems with microscopic objects. Many of these busy microbes invade the human body. Viruses, pollen, bacteria, fungi, toxins, mineral particles, soot, and—these days—microplastics permeate the food we eat and the air we breathe.

To combat this assault, the body uses a diverse tool kit: the immune system. The body's response to threats depends upon its ability to generate an omnifarious defense, while the microbiome lining the gut surface contains a complexity that protects and sustains us in more ways than one. It's tempting to conclude that diversity is always a faithful ally.

When a vertebrate immune system faces a new pathogen, it comes prepared with a variety of weapons. "The immune system is all about diversity," said Akiko Iwasaki, PhD, the Waldemar Von Zedtwitz Professor of Immunobiology, professor of molecular, cellular, and developmental biology, and of dermatology, and a Howard Hughes Medical Institute investigator.

Each young cell of the adaptive immune response begins life wielding a unique appendage—a single type of receptor. Each receptor is generated afresh, one per cell, by genes that recombine and mutate rapidly.

If the pathogen happens to fit a single cell's receptor—an event analogous to a random key fitting a lock—the lymphocyte that wields it begins to divide. Equipped with the correct receptor, all the cell's progeny can more effectively meet the intruder.

Absent this process, there would be no adaptive immune response—a "clear example of diversity being required for survival," Iwasaki said.

Similarly, at the population level, individual people muster a variable array of immune responses that limit the damage that any specific pathogen can do. People contract infectious diseases all the time, but

few people are killed by them, save in examples in which people are immunocompromised or in cases where the pathogen is extremely deadly.

(Iwasaki has argued that the immunology community itself ought to follow similar principles in its own ranks, criticizing the ubiquity of homogeneous panels and speakers at research symposia.)

Then there is the gut microbiome. In recent years, studies about it have flourished, even as researchers have come to suspect that this inner ecosystem is growing less diverse due to restricted diets and antibiotic overprescribing over several decades. This loss of diversity is, it appears, to our detriment: a higher number of species in the gut microbiota seems to correlate with better health.

Severe loss of diversity in the gut microbiome can predispose a person to opportunistic infections. The classic example is *Clostridium difficile* infection (CDI), which can take hold after chronic antibiotic use eradicates ordinary gut residents. As it flourishes, CDI can cause a life-threatening diarrhea.

"[Antibiotic use can be] like clearing the rainforest in the gut," said Noah Palm, PhD '11, assistant professor of immunobiology. "This weed that was hiding in the background as spores is able to grow."

Until recently, physicians treated repeat CDI episodes with antibiotics, a tactic comparable to burning over the same ground again and again. An alternative approach: replace the dangerously simple ecosystem with a diverse one using a fecal microbiota transplant. With cure rates topping 90%, it is now first-line therapy for third or subsequent nonsevere episodes of recurrent CDI. This success has inspired researchers to experiment with fecal microbiota transplantation in a wide variety of other diseases, including autoimmune disease, autism, and cancer.

Why did we evolve such a diverse gut community in the first place? One explanation is that it can shield us from colonization by pathogens, Palm said. Without friendly bacteria occupying all available ecological niches in the gut, a person is profoundly susceptible to infectious disease.

As an example, to infect a healthy mouse with *Salmonella* requires something like 100 million individual bacteria. But if you dose that mouse with an antibiotic, thus eradicating part of its gut flora, it may take only 100 or even 10 *Salmonella* cells to cause infection.

“In my opinion, that’s the most important rule that the microbiota plays evolutionarily,” Palm said. “Without our microbiota, for that reason alone, all of us would be dead from pathogenic infection.”

Over deep time, a certain level of gut microbiome diversity has become necessary for another reason: nutrition. We’ve lost the ability to synthesize certain vitamins on our own, instead depending on specific microbes to perform that metabolic task. The gut microbiome, too, can unlock complex carbohydrates whose nutrients would otherwise be out of reach.

On a local level, though, greater diversity isn’t necessarily better. Compared with the gut, for instance, the vagina prefers a far simpler microbiome. Whether the lung does best with a wide or narrow range of organisms remains to be determined.

Andrew Goodman, PhD, the C.N.H. Long Professor of Microbial Pathogenesis, and director of the Yale Microbial Sciences Institute, emphasizes the importance of avoiding the reflexive belief that diversity is invariably beneficial to biological systems.

