

Yale Medicine



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ONLINE EXTRA



Yale team returns from medical mission to Haiti

Arriving with \$12,000 worth of medical equipment and supplies, physicians treated fractures and crush injuries.

Letter from Haiti

Public Health alum Amelia Shaw writes from a U.N. compound in Port-au-Prince.

M.D./M.B.A. program reaches its 10th year

A decade in, the joint five-year program trains students to be leaders in the increasingly corporate world of medicine.

Outside the bounds of polite conversation

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Class of 2012 presents “Love in the Time of the Swine Flu”

The second-year class affectionately mocked faculty while carrying on a 61-year-old tradition.

yalemedicine.yale.edu

On our website, readers can submit class notes or a change of address, check the alumni events calendar, arrange for a lifelong Yale e-mail alias through the virtual Yale Station, and search our electronic archive.



SPRING 2010

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ON THE COVER Science and architecture are moving away from the era in which a laboratory was built to order for a single scientist. New buildings and renovations to older ones aim to provide more support space for scientists, as well as more flexibility. Modern lab buildings include a little wiggle room, including common areas that encourage mingling among scientists.

Illustration by Shane McGowan



HOW TO REACH US

Yale Medicine welcomes news and commentary. Please send letters (350 words or fewer) and news items to *Yale Medicine*, 300 George Street, Suite 773, New Haven, CT 06511, or via e-mail to ymm@yale.edu, and include a telephone number. Submissions may be edited for length, style, and content.

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Online: Yale Netcasts

Additional content for articles in this issue of *Yale Medicine* is available online at iTunesU, or by pointing your browser to yalemedicine.yale.edu.

Congratulations for embracing PA program

I was very pleased to see the Yale Physician Associate Program featured in the Autumn 2009 issue of *Yale Medicine* ["Yale's Physician Associate Program Nears 40"], and to read the history of how the program came to be and how it has successfully evolved since 1970. Several points deserve emphasis. While the Duke program preceded the founding of ours by five years, it focused heavily on returning U.S. military corpsmen, which was not the emphasis of the Yale program, even from the beginning. The Yale program drew its applicants from a broad spectrum of individuals who had health care experience and were committed to working in some aspect of primary care. Although the program was born out of the trauma program under the Department of Surgery chaired by Jack W. Cole, M.D., all students received generalist training across the medical landscape and were prepared to enter any field of medicine. From the beginning, the faculty and leadership of the entire Medical School were very supportive.

The program leadership, including Blair L. Sadler, J.D., Ann A. Bliss, R.N., and Paul Moson, PA-C, was committed to a program that was open equally to women and men. Although the first classes had more men than women, the applicant pool quickly evolved to the point that there were more women than men. Recent classes have more than 70 percent women, which corresponds to the national average. The white paper on the future of the physicians' assistants, prepared for five national foundations by Sadler, Sadler, and Bliss in 1971, drew the blueprint for the evolution of the field and served as the basis of the first policy book on PAs that is still used in programs today, *The Physician's Assistant—Today and Tomorrow* (Yale University Press, 1972). The Yale PA Program continues to provide national leadership through its faculty directed by Mary Warner, PA-C, and by its

accomplished graduates, who now number more than 900.

Congratulations to Yale School of Medicine for embracing a bold experiment in medical education that enhanced its development and provided leadership for the field nationally.

Alfred M. Sadler Jr., M.D.

Founding Director, Yale PA Program

Strong forces aligned against medicine

"Doctors for America," which appeared in the Winter 2010 issue of *Yale Medicine*, emphasized the need for physicians to be engaged in health reform.

Never have the forces aligned against medicine been so numerous and so strong. The destiny of the profession has been jerked out of physicians' hands by insurance and drug companies. Their profit-based goals undermine medicine's humanism. Thus Doctors for America's efforts to recruit physicians to protect the heart and soul of medicine are as necessary as they are admirable.

Two issues resonated strongly with me: increasing the reimbursements for primary care physicians and eliminating the defects of the malpractice system.

As is widely known, most students are turned off by primary care. But merely paying these physicians more for their services is not the whole answer. Their training should be more in touch with what the real world requires of them. In my pre-med years I knew several students who would have made excellent general practitioners but who, because of average grades in organic chemistry or biochemistry, lost out on their dreams of becoming physicians.

Making the basic science courses less intensive for those interested in primary care would attract more into the specialty. This sounds heretical, but most primary care doctors have no need for the organic chemistry and physics and biochemistry that they endured as rites of passage.

The biggest problem with the malpractice system is that it allows unpreventable bad

outcomes to be misconstrued as malpractice. Because malpractice suits can seriously harm physicians' reputations and livelihoods, many doctors order tests and consultations that are not necessary specifically to ward them off. Not only does this raise the cost of health care immensely but it exposes patients to risky procedures and medications.

One thing is certain: Without strong physician engagement, the destiny of the medical profession will remain in the hands of those whose methods and goals undermine the humanitarian impulses that attracted most doctors to medicine in the first place.

Edward J. Volpintesta, M.D.
Bethel, Conn.

No guarantee of happiness in life

The article in the Winter 2010 issue ["Doctors for America"] floored me with its naïve egalitarian comments, especially from young physicians. The commentators bemoaned inequality in health care access and that health care is not a right, and argued for the need for comprehensive services—including that sticky marshmallow, mental health.

Theoretically there may be equality of opportunity, even fairness under law, but emphatically people are not clones. We are not all tall, blond, and blue-eyed; I certainly am not (just informed, realistic, and elegant, which is enough).

We are not guaranteed certified Grade A parents. So far the government does not send a nice cake and a sunny day on your birthday. There never will be enough Château Palmer for everyone.

People are much different in abilities and fortunes. There may be a right to pursue happiness, but there is no guarantee thereof. The good die young and I am retired.

Eugene Patrick Cassidy, M.D. '66
Marshalltown, Iowa

Alumni offer their time and wisdom

In February about a dozen alumni, as well as past and current faculty members, came together at New Haven's Lawn Club for the inaugural meeting of *Yale Medicine's* advisory board. The group spanned the decades and created some interesting juxtapositions as former students engaged their former teachers in a new forum. (One alumna later commented that it was the first time she'd seen the face of a surgeon who'd been her teacher—as a student she'd seen only his eyes peering out from above his mask in the operating room.)

The group owes its existence to our readers' survey, which we completed last year. The feedback from the survey was resoundingly positive; we thought an advisory board would allow us to extend and maintain our links to our readership. We asked about 15 alumni and faculty members to gather twice a year to tell us what they like about *Yale Medicine*, what they think could be better, and what they'd like to see in its pages. We also asked the members—several of whom are authors and whose numbers include a nationally recognized writer/physician, a leading cardiothoracic surgeon, and a former deputy dean—to serve as a sounding board and offer their advice in their respective areas of expertise.

At this first meeting the conversation continued more than half an hour past our allotted time; it was another half hour before everyone left. Members of the new advisory board bombarded us with topics and ideas for future articles in *Yale Medicine*. We hope to see many of these ideas in the pages of the magazine or in our Online *Extra* edition. Thanks to all the board members who offered their time, expertise, and wisdom.

John Curtis
Managing Editor

SECOND OPINION BY SIDNEY HARRIS



"REPUBLICANS, DEMOCRATS... AS LONG AS THEY
KEEP GETTING SICK, WE'LL BE ALL RIGHT."

yale medicine

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Cushing collection once again open for research

Library makes a new home for the tumor registry while an autopsy vindicates the neurosurgeon.

Over the years, in what became a rite of passage, Yale students would break in—by unscrewing a door panel and squeezing inside—to a room in the basement of Harkness Dormitory. It is a daunting trek, dimly lit, beneath oversized heating and ventilation ducts and through spaces that haven't seen a broom or mop in years. The students came to see the brains. Hundreds were lined up on dusty metal shelves, submerged in

cloudy formaldehyde, their gray matter crumbling at the edges. Since the mid-1990s and continuing to this day, students paid their respects by signing a poster in the room, thereby becoming members of the “Brain Society.”

“The pledge on the poster was ‘Take Only Memories,’ ” said Terry Dagradi, a photographer at the medical school who has been working on the preservation and cataloging of the collection’s archive of patient photographs.

The brains belonged to patients of Harvey Cushing, M.D., the pioneering neurosurgeon, who preserved them as part of his tumor registry and left them to Yale upon his death in 1939. In storage since the 1950s, they are about to come to light again. During the 1990s Christopher Wahl, M.D. '96, wrote his thesis on the collection, bringing new attention to the Cushing brains. Now, under the direction of Dennis D. Spencer, M.D., HS '76, chair and Harvey and Kate Cushing Professor of Neurosurgery, the collection is being restored and moved to a “brain library” within the medical library. The Cushing Center, designed by architect Turner Brooks, will display all 550 brains in jars. Some will be shown alongside Cushing’s meticulous medical records and striking photographs of patients. “I don’t know of another library that has a collection of autopsied preserved brains as their primary holdings,” said Spencer.

When he began the project in 2005, much of the brains’ formaldehyde had partly evaporated long ago, and what

TOP Pioneering neurosurgeon Harvey Cushing’s tumor registry included detailed records of each patient, photographs of the patients, brains, and tumor samples. The collection, which had been stored in a basement room under the Harkness dormitory, is moving to a new home—the Cushing Center in the Cushing/Whitney Medical/Historical Library.

LEFT Dennis Spencer, chair of neurosurgery, holds a specimen in the basement where the Cushing tumor registry has been stored. Spencer has been leading the restoration of the collection.



TERRY DAGRADI (2)

remained was dirty. The jars had leaky seals and were coated in filth. Nicole St. Pierre, who holds a degree in forensic science and will soon begin training as a physician associate, is cleaning them and replacing the preservative. Dagradi and others will coordinate the displays. The Cushing Center will open on June 5, with Kate Cushing, Harvey Cushing's granddaughter, taking part in the ribbon cutting.

Perhaps the most famous brain in the collection belonged to a well-known figure of the early 1900s: Major General Leonard Wood, M.D. A physician and friend of Theodore Roosevelt, he led the Rough Riders' charge up San Juan Hill, and was governor of Cuba and the Philippines. In 1904, in his 40s, Wood suffered seizures in his left leg. For a time, he treated them by sniffing chloroform. But after a few years the seizures and a growing lump on his skull could no longer be ignored. Cushing agreed to operate, though no one at the time had much experience in removing brain tumors. In a groundbreaking 1910 operation at Johns Hopkins, Cushing removed a large benign growth; it proved to be a meningioma, a tumor of the lining of the brain. Wood was cured of his seizures and resumed his active life, which included service as Army chief of staff and a candidacy for the Republican presidential nomination in 1920.

The success of the operation so impressed a group of Harvard physicians that they invited Cushing to relocate to the brand-new Peter Bent Brigham Hospital in Boston. He agreed and went on to become the father of neurosurgery.

But Wood's tumor recurred, forcing him to return from the Philippines in 1927. Cushing, by now far more experienced, operated again, and found a second meningioma almost twice the size of the first. After a difficult operation and much blood loss it was removed and the patient appeared to be recovering. A few hours later, though, Wood became unresponsive and died. Cushing autopsied him and found the

ventricles of the brain filled with blood. Devastated, he preserved both brain and tumor and wrote up the case in his 1938 textbook, *Meningiomas*, which he co-authored with neuropathologist Louise Eisenhardt, M.D. With customary precision and candor, he blamed himself for failures of surgical judgment. He retired five years later.

"It's amazing how these two men's careers were so much in parallel," said Spencer. "They crossed at the beginning of their careers and again at the end."

Spencer and St. Pierre recently re-autopsied Wood's brain to learn more about his death; Spencer had suspected that a bleeding vessel from the tumor was the culprit. But he could find none, and he now thinks the primitive blood transfusion practices of the day may have disturbed Wood's clotting mechanisms and led to the deadly bleed.

It was postmortem examinations like these that made the Cushing brains such an important resource. Before imaging technology was available, surgeons and pathologists studied gross specimens to see damage wrought by strokes, tumors, or injuries. But few brains are saved today, since autopsies are falling out of favor—CT and MRI are the preferred teaching tools. Yet even though they're not used for didactic purposes, said Spencer, the brains are "beautiful and historic." And as the students knew, they make an impressive sight. Alongside Cushing's detailed writings and photographs, they embody memories of neurosurgery's pioneering era.

—Jenny Blair



Online: Yale Netcasts

Dennis Spencer: Doctors Develop Surgical Cure for Epilepsy by Watching the Brain at Work

et cetera ...

WEBSITE TRACKS ARRA FUNDING

Since February 2009 Yale faculty have received more than 280 research awards with a value of \$121 million through the American Recovery and Reinvestment Act (ARRA). The act's goal is to reinvigorate the economy and stimulate long-term growth through increased investments in infrastructure, education, the environment, and scientific research.

The university in January debuted a website designed to provide information about grants received through ARRA. The website, opa.yale.edu/sp/arra1/, includes vignettes of faculty research, background information on the competitive process used to select applications, and such key statistics as the number of jobs created or retained through ARRA-funded projects. The site also links to a site developed by the Association of American Universities, the Association of Public and Land Grant Universities, and the Science Coalition. That site demonstrates the impact of ARRA funding at research universities across the country.

—John Curtis

YALE DOCS ON HAITI MISSION

Six health professionals from the School of Medicine and Yale-New Haven Hospital treated about 400 victims of the Jan. 12 earthquake at a hospital in the town of Hinche in February.

"We were careful to make sure that we took the right people with the right stuff to the right place," said Gregory Luke Larkin, M.D., professor of emergency medicine. Although the earthquake struck Port-au-Prince, many patients are being sent to other sites for medical treatment.

The team brought \$12,000 worth of equipment and supplies, as well as their own food and water. "We didn't need to drain any of the local resources," said Larkin.

The group treated fractures and crush injuries, many of which were worsened by delays in obtaining medical care. Wounds that would have been minor if treated early became infected, often requiring amputation.

Medical teams continue to arrive in Haiti to relieve one another. "We handed off the baton," said Larkin, "but the road to recovery is a long one."

