

MEDICINE at YALE.

ADVANCING PHYSICK, EDUCATION, AND PATIENT CARE

SPECIAL BICENTENNIAL ISSUE - NOVEMBER 2010

VOL. XL. NO. 4

MEDICAL SCHOOL TO OPEN AT YALE COLLEGE

Three years after Yale College joined with the Connecticut Medical Society to establish the Medical Institution of Yale College by an Act of the Legislature, thirty-seven Students are soon arriving in New-Haven from all corners of New England to commence studies in *Medicine, Anatomy, Chemistry, and Materia Medica* at the new school. Seventeen members of the class come from Connecticut; the rest come from Vermont, New Hampshire, and Massachusetts.

The Students, whose names, towns, and places of residence in New-Haven are listed here, met the requirement for admission, to "produce satisfactory evidence of a blameless life and conversation."

The new Medical Institution has a most illustrious and accomplished faculty, assembled by Dr. TIMOTHY DWIGHT, the President of Yale College.

Dr. NATHAN SMITH, late of Hanover, New Hampshire, where he founded the Medical School at Dartmouth College, is known throughout New England as one of our finest doctors and surgeons. Dr. Smith has a medical degree from Harvard College, and has engaged in additional study in Edinburgh, Glasgow, and London.

Dr. BENJAMIN SILLIMAN is professor of chemistry and of natural history at Yale College, where he has outfitted and equipped a most remarkable Laboratory. Dr. Silliman's Laboratory includes the famous Cabinet of Minerals donated to Yale College by Col. George Gibbs of Newport, Rhode Island, which has placed the College in the forefront of studies of Geology and Mineralogy. Dr. Silliman studied Chemistry for several years in Philadelphia and abroad and also attended medical lectures.

Dr. ENEAS MUNSON is well known to all New-Haveners for his successful practice of Medicine and prominence in the government of the town. In 1784, Dr. Munson cofounded the Medical Society of New Haven County and served as its second president. Dr. Munson has played a major role in the formation of the Connecticut Medical Society and was vice president of that organization when it was founded in 1792. He later served as president of the Society from 1794 to 1801.

Dr. Munson will be assisted in his teaching by Dr. ELI IVES, a master of Botany and of the system of *Materia Medica* propounded by Dr. John Murray of Edinburgh. Dr. Ives has an especially keen knowledge of our local plants,

and he has discovered several new plant species, including species of milkweed and balsamweed. His garden and conservatory at the Medical Institution are filled with plants that he uses to prepare his efficacious Medicines.

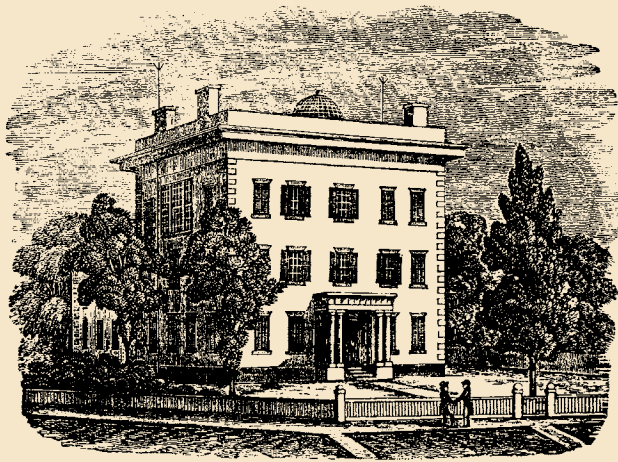
Dr. JONATHAN KNIGHT, who graduated from Yale College five years ago, studied Medicine in Philadelphia, and his practice in Medicine and Surgery is familiar to many in the town. Dr. Knight will instruct the new Students in Anatomy.

The cost to the Students for the full course of Lectures, described further in the Advertisement placed on this page by Dr. Dwight, will be fifty dollars. The course will last six months, with no vacation, and will be given to all thirty-seven Students. During this time, the Medical Professors will perform Surgical Operations, gratis, upon such patients as will consent to be operated upon in presence of the Students of Medicine.