In clinical care, for example, fecal transplantation has not fulfilled everyone’s hopes.

“To date, [CDI is] really the only example where there’s been widespread clinical application of a microbiome-based therapy that’s gone beyond a few isolated trials,” Goodman said.

Even in the gut, the addition of a new kind of microbe—ratcheting up the diversity, he points out—is arguably less healthful if the newcomer is a pathogen.

Palm added that many recent non-CDI fecal transplantation trials have little basis beyond hope on which to proceed.

“People are throwing darts at a wall without understanding what’s going on” he said. “It’s much less clear that loss of diversity is actually a cause of disease in these other, more chronic disorders.”

“The idea of diversity being good, I think, has caught hold because it’s an attractive idea, and fits with our concepts also of biodiversity environmentally,” Palm added. “It’ll be interesting ... to figure out in a bit more mechanistic detail when and why it’s actually good to have diversity, and get beyond some of these generalizations.”

If fecal transplantation turns out not to be a panacea, what other roles might gut biodiversity play in clinical care? Goodman, for his part, is studying the role played by the gut microbiome in the body’s response to medications. People with the same disease can have different responses to the same drug. Some of that variability may be explained by differences in the human genome, but the gut microbiome’s genome, which dwarfs that of its human host, may also be involved.

Goodman points out that researchers have identified gut microbes that metabolize two-thirds of the medications they’ve examined. How those metabolites affect the host is still unknown, he said, “but at least the potential is there. We’re just starting to understand the rules.”

“I’ve always been interested in the molecular mechanisms of gut microbial ecology. We have a lot more to learn,” Goodman said. “It’s a very fun time and a very exciting time to be in the field.” *yale medicine magazine*

Jenny Blair is a frequent contributor to Yale Medicine Magazine.



A bottle for baby

Many know of YSM’s renowned collection of medical curiosities. Few, however, know of a unique collection: antique baby bottles.

By Christopher Hoffman

Wander the maze of interconnected Yale New Haven Hospital (YNHH) and Yale School of Medicine buildings between Cedar Street and Howard Avenue, and you will eventually come across a pair of facing display cases. They hold one of Yale’s most unusual collections: antique baby bottles.

The 27 infant feeding vessels range in historical period from the first or second century B.C. to the 1940s, and provide a fascinating visual primer on the evolution of the baby bottle. They include a tiny two-handled terracotta vessel resembling a vase discovered in a Roman child’s tomb in southern Italy; an elaborately patterned blue-and-white Staffordshire “submarine” bottle from the early- to mid-19th

century; and a 1940s milk bottle-style feeder with a built-in thermometer. Other shapes include oval—to mimic a breast—oblong, and pear, with a variety of lips, spouts, and mouths to facilitate feeding.

YNHH owns the collection, thanks to the passion and generosity of one

man, Howard Fink, MD. A retired Milford pediatrician and professor at the School of Medicine, Fink spent decades collecting and researching the vessels—most of which were given to him. He scoured old advertisements, journal articles, and books to learn their makers, ages, and histories. His relentless sleuthing paid off, yielding basic information—and often much more—about of all the bottles.

“You suspect something, but you don’t really know until you research it,” Fink, who is 90 and lives in a senior facility in Chicago, Illinois, said in a recent phone interview. “There was really no organized place to look. They were all rather difficult.”

As Fink approached retirement in 2000, he wanted to preserve all of his hard work and give back to Yale after years spent training young pediatricians. He decided to offer the collection to the hospital, which accepted it. “I spent so much wonderful time at the children’s hospital, I wanted to leave something to the hospital.” Fink said. “It gave a lot of satisfaction to be able to do that.”

Consulting his research, Fink wrote captions, and he and his wife placed the bottles in the display cases nearly 20 years ago. They’ve been there ever since, according to hospital archivist Susan Dee. In 2012, hospital officials retyped the collection’s labels and installed new lights, but the collection is otherwise unchanged from the time that Fink donated it, Dee said. Although the bottles are not in an area accessible to the general public, their location in

a high-traffic hallway of the Clinic Building means they get a lot of passersby, Dee said. “It’s kind of a landmark,” she said in a recent interview. “People know them.”