—Jill Max

A video game to help teens make the right choices about preventing HIV

For many teenagers, the high point of an interactive video game is being as bad as they can be—crashing the most vehicles or squashing the most opponents. Between them, Lynn E. (Sullivan) Fiellin, M.D. '96, HS '00, and David A. Fiellin, M.D., HS '95, have five children ranging in age from 11 to 20, and as Lynn Fiellin watched them play their video games she realized that she could tweak that concept. She envisioned an interactive game in which kids score points not by pulverizing opponents but by making choices that could help them reduce risk behaviors and avoid HIV infection.

This year the Eunice Kennedy Shriver National Institute of Child Health and Human Development gave the School of Medicine a five-year research grant to develop and test such a game. Fiellin, assistant professor of medicine, has gathered a team of like-minded experts, including her husband, an associate professor of medicine and an addiction researcher, and other Yale faculty. Fiellin is working with such experts as Alexander Seropian, executive producer of the popular Halo science fiction video game, on game design and development. Ben Sawyer, co-founder of the Games for Health Project, funded by the Pioneer Portfolio of the Robert Wood Johnson Foundation, is assisting as a consultant working with other game designers.

“Harnessing technology for health behavior games is a vastly growing area,” said Fiellin, an attending physician in Yale’s Primary Care Center and Nathan Smith HIV Clinic.



The game is still in its earliest stages of development, but Fiellin envisions an interactive world in which the player, using an avatar (virtual character), “travels” through life, making decisions that bring different risks and benefits. The players will be able to see how their choices affect their lives and can move back in time to see how different actions might lead to different outcomes. By negotiating challenges in a highly repetitive and meaningful way, the player should learn skills that equip him or her to avoid real-life situations that increase their risk of HIV. “Through the video game play we can evaluate in real-time how our players are acquiring skills to help them make better choices,” Fiellin said.

She plans to conduct a randomized clinical trial with 330 ethnically diverse children between 11 and 14 years old at an after-school program in a New Haven community center in order to study the game’s impact on delaying the age of initial sexual activity. She expects eventually to distribute the game to schools

throughout the country, although teenagers can also play it at home, on cell phones, or on personal digital assistants. The game has international implications, as access to the Internet is on the rise in developing countries that have growing HIV epidemics but only limited access to targeted risk-reduction strategies.

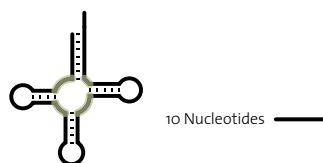
In 2006, more HIV infections occurred in individuals between the ages of 13 and 29 than in any other age group in the United States, according to the most recent figures available from the Centers for Disease Control and Prevention. “If we start teaching kids about risky behaviors early,” Fiellin said, “maybe we can prevent some cases of HIV.”

—Kathy Katella

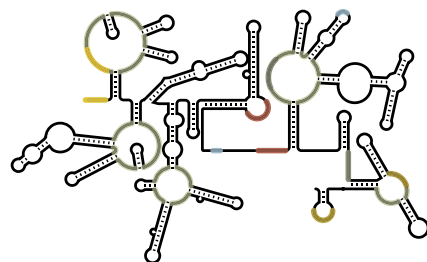
“Amazing” RNAs found to play a more complex role than thought

Any biology textbook will depict proteins as the workhorses that carry out the lion's share of biochemical reactions in cells. Aside from a few exceptions, however, RNAs have largely been pigeonholed as passive middlemen between DNA and proteins.

New findings from the laboratory of Ronald Breaker, PH.D., Henry Ford II Professor of Molecular, Cellular, and Developmental Biology, and Howard Hughes Medical Institute Investigator, suggest that RNAs play a more complex role than previously thought, and that, in certain tasks in certain organisms,



A typical RNA molecule (above) involved in transfer of genetic information is dwarfed by the RNA molecule GOLLD (below), the third-largest and most complex RNA discovered to date. GOLLD appears to be used by viruses that infect bacteria.



they take on a more dominant role than proteins. Breaker and colleagues have discovered a slew of large RNAs that do not code for proteins but instead form complex three-dimensional structures in simple organisms like bacteria—structures that may carry out complex biochemical functions. “Every time we feel as though we’re giving RNA just about the right amount of credit, we find more amazing RNAs,” said Breaker. “I think this is just a continuation of the data that forces us to move our

standards ever higher for what we think RNA should be able to do.”

First author Zasha Weinberg, PH.D., a postdoc in Breaker's lab, and colleagues reported in the December 3 issue of *Nature* on several new large noncoding RNAs in bacteria, two of which the research team christened GOLLD and HEARO. Preliminary work suggests that GOLLD helps viruses that infect bacteria to burst out of infected cells so that they can seek new targets, whereas HEARO might be a mobile genetic element, which are present in all organisms and a cause of spontaneous genetic change.

Breaker's group culled these and other noncoding RNAs out of stretches of “junk DNA” that do not code for proteins. The researchers matched junk DNA sequences between related bacteria to identify stretches that were highly conserved—a red flag that signals evolutionary preservation and perhaps importance. They then looked at these conserved DNA sequences to pick out regions that, when transcribed into RNA, could form complex RNA structures—hairpins, loops, and knots—enabling them to sift out the probable noncoding RNAs.

Breaker hasn't determined whether these noncoding RNAs represent living relics of an ancient RNA-centered world that might have existed before proteins evolved and drove many catalytic RNAs to extinction, or whether they represent more modern developments.

Whatever their origin, given the number of noncoding RNAs that Breaker suspects may be active in select organisms, he feels it is important to come to grips with how modern cells really function. “It's not that the science that we know about modern cells is wrong, but as we find more and more noncoding RNAs, we recognize how incomplete our understanding is,” Breaker said.

—Kara A. Nyberg



Online: Yale Netcasts

Ronald Breaker:

Riboswitches: Nature's Ancient Turn-On

et cetera ...

MEDICAL EXPERTS FOR MEDIA

Yale Medical Group (YMG) in December launched a website that offers access to 90 specialists in clinical care and scientific research to journalists on deadline. The scientists on this website represent some of the nearly 800 members of YMG who treat patients, teach, and conduct research at Yale.

The website, opa.yale.edu/experts, can also be accessed through the Office of Public Affairs, opa.yale.edu, by clicking on the link “For The Media: Find a Medical Expert.”

The site contains more than 50 categories of experts, with photos, profiles, and video clips of the experts and a link to their contact information. Instructions are also available for setting up remote television or radio interviews with the Yale experts. (Yale University maintains a professional radio and television broadcast studio in New Haven with full satellite transmission capability.)

—John Curtis

NANOSENSORS TEST FOR CANCER

Yale researchers have for the first time used nanosensors to measure two cancer biomarkers in whole blood, opening up the possibility of simpler testing for cancer and other diseases.

“Nanosensors have been around for the past decade, but they only worked in controlled laboratory settings,” said Mark A. Reed, PH.D., the Harold Hodgkinson Professor of Engineering and Applied Science and Electrical Engineering. “This is the first time we've been able to use them with whole blood, which is a complicated solution containing proteins, ions, and other things that affect detection.”

Reed and Tarek Fahmy, PH.D., associate professor of biomedical and chemical engineering, reported on December 13 in the advance online publication of *Nature Nanotechnology* that they had developed a device that can detect concentrations equivalent to a grain of salt in a swimming pool. The device can detect biomarker concentrations in minutes instead of days and could test for a wide range of biomarkers for disorders from ovarian cancer to cardiovascular disease.

—J.C.

Getting the science on paper

A new guide helps scientists avoid basic writing mistakes and express their ideas clearly.

Angelika H. Hofmann, PH.D., conducted a modest study before beginning her book on scientific writing. To gauge the state of the art, Hofmann examined 100 prepublication drafts of scientific papers. She found pervasive problems: unnecessary repetition, over-long sentences, missing information, and faulty verb tenses. Three out of four authors had misplaced or omitted such

an essential element of the paper as the purpose of the experiment.

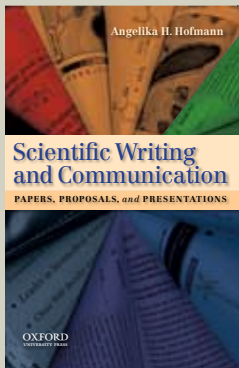
Hofmann's new book, *Scientific Writing and Communication*, provides a broad-spectrum remedy for such ills. In 700 pages, she offers step-by-step instructions for producing research papers, review articles, grant proposals, posters, talks, and job applications.

Hofmann, a writer and grant editor at Yale's Office of Development and an adjunct instructor who teaches Scientific Writing I, begins with such fundamental principles of composition as keeping tenses straight and sentences short. She addresses such topics as using references, avoiding plagiarism, overcoming writer's block, and choosing between figures and tables to report data. Summary boxes and revision checklists consolidate information. The book includes samples of both good and bad writing, alongside suggested revisions for the clunkers.

Hofmann estimates that about half of scientists writing in English are not native speakers; throughout, she includes notes addressing such writers. Each chapter ends with exercises, and answers appear in the back of the book.

As Hofmann points out, the scientific enterprise requires not only running sound experiments but also disseminating results. Skillful communication, she writes, "is the engine that propels virtually all scientific progress."

—Cathy Shufro



Scientific Writing and Communication: Papers, Proposals, and Presentations

By Angelika H. Hofmann, PH.D., writer and grant editor for corporate and foundation relations, Yale Office of Development (Oxford University Press)

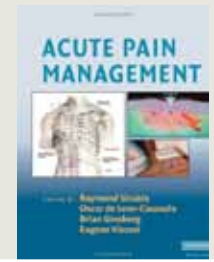


Blows to the Head: How Boxing Changed My Mind

by Binnie Klein, M.S.W., lecturer in psychiatry (State University of New York Press) The author offers a series of memories and insights from an unlikely contender. Klein's unexpected midlife fascination with boxing takes her beyond the ring, leading her back to her roots and to a surprising chapter of the Jewish immigrant experience. Klein shows us that if we turn over the "weird stones" on our path—the ones we usually ignore—we may find ourselves on a remarkable and revitalizing journey.

Human-Animal Medicine: Clinical Approaches to Zoonoses, Toxicants and Other Shared Health Risks

by Peter M. Rabinowitz, M.D., M.P.H., associate professor of medicine; and Lisa A. Conti, D.V.M., M.P.H. (Saunders) This reference work explores the convergence of human, animal, and environmental health concerns. It calls for greater communication and cooperation among human health care providers, public health professionals, and veterinarians to address vital issues of emerging diseases and environmental change. This book provides practical guidelines for collaborations on a wide range of clinical human-animal health issues, including the H1N1 virus, zoonotic diseases, the human-animal bond, animal allergy, bites and stings, and animals as sentinels of environmental health hazards.



Acute Pain Management

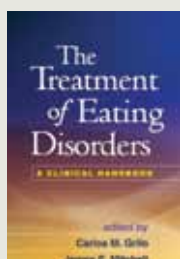
by Raymond S. Sinatra, M.D., PH.D., professor of anesthesiology; Oscar A. DeLeon-Cassasola, M.D.; Eugene Viscusi, M.D.; and Brian Ginsberg, M.D. (Cambridge University Press) This textbook provides a comprehensive overview of acute pain management, including the anatomy of pain pathways; the pathophysiology of severe pain; pain assessment; therapeutic guidelines and analgesic options; organization of pain services; and the roles of anesthesiologists, surgeons, pharmacists, and nurses in providing optimal care.

Pathology of the Breast

by Fattaneh A. Tavassoli, M.D., professor of pathology (McGraw-Hill Companies) This book provides information on all benign and malignant lesions of the breast. It focuses on facts and details that pathologists need to make precise critical diagnoses: morphological features, differential diagnoses, and diagnostic aids for both common and rare lesions in men as well as in women. The book includes illustrations, photographs, photomicrographs, and extensive literature reviews.

Speech Sound Disorders in Children: In Honor of Lawrence D. Shriberg

edited by Rhea Paul, PH.D., CCC-SLP, lecturer in the Child Study Center; and Peter Flipsen Jr., PH.D. (Plural Publishing) This text provides insights from a variety of perspectives and disciplines into the development of children's speech sounds. The authors discuss the difficulties in the analysis of and treatment implications for both specific speech disorders and the speech of children with other primary disabilities.



Letters to a Best Friend

by Richard Selzer, M.D., HS '61; Peter Josyph, editor (SUNY Press) This book is the record of two decades of written conversation between two friends: Selzer, the essayist, short story writer, and former surgeon; and Peter Josyph, a New York painter, actor, and filmmaker who began the correspondence in 1988. The book is an edited selection of the thousands of letters that Selzer wrote about his life, his work, and his friendship with Josyph.

The Treatment of Eating Disorders: A Clinical Handbook

by Carlos M. Grilo, Ph.D., professor of psychiatry and psychology; and James E. Mitchell, M.D. (The Guilford Press) This clinical handbook brings together leading international experts on eating disorders to describe the most effective treatments and their implementation. Coverage encompasses psychosocial, family-based, medical, and nutritional therapies for anorexia nervosa, bulimia nervosa, binge eating disorder, and other disorders and disturbances. The volume also provides an overview of assessment, treatment planning, and medical management issues. Special topics include psychiatric comorbidities, involuntary treatment, support for caregivers, eating disorders in children, and new directions in treatment research and evaluation.

Health and Social Justice

by Jennifer Prah Ruger, Ph.D., associate professor of public health (Oxford University Press) Societies make decisions and take actions that profoundly affect the distribution of health care. Why and how should collective choices be made and policies implemented to address health inequalities under conditions of resource scarcity? How should societies conceptualize and measure health disparities, and determine whether they've been adequately addressed? Who is responsible for various aspects of this important social problem? In this book Ruger elucidates principles to guide these decisions, the evidence that should inform them, and the policies necessary to build equitable and efficient health systems worldwide.

Netter's Gastroenterology, 2nd ed.

by Martin H. Floch, M.D., clinical professor of medicine; Neil R. Floch, M.D.; Kris V. Kowdley, M.D.; C.S. Pitchumoni, M.D.; James Scolapio, M.D.; and Raul Rosenthal, M.D. (Saunders) This text covers the field of digestive diseases—including those related to gastroenterology, hepatology, and nutrition. A templated format offers a quick summary of nearly 300 of the most commonly encountered clinical conditions, while the illustrations provided by Frank H. Netter, M.D., depict key anatomical structures and highlight important concepts.