Students at the Medical Institution may also attend Lectures at Yale College on Natural Philosophy, Mineralogy, and Geology, and they will enjoy access to the Library of the Academical as well as of the Medical Institution. There is a respectable Anatomical Museum, and every demonstration which is needed in that department will be given.

By the Articles of Union Act of the Legislature passed in 1810, to be examined for a license to practice Medicine in Connecticut, a candidate must be 21 years of age, and must have completed three years of apprenticeship with a practitioner of "respectable standing," as well as attend one course of lectures at the Medical Institution. Each candidate for Medical Licensing must also pass an oral examination administered by a board made up of professors from the Medical Institution and members of the Connecticut Medical Society. Students wishing to obtain the M.D. Degree must fulfill those same requirements but must attend two courses of lectures, one of which must be completed at the Medical Institution of Yale College.

Most Students have taken rooms in the large stone house at the head of College-street that has been taken by the Medical Institution. Others are lodging elsewhere around the town, including in Mr. Munson's, in the Lyceum—which also houses Dr. Silliman's Chemistry Laboratory—in Mr. Gorham's, and also in Dr. Skinner's.



THE MEDICAL INSTITUTION OF YALE COLLEGE.

Names.	Residence.	Rooms.
• ELIJAH ALEXANDER,	Hartland, Vt.	Mr. Munson's.
• Jonathan K. Barlow,	Brandon, Vt.	7
Zacheus Bass,	Middlebury, Vt.	6
Emery Bissel	Lebanon,	2
Elijah W. Carpenter,	Brattleborough, Vt.	3
Jonas Cutter,	Jaffrey, N. H.	1
Beriah Douglass,	Brandon, Vt.	7
Freeman Edson,	Westmoreland, N. H.	6
Elmore Everitt,	Sharon,	8
Lyman Foot,	Wallingford,	7 Lyc.
Miles Goodyear,	Hamden,	2
Joel L. Griffing,	Guilford,	3
Philip Hall,	Westmoreland, N. H.	6
Nathaniel Howard,	Chesterfield, N. H.	Mr. Gorham's.
Selah Kirby,	New-Haven,	2
Jared P. Kirtland,	Wallingford,	5
Willoughby L. Lay,	Lyme,	7
• Willard Marsh,	Ankersl, Mass.	3
John H. Mason,	Wrentham, Mass.	6
Joseph Moffett,	Windsor, Vt.	1
Lyman Padelock,	Barre, Vt.	Mr. Gorham's.
John Payne,	Montague, Mass.	5
Eli Pease,	Blandford, Mass.	3
Benjamin Potwine,	East-Windsor,	Mr. Munson's.
Dudley W. Rhodes,	Stonington,	3
Roger S. Skinner,	New-Haven,	Dr. Skinner's.
David S. C. H. Smith,	Hanover, N. H.	1
J. Talcott Smith,	Hartford,	9
Heman Swift,	Bennington, Vt.	2
Amos Taylor,	South-Hadley, Mass.	7
John A. Tomlinson,	Huntington,	3
Rufus Turner,	Mansfield,	5
Lucius Tyler,	Preston,	5
Peter P. Woodbury,	Francistown, N. H.	4
Sylvester Wooster,	Huntington,	3
Robert Worthington,	Lenox, Mass.	3
Jesse D. Wright.	Saybrook,	4

37.

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TO THE PUBLIC.

The Medical Institution of Yale College, established by an act of the Legislature of this State, will go into operation in the last week of the month of October.

It is expected, that the following arrangement of the Lectures will take place, viz:—
Theory and Practice of Medicine, by ENEAS MUNSON, Sen. M. D. and ELI IVES, M. D.
Surgery and Midwifery, by NATHAN SMITH, M. D.

Anatomy, by Dr. JONATHAN KNIGHT,
Chemistry, Pharmacy and Mineralogy, by PROFESSOR SILLIMAN.

Materia Medica will, for the present, be connected with the other courses; and the *Elements of Botany* will be given by one of the Professors.