Fink, a New York City native who attended medical school at the University of Louisville, moved to Milford in 1959 and established a pediatrics practice. One day, a nurse told Fink she’d found some old baby bottles in her attic and asked him if he wanted them. He said yes and quickly became an avid collector. “I was always a real hobbyist, and this was my favorite hobby,” he said.

Why the fascination? Professional curiosity, Fink replied. “So much of a pediatrician’s time is spent advising mothers on how to feed babies, how to prepare formula, how to nurse,” he said. “So any pediatrician would naturally be interested in something like this.”

Other highlights of Fink’s collection are a lantern-shaped vessel with a spout that dates from A.D. second- or third-century Israel, and a circa 1774 tin feeder forged by German craftsmen in Pennsylvania. It resembles a tiny pitcher with a rod topped by a tiny ball on the end—the feeding



Among the noteworthy collections at Yale is Yale New Haven Hospital’s collection of baby bottles, which includes extraordinary examples from across a broad scope of cultures and human history dating back to ancient Rome. As is often the case, the collection was the result of one doctor’s curiosity and interest in the subject.

spout—sticking out from its side. Its makers called it a *Mammele*—“little breast” in German, according to Fink’s research.

Not all the bottles have happy stories. The display includes several so-called “murder bottles”—a style popular in the late 19th and early 20th centuries that used a rubber hose to convey milk from the vessel to the baby. The rubber hoses proved impossible to sterilize completely, leading to infections that killed many infants. In spite of moves to ban the bottles as early as 1897,

they remained for sale in the Sears, Roebuck & Co. catalog—the mail-order Amazon of its day—as late as 1915, according to Fink’s research.

Dee said the school greatly appreciates the collection, adding she wishes she knew even more about it. “To have it right here on our property on the hospital grounds is pretty unique,” she said. “I know it gets seen.” That’s music to Fink’s ears. Decades later, he remains happy that he gave YNHH the bottles he painstakingly collected and researched.

“It gave me a lot of pleasure,” Fink said. “All my work hasn’t been wasted. Someone else is enjoying them.”



Learning across boundaries to end preventable maternal deaths

EVERY TWO MINUTES, a woman dies from pregnancy- or childbirth-related complications. Mary-Ann Etiebet, MD/MBA '03, wants to change that. In 2016, Etiebet joined Merck to be the executive director of *Merck for Mothers*, a global initiative focused on ending preventable maternal deaths. She uses her background in medicine and business to advance innovative multisectoral approaches to reducing maternal mortality around the world.

Etiebet, who grew up in Nigeria, always knew she was going to become involved in health care—she just didn't know how. She decided to pursue medicine when on a drive to school one day, she spotted a teenage girl with rickets walking down the road with her younger brother. The brother wore a school uniform, but the young girl did not, and could no longer pursue her education.

"I realized that without good health you couldn't realize your full potential, or completely have

economic independence," Etiebet said. "Even now, that moment is a reminder that we cannot separate the effects of health from broader societal opportunities."

Etiebet pursued her higher education in the United States, studying political science as an undergraduate at Yale before continuing on to the MD/MBA

program. She realized that to effect the kind of institutional changes and sustainable health care outcomes she envisioned, she would need to understand medicine, society, business, and policy—and that Yale was the perfect place to do all of that.

"The whole ethos of the University, and the cross-disciplinary learning that happens between the schools and the departments, meant there was enough flexibility in the curriculum to be able to prepare myself for those non-traditional paths," she said.

After graduation Etiebet completed her internal medicine residency at Cornell, infectious disease fellowship at Columbia, and then joined the faculty at the University of Maryland, where she worked on their PEPFAR HIV/AIDS program in Nigeria. During her time there, she contributed to health care policy and health system-strengthening efforts, and saw firsthand the positive effects of integrating the clinical public health and public policy arenas.

Merck for Mothers offered Etiebet the perfect opportunity to put to use skills she had accrued over the years. "It brought together my international experience, my U.S.-based experience, and the research I'd done," she said. "More importantly, it allowed me to think about how to harness the role of the private sector to advance innovation and bring diverse stakeholders to this issue—space."