The descriptions above are based on information from the publishers.

SEND NOTICES OF NEW BOOKS TO Cheryl Violante, *Yale Medicine*, 300 George Street, Suite 773, New Haven, CT 06511, or via e-mail to cheryl.violante@yale.edu



SHARON BEGLEY

Educating the public about science is an uphill battle

Sharon Begley, science editor of *Newsweek*, despairs of the challenge of educating the American public about science. Such issues as evolution, she said, have become so politically charged that a rational discussion seems impossible. "No amount of excellent journalism on evolution is likely to make a difference," she said. "We can write it, but that doesn't mean that people will believe it."

In a talk sponsored by the Poynter Fellowship in November, Begley said that there is a large disconnect between factual knowledge and belief. "Human-kind has practiced magical thinking and has relied on instinctual thinking and superstition much longer than it has relied on critical thinking," she said.

While people accept scientific findings on noncontroversial topics—most, for example, believe correctly that the center of the planet is extremely hot—the reverse is true for evolution. About half the population, she said, believes that humans and dinosaurs coexisted. And only 21 percent know that DNA is the molecule of heredity.

"Knowledge is not enough to support rational scientific thinking," she said. "You have to want to think rationally."

—John Curtis



TRACY KIDDER

Relying on the kindness of strangers

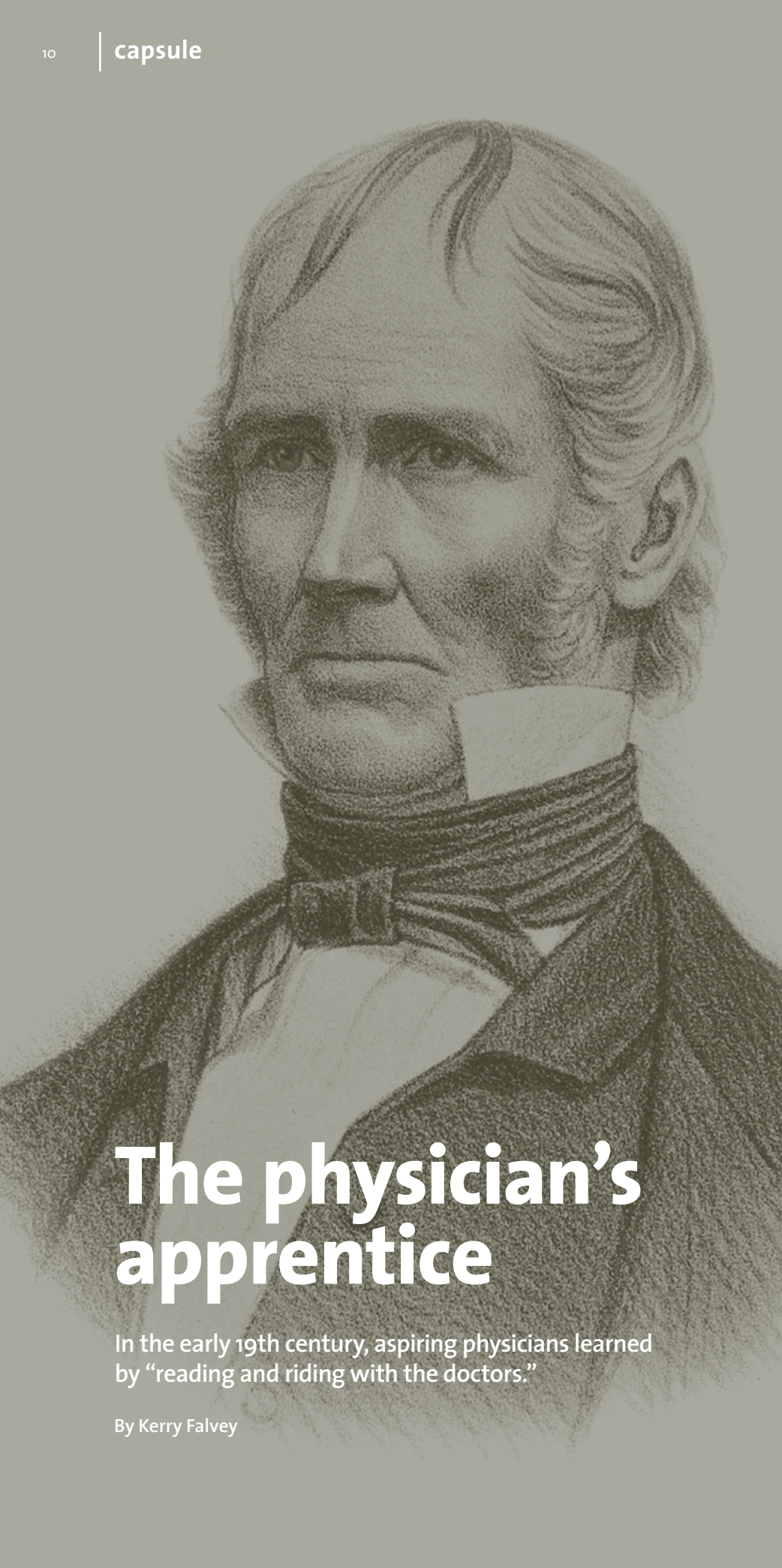
The central figure in Tracy Kidder's new book escaped death by machete in his native Burundi, beat overwhelming odds to get an Ivy League education, and returned to his war-torn country to build a free clinic that treats what the author called "stupid illnesses," which are often fatal in Africa but easily treated in the developed world.

In his book *Strength in What Remains*, Kidder maintains that the kindness of strangers shines even in a dark world, as he told an audience in Harkness Auditorium during a talk co-sponsored by Yale Cancer Center and WSHU Public Radio in November.

His book is the story of Deo, a survivor of an ethnic massacre who fled to New York City and slept in Central Park until a childless couple adopted him and paid his way through Columbia University. Deo was mentored by Paul Farmer, M.D., the subject of Kidder's 2003 bestseller *Mountains Beyond Mountains*. Deo returned to Burundi and built the clinic with the help of strangers. The organization that Deo founded and that sponsors and operates this facility is called Village Health Works.

The center has treated 28,000 patients since its opening in 2008. It has become "an instrument of peace," Kidder said, because the various tribes put aside their "artificial" differences to realize "our common susceptibility to illness and injury."

—John Dillon



The physician's apprentice

In the early 19th century, aspiring physicians learned by “reading and riding with the doctors.”

By Kerry Falvey

In March 1811, at the age of 22, Elijah Woodward Carpenter of Brattleboro, Vt., signed his name to an indenture, a contract with Cyrus Washburn, a doctor in the nearby town of Vernon. Carpenter agreed to serve as Washburn's apprentice for the next two years or more and pay him a fee of \$133.33. In return Washburn would provide room and board in his home, and would instruct Carpenter “personally and by the use of books, in the art & science of Anatomy, Surgery and Physic.”

At that time only a handful of American medical schools existed, and Carpenter's apprenticeship represented the most common form of medical training in the New World. The Medical Institution of Yale College had been chartered the previous year, but its first class, in which Carpenter would be one of 37 students, would not begin studies until November 1813.

For the elite, premier medical training could be had in European universities. But for Carpenter—who was born in a log hut—university training in Europe was not an option. In fact, it took him three years to pay Washburn's fee. For most Americans who wished to pursue medicine, apprenticeship to a local practitioner was the only option.

The quality of the training, which usually lasted for two or three years, depended on the skills of the teacher. Often described as “reading with the doctors and riding with the doctors,” apprenticeship consisted of book study and a later phase in which the student attended his preceptor on his rounds—on horseback.

In exchange for his on-the-job learning, the apprentice did the “grunt work” of the medical practitioner. Carpenter agreed to “diligently during said term attend to the study, and art of practicing Physic, Surgery &c. and agreeably to the directions of the said Washburn from time to time, prepare & Compound medicines for his the said Washburn's use.” Carpenter may have been lucky: Beyond compound-ing medicines, apprentices often tended the horses and cleaned the stables.

Despite its shortcomings, apprenticeship offered a crude prototype of clinical training. It was the most practical system available, and physicians saw apprenticeship as one way to standardize medical training. In 1800, a committee of the Connecticut Medical Society, seeking to regularize physician education in the state, recommended that candidates wishing to practice medicine be at least 21, have a good reputation, have a college education, and have two years of study with a respectable physician or surgeon.

When the apprenticeship concluded, the preceptor sent off his student with a written certificate, much like the one Washburn provided Carpenter in July of 1814 after Carpenter had attended one course of lectures at Yale's fledgling medical institution. (Lack of funds prevented Carpenter from taking a second course.) Washburn began his testimony by citing Carpenter's "reputable family" and "good moral character." Then he explained that Carpenter had "with much industry and success devoted three years to the theory & practice of Physic, Surgery &c. under my immediate inspection."

Washburn's certificate would be virtually worthless to anyone not familiar with his skill, thus underscoring a major problem with apprenticeship: its authority resided with the preceptor. What was lacking was a standard and objective body of knowledge, and an institution to communicate such knowledge. As the medical school grew in stature, it would become the locus of science, and the medical profession in the middle and later parts of the 19th century would embrace both.

Carpenter went on to a successful career as a physician and surgeon in Vermont and was a surgeon's mate in the Massachusetts militia. He died in Vermont in 1855.

This article has been adapted from a forthcoming book by Kerry Falvey celebrating the bicentennial of the Yale School of Medicine. The book can be preordered at a discount at yalebooks.com/ysm200.

Vernon July 21st 1814.

Doct. Elijah W. Carpenter, the
Receaver hereof, is of a reputable
family in Dorsetshire & sustains
a good moral character; he has with
much industry and success devoted
three years to the Theory & practice
of Physic, Surgery &c. under my
immediate inspection; and attended
one full course of Lectures at the
Medical Institution of Yale College.
Should he be so fortunate as to settle
in some place, where the good people
would confer on him, that attention
and confidence, which a character
like his deserves, he will doubtless
answer all reasonable expectations;
and be a useful member of Society in
the Practice of the healing art.

With due regards, I am his, & the Public's
 sincere and devoted Friend &c.

Cyrus Washburn

To the Minister, Selectmen and People of
any Town; or, to whom it may concern
greeting.

TOP When Elijah Carpenter completed his studies, his instructor Cyrus Washington sent him off with a letter of recommendation that cited his good moral character and his success in his studies of medicine.

MIDDLE In the earliest days of the School of Medicine, students bought tickets to lectures. Elijah Carpenter, who began his studies with the first group of students to enter the school, attended a first course of lectures but could not afford a second.

BOTTOM In 1814 the state of Vermont issued a certificate attesting to Carpenter's abilities in the practice of medicine.

OPPOSITE PAGE This lithograph of Elijah Carpenter was made from a portrait photograph taken in early 1855, the year he died. After his apprenticeship and studies, Carpenter went on to a successful career as a physician and surgeon in Vermont.

YALE COLLEGE
October 1813

Doct. Elijah W. Carpenter
is the Course of Lectures in
CHEMISTRY & Pharmacy
Benjamin Silliman Chem. Professor

STATE OF VERMONT: } This was certify that on the Subscribers,
COUNTY OF WINDHAM. } Officers of the Second Medical Society of the
State of Vermont in the County of Windham, have examined _____
of said State, as to his abilities in the Practice of
Physic and Surgery and find him sufficiently skilled in the same.

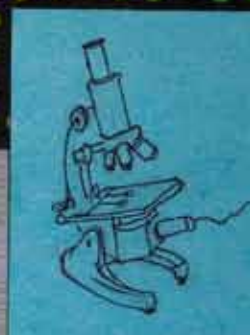
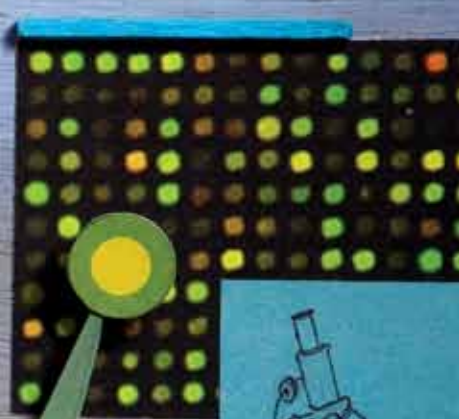
In testimony whereof, do hereunto set our names, at New Haven
the _____ day of _____ 1814. _____
Cyrus Washburn
Benjamin Silliman } Officers of the F. S. M. S.

In approbation of the above, and by vote of said Society to admit the
above named _____ as a Member thereof,
I have caused the Seal of said Society to be hereunto affixed.

_____ President of the F. S. M. S.
_____ Secy.



Y



\$



Biotech after the bust

Five new Yale-affiliated biotech companies started up last year, but the industry sees problems ahead.

By Charles Gershman

Illustration by Rakefet Kenaan

After the U.S. and world economies faltered in the fall of 2008, it became clear that future plans for Yale's various activities were going to change. The signs around the country and the world were not auspicious. On September 15, 2008, the New York financial services firm Lehman Brothers filed for Chapter 11 bankruptcy protection. The next day, the insurance giant American International Group (AIG) suffered a liquidity crisis after its credit rating was downgraded. AIG's stock had already dropped 60 percent before the market's opening that day. The nation's GDP then fell at a pace not seen since the 1950s. The unemployment rate in the United States more than doubled, from 4.9 percent at the end of 2007 to 10.2 percent in October 2009. Outside Yale, layoffs and bankruptcies were taking place en masse. The ensuing \$700 billion bailout package softened the blow but did not prevent belt tightening in boardrooms around the world and rising global unemployment.

Whatever immunity universities may have had to previous swings in financial markets, Yale couldn't dodge the 2008 bullet. On December 16 Yale President Richard C. Levin gave faculty and staff the bad news: all departments and offices at the university must find ways to cut costs. By June 2009, Yale's endowment had lost 29 percent of its value, from \$22.9 billion

to \$16.3 billion. The air—off campus and on—was filled with uncertainty. But in the Temple Street office of Jon Soderstrom, PH.D., it was business as usual.