The large stone house, at the head of College-street, has been taken as a Medical College; it contains a very fine lecture room, with every necessary appendage, and chambers for the medical students.

A good Anatomical Museum and Library, will be furnished by the College and the Professors.

The Chemical establishment is competent to a complete course of instruction; and has been, for several years, in operation.

The Cabinet of Minerals belonging to the College, connected with the splendid collection of Col. Gibbs, is unrivalled in this country.

It will be remembered, that every person who shall commence the study of medicine, after the above courses have begun, is by law required to attend them, or other similar courses of instruction.

TIMOTHY DWIGHT,
President of Yale College.
Yale College, July 15, 1813.

UMBRELLA MANUFACTORY.



J. M'Kee,

RESPECTFULLY informs his friends and the public, that he continues Manufacturing Umbrellas and Parasols in Church-street, opposite Trinity Church, where he has a large and fashionable assortment which he will sell at New-York prices, wholesale or retail. He humbly solicits the merchants of this city and the neighboring towns to take a look at them before they go to York or elsewhere to purchase, as he flatters himself that their quality and price cannot fail to please them. Tow-cloth, Butter, old Brass, Whalebone or old Umbrellas received in payment.

N. B. Umbrellas and Parasols repaired and covered in the neatest manner.
New-Haven, May 17, 1813. 77

New Grocery Store.

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Real Cognac Brandy;	Nutmegs
Naples do.	Ginger
Old Spirits;	Mustard
St. Croix Rum;	Cayenne
Gin;	Box and cast Raisins
Old Madeira,	Currants
Sicily,	Prunes
Teneriffe,	Almonds
Sherry and	Eggs (co
Port	Hand & twist Tobacco
Hyson	Paper do.
Hyson Skin	Macaboy and Scotch
Stonington	Spanish Sgars (Shut
Lump and brown Sugar;	Potato Starch
Coffee,	Brown Salt
Crackers and Biscuit	Codfish
Chocolate;	Corks
Pepper;	Bar & shaving Soap
Pimento; Cassia;	Mould Candles
Cloves;	Powder, Shot and Flints; a few bbls. superior
FLOUR.	

Orders from town and country, will be thankfully received and punctually executed.

BACON & LEWIS.

New-Haven, May 17, 1813. 1177

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HAVE constantly for sale a large assortment of PLAYS—best American editions; among which are most of those now performed at the Theatres in the United States and G. Britain.

New-Haven, Church-st. June 14.

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1500 barrels Texas superfine Flour,
200 do fine do
500 half barrels superfine do
500 barrels Prime Beef
100 half barrels Mess Beef

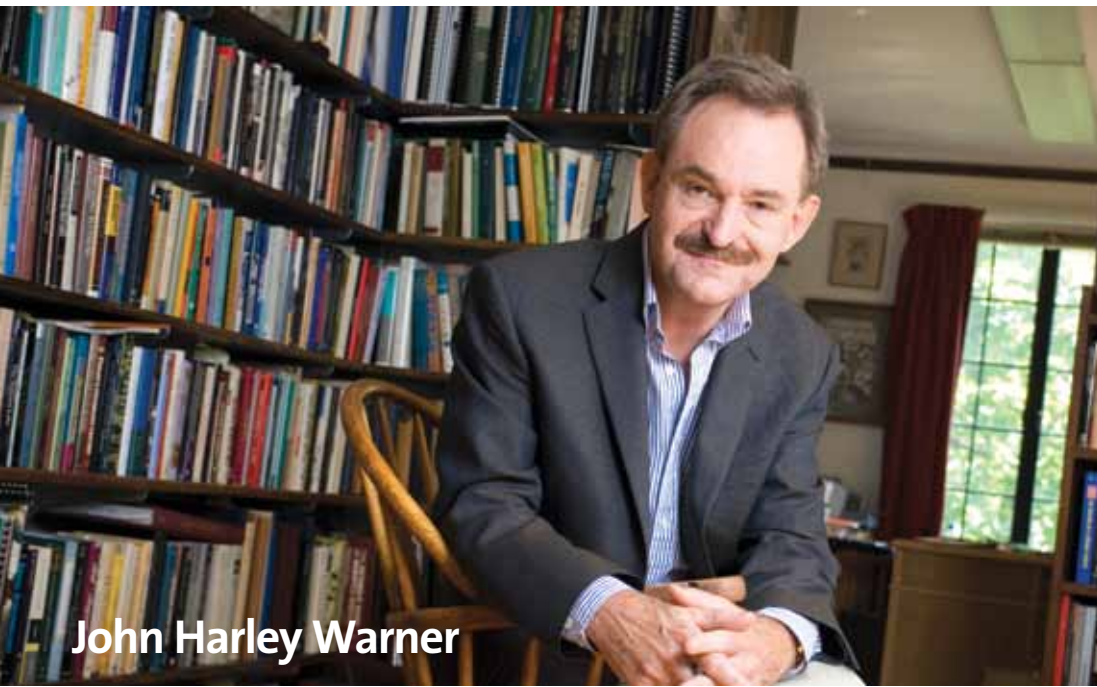
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LIFELINES