At Merck, Etiebet manages a core team of 12 people, access to experts across the Merck enterprise with whom she can consult with for different projects. *Merck for Mothers* currently has active projects in 48 countries, with a focus on four countries with high rates of preventable maternal deaths: Nigeria, India, Kenya, and the United States.

It often surprises people that maternal mortality is on the rise in the U.S., Etiebet said, particularly since global rates are declining. For many years, the U.S. did not closely track its number of preventable deaths, and thus researchers did not understand why women were dying during pregnancy and childbirth. Data collected by the CDC through the support of *Merck for Mothers* found that over 60% of maternal deaths for American women are preventable.

“Once data became available, we saw that our rates are actually getting worse, not better, and we’re seeing increased disparities between Black and White women,” Etiebet said.

Black women are, on average, three to four times more likely to die from maternal complications than White women. Maternal mortality rates highlight some of the institutionalized inequities in the U.S., Etiebet said.

That’s why in 2018, *Merck for Mothers* launched the Safer Childbirth Cities Initiative, which aims to support community-based organizations in



In her role at *Merck for Mothers*, Mary-Ann Etiebet leads active projects in 48 countries to help reduce the rate of preventable maternal deaths.

cities across the U.S. with a high burden of maternal mortality and morbidity by implementing local solutions that bridge the gap between clinic and community, which helps cities become safer—and more equitable—places to give birth.

Additionally, by supporting organizations like the CDC and the Association of Maternal & Child Health Programs (AMCHP), *Merck for Mothers* has helped increase the number of states with official maternal death review committees to more than 40. And most importantly, Etiebet said, these states have incorporated patients’

voices into those committees, to make sure health care providers understand what happens to women before they walk into a hospital to deliver.

“To reduce preventable maternal deaths, health equity needs to be put front and center, and we believe that all the solutions that are developed and implemented should not just be informed by, but led by the women that are impacted,” Etiebet said. At the international level, Etiebet and



ONLINE EXCLUSIVE

Ilkay Alp Yildirim, PhD, an associate professor of pharmacology at Istanbul University, learned many key practices and research habits during a postgraduate fellowship at Yale School of Medicine.

For more on Yildirim, visit ymm.yale.edu/pharma

her team work to make sure that the interventions they bring to different countries are sustainable.

“We think about the local ecosystem, and who will continue to champion and invest in this work,” Etiebet said. “We ask, ‘How can we use the local private sector to continue to advance progress?’”

A good example is a platform called Together for Her Health, which creates an online rating system for women in communities in India to review their maternal health care providers. The system not only informs other women about the best clinics to seek for different services, Etiebet said, it also creates an incentive for other facilities to improve their offerings so that they don’t lose patients.

“Sustainability is enabled when we create value,” Etiebet said. “If we listen to and value women and their experiences, we can reduce the number of maternal deaths.”

—Riley Davis



Bringing it full circle

The UCLA School of Law faculty biography page for Julie D. Cantor, JD, MD ’05, describes her as “a national expert on issues that fall at the intersection of medicine and law.” It’s clear that Cantor, as a professor, attorney, physician, artist, entrepreneur, and mother, operates at many intersections.

Her rich diversity of passions and interests began in

childhood. “I came from a family that valued both education and entrepreneurship,” Cantor said. “And always trying to contribute in a unique and necessary way.” Even at a young age, she understood the need for social justice and advocacy. When a busy street near her childhood home needed a crossing guard, Cantor said, “I was so incensed about that problem that as a 6-year-old, I wrote a letter to the editor of the local newspaper about it.”

Cantor was raised on action. In the 1970s, her father, a children’s dentist and artist, and her mother, a kindergarten teacher, created a space-themed children’s dental practice. It was complete with spaceship decor and pilot uniforms. “I think they had an innate sense that what it takes to succeed in this culture is to do something that’s different, that’s creative,” Cantor said.

She quickly discovered both aptitude and enthusiasm for school, which eventually led to Stanford University. Majoring in psychology, she also engaged with history, literature, and art history—and took advantage of an opportunity to study in Italy, where her mother had studied and where her parents honeymooned. The country had a lasting effect on Cantor.