The view from Temple Street

"In terms of new deals, we haven't seen the downturn," says Soderstrom, director of Yale's Office of Cooperative Research (OCR), which helps Yale scientists found businesses based on promising discoveries. "Hardly a week goes by when we don't get venture capitalists calling up to talk to us about what new things we have. ... If you were to look at our performance last year, and you didn't know anything about the economic downturn, you wouldn't have guessed it."

Last year, for example, saw five Yale startups. One of them, Kolltan Pharmaceuticals, launched by Joseph Schlessinger, PH.D., chair and William H. Prusoff Professor of Pharmacology, working in partnership with OCR, raised more than \$35 million despite lean times. "Five is actually above our average," Soderstrom says. "We're [usually] in the three-to-four range. In terms of financing, we didn't see a significant downtick in any of our numbers—licenses, royalties, revenue-generating technology, startups."

The number of new startups is not the only sign that New Haven biotech is on the rise. Office occupancy rates in New Haven are up, laboratory space is tight, and developers are racing to keep up, notes John Puziss, PH.D., OCR's director of technology licensing. "Hopefully, with the economic crisis sort of easing and more money being available for investing in technologies, we'll see more startups coming out of Yale," he said.

But the increase in the number of new deals, Soderstrom notes, is only one side of the coin. Companies that are already up and running have seen some problems. "Although the number of new deals was steady, we were all too aware of the struggles of many existing ventures to attract new capital or stretch what they had to bridge the downturn." And forces around the country appear to be limiting the growth in biotech. According to the MoneyTree report from the accounting firm PricewaterhouseCoopers, only seven companies went public in the United States in January 2010 via initial public offerings (IPOs)—a big drop from the monthly average of 22.6 in 2007. In the United States, investment from venture capital dropped from \$4.4 billion in 2008 to \$3.5 billion in 2009. The number of biotech deals also fell, from 501 in

2008 to 406 in 2009. (By contrast, 2007 saw 494 deals and \$5.3 billion in venture capital invested.)

"The state of biotech nationally, even internationally, is in a difficult time right now because venture capital dollars have dried up. [The economic downturn] makes everybody, on paper, feel poorer. It makes [venture capitalists] more risk-averse," says Paul R. Pescatello, J.D., PH.D., president and CEO of Connecticut United for Research Excellence (CURE), a non-profit organization that supports bioscience in the state.

But Pescatello adds that other factors have taken a toll on investment in biotech. The Sarbanes-Oxley Act of 2002, enacted to combat corporate corruption, accounting fraud, and mismanagement by extending government oversight of public (though not of privately held) companies, makes it more expensive to go public—especially for small companies. It's not always feasible, says Pescatello, "to go public and incur the annual ongoing costs, the accounting costs, the auditing costs, the disclosure costs. ... You see fewer companies going public to avoid that kind of regulatory and administrative burden."

The debate over health care reform has also caused tension over patent life: the generic drug industry and lawmakers

The five companies financed in 2009:

Kolltan Pharmaceuticals

Kolltan, which has secured over \$35 million in financing, is developing monoclonal antibodies against various cancers and hopes to move these antibodies into clinical trials.

FOUNDER

Joseph Schlessinger, PH.D., chair and William H. Prusoff Professor of Pharmacology

Advanced Orthopedic Technologies

The company develops a series of implants and regenerative products for cartilage defect repair and joint fusion.

FOUNDER

John S. Reach Jr., M.D., assistant professor of orthopaedics and rehabilitation

CardioPhotonics

The company is developing and marketing technology that provides real-time, noninvasive blood volume monitoring.

FOUNDERS

Kirk H. Shelley, M.D., PH.D., associate professor of anesthesiology

David G. Silverman, M.D., professor of anesthesiology

MiraDx

Yale Cancer Center researchers have pioneered a diagnostic test to identify individuals predisposed to lung, ovarian, and other cancers by examining genetic biomarkers.

FOUNDERS

Frank Slack, PH.D., associate professor of molecular, cellular and developmental biology in the Graduate School of Arts and Sciences

Joanne B. Weidhaas, M.D., PH.D., assistant professor of therapeutic radiology

Oasys Water

The company is commercializing a technology that employs osmosis to produce fresh water from sea water or industrial waste water and uses 90 percent less energy than conventional desalination systems.

FOUNDERS

Rob McGinnis, a doctoral student in environmental engineering in the Yale School of Engineering and Applied Science, and his advisor;

Menachem Elimelech, PH.D., chair of the Department of Chemical Engineering and Roberto Goizueta Professor of Environmental and Chemical Engineering

like Rep. Henry A. Waxman, a California Democrat who chairs the House's Energy and Commerce Committee, are calling for a five-year patent limit on biologics (medicinal products that are made from living organisms) instead of the 12 years allowed for pharmaceuticals. "If you only have five years to recoup your investment," Pescatello says, "no one's going to invest in biotech."

Another poorly defined area in health care reform has been reimbursement. How would biologics, pharmaceuticals, and other drugs and devices be reimbursed under health care reform? "That's a big deal," Pescatello says, because it's impossible to establish price points without knowing what the system will allow. "Investors hate uncertainty."

William Wiesler, PH.D., director of new ventures at OCR, agrees that uncertainty about pending legislation leads to caution among investors. It happened in 1993: "When everybody was worried that Hillary Clinton was going to nationalize medicine, all the pharma companies were down, and venture capitalists got a little sour on biotechs. But that didn't last too long, and [investment] popped back up," Wiesler says. "Some industries have a cyclical nature that's a little bit different than

the rest of the market. And I am quite certain if the economy finally turns around and picks up, and unemployment drops ... and the NASDAQ picks up that we'll have another banner year with the venture capitalists."

Nurturing a young industry

Few people know New Haven biotech better than venture capitalist David Scheer, whose New Haven-based firm, Scheer & Company, has helped to launch more than 10 biotech companies. His latest partnership with Yale is Axerion Therapeutics, a company formed in 2009 in partnership with OCR and Yale neurobiologist Stephen M. Strittmatter, M.D., PH.D. The company's research efforts will focus on stimulation and regeneration of axons in the brain and central nervous system, with the hope of reversing damage caused by traumas like spinal cord injury and stroke.

But Scheer & Company does more than launch biotech companies. "We've helped them in a variety of ways—recruiting, fundraising, taking them through the usual rounds of private financing, IPOs, mergers and acquisitions transactions, business development, partnerships," Scheer says. He has served on

Active companies in the New Haven area, and their founders:

Achillion Pharmaceuticals

Innovative treatments for infectious diseases (achillion.com)

FOUNDER

Yung-Chi Cheng, PH.D., Henry Bronson Professor of Pharmacology

Affomix Corporation

Antibody screening technology (affomix.com)

FOUNDER

Michael Snyder, PH.D., former Lewis B. Cullman Professor of Molecular, Cellular, and Developmental Biology and professor of molecular biophysics and chemistry

Alexion Pharmaceuticals

Treatments for rare diseases (alxn.com)

FOUNDERS

Leonard Bell, M.D. '84, former assistant clinical professor of medicine and pathology

Joseph A. Madri, M.D., PH.D., HS '76, professor of pathology

Applied Spine Technologies

Spinal implant device (appliedspine.com)

FOUNDER

Manohar M. Panjabi, PH.D., professor emeritus of orthopaedics and rehabilitation

Axerion Therapeutics

Treatments for spinal cord injury and Alzheimer disease

FOUNDER

Stephen M. Strittmatter, M.D., PH.D., Vincent Coates Professor of Neurology and professor of neurobiology

BioRelix

Antibiotic discovery (biorelix.com)

FOUNDER

Ronald Breaker, PH.D., Henry Ford II Professor of Molecular, Cellular, and Developmental Biology

Carigent Therapeutics

Drug delivery technology (carigent.com)

FOUNDERS

W. Mark Saltzman, PH.D., chair and Goizueta Foundation Professor of Chemical and Biomedical Engineering

Tarek Fahmy, PH.D., assistant professor of biomedical engineering

CGI Pharmaceuticals

Kinase drug discovery (cellulargenomics.com)

FOUNDERS

David Armistead, PH.D.

Mark Velleca, M.D., PH.D., HS '97, FW '99, assistant clinical professor of laboratory medicine

Ira Mellman, PH.D., former Sterling Professor of Cell Biology and Immunology

the boards and as chair of all the New Haven-based companies he's helped to launch. "It used to be easier to raise money," says Scheer. "The capital markets are tighter." In the current economic climate, he says, venture capitalists need to support their existing portfolios. As a result less money is available for new investments in the life sciences. "Only the strongest companies are in a position these days to raise capital," Scheer says.

A reputation in science

Just as Scheer nurtures his companies to success, Yale's OCR has learned over the years to shepherd biotech firms from a notion in the lab to a full-fledged company with investors. OCR was created in 1982 after Congress enacted the Bayh-Dole Act of 1980, which allows universities to retain title to inventions resulting from federally supported research. The office got a boost in 1995 when the university tripled its budget and staff; hired a new director; and charged the office with founding and building local companies based on technology licensed from Yale. In the last 10 years, OCR has helped Yale scientists to found more than 40 companies that have in turn attracted more than \$450 million in financing. The university earns

between \$10 and \$20 million per year in royalties from the commercialization of licensed patents. (OCR has tracked patent applications since 1987. Since then, there have been 5,897 applications filed and 1,483 patents issued in 54 countries.) "We are actively pursuing a portfolio of 1,306 applications worldwide," says Diane K. Harmon, OCR's director of intellectual property administration.

To Soderstrom, Yale's reputation and strength in the sciences is paramount. "Without quality science and technology," he says, "you don't have a whole lot to trade on. Yale is a 300-year-old institution, it's considered to be one of the premier research institutions in the world, [and it] has a faculty that bespeaks that reputation." Soderstrom cites the number of Yale faculty belonging to the National Academy of Sciences—59 as of this writing—as a testament to the medical school's depth and excellence. "Particularly from the perspective of the medical school, the quality of the technology, the quality of the science that's performed at the medical school, continues to attract attention from investors and companies," he says. "And I think we've gained a pretty good reputation for identifying good ideas that people find worth investing in."

CoolSpine LLC

Cooling catheter for use in cardiothoracic surgery

FOUNDER

John A. Elefteriades, M.D. '76, HS '81, FW '83, William W.L. Glenn Professor of Surgery

Helix Therapeutics

Genetic repair therapies (helixtherapeutics.com)

FOUNDER

Peter M. Glazer, M.D., Ph.D., Robert E. Hunter Professor of Therapeutic Radiology

HistoRx

Quantitative histopathology testing and diagnostics (hisorx.com)

FOUNDERS

David L. Rimm, M.D., Ph.D., professor of pathology
Robert L. Camp, M.D. '97, Ph.D., associate research scientist in pathology

JS Genetics

Genetic tests for Turner's syndrome and dyslexia (jsgenetics.com)

FOUNDERS

Jeffrey R. Gruen, M.D., associate professor of pediatrics (neonatology), investigative medicine, and genetics
Allen E. Bale, M.D., professor of genetics
Scott A. Rivkees, M.D., professor of pediatrics (pediatric developmental biology and biophysics)

L2 Diagnostics

Infectious disease diagnostics

FOUNDERS

Erol Fikrig, M.D., Waldemar Von Zedtwitz Professor of Medicine
Joseph E. Craft, M.D., professor of medicine (rheumatology) and immunobiology
Richard A. Flavell, Ph.D., chair and Sterling Professor of Immunobiology

Marinus Pharmaceuticals

Therapeutics for psychiatric disorders (marinuspharma.com)

FOUNDER

Vincent A. Pieribone, Ph.D., associate professor of physiology

MGS Research Inc.

Medical gel dosimetry systems (mgsresearch.com)

FOUNDERS

Marek J. Maryanski, Ph.D.
John C. Gore, Ph.D., former professor of psychology
Robert J. Schulz, Ph.D., professor emeritus of therapeutic radiology

MiraDx

Cancer diagnostics

FOUNDERS

Frank Slack, Ph.D., associate professor of molecular, cellular, and developmental biology
Joanne B. Weidhaas, M.D., Ph.D., assistant professor of therapeutic radiology

Although the New Haven region—home to about 50 biotech companies—enjoys a collaborative spirit, Connecticut faces particular challenges. “We’re part of a growing community that sees a very strong need to help each other and build out the economy of the area by investing in biotech,” says Susan Froshauer, PH.D., FW ’88, founding CEO and currently chief scientific officer of Rib-X Pharmaceuticals. The company aims to bring to market small-molecule antibiotics based on the work of 2009 Nobel laureate Thomas A. Steitz, PH.D., Sterling Professor of Molecular Biophysics and Biochemistry and professor of chemistry; Peter B. Moore, PH.D., Sterling Professor of Chemistry and professor of molecular biophysics and biochemistry; and William L. Jorgensen, PH.D., Sterling Professor of Chemistry. “In environments such as San Diego or Boston, there’s a larger critical mass,” Froshauer says, “and so there’s more of a momentum that has been sustainable, even through hard times.”

Whether Connecticut has a pool of talent large enough to meet the local need is a sticking point. In Connecticut and at Yale, says Scheer, “there is absolutely no dearth of great technology. But one of the critical issues that we have

found over the years is recruiting CEO talent. Some of the more business-oriented pharmaceutical executives tend to be in other places. They have their families, kids, et cetera, in places like Princeton or Boston or New Jersey or the Bay Area, and they just don’t want to move.”

But New Haven’s biotech economy is also a young one. “When you’re talking about size, we’re never going to be that [large],” says Soderstrom, referring to more established biotech centers around the country. “What we can do is be really good at what we have.” Soderstrom says the local market has begun to sustain itself, so OCR no longer needs to be chiefly responsible for all new ventures. “There was a time when we were putting together the PowerPoint presentations, making the calls to the investors, doing the pitch with investors, helping to recruit the talent, actually negotiating leases on space. We don’t have to do a lot of that stuff anymore, because there’s already talent stepping in and doing those kinds of things.” **YM**

Charles Gershman is an assistant editor at Yale School of Medicine’s office of Institutional Planning and Communications.