John Harley Warner

Historian John Harley Warner has charted changes in American medicine and the shaping of doctors' identities by studying diaries, letters, and patient records of 19th-century medical students and physicians. The late 1800s were a time of rapid change and growing uncertainty, as "rationalistic" systems that advocated therapies such as bloodletting gave way to the experimentally grounded medicine that would dominate the 20th century.

TERRY DAGRADI

Seeing how doctors saw themselves

The shifting identities of physicians through time are a scholar's life's work

It's only partly a figure of speech to say that John Harley Warner, PH.D., lives surrounded by books. To meet with him, a visitor first ascends to a second-floor balcony that overlooks the book collection of the School of Medicine's Harvey Cushing/John Hay Whitney Medical Historical Library. Then, a walkway to a door built directly into the stacks opens into Warner's office, which is filled with floor-to-ceiling bookcases of its own. It is a fitting perch for Warner, Avalon Professor of the History of Medicine and chair of the School of Medicine's Section on the History of Medicine.

Warner, whose demeanor is also bookish, and is marked by the reserve of many scholars in the humanities, originally planned to become a scientist. But in college, a late-night conversation over coffee with a friend about *The Two Cultures*, British physicist/novelist C.P. Snow's classic 1959 lament on the divide between the sciences and the humanities, opened his eyes to a new path. "People think about this?" Warner recalls asking himself. "I really hadn't realized that such a field existed."

He went on to graduate training with Barbara G. Rosenkrantz, PH.D., professor of the history of science (now emerita) at Harvard University, and

became interested in the changing identities of medical practitioners of the 19th century—how were physicians' views of themselves and their profession transformed in that rapidly changing world?

"What historians are good at is messiness," Warner says. "In some ways we're better as cultural critics in getting people to ask questions, and to reflect, than we are as boosters."

These concepts inform much of Warner's research, including his major 1998 work *Against the Spirit of System: The French Impulse in Nineteenth-Century American Medicine*, which is rooted in the diaries, letters, and clinical notes of young American doctors studying medicine in early-1800s Paris—then the center of cutting-edge science—who returned to America armed with new knowledge and perspectives.

Generally, Western medicine had inherited "theoretically complex, very rationalistic" medical systems from the Enlightenment, Warner says. But in Paris, American doctors saw an opportunity for systematic change that could "socially and culturally uplift the medical profession in the United States." They could now "ignore things they saw as literally irrelevant, because they didn't have any purchase on the real world," instead focusing on the patient at the bedside and at the body at autopsy, and making correlations between the two.

"Observe and describe, don't go beyond that," is how Warner describes this

new outlook. "It really is the origin of the American kind of clinical, hospital-based medicine, and the idea that the hospital should be a place for research as well as practice that takes shape as a consequence," profoundly changing the profession and doctors' identity in the process.