After completing both a BA and an MA in psychology, Cantor worked at the Program in Bioethics at UCSF. There, she worked with a physician and an attorney. “I liked the way

[they] would comment on things that were going on in the world at the intersection of law and medicine,” she said. Her mentors wrote about the potential impact of cases pending before the Supreme Court of the United States on assisted suicide, and the piece was published in a leading medical journal. “I remember thinking: that’s the pinnacle of greatness,” Cantor said. “How do I get to do that?”

Cantor spent two years at the University of California, Berkeley, School of Law, then moved to Yale to complete a visiting year at Yale Law School and begin medical school. Yale School of Medicine proved an opportunity for Cantor to explore, refine, and coalesce her interests. She enjoyed writing and lecturing, and published her first article in the *New England Journal of Medicine*. Though her passions did not fit neatly, Cantor said, “I just kept pursuing things that were interesting to me and had hoped—and continue to hope—I can contribute to other people’s lives and contribute to the dialogue.”

After graduating, Cantor accepted a position with a Los Angeles law firm, Munger, Tolles & Olson LLP. She was one of a handful of physicians in her Yale class to pursue an option other than residency. “It was a very academic firm, so I knew they would be okay with me wanting to teach and lecture,” she said. While juggling work as an adjunct professor at UCLA School of Law and also starting

a family, she made a name for herself at the firm working on cases informed by her medical background, including a case challenging Kentucky's lethal injection protocol, for which she co-authored an amicus brief to the U.S. Supreme Court.

"I was really fortunate to work on teams with people who were so illustrious in their field as lawyers that they brought in these incredibly interesting cases," she said.

Cantor's next career endeavor grew, as always, from an eye attuned to progress. Working as a litigator and representing high-profile clients, she found herself saddled with an unwieldy amount of paperwork, baggage, and materials. "I had a rolling bag, a tote, plus a laptop," she said. "When you add it all up it's pretty heavy, and I thought there's got to be a way where this can really have an element of self-expression and style, and also be beautifully made and made to last forever, and can be totally functional."

As she had when she was 6 years old, Cantor recognized and addressed a need. To create a perfect career accessory, Cantor founded Harlen, a brand that elevates women's work bags to Modern Careerpieces, a term she trademarked. Harkening back to her time—as well as her mother's time—studying art history in Italy, the Harlen Collection is handcrafted in Italy. She named the brand for her grandparents, Harriet and Lenny, whom she



Yale School of Medicine alumna Julie Cantor demonstrates that an MD can lead far outside the physician's field. She has co-authored an amicus brief to the Supreme Court, founded the Harlen Collection, and published in *The New England Journal of Medicine*.

credits with igniting her sense of style and who were also "real supporters of girls' education and empowerment and autonomy and independence." In that spirit, to move opportunity from successful women to the next generation, Harlen partners with Room to Read, an acclaimed non-governmental organization dedicated to global literacy and girls' education.

Though many things have come full circle for Cantor, she isn't finished. In addition to leading Harlen, she remains engaged with both medicine and law through her UCLA Law seminar, "Reproductive Rights, Medical Ethics & the Law," which began at Yale as

a sophomore seminar; and by writing about issues that affect both of those fields. And she's frequently approached with requests for public comment. Whether in the *New England Journal of Medicine* or on *Good Morning America* or somewhere in between, Cantor is always happy to speak. As she puts it, "it's an opportunity to take what I've learned, including what I learned at Yale, and advance the conversation, improve lives, and solve problems."

—Lauren Kay Johnson

When the bone breaks, the cradle won't fall

LISA LATTANZA, MD, credits strong mentorship and an unusual career path with her resounding success in the field of orthopaedic surgery. She's excited to bring the lessons she's learned to the Yale Department of Orthopaedics and Rehabilitation. There are three female chairs of medical school orthopaedics departments in the United States. The most recent, Lisa Lattanza, MD, comes to Yale School of Medicine via the University of California San Francisco.

Your journey to department chair has been unusual.

How did growing up lead you to the field of medicine?

I come from a family of five kids in rural Ohio. My mother was a teacher and my dad was a school psychologist. I had always thought about a career in medicine but they told me they couldn't afford medical school. A high school sports injury exposed me to orthopaedic surgery and physical

therapy, and the latter seemed like a feasible way to enter the profession, so that's what I studied in undergrad. I landed a job at the Kerlan-Jobe Orthopaedic Center in Los Angeles, where I treated patients with sports injuries and did research. I also met a prominent orthopaedic surgeon, Jacquelin Perry, MD.