New Haven Pharmaceuticals

Therapeutics for depression and GI disorders (newhavenpharma.com)

FOUNDERS

John H. Krystal, M.D. ’84, HS ’88, Robert L. McNeil, Jr., Professor of Clinical Pharmacology

John P. Geibel, M.D., PH.D., associate professor of surgery (gastroenterology)

Wajahat Z. Mehal, PH.D., assistant professor of medicine (digestive diseases)

Gerard Sanacora, M.D., PH.D., assistant professor of psychiatry

Vladimir Coric, M.D., associate clinical professor of psychiatry

Optherion

Therapeutics and diagnostics for age-related macular degeneration (optherion.com)

FOUNDER

Josephine J. Hoh, PH.D., associate professor of epidemiology and ophthalmology

PGxHealth, a division of

Clinical Data

Biomarker discovery and drug development (pgxhealth.com)

FOUNDER

Gualberto Ruaño, M.D. ’97, PH.D. ’97

PhytoCeutica

Traditional Chinese botanical remedies developed into FDA-approved drugs for cancer (phytoceutica.com)

FOUNDER

Yung-Chi “Tommy” Cheng, PH.D., Henry Bronson Professor of Pharmacology

Rib-X Pharmaceuticals

Antibiotic drug discovery and development (rib-x.com)

FOUNDERS

Thomas A. Steitz, PH.D., Sterling Professor of Molecular Biophysics and Biochemistry (and co-recipient of the 2009 Nobel Prize in Chemistry)

Peter B. Moore, PH.D., Sterling Professor of Chemistry and professor of molecular biophysics and biochemistry

William L. Jorgensen, PH.D., Sterling Professor of Chemistry

SurExam

Ovarian cancer diagnostics for Chinese market

FOUNDER

Gil G. Mor, M.D., M.Sc., PH.D., associate professor of obstetrics, gynecology, and reproductive services

Vascular Insights LLC

ClariVein catheter for treating varicose veins (vascularinsights.com)

FOUNDERS

John P. Marano Jr., PH.D. ’69

Michael Tal, M.D., associate professor of radiology

Science by Design

As research becomes more interdisciplinary, architects are designing buildings that foster collaboration.

By John Dillon
Illustrations by Shane McGowan

After 15 years in his warren of offices and lab space on the sixth floor of the Laboratory of Epidemiology and Public Health, where he studies how ticks spread Lyme disease and ehrlichiosis, Durland Fish, Ph.D., has grown fond of its dark nooks and labyrinthine passageways. But by 2008 plans were in the works for renovations that would transform the floor into a more open, communal atmosphere—and pull Fish, professor of epidemiology, into the 21st-century world of science architecture. “Renovations have to be done,” he conceded. “I personally am not looking forward to it.” New interior windows will make the floor more transparent, and Fish doesn’t want to think he’s working in a fishbowl. “I don’t want anybody peeking in and seeing what I’m doing,” he said. “I want to get my work done in my own way and not be bothered.”



PREVIOUS PAGE Although many scientists have grown used to working in a warren of offices and laboratories, a new philosophy in laboratory design promotes interaction among disciplines and encourages collaboration.

But science and architecture are moving in a new direction—away from the era in which a laboratory was built to order for a single principal investigator. While both new buildings and renovations to older ones aim to provide more support space for scientists, they also offer flexibility. Designed more like mittens than gloves, modern lab buildings include a little wiggle room. More ample common areas encourage mingling among scientists. And if a researcher departs for new academic pastures, their space can easily accommodate a new scientist.

Yale has been on an ambitious quest to increase lab space and improve its existing labs since the early 2000s. The Anlyan Center, which opened in 2003 at a cost of \$172 million, was a major step. Its 450,000 square feet increased the school's research space by 25 percent. The Amistad Street Building, which opened in 2007 with an \$88-million price tag, added another 120,000 square feet. The school also spent \$14 million in 2002 on a 23,700-square-foot extension of the Sterling Hall of Medicine's B wing. By 2011, the school will have spent an additional \$467 million in renovations to various lab buildings, not including Amistad, The Anlyan Center, and the B wing extension, or the West Campus in neighboring Orange and West Haven. Because of the economic slowdown, plans for renovations to the West Campus have slowed down and construction of a new building on the main medical campus is on hold. The medical school is awaiting word on applications to NIH for construction funding for other projects.

Despite these expansions, the way in which space is distributed and used by researchers remains an issue. The new philosophy in interior design promotes interaction among disciplines and provides more comfortable digs for collaboration to take place. At the same time, the new spaces segregate offices from laboratories, partly to discourage researchers from eating in their labs—food can contaminate experiments—but also to allow reconfigurations as circumstances change.

In the past, said M. Virginia Chapman, M.Arch. '85, director of construction and renovation for facilities at the School of Medicine, "every lab was tailored to the specific needs of the researcher. ... It was so specific that you had to do a comprehensive renovation when a new user came in."

And, said Reyhan T. Larimer, project manager for facilities construction and renovation at the School of Medicine, noting the often transient nature of academic life, "The major trend in lab design is generic, flexible design."

And that's why a "plug-and-play" approach guides the design of lab modules, said architect J. Ian Adamson, a principal with Payette Associates of Boston—the firm that co-designed The Anlyan Center and designed the additions to the Sterling Hall of Medicine's B wing. "As people come and go and research ebbs and flows, you're not doing a lot of renovation. It looks like an Erector Set. These [new labs] are easy enough that the principal investigators could change things on a weekend and not have to put in a requisition order." Desks, tables, and benches in the Amistad Street Building, for instance, are on casters and can be reconfigured easily. The generic design "stops some 800-pound gorilla from saying, 'I want to do the lab,' and when he retires, they're stuck with this idiosyncratic lab," Adamson said.

Academic fiefdoms are "a battle we deal with all the time" in building renovations, said Michael E. Schrier, project manager for facilities construction and renovation at the school, who has overseen renovations to many of the older structures. Once the building is renovated, the facilities "are turned over to the assigned department. If within five years Department A left, Department B could come in with little or no work at all."

As science has changed, so has another element of lab design: support space. Historically, architects had set aside 30 square feet of support space for every 100 square feet of lab space; however, that ratio increased even as The Anlyan Center was under construction. Part of Schrier's job is to make room by squeezing utilities that were once out in the open—plumbing, electrical, and computer lines—into walls and ceilings. With scientists spending more time at computers and in controlled environments, newer designs require that each square foot of lab space be matched by a square foot of support space. "We're finding that far more time is spent in these specialized support rooms than on the benches, hence the shift in the ratio," said Adamson. Temperature and humidity control have become more important in many fields, and "air displacement can have a huge effect."

The school takes pains to give researchers what they need, said Chapman, while Larimer added, "You have to remind them that it's a generic space."

Flora M. Vaccarino, M.D., a professor in the Child Study Center, said she was happy to see renovations under way at Sterling's I-Wing, where her lab investigates the responses of neural stem cells to genetic and environmental factors; but she wondered about the allocation of space. As priorities change

with funding, space needs in laboratories also change. “What happens when labs undergo major changes in research directions?” Vaccarino asked.

A square peg in a round hole

The Amistad Street Building, which opened in 2007, offers an example of both the new philosophy at work and the perennial space problems facing the medical school. Amistad became a starter home for the Yale Stem Cell Center as well as the Human Translational Immunology program and the Vascular Biology and Transplantation program. In less than three years, however, the Stem Cell Center, which had been scattered around the campus, has expanded to six independent research laboratories and eight faculty members housed in roughly 30,000 square feet. “We have four new recruits,” said Diane S. Krause, M.D., Ph.D., associate director of the center. “Now that they’ve moved in, we will soon be bursting at the seams.”

Krause, a professor of laboratory medicine, cell biology, and pathology, appreciates the communal aspect of the Amistad building, which has lounges in the middle of the floors where researchers can gather. “It is nice to have these opening areas where people can interact,” she said.

Creating such gathering spots is a key element in designing new research space. “Where will the next Nobel Prize project develop?” said Robert Venturi, whose firm Venturi, Scott Brown and Associates co-designed The Anlyan Center. “In the lab? The meeting space? The café?”

To create that common shared space, The Anlyan Center is split into two wings—three stories for teaching and six stories for research—that are connected by walkways and share a lobby. The purpose of the lobby “was to simulate a street going through, a communal space between two buildings,” said Larimer. In the research wing, 450-foot-long corridors end in lounges that are part kitchenette, part cafeteria, and part mini-lecture hall. Blackboards (which won the battle against whiteboards in this instance) dominate one wall opposite fixed benches, with tables and chairs scattered about. The benches were added so that researchers could catch forty winks. “You get folks who are in these buildings for long hours,” Adamson said. “If you build these lounges, they can lie down and stretch out for two hours.”

Promoting multidisciplinary chats at the water cooler is not an attempt at social alchemy; it was born from necessity.

“Science itself is becoming more interdisciplinary,” Adamson said. “Boundaries between departments are breaking down across the board.”

At The Anlyan Center, corridors and even the stairway landings act as meeting spaces, whether planned or impromptu. X-ray readers, for example, are in the hallway outside the anatomy teaching lab to promote group discussions.

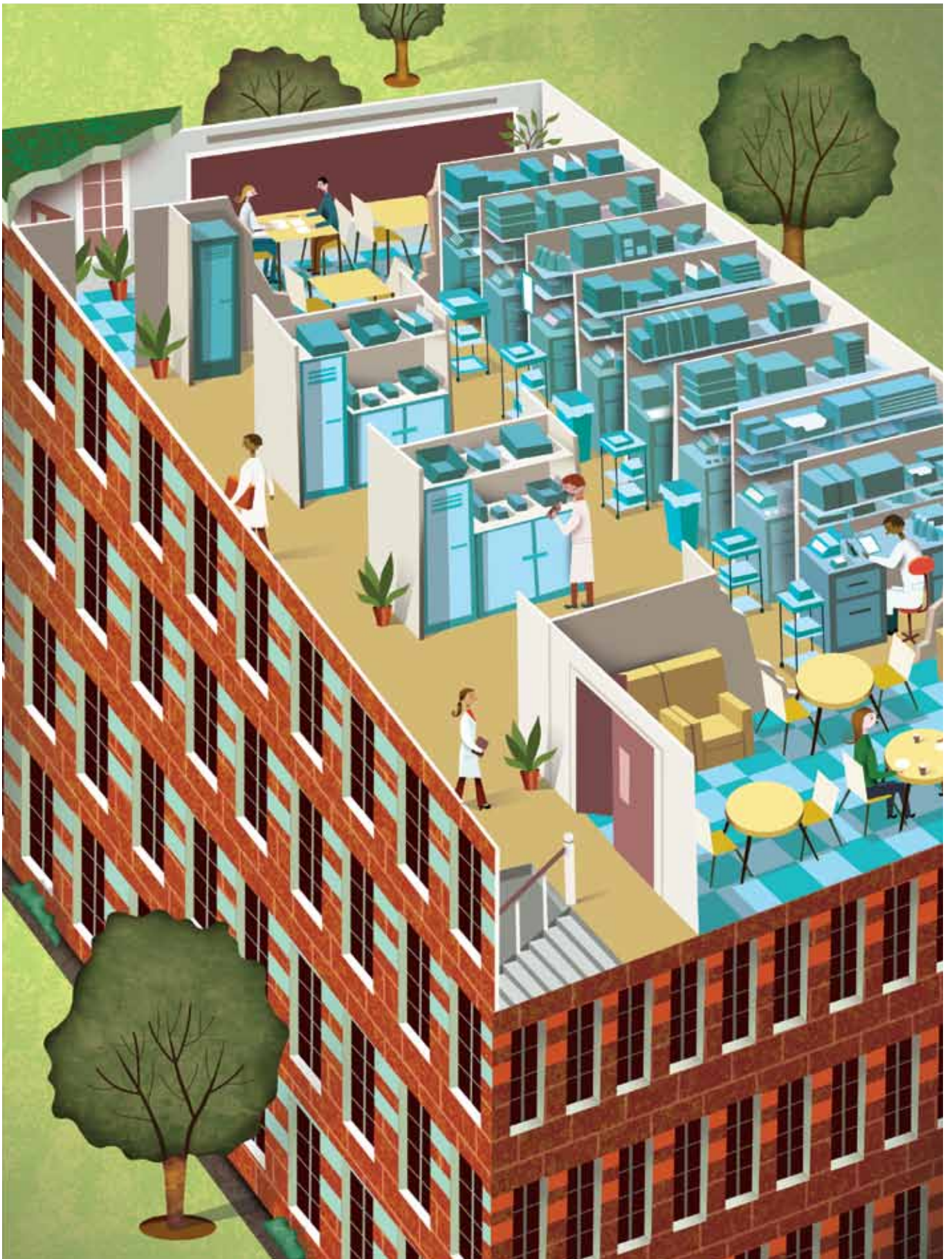
The lengthy corridors that bisect Anlyan separate offices and research spaces; in Amistad, the offices are bookends between the labs. “In the old days, you could have your office in the labs,” Chapman said. “That’s something that’s hard to do now. The idea is to create open laboratories to allow for flexibility. If you insert offices midway through these labs, you create labs that cannot grow or contract with research needs.”

The medical school has heard some grumbling about the division. “People don’t like having their offices remote from their labs,” Chapman said, “so we try to make the offices as close to the labs as possible.” Since food and beverages aren’t allowed in the labs, shelving units or “coffee cubbies” are placed outside each lab so researchers can store a cup of coffee or other food items while they are in the lab. (At the newer Amistad Building, the “coffee cubbies” are tall enough to accommodate a Starbucks venti-sized cup.)

Fostering that water cooler collegiality, however, requires more than redesigning the physical plant. Jeffrey R. Bender, M.D., the Robert I. Levy Professor of Medicine (cardiology) and professor of immunobiology, notes that such labs as his, at the end of a corridor at The Anlyan Center, tend to be self-contained. And the labs between the ends might be occupied entirely by a senior faculty member with abundant grants. Such labs, Bender said, could have up to 36 work stations for one PI. “An assistant professor is going to get four to eight work stations,” he said.