Warner is now working on a book-length study of James Jackson Jr., M.D., a young American doctor who apprenticed in a Paris hospital in the early 1800s, making use of his "wonderfully rich" weekly correspondence with his father, a Harvard professor and one of the founders of Massachusetts General Hospital. Another current research project is a study of the transformations of the hospital patient chart from the 19th to 21st centuries.

In this year of the School of Medicine's Bicentennial, Warner says, one could argue it is the notion of identity that now sets the medical school apart. Before the 1910s and the philanthropic infusion of funds that made reform possible, Yale's medical school "resembled a trade school," as was typical of American medical schools at the time. And with the establishment in the 1920s of the Yale System of medical education, which respects students' independence, "Yale took a very brave, controversial, and consequential step," he says, to "treat medical students as adults, as grown-ups, as graduate students—as people who could have an active role in shaping . . . what kind of doctors they became."

Obstetrician honored for superb patient care

In his medical practice, Michael J. Paidas, M.D., associate professor of obstetrics, gynecology, and reproductive sciences, has a custom that some physicians might find unusual: in his initial consultations with new patients, he provides them with his cell phone number.

The compassion and thoughtfulness that lies behind such gestures are among the reasons Paidas earned this year's David J. Leffell Prize for Clinical Excellence. "Dr. Paidas has focused on providing excellent, patient-focused

clinical care," said Robert J. Alpern, M.D., dean and Ensign Professor of Medicine, at the October annual meeting of the Yale Medical Group (YMG), the clinical practice of School of Medicine faculty. "His patients have access to him 24/7. It's faculty like this that make Yale what it is today."

Paidas, who came to Yale in 2002, is a founding co-director of Yale's Women and Children's Center for Blood Disorders, which addresses clotting and bleeding disorders during the reproductive, menopausal, fetal, neonatal



Michael Paidas

and geriatric periods of life. Paidas also co-directs the National Hemophilia Foundation Baxter Clinical Fellowship at the School of Medicine.

The Leffell Prize was established in 2007 with a donation made by David J. Leffell, M.D., David Paige Smith Professor of Dermatology and Surgery and chief executive officer of YMG, and his wife Cindy.

School launches new program in biomedical ethics



Mark Mercurio

The School of Medicine is launching a new Program for Biomedical Ethics, which will be directed by Mark R. Mercurio, M.D., M.A., associate professor of pediatrics.

Biomedical ethics is a subject of great interest to students and of increasing importance to medicine, as technological advances and other influences on health care add complexity to the decision making of physicians and their colleagues.

The new program will coordinate and augment the educational and other scholarly work in biomedical ethics at the medical school, and create international visibility for work in biomedical ethics at Yale through publications, working groups, and other initiatives. The program will provide support to medical students pursuing research in biomedical ethics for their thesis work, and will also assist students in graduate school and postdoctoral training programs.

Mercurio, an associate director of Yale's Interdisciplinary Center for Bioethics, received his M.D. from Columbia University's College of Physicians and Surgeons in 1982 and trained at Yale as a resident and fellow. An accomplished neonatologist, he received his master's degree in philosophy from Brown University in 2004 and has for many years taught medical ethics to Yale residents, fellows, and medical students.

CORRECTION

Due to an editorial oversight, an article in the July/August issue on Glenn Greenberg's support for post-traumatic stress disorder research at the medical school described Mr. Greenberg's son, Greg, as a member of the Yale College Class of 1984 rather than the Class of 2004. We regret the error.

Medicine@Yale

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Yale SCHOOL OF MEDICINE

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Lung expert is president of venerable medical society

A leader at the School of Medicine is elected president of the prestigious Association of American Physicians

Jack A. Elias, M.D., chair of the Department of Medicine and a leading authority on the molecular basis of asthma and other pulmonary disorders, has been elected president of the Association of American Physicians (AAP) for 2010–2011.