Is that the Perry of your Perry Initiative? That's right. Perry had an enormous impact on how I viewed the practice of

medicine. She would always listen to everyone in the room, regardless of hierarchy. ... She encouraged me to attend medical school, and was generally a huge advocate of women in medicine. Being a doctor had always seemed impractical and then I worried that maybe I wasn't smart enough—I'm old enough to remember being told by an elementary school teacher, "You don't want to be smarter

than the boys." I didn't personally know any doctors growing up. And the impact of one encouraging me to pursue that goal, acting as a mentor and role model—that was so important. The Perry Initiative is held in 54 locations nationwide now, offering daylong programs for young women in high school who want to explore opportunities in science, specifically engineering and orthopaedic surgery. We also have a Medical School Outreach Program for first- and second-year female medical students to expose them to the specialty; as an overall field, the national average for women applying and being accepted into an orthopaedics program is 14%. For first- and second-year women who have gone through our program, it's 26-30%.

Do you view your time as a physical therapist as a distraction, then? Quite the contrary. I wouldn't be the surgeon I am without that practical whole-person approach that I learned as a physical therapist. Surgeons can fall into the trap of viewing the body mechanistically,

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like, a part here breaks and you fix it. And while there's some truth to there being a kind of interchangeability of some parts, they all affect each other, and you really see that with certain injuries that cause a cascade of secondary and tertiary problems. All surgeons don't need to take the path I did, but I appreciate the road I traveled.

When did you realize you wanted to be an orthopaedic surgeon specifically?

The seed was planted at Kerlan-Jobe, a big sports medicine group that took care of the Lakers and Dodgers among other professional athletes. I'd lettered in three sports in high school, played basketball, ran cross country in college, and had a passion for athletic competition. I went back to medical school to become an orthopaedic surgeon. I initially thought during residency that I would pursue sports medicine specialty training but that changed when I did a couple of congenital hand cases with a hand surgeon at the children's hospital in Kansas City. It blew my mind that you could take a child that was born without a thumb

and make them a thumb from an index finger or toe. And, boom, their life was impacted forever in a positive way. Prior to that experience my dream job had been team physician for the Pittsburgh Steelers (my dad had grown up there), but seeing the impact that kind of surgery had versus an ACL reconstruction so that someone could go back to playing a sport. ... and now I'm a hand and upper extremity surgeon treating both children and adults. My time at Texas Scottish Rite Hospital for Children in Dallas with Marybeth Ezaki, MD, and Peter Carter, MD, also helped play a role in that decision; I really have been blessed with fantastic mentors.

What are your plans for the department, moving forward?

Right now, orthopaedic surgery benefits tremendously from 3D printing for planning—where to cut a bone, how to resolve complicated procedures—this increases the effectiveness of operations and reduces error. In the future, though, it looks like we're headed toward 3D-printed biomaterials. Printing bones,

printing organs, using material grown from a patient's own cells for transplant. What I would like to see happen on this campus is a 3D surgical center that's multidisciplinary. ... Radiology, general surgery, orthopaedics, maxillofacial, plastic surgery, urology, whoever can benefit from this technology. That will keep Yale at the forefront of surgical innovation and treatment.

Other plans include an expansion of our capabilities regionally and internationally. We can always add to the great job we've done supporting the local community's orthopaedic needs. There are also plans to continue building on existing global partnerships. Those take the shape of clinical growth, and also volunteer projects.

Finally, I hope to keep our departmental eye on the ball when it comes to diversity, equity, and inclusion. A lot of people who grew up thinking they couldn't make it or ortho wasn't for them when I was younger have done a good job of opening locked doors. We're all hoping to see the next generation walk through.



How to make the lives of those with dementia joyful

By Cathy Shufro

Psychiatrist and bioethicist Tia Powell, MD '87, has already written her dementia playlist just in case. The list comprises 16 songs she loves, beginning with “Let’s Groove” by Earth, Wind & Fire, and wrapping up with Otis Redding’s version of “Try a Little Tenderness” and the Billie Holiday rendition of “I’ll Be Seeing You.”