And that’s where the interactions are likely to occur—in a large lab space occupied by up to half a dozen assistant professors and their lab groups. “Their graduate students and post-docs are going to be sharing the same space,” Bender said.

Girish Neelakanta, Ph.D., a postdoctoral fellow in infectious disease, has worked in such a lab in The Anlyan Center for four years and finds it encourages collegiality in several ways. One is its location near other lab buildings. And within the building itself, he said, it’s easy to talk to other scientists. His first-floor lab, where he works on Lyme disease, is shared by four principal investigators.



New ideas in lab design encourage interdisciplinary cross talk and collaboration through common areas that lend themselves to “water cooler” conversations.

“Here we are all friendly. We share a lot of equipment,” he said. “You can talk to postdocs working on different projects.”

Sarojini Adusumilli, PH.D., also a postdoc in infectious disease, echoes Neelakanta’s comments. “We share ideas with people when we meet in the break room,” she said. “The break room is a place where we talk about science. Maybe someone saw a paper and they thought it was interesting. We also discuss the problems of science and the kind of work we do.”

But the building’s layout also encourages interdisciplinary conversations. “Doctors and postdoctoral researchers can all interact,” she said. “People working in basic science as well as clinical science can discuss things.”

A few miles away, the interdisciplinary approach is driving plans for the West Campus. Built in several stages over a period of years, the former Bayer facility has almost half a million square feet of pristine lab space for both biology and chemistry researchers. Unlike spaces on the medical school campus, West Campus will not be home to generic labs but to specialized core facilities and new institutes dedicated to specific fields of research. George Zdru, director of capital programs at the medical school’s facilities office, notes that so far three core research facilities—the Yale Center for Genome Analysis, the Center for High Throughput Cell Biology, and the Small Molecule Discovery Center—have opened up on the West Campus with few modifications to existing space. Five institutes are in the preliminary stages of planning—microbial biology, chemical biology, cancer biology, systems biology, and cell biology. “At this point it is hard to tell how much restructuring will be required,” Zdru said. “The West Campus in its totality is being thought of as a multidisciplinary environment by the nature of the definition of the institutes. The three primary research buildings are interconnected. Inherently, there is a multidisciplinary nature to the planning of West Campus.”

A room with a view

More glass and better lighting are dominant features in both the new buildings and the refurbished ones on the medical school campus. A driving force behind that is Yale’s sustainability initiative that aims to reduce energy use. But the school also desires more openness in its labs, which had been “like rabbit warrens,” Chapman said.

At The Anlyan Center some interior windows have been treated with translucent film or otherwise covered to offer privacy for occupants who don’t want everything they do on public

display. Most labs, however, retain their original openness. Because the building was designed for transparency, it was left up to the departments and researchers to either keep it that way or have a modicum of seclusion.

Venturi said that science buildings should have work spaces near windows at the building’s exterior “for enjoying the amenity of natural light and the view,” while the mechanical space belongs in the center and on the top. The Anlyan Center, whose architecture is based on that of an old New England mill, follows that thinking even in the third-floor anatomy lab. “Because it has a lot of windows, it was controversial,” Adamson said. “We thought it was important to have natural light in there. If you’re stuck in a windowless room six hours a day, it’s depressing.”

Though Adamson said that most scientists are “more than happy to work in a shared space,” not everyone is fond of breaking the labs open; some researchers still prefer their warrens and cubicles.

“That attitude is really waning,” said Bender. “You can have a chunk of space that you feel is your own. It is more generic and it’s more flexible. If you need two extra benches, you don’t need to invade someone else’s room.” **YM**

John Dillon is a freelance writer in New Haven.



Frederick Haeseler



Peter Ellis



Janet Hafler



Murat Günel



David Hafler



Steven Leder



Ruslan Medzhitov

Change in primary care clerkship

FREDERICK D. HAESELER, M.D., FW '76, has stepped down as head of the fourth-year primary care clerkship that he has directed since 1993. **PETER J. ELLIS, M.D., M.P.H.**, assistant professor of medicine, took over effective January 1.

Haeseler founded the clerkship in 1993 with a grant from the Robert Wood Johnson Foundation for curriculum reform. The goals of the reform included increasing medical student exposure to primary care and developing outpatient educational sites for clinical clerkships. The present month-long clerkship includes a combination of faculty-led discussion groups on key primary care topics and supervised patient care in community-based practices and clinics.

The transition comes as the medical school begins a strategic planning process covering the entire four-year curriculum. Ellis is interested in exploring several contemporary themes in primary care, including the patient-centered medical home, outpatient clinical reasoning, and cost containment. One of the principal goals of the clerkship, said Ellis, is to “enable students to perform an accurate problem-focused patient assessment in an ambulatory setting.”

Haeseler will continue to direct the standardized patient program that he also founded in 1993. He writes scripts for the program and trains actors to portray patients with a variety of medical disorders. Medical students then interview and examine the standardized patients to learn and practice clinical skills. Haeseler will also continue to mentor students as an attending physician at HAVEN, the student-run free clinic in New Haven's Fair Haven neighborhood.

New assistant dean for education

JANET P. HAFLER, M.ED., ED.D., has been appointed assistant dean for educational scholarship in the office of education. Hafler, who began her career as a registered nurse, earned a master's degree in education from Teachers College of Columbia University and a doctorate in education from Harvard University. Hafler comes to Yale with extensive experience in the medical schools of Harvard and Tufts, where she worked in faculty development. At both schools she addressed teaching, learning assessment, and curriculum development. At Yale Hafler will work with faculty and residents to improve teaching and learning. She will develop and implement educational programs and individual educational consultations, and work on defining and evaluating educational contributions.

One new program she plans to start is a fellowship for faculty in medical education. The project will begin in July with one or two faculty members from each of five departments. Each participant will design a resident-as-teacher program for training residents to teach medical students as well as fellow residents. Hafler is also developing metrics for evaluating teaching. Richard Belitsky, M.D., deputy dean for education, noted that Hafler's appointment coincides with the medical school's decision to review its curriculum with an eye toward strategic revisions. “There was a clear consensus,” he said, “to bring to Yale someone with expertise in medical education who is trained as an educator.”

Murat Günel, M.D., HS '98, has been named the Nixdorff-German Professor of Neurosurgery. Günel, also professor of neurobiology and of genetics, is co-director of the Yale Neurogenetics Program and studies genetic risk factors for neurovascular disease. He received his medical degree from Istanbul School of Medicine in Turkey and completed his residency in neurosurgery at Yale-New Haven Hospital in 1998. That same year, he joined the School of Medicine faculty as an assistant professor of neurosurgery. Günel has been chief of the Section of Neurovascular Surgery since 2001 and a full professor of neurosurgery since 2008.

David A. Hafler, M.D., chair of neurology at the School of Medicine, has been named the inaugural Gilbert H. Glaser, M.D., Professor of Neurology. Hafler, a leader in the effort to better understand the molecular basis of multiple sclerosis, joined the faculty in September. An authority on the mechanisms of autoimmunity and inflammatory diseases of the central nervous system, he was previously director of molecular immunology in the neurology department of Harvard Medical School, where he was the Jack, Sadie, and David Breakstone Professor of Neurology (Neuroscience) and a neurologist at Brigham and Women's Hospital. Hafler also received the John J. Dystel Prize for Multiple Sclerosis Research from the American Academy of Neurology in January. The prize is given in recognition of his outstanding achievements in multiple sclerosis research. The award comes with a \$15,000 prize.

Steven B. Leder, PH.D., professor of surgery (otolaryngology), has been installed as the incoming president of the Dysphagia Research Society for 2010-2011. The society is an international organization devoted to all aspects of swallowing and its disorders. Leder is involved in clinical care. He also does research in dysphagia diagnostics and rehabilitation for patients with head and neck cancer, as well as other acute and long-term diseases, voice restoration following total laryngectomy, and voice rehabilitation following tracheotomy and ventilator dependency. Leder received his doctorate from the University of Connecticut and is a fellow of the American Speech-Language-Hearing Association.

Ruslan Medzhitov, PH.D., the David W. Wallace Professor of Immunobiology and a Howard Hughes Medical Institute Investigator, has received the 2010 Lewis S. Rosenstiel Award for Distinguished Work in Basic Medical Science. The award was conferred for Medzhitov's “elucidation of the mechanisms of innate immunity.” Medzhitov's studies helped shed light on “the critical role of Toll-like receptors (TLRs) in sensing microbial infections, mechanisms of TLR signaling and activation of the inflammatory and immune response.” Rosenstiel Awards are given to scientists for recent discoveries of particular originality and importance to basic medical research. A \$30,000 prize and a medal accompany each award. Sharing the award for his work in innate immunity is Jules Hoffman, PH.D., Research Director and Member of the Board of Administrators of the National Center of Scientific Research, University Louis Pasteur, Strasbourg, France.



Andres Martin



Carolyn Mazure



Kevin Pelphrey



Nancy Ruddle



Gerald Shulman



Robert White

Past Yale winners of the Rosenstiel Award include: in 2008, Arthur L. Horwich, M.D., Eugene Higgins Professor of Genetics and Pediatrics and Howard Hughes Medical Institute Investigator, for his work in the field of protein-mediated protein folding; in 2002, Joan A. Steitz, PH.D., Sterling Professor of Molecular Biophysics and Biochemistry and Howard Hughes Medical Institute Investigator, for her work in establishing a subfield of molecular biology concerning small nuclear ribonucleoproteins; in 2001, Thomas A. Steitz, PH.D., Sterling Professor of Molecular Biophysics and Biochemistry and Chemistry and Howard Hughes Medical Institute Investigator, who later won the 2009 Nobel Prize in Chemistry; in 1989, Sidney Altman, PH.D., Sterling Professor of Molecular, Cellular, and Developmental Biology, for discovering the catalytic properties of RNA. Altman won the Nobel Prize in Chemistry the same year.

Andres S. Martin, M.D., M.P.H. '02, was appointed the Riva Ariella Ritvo Professor of Pediatric Psychosocial Services in December. Martin, an associate professor of child psychiatry and psychiatry in the Yale Child Study Center, is also the medical director of the Children's Psychiatric Inpatient Service at Yale-New Haven Children's Hospital.

Carolyn M. Mazure, PH.D., professor of psychiatry and psychology and associate dean for faculty affairs, was inducted into the Connecticut Women's Hall of Fame in October for her work

that explores gender-specific differences in the causes, treatment, and prevention of cancers, osteoporosis, depression, and other disorders more prevalent in women. Mazure created the Women's Health Research at Yale (WHRY) program in 1998 based on the premise that understanding gender differences is vitally important to the health of both women and men. WHRY—which Mazure began with a grant from the Patrick and Catherine Weldon Donaghue Medical Research Foundation of West Hartford—has grown to become a national model for conducting research on women's health and disseminating findings with real-world benefits to the community.

Kevin Pelphrey, PH.D., has been named the Harris Family Associate Professor of Child Psychiatry in the Child Study Center. Pelphrey studies brain mechanisms underlying the development of different aspects of social cognition. His interests include the development of social perception, the perception and regulation of emotion, and the development of theory of mind—a crucial cognitive capacity defined as the ability to make inferences about the mental states of others. Pelphrey completed his doctorate in psychology at the University of North Carolina, Chapel Hill, in 2001. He then held a postdoctoral fellowship in cognitive neuroscience at Duke University. He remains a core faculty member of Duke University's Brain Imaging and Analysis Center. Pelphrey is a frequent collaborator with colleagues in Yale's Department of Psychology; he is also a member of the Interdepartmental Neuroscience Program and the Cognitive Science Program.

Nancy H. Ruddle, PH.D. '68, professor emerita and senior research associate in the Division of Epidemiology of Microbial Diseases in the School of Public Health, received the 2009 Lifetime Achievement Award from the International Cytokine Society at its annual meeting in Lisbon, Portugal, in October. The award is given annually to a scientist who has contributed to research on cytokines, proteins released by cells within the immune system that are critical to regulating the body's immune response. Ruddle's research, which began during her years as a graduate student in microbiology at Yale, focuses on lymphotoxin and other cytokines involved in autoimmune diseases and lymphoid organ development.

Gerald I. Shulman, M.D., PH.D., the George R. Cowgill Professor of Physiological Chemistry, professor of medicine and of cellular and molecular physiology and a Howard Hughes Medical Institute Investigator, was named a fellow of the American Association for the Advancement of Science (AAAS) in December. He is one of 531 AAAS members elevated to this rank last year for their efforts toward advancing science applications that are deemed scientifically or socially distinguished. Shulman was honored for his contributions to the understanding of type 2 diabetes, notably the mechanisms of insulin resistance and the metabolic syndrome, a cluster of risk factors for diabetes and heart disease.

William V. Tamborlane, M.D., FW '77, professor and section chief of pediatric endocrinology and deputy director of the Yale Center for Clinical Investigation, has been honored with the Diabetes Technology Leadership award by the Diabetes Technology Society for his lifetime accomplishments in diabetes research and technology. Tamborlane's achievements have included pioneering work in the development of insulin pump therapy, continuous glucose monitoring, sensor-augmented pumps, closed-loop systems, and development of an artificial pancreas. He also demonstrated the role of insulin resistance in pediatric metabolic disorders, including obesity and type 2 diabetes.

Robert I. White, M.D., professor of diagnostic radiology, received the 2010 Career Achievement Award from the International Symposium on Endovascular Therapy at its annual meeting in Florida in January. White, the director of the Yale Vascular Malformation Center, is credited with developing four new procedures in vascular interventional radiology, including embolization of pulmonary arteriovenous malformation and varicocele, and percutaneous valvuloplasty for pulmonary valve stenosis and coarctation stenosis. He has authored two textbooks and more than 300 papers. His honors include a Gold Medal and Leaders in Innovation award from the Society of Interventional Radiology, of which he is a past president.

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New PA grads face a bright future

Physician associates can help solve some of the biggest problems in health care.

“It’s a great time to be a physician associate,” said Robert S. Galvin, M.D., in a Commencement address given in December to 35 new graduates of Yale’s Physician Associate Program.