One of the most prestigious and selective medical societies, the AAP was founded in 1885 by Sir William Osler, M.D., a major figure in medical history, and six other physicians for “the advancement of scientific and practical medicine.” Elias, the Waldemar Von Zedtwitz Professor of Medicine and chair of the Department of Medicine, studies the cellular and molecular biology of processes related to both injury and repair in the lungs in asthma, emphysema, pulmonary fibrosis, and acute lung injury. His research group has developed and studied genetic models of these diseases and translated findings from this work to their human counterparts, work that has validated therapeutic targets for new therapies for these conditions.

“To be president of the AAP is, needless to say, a very great honor,” says Dean and Ensign Professor of Medicine Robert J. Alpern, M.D. “This really attests to Jack’s reputation among the leaders of academic medicine, nationally and probably internationally.”

Elias became chair of Yale’s Department of Internal Medicine in 2006. He is board certified in internal medicine, pulmonary disease, allergy and immunology, and critical care medicine.

“Jack’s research in pulmonary medicine has really led the field and has spanned all the way from very basic science to clinical research, where his basic science is leading to new treatments for pulmonary disease,” says Alpern. “As chair of internal medicine, he’s recruited a number of outstanding faculty. He has taken

a department that was strong, and made it even stronger.”

Recent research by Elias and colleagues has shed important insights into asthma. In a 2007 article in the *New England Journal of Medicine* (*NEJM*), Elias and Geoffrey L. Chupp, M.D., associate professor of medicine and director of the Yale Center for Asthma and Airway Disease, reported that asthmatic patients have high levels of the protein YKL-40, which helps to regulate the immune response and causes lung inflammation associated with asthma. In a 2008 *NEJM* article, Elias, Chupp, and colleagues showed that people who have a particular version of the YKL-40 gene are at greater risk of getting asthma. Their work has led to a better understanding of asthma, and provided new targets for the development of novel treatments for the disease.

Elias received his undergraduate and medical degrees from the University of Pennsylvania and was an intern and resident at Tufts-New England Medical Center in Boston. He returned to the University of Pennsylvania as a senior resident and completed fellowships there in both allergy and immunology and in cardiovascular-pulmonary medicine. He came to Yale in 1990 as professor and chief of pulmonary and critical care medicine.

Elias has been a member of the AAP since 1998 and a councilor since 2003. The group has about 1,000 active members as well as 550 emeritus and honorary members, including 33 members of the Yale faculty.



Jack Elias, chair of the Department of Medicine, is the newest president of the Association of American Physicians, an organization that has promoted the advancement of scientific medicine for more than 200 years.

Each year, 60 individuals with outstanding credentials in biomedical science or translational biomedical research are elected to the association. Thomas M. Gill, M.D., the Humana Professor of Geriatric Medicine and professor of medicine and epidemiology at the School of Medicine, was elected to the AAP this year.

“Jack is a widely admired leader of medicine in America,” says Richard P. Lifton, M.D., PH.D., chair and Sterling Professor of Genetics, professor of medicine, and the AAP’s current secretary. “He’s a terrific scientist, a passionate clinician, and a visionary chair of medicine. These qualities are all recognized in his role as president of the AAP. There are few like him in the country, and we are particularly fortunate to have him as chair of medicine at Yale.”

Globally minded orthopaedic surgeon is first Elihu Professor

Joint-replacement innovator’s medical education foundation has had a worldwide impact

On September 23, a festive crowd of colleagues, family members, and friends filled the medical school’s Historical Library for a reception to celebrate the appointment of surgeon Kristaps J. Keggi, M.D., as the inaugural Elihu Professor of Orthopaedics and Rehabilitation.

Many of those present had contributed directly to the creation of the new professorship, which was established with the combined contributions of a number of corporate and individual donors.

The professorship will serve as the cornerstone of a Joint Reconstruction Program being established at the School of Medicine as a center of excellence in clinical care, research, and medical education and training.

Keggi is internationally renowned for his work as an orthopaedic surgeon specializing in hip and knee replacements. In particular, he pioneered and has continually refined a minimally invasive approach to hip replacement that relies on a single “mini-incision” only eight to 10 centimeters long, sometimes combined with one or two additional tiny incisions to accommodate surgical instruments. This approach causes less



Kristaps Keggi

tissue trauma and less risk of infection than conventional approaches, and promotes quicker recovery, getting patients back on their feet more quickly.