Those tunes could come in handy if Powell develops dementia, as even people who can no longer speak often still enjoy music. “This playlist helps me create a positive image of living with dementia,” said Powell, who directs the Montefiore Einstein Center for Bioethics and holds the Shoshanah Trachtenberg Frackman Chair in Bioethics at Albert Einstein College of Medicine.

In *Dementia Reimagined: Building a Life of Joy and Dignity from Beginning to End*, Powell explores how technology, intergenerational symbiosis, and shifts in values can make the lives of those affected not only more

tolerable but even joyful. Powell reminds readers that the burden of Alzheimer’s and other forms of dementia will only worsen as she and her fellow baby boomers grow older. Dementia affects roughly four out of 10 people who reach age 85. However, she writes, “This illness is not just about loss; it is also about preservation—of affection, of dignity, of hope.”

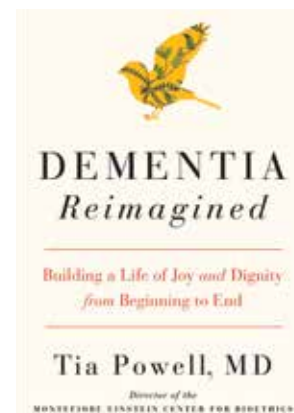
Powell fears that no pill will arrive to save her generation; present experimental drugs for Alzheimer’s, for instance, have a 99.6% failure rate. “Science plays the long game,” she said. And so while scientists work toward a cure, Powell recommends that we also invest in care. “If we focused more on the reality of care and less on the fantasy of eradication, we might deal with these pressing issues.”

For physicians, this approach will require a cultural shift. Medicine “sees itself as manly, offering heroic cures,” Powell wrote. “But a great deal of what medicine offers patients is care—incremental, accommodating, feminine (if you stick with the outmoded

metaphor). Yet medicine is embarrassed to admit this. Care seems soft and unscientific; we’d prefer to hand out [a] swashbuckling cure.”

She said physicians can improve care by looking beyond the immediate effects of a potential treatment or test. For instance, perhaps the \$2,500 for a PET scan would be better spent helping a patient arrange help with meals (nutrition) or avoid isolation by joining a singing group (possibly improving mood and mental status). To add this layer of care, medical practices could employ a social worker or treatment coordinator. “The benefit of being part of Big Medicine is you may be able to access resources that a single doc in a lone office is not able to,” Powell said.

Powell manages to remain upbeat, peppering her book with witticisms while also addressing the challenges of dementia, from the huge expense (“heading like a meteor toward the children of the baby-boom generation”) to the nitty-gritty: adults in



diapers, older individuals lost after wandering away from caregivers. She rejects the claim that the costs of dementia care will spark an intergenerational war. Older and younger individuals can benefit from working together. In some places in Europe, for example, young artists and musicians get free or reduced housing in return for helping older people who live alongside them.

Powell believes that our society overvalues intelligence. “I love to think I’m smart, but I’m not sure that snobbery is one of my best features. There has been some very interesting thinking by people in the disability rights movement about what defines a person, and to what sort of person we owe respect and consideration.

“I find it very upsetting when people talk about having dementia as being a loss of dignity,” she said. Drooling and incontinence are “adorable in babies, and accepted as a natural part of the developmental arc.” In older people, “that’s just the body breaking down, not a moral failure. It’s an arc, and it goes back down again.”

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Changing of the guard

FROM A DIVERSITY PERSPECTIVE, the future is now when it comes to the student body of the School of Medicine. At Yale’s White Coat Ceremony on August 12, it was impossible not to witness progress in a class that is anything but homogeneous as members of the Class of 2023 pulled on their symbolic white coats.

Beyond the superficial differences among students, the class included 32 future physicians born in 15 countries outside the United States, and from disparate economic and academic backgrounds (including 29 students from groups underrepresented in medicine, or URiM, over a quarter of the class). Fifteen students were the first in their family to attend college.

Emily Wang, MD, associate professor of medicine (general medicine) and director of the Health Justice Lab, delivered the keynote address. She instructed her audience to think about the roles they can play in their patients’ lives. “Starting today, your white coat gives you the privilege to bear witness to your patients’ sufferings and their strengths; to share that burden, and then to safeguard their human civil rights.”

—Adrian Bonenberger