Galvin, the executive director of health services and chief medical officer of General Electric, told the graduating class that their profession is “close to

recession-proof” because their skills are in such demand. Physician associates, he said, can help solve several of the biggest problems in health care, such as the shortage of physicians, the expanding need for health care, and rising costs. All of these issues will be intensified, he added, once Congress passes a health care reform bill that could bring 30 million currently uninsured people into the health care system.

Galvin advised the graduates to become lifelong learners, because the ongoing explosion in medical knowledge constantly renders old information obsolete. He also urged them to treat their patients with kindness.

Three students were given special honors: Dominique Caruso received the Dean’s Academic Award for excellence in the classroom; Lauren Swisher received the Dean’s Clinical Award for distinction in the clinical portion of the program; and Megan Dieterich won the Dean’s Humanitarian Award for volunteer work at the HAVEN free clinic.

The students also gave three awards of their own: to Rex L. Mahnensmith, M.D., professor of medicine, for excellence as a teacher; to the Clover Fork Clinic in Evarts, Ky., for providing exemplary clinical teaching; and to Rita Rienzo, PA-C, M.M.Sc., assistant professor in the Physicians Associates Program, who accepted the Jack Cole Society Award for her support of students and the profession.

Robert J. Alpern, M.D., dean of the Yale School of Medicine and Ensign Professor of Medicine, congratulated the graduates and handed out the diplomas. And lastly, as a sonorous recessional was played on the Woolsey Hall pipe organ, 35 new physician associates marched down the aisle past beaming families and friends.

—Steve Kemper



TOP Robert Galvin, chief medical officer of General Electric, told physician associate graduates that they can help solve some of the biggest problems in health care, such as the shortage of physicians.

ABOVE Dean Robert Alpern awarded a diploma to Dominique Caruso.

RIGHT Students Carolyn Canonica, Emily Burgun, Nicholas Bonomo, and Sarah Bailey waited for the procession into Woolsey Hall to begin.



JOHN CURTIS (3)

Hunger and Homelessness Auction raises funds for local organizations

Tarot card readings, a vintage Epiphone guitar, a chance to challenge the dean's softball team, and an afternoon of handy work by second-year medical students were on the block on Nov. 19 at the 17th Annual Hunger and Homelessness Auction sponsored by the Yale Health Professional Schools.

This year the auction netted about \$25,000 for local nonprofits whose programs combat hunger and homelessness. In the past, grants have been awarded to such agencies as the Community Health Care Van, Loaves and Fishes, the Community Soup Kitchen, and Domestic Violence Services.

Traditional items were offered during the live auction in Marigold's, including a bow tie belonging to William B. Stewart, PH.D., associate professor of surgery and chief of the Section of Anatomy and Experimental Surgery. (The tie, which "smells faintly of formaldehyde," fetched \$900.) Stewart also offered his usual Beef and Beer Dinner for eight, which fetched an additional \$900. Nancy R. Angoff, M.P.H. '81, M.D. '90, HS '93, associate dean for student affairs, and Margaret J. Bia, M.D., professor of medicine, reprised their "Girls' Night Out"—"Share good food, great company, juicy gossip, and worldly wisdom with Drs. Peggy Bia, Jean Vining, Joni Hansson, and Nancy Angoff. (Dinner for girls only)." The dinner was worth \$800 to a group of medical students.

And continuing into his fourth year, Wade Brubacher, a professional auctioneer from Kansas and father



JOHN CURTIS (3)

of medical student Jake Brubacher, offered his services and led the bidding.

The live auction came after a silent auction that began on Monday, Nov. 16. The silent auction included offerings of clothing, dinners, food, and lessons in language, arts, dance, and sports. Assorted services offered included trips to Costco, gofer services for one business day, computer help, and a personal tour of the Big Apple from a native New Yorker.

—John Curtis

TOP Medical student Stacey Kallem offered a bid on a "girls' night out" with faculty including Nancy Angoff and Margaret Bia.

ABOVE LEFT Nursing students Katherine Magoon, Meaghan Hamilton, and Emily Miller perused the list of items before the start of the live auction.

ABOVE RIGHT Auctioneer Wade Brubacher cajoled first-year medical student Nathan Pirakitikulr into making a bid.



MARION S. WHELAN

Edward Halperin, dean of the School of Medicine at the University of Louisville, believes that knowledge of the cultural, historical, and philosophical underpinnings of medicine is essential to medical education.

Keeping body and soul together

For one doctor, history and the other humanities are a vital part of medicine.

If you type the name “Halperin EC” into the medical journal search engine PubMed, the results—nine pages worth—seem to be the works of different authors. There are articles about brain tumors and radiation treatments. But then there’s one about the theft of the bodies of African Americans for anatomy classes in the late 18th and early 19th centuries. There is one entitled “The pornographic anatomy textbook?” And there is “Should academic medical centers conduct clinical trials of the efficacy of intercessory prayer?” All were written by Edward C. Halperin, M.A., M.D. ’79, a pediatric radiation oncologist, dean of the School of Medicine at the University of Louisville, Ky., and a passionate devotee of the liberal arts.

“Physicians like to be convinced that they’re rarified and scientific,” Halperin said, “but medicine is a social activity that takes place in the context of its times.” Knowledge of the cultural, historical, and philosophical underpinnings of medicine, he believes, is central to medical education. When he became dean at Louisville in 2006, Halperin instituted three compulsory humanities classes for medical students—Intersection of Religion and Medicine, History of Medicine, and Literature in Medicine—and helped start a joint M.D./M.A. in medical humanities there. He earned a master’s in liberal studies himself while at his previous post as vice

dean of Duke University’s School of Medicine, attending classes like The Human-Animal Boundary, Travel Writing in the Ancient World, and South African History.

For his master’s thesis on drug screening of medical residents, he asked doctors-in-training at Duke whether they thought drug tests violated their civil rights. They didn’t, it turned out. “Interns and residents are so acculturated to jumping through hoops, that if you say ‘Urinate in the cup,’... They say, ‘Which way is the bathroom?’ ” He is troubled by evidence that criminal background checks on medical students are racist—minor crimes like marijuana possession can lead to very different consequences for minorities as opposed to affluent whites. And he is leery of medical students doing “audition electives” at faraway hospitals in the hopes of matching at competitive residencies, since the inherent expense discriminates against less affluent students.

A native of Somerville, N.J., Halperin developed a passion for ethics and human rights in childhood. He idolized lawyers, including a relative who sat on New Jersey’s Supreme Court, as well as then-Justice Department lawyer Nicholas Katzenbach. Katzenbach’s 1963 “schoolhouse door” confrontation with Gov. George Wallace, who opposed desegregation at the University of Alabama, deeply impressed Halperin. After seeing photos of the event, he decided to become a civil rights lawyer. Eventually, though, he realized that most lawyers don’t wind up on supreme courts or engaged in historic civil rights struggles. “I might end up having to do parking tickets, divorces, house closings,” he remembers thinking. “That might not make a really big difference in society.

It was then that Halperin turned to medicine. He chose radiation oncology in part because he felt it was one of the most consequential, high-stakes things a doctor could do. He trained at Stanford and at Massachusetts General Hospital and is now an authority on childhood cancers.

The granddaughter of a legend finds her own way as a physician

Sally Winternitz, M.D., HS '86, grew up in northern New Jersey consumed by things that are typically only passing fancies for little girls—riding horses, playing in the woods, and collecting shells. At 16, her passions took a turn when she decided that she wanted to attend medical school. “I didn’t think of it as being part of a family tradition,” she said. Whatever the spark, Winternitz’s decision continues a rich heritage of medicine initiated by her ancestors.

Winternitz’s grandfather, Milton Charles Winternitz, M.D., a second-generation physician, reigned as dean of the School of Medicine from 1920 to 1935, during which time he boosted the school to elite status and established the Yale system of medical education. Her grandmother, Helen Watson Winternitz, M.D., earned her medical degree at Johns Hopkins before marrying Milton, although she declined to practice medicine in favor of raising her children.

Despite never really knowing her grandparents—Winternitz was 5 when her grandfather passed away in 1959, and her grandmother had died 29 years earlier in the prime of her life—she feels that her grandparents exerted an unconscious influence on her and her relatives, one that has guided many of them toward medicine. “Why did eight of my cousins become physicians?” Winternitz wondered. “We have a good proportion of a medical school class. That was my grandfather’s life’s work—running a medical school.”

For much of Winternitz’s life her father, Tom, talked little of her grandfather, as the two had broken ties many years before. “Great men sometimes are great men, but not great parents,” she said. Winternitz believes that her grandfather’s hot temperament led to the schism between the two. Perhaps straining their relationship was the decision

The patients Halperin cares for are indeed those who force doctors to think about whether the world makes sense. “Doctors have a lot of rationalizations that get them through the day,” he said. A long-time smoker with untreated hypertension who has a stroke, or a woman with cervical cancer who had dozens of sexual partners and never got a Pap smear may prompt a doctor to privately rationalize that the patient’s irresponsibility is to blame. “But there’s nothing to blame when a 7-year-old has leukemia,” he said. “Children with cancer bring up the problem of evil.”

Medicine and the humanities are part of the culture of Halperin’s family. His wife, Sharon, and his eldest daughter, Rebecca, are physical therapists; the two of them recently volunteered their expertise in Nicaragua. His middle daughter, Jennifer, works in fashion as a dress buyer for Victoria’s Secret, while his youngest, Alison, is a senior at Barnard College and studies limb injuries and artificial limbs during the Civil War.

That interest in medical history is part of the cultural legacy Halperin tries to impart to his students. One of his most remarkable articles concerns a 1971 anatomy textbook that included chauvinist remarks and photographs of women in an alluring pin-up style; the textbook met with outrage and was withdrawn soon after publication. “The story of discrimination against blacks and Jews and Catholics and women is part of the story of medicine, and is worth telling,” he said. “If we fail to tell these tales and remember our history, we’ll be the worse for it.”

—Jenny Blair, M.D. '04

made by Tom, the eldest son, not to pursue a career in medicine. Instead he followed the path of his maternal grandfather, Thomas Watson, who with Alexander Graham Bell invented and developed the telephone. Tom Winternitz worked as an electrical engineer with Bell Laboratories for 40 years.

Sally Winternitz started medical school at Rutgers in New Jersey and after two years transferred to Tufts in Boston, graduating in 1980. She pursued internal medicine as her older brother Charlie had done, which took her to a residency at Case Western Reserve University in Cleveland. But Winternitz soon realized that psychiatry is her true calling. She completed two years of internal medicine at Case Western, focusing heavily on neurology due to her plans to pursue psychiatry. Then the break she was waiting for appeared: she was offered a spot in the general psychiatry training program at Yale—a department founded by her grandfather more than 50 years earlier.

Since completing the Yale program in 1986, Winternitz has worked in inpatient and outpatient psychiatry settings. She feels privileged to be allowed to share in the very intimate struggles raging within her patients and to be trusted enough to lead them toward solutions. “Spiritually, there isn’t a much better place to be than being in the service of others, and that’s really important to me,” she said.

Winternitz lives in Sequim, Wash., on the Olympic Peninsula, sheltered by the Olympic Mountains on one side and a view of the Strait of Juan de Fuca separating the United States and Canada on the other. She runs a small psychiatry practice in which she sees patients

Sally Winternitz carries on a family tradition of entering medicine. A psychiatrist in the Pacific Northwest, she is the granddaughter of Milton Winternitz, legendary dean of the School of Medicine.



MATTHEW BARTON

two days per week, and also serves as a psychiatric consultant at a local community health center. The balance of Winternitz's time is devoted to her husband, Matthew Barton, M.D., an anesthesiologist, and her two teenage children, son Jay and daughter Babette.

Over the past few years, Winternitz has done a lot of questioning to determine the role of her grandparents in her life. She clearly recognizes the culture of medicine that they unknowingly fostered within the family. However, her revelations go deeper: "What's interesting to me in a synchronistic way is that my life in some ways parallels my grandmother's, except that I get to live mine and she died." When Helen, a much beloved wife and mother, died from probable renal failure at the age of 45, she left behind five children between the ages of five and 14, and a dark void within the family. "The irony and sad part was that here was this world-famous physician who had a wife he couldn't heal," says Winternitz. "Lucky me, I'm married to a physician, I get to be a physician myself, and I get to raise my kids."

—Kara A. Nyberg

Medical School Reunion Weekend June 4-6, 2010

- Alumni lectures: Robert Klitzman, M.D. '85—*When Doctors Become Patients*
Jerrod M. Post, M.D. '60—*When Illness Strikes the Leader*
- The Legacy of Harvey Cushing at Yale: Past and Future Perspectives
- Tours of Medical Library, medical campus, West Campus, and Smilow Cancer Hospital
- Dean Alpern's State of the School address
- Harvey Cushing Center Dedication and Open House
- Saturday evening Class Dinners

Weekend schedule and online registration:
medicine.yale.edu/alumni



1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

Familiar Faces

Do you have a colleague who is making a difference in medicine or has followed an unusual path since leaving Yale? We'd like to hear about alumni of the School of Medicine; Physician Associate Program; and the medical school's doctoral, fellowship, and residency programs. Drop us a line at ymm@yale.edu or write to Faces, *Yale Medicine*, 300 George Street, Suite 773, New Haven, CT 06511.



Helen Smits



Jennifer and Matthew Davids



George Lui



David Spar and Barbara Wexelman

1960s

Helen L. Smits, M.D. '67, was inducted into the Connecticut Women's Hall of Fame in October. Smits, a retired physician-manager whose most recent work has been in Mozambique and other countries in sub-Saharan Africa, was honored for her work as an international health care leader and teacher. She currently serves as a senior consultant to the Doris Duke Foundation's African Health Initiative. She is the former director of the John Dempsey Hospital at the University of Connecticut Health Center in Farmington, and is a former member of the board of directors of the Hartford Stage.

1970s

Colleen Livingston, M.D., HS '73, FW '75, was recognized as a Distinguished Life Fellow by the American Psychiatric Association at the annual meeting in San Francisco last year. Livingston has a private practice in Canton, NY. She has a special interest in mood and anxiety disorders.