Over the past three decades Keggi and colleagues he has trained at Yale and at Waterbury Hospital in Waterbury, Conn., have performed over 6,000 hip-replacement surgeries using this general approach, and have seen significantly fewer complications, shorter operative times, low blood loss, and a more appealing post-operative appearance.

In addition to his work in the operating room, Keggi has made a lasting contribution to medical education as the founder and president of the Keggi Orthopaedic Foundation (KOF). Since its launch in 1988, KOF has provided fellowships in advanced orthopaedic surgery at the School of Medicine and at Waterbury Hospital for more than 300 surgeons from the Baltic nations, Russia, and Vietnam.

A native of Latvia, Keggi came to the United States with his family when he was 15. “We had a dollar among us,” Keggi said in a 2009 interview, referring to his parents

and three brothers. Sponsored by a church in Brooklyn, N.Y., the family lived in the parish house, and young Keggi, at age 15, worked as a bellboy at Brooklyn’s St. George Hotel. After attending three high schools in New York, Keggi ended up at the Brunswick School in Greenwich, Conn. From there he came to Yale College, graduating in 1955.

Keggi applied for admission to Yale School of Medicine, and was slightly intimidated to be interviewed by Dorothy M. Horstmann, M.D., a legendary faculty member whose research during the 1940s had provided a basis for the vaccine against polio. “Much to my surprise they accepted me,” Keggi has said. “My performance in organic chemistry hadn’t been that stellar.” // Keggi (page 7)

Named professorships: a lasting legacy

Yale School of Medicine is privileged to count among its faculty many of the finest physicians and scientists in the world, innovators who help to solve today’s most pressing medical issues through their research, teaching, and clinical care.

The most direct way to support outstanding faculty such as Kristaps Keggi, the new Elihu Professor of Orthopaedics and Rehabilitation profiled on this page, is through the establishment of endowed professorships, which supply a substantial and reliable flow of funds to support a professor’s teaching and research activities.

Equally important, when a current or newly recruited faculty member is appointed to a named chair, it signals Yale’s high regard for that scholar, our confidence in that individual’s intellect, creativity and drive, as well as our lasting commitment to his or her area of expertise. Endowed chairs thus serve as a powerful means for Yale School of Medicine to attract the best people and keep them working here.

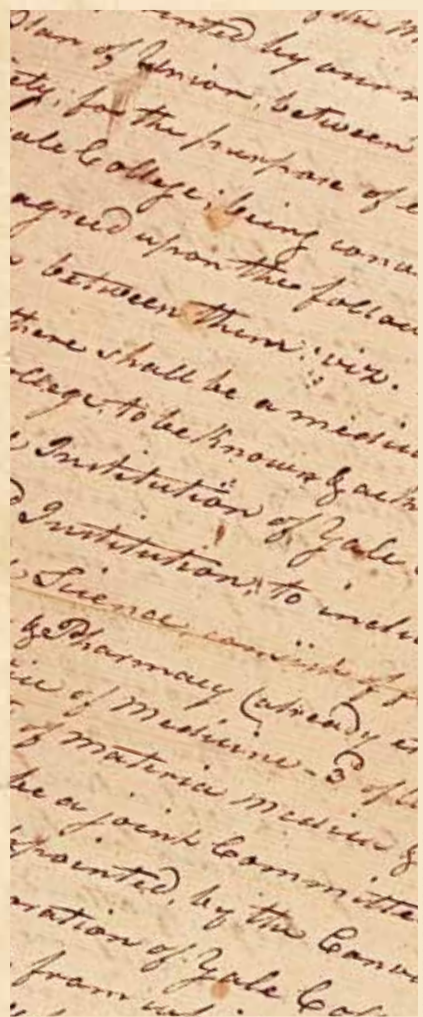
The named professorship stands among the highest honors Yale University can bestow, and once appointed, a professor retains that position for the remainder of his or her career at Yale. The endowed professorship also ensures that the donor’s name and particular interests are advanced in perpetuity.