1980s

Howard S. Jaffe, M.D. '82, is president of the Gilead Foundation and a member of Gilead's senior management team. Gilead is a nonprofit that seeks to improve the health and well-being of underserved communities around the world through expanding access to HIV and hepatitis B education, outreach, prevention, and health services. He has been a member of the management team since 1991, serving in such roles as chief medical officer and senior vice president for drug development. Prior to joining

Gilead, Jaffe was director of clinical research and cytokine project team leader at Genentech.

From 2002 to 2004, he served as research director at the Gordon and Betty Moore Foundation. Jaffe is a former faculty member at the University of California, San Francisco, and has served as an attending physician in internal medicine at San Francisco General Hospital.

Diane Louie, M.D. '87, M.P.H., wrote to say that after several years as an attending pathologist at Memorial Sloan-Kettering Cancer Center, in New York, she reinvented herself. She earned a degree in Health Policy and Management at Columbia and moved from academic medicine to the pharmaceutical industry. After positions at Merck & Co. and Roche, she now works at Sanofi-Aventis, where she is a regulatory liaison to the FDA, developing oncology drugs and companion diagnostic tests. She lives in Madison, N.J., with her husband, Paul Rothenberg, M.D., PH.D., who works in the pharmaceutical industry as a clinical pharmacologist.

2000s

Jennifer Davids, M.D. '05, and **Matthew Davids, M.D. '05**, announced the birth of their first child, Emily Isabella, on August 20, 2009. "Emily couldn't wait to see everyone, so she decided to come a month early. Mom, Dad, and baby are all doing well." Jennifer is a general surgery resident at Brigham and Women's Hospital. Matthew is a hematology/oncology fellow in Harvard's combined Dana-Farber Cancer Institute, Brigham and Women's Hospital, and Massachusetts General

Hospital program. They live in Boston.

George Lui, M.D. '02, was recently appointed director of adult congenital heart disease at Montefiore Medical Center, and assistant professor of medicine and pediatrics at the Albert Einstein College of Medicine in the Bronx, N.Y. He also received the Outstanding Research Award in Pediatric Cardiology at the American Heart Association's 2009 Scientific Sessions.

Jordan M. Prutkin, M.D. '02, was married on December 5 to **Heather S. Camp, R.N., M.P.H.**, a nurse with the Seattle branch of a company that provides nursing and medical staff to hospitals and other organizations. Prutkin is an assistant professor in the medicine-cardiology department at the University of Washington School of Medicine in Seattle.

Michael Singer, M.D. '02, PH.D. '02, has completed his work with HealthHonors, a behavioral economics company that he co-founded in 2006. He is now at the Novartis Institutes for Biomedical Research, where he's working on early-stage drugs for ophthalmology. He lives in Newton, Mass. with his wife, Baha, an optometrist, and their two children, Leili and Samia.

Barbara A. Wexelman, M.D. '08, M.B.A. '08, was married on October 24 to **David S. Spar, M.D., HS '08**, in Westhampton Beach, N.Y. Wexelman is a second-year resident in general surgery at St. Luke's-Roosevelt Hospital in Manhattan. Spar is a second-year fellow in pediatric cardiology at New York-Presbyterian/Columbia University Medical Center.

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Karel B. Absolon, M.D. '52, PH.D., died of respiratory failure on October 2 at his home in Rockville, Md. He was 83. Born in Brno in what is now the Czech Republic, Absolon left in 1948 during the Communist takeover of his homeland. A heart surgeon, he was chief of surgery at Washington Hospital Center and also worked at the National Institutes of Health. He retired from the National Heart, Lung, and Blood Institute in the mid-1980s. Absolon was a collector of history and medical books and wrote a three-volume biography of Theodor Billroth, the father of modern gastrointestinal surgery.

Sophia Chamberlin Alway, M.D. '41, died on February 10, 2009, in Redmond, Wash. She was 92. Alway completed her residency in pediatrics at the University of Minnesota, where she met her husband, also a pediatrician. The couple moved to Portola Valley, Calif., in 1955 when her husband, Robert H. Alway, M.D., became dean of Stanford Medical School.

Donald S. Baim, M.D. '75, a cardiologist and medical device executive, died on November 6 in Natick, Mass., following surgery for adrenal cancer. He was 60. Baim, a former professor of medicine at Harvard, most recently was chief medical officer at Boston Scientific Corp., a manufacturer of medical devices. Baim established the interventional cardiology program at Beth Israel Deaconess Medical Center, which specialized in teaching surgeons to use such new devices as stents. He also edited the standard medical textbook for using the devices, now in its seventh edition.

Albert W. Diddle, M.D. '36, died on December 23 in West Knoxville, Tenn. He was 100. Diddle completed his residency in obstetrics/gynecology at the University of Iowa. He served as a physician in the U.S. Navy in the Pacific and China during World War II. After the war he trained in oncology at Parkland Hospital in Dallas, Texas.

He moved to Knoxville in 1948, where he was the first board-certified ob/gyn. He was on the planning committee for the University of Tennessee Medical Center there and was one of the original researchers of birth control pills. He published more than 130 papers during his career.

Peter A. Duncan, M.D. '41, died on September 25 in Greenwich, Conn. He was 93. Duncan served as a captain in the U.S. Army during World War II and practiced pediatrics in Rye, N.Y. In the late 1970s he founded the Birth Defects Center of Westchester County Medical Center and New York Medical College in Valhalla, N.Y. Duncan, a pioneering researcher in pediatric dysmorphology, wrote more than 150 research articles and abstracts.

John L. Howland, M.D. '61, died on October 18 in Brunswick, Maine. He was 73. Howland joined the faculty of Bowdoin College in 1963 as an assistant professor of biology and by 1971 had elevated biochemistry into a separate department. He served as chair of the department several times and retired in 2002. He was best known for his research into the causes of muscular dystrophy and the cellular biochemistry of genetic disorders.

Alan M. Levine, M.D. '74, HS '80, founder and director of the Alvin & Lois Lapidus Cancer Institute for Sinai Hospital and Northwest Hospital Center in Baltimore, died on October 25 in Pikesville, Md., of a heart attack. He was 61. Levine was renowned in his field as an expert on scoliosis. He was editor-in-chief of the *Journal of American Academy of Orthopaedic Surgeons* for eight years; his published works included *Skeletal Trauma* and *Nonoperative Musculoskeletal Care*. From 1976 to 1978, he was a commissioned officer with the U.S. Public Health Service. Levine was director of the orthopaedic rehabilitation unit at Montebello State Hospital

from 1980 to 1986. From 1983 to 1998, he was chief of orthopaedic oncology service and director of the spinal injury clinic at the University of Maryland Medical Center. In addition to his professional success, Levine was active in charitable works. One of his hobbies was making teddy bears to explain the procedure of scoliosis surgery to children facing it and reduce their fears.

John R. Lyddy, M.D., HS '57, died on October 3 at Bridgeport Hospital. He was 90. A graduate of the College of the Holy Cross and NYU College of Medicine, Lyddy completed his residency in ob/gyn at Yale. He served as a naval officer during World War II and the Korean conflict. He practiced general medicine in Bridgeport in his early years and then established a private practice in Stratford. He also served at Bridgeport Hospital for many years, both as chair of ob/gyn and chief of staff. Lyddy was an accomplished carpenter and avid golfer. He loved sports, particularly the New York Mets.

Donald M. Mandelbaum, M.D., HS '72, died of brain cancer on October 15 in Hollywood, Fla. He was 69. Mandelbaum received his medical degree from New York University in 1965. After internships in New York and service in the U.S. Army, Mandelbaum completed a three-year diagnostic radiology residency at Yale. In 1972 he moved to Hollywood to join a radiology practice.

Hoyt B. Miles, M.D. '43, died on October 20 in Reno, Nev. He was 91. Although he played piano and flute in high school and won two national orchestral contests, Miles decided on medicine when he observed that the local musicians were poor and that the family doctor had two cars. After his graduation from medical school he served as a doctor with the 3rd Marine Division on Guam. He also served in China with the Marines. After World War II he resumed surgical training and practiced urology in Los Angeles. In 1958 he opened a practice in Reno.

Lawrence E. Shulman, PH.D. '45, M.D. '49, died on October 10 at his home in Washington, D.C., from complications of bladder cancer. He was 90. Shulman helped to found the Johns Hopkins University medical school's rheumatology department and was founding director of the National Institute of Arthritis, Musculoskeletal, and Skin Diseases. He joined the staff of the National Institutes of Health in 1976; in 1994 he was named director emeritus of the arthritis institute. Shulman received numerous national and international awards and fellowships for his service to the field of medicine, including the infrequently given Gold Medal of the American College of Rheumatology.

Harris B. Shumacker Jr., M.D., HS '38, died on November 12 in Gladwyne, Pa. He was 101. A graduate of the medical school of Johns Hopkins University, Shumacker was a pioneer in heart surgery and author of more than 600 professional articles and papers, eight books and monographs and chapters in about 40 textbooks. He was an expert in such areas as frostbite and the early development of the artificial heart. He served as an officer in the U.S. Army; as consultant to the surgeon general, he was instrumental in putting the first monkey into space in 1949.

Alvin Somberg, M.D. '47, died on October 13 in Chicago. After his graduation from the School of Medicine, Somberg, a general and family practitioner, served in the U.S. Army in France and spent most of his medical career at Swedish Covenant Hospital in Chicago.

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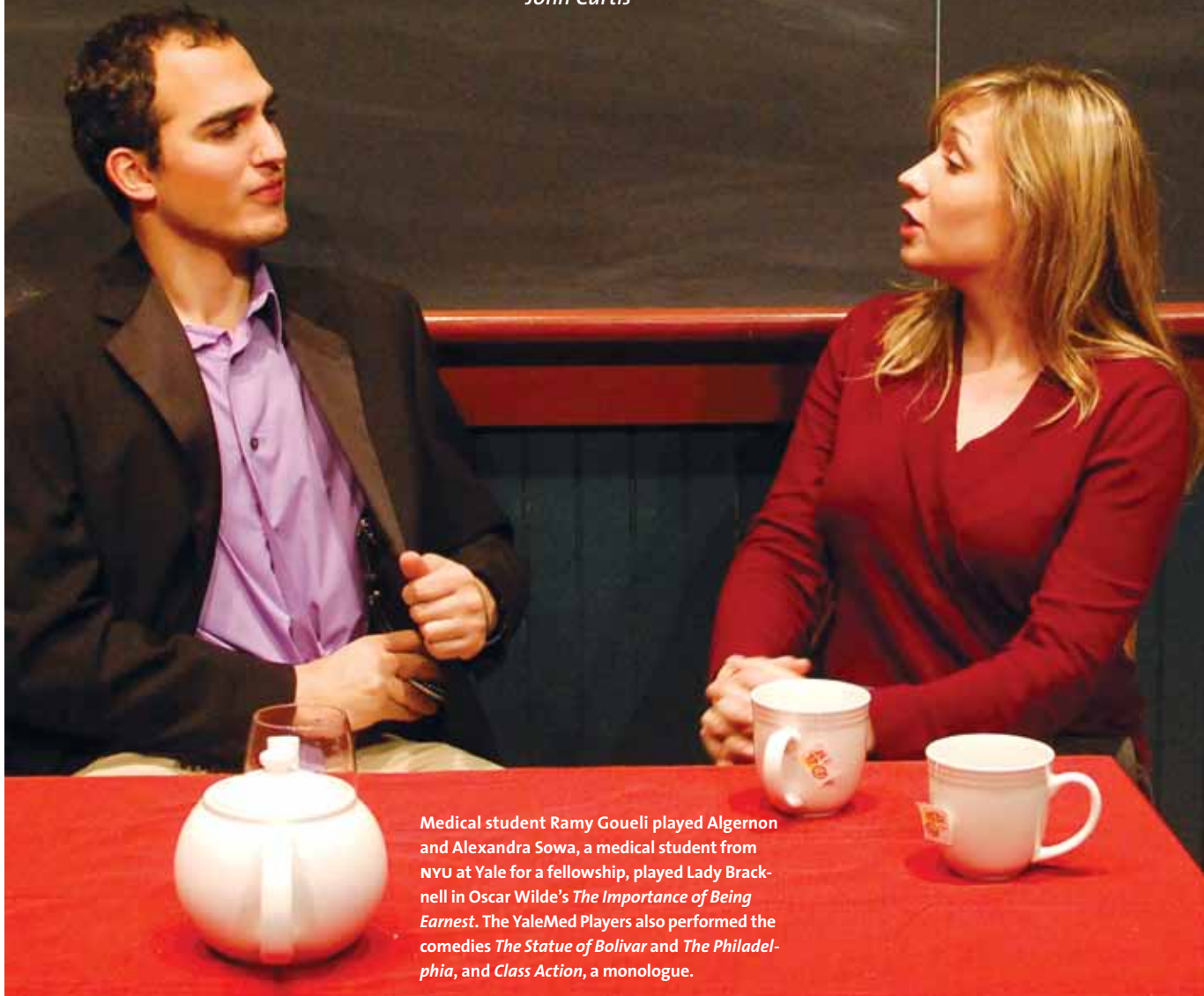
Back to the (not medical) boards

On two nights in January, in a lecture hall in the Jane Ellen Hope Building, a dozen students in medicine, public health, law, and the Physician Associate Program forgot their studies and took on new roles. For the third year in a row, the Yale Med Players presented a night of one-act plays, this year adding the first act of Oscar Wilde's *The Importance of Being Earnest*.

The troupe started four years ago when then-first-year medical students Abigail Baird and Scott Hunter, theater buffs in high school, rekindled their interest in theater and staged a reading of *The Doctor Stories* by Richard A. Selzer, M.D., HS '61. A year later, with support from Thomas P. Duffy, M.D., professor of medicine (hematology), and director of the Humanities in Medicine program, the group decided to perform Selzer's plays.

Their production this year, "Lost in Transplantation," deliberately eschewed medical themes. "We felt that we wanted to try something different, something really funny, so we picked comedies," said Baird.

—John Curtis



Medical student Ramy Goueli played Algernon and Alexandra Sowa, a medical student from NYU at Yale for a fellowship, played Lady Bracknell in Oscar Wilde's *The Importance of Being Earnest*. The YaleMed Players also performed the comedies *The Statue of Bolivar* and *The Philadelphia*, and *Class Action*, a monologue.