For information about how you can endow a professorship at Yale School of Medicine, contact Jancy Houck, assistant vice president for development and director of medical development, at (203) 436-8560.

MEDICINE >> tomorrow

200 years of medicine

1810–1835



The Medical Institution of Yale College is born

Articles of Union that bound Yale College and the Connecticut Medical Society together in the creation of the Medical Institution of Yale College were signed in 1810, but preparations delayed the school's opening until November 1813. The first medical school in Connecticut and the sixth in the United States, the Medical Institution initially drew students primarily from Connecticut and the New England region. In the school's earliest years, a faculty of five taught just five courses: Theory and Practice of Medicine; Surgery and Midwifery; Anatomy; Chemistry, Pharmacy, and Mineralogy; and Materia Medica (which mainly covered the use and preparation of medicinal plants). For those who wished to practice medicine, the school offered a level of formal training that went beyond the traditional apprenticeship system, the most common form of medical training in America in the 18th and early 19th centuries. The Medical Institution also provided an educational solution for those unable or unwilling to train abroad or at one of the handful of other medical schools in the United States, the oldest of which were located in Philadelphia and New York.

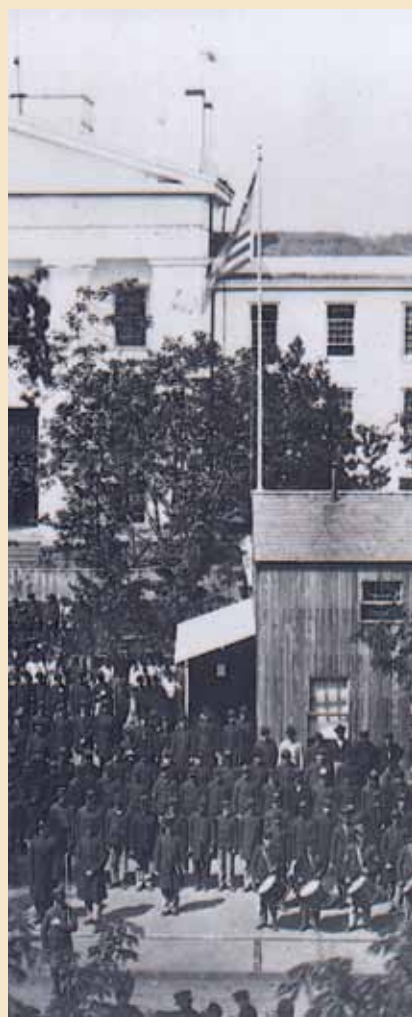
1836–1860



A fledgling medical school gains a surer footing

The Medical Institution had many successes in its first decades, but by mid-century the increasing professionalization of medicine forced attendant changes in medical education. Yale, like many other American medical schools, struggled to make its curriculum requirements more stringent while maintaining student enrollment. The school continued to be run jointly by the Connecticut Medical Society (which had the deciding vote in terms of governance) and by Yale faculty (which included the professors of Yale College as well as the Medical Institution). In 1845, the election of *Charles Hooker*, M.D., as dean of the Medical Institution marked the first appointment of a dean at any of Yale's graduate schools. Cortlandt Van Rensselaer Creed, M.D., became the first African American to earn a degree from the Medical Institution when he graduated in 1857. In 1839, the school began to require a thesis for the M.D. degree, a requirement that is still in place today. (The oldest extant bound thesis written by a Yale medical student, entitled *De Calculo Vesicae*, is focused on bladder stones, and dates to 1837.)

1861–1885



The Civil War, and a new ideal in American medical education

During the Civil War, the staff of the *Knight U.S. Army General Hospital* in New Haven, under the direction of Pliny Jewett, M.D., an 1840 graduate of the Medical Institution, provided care for more than 25,000 wounded Union soldiers. The period following the war proved difficult for the Medical Institution, due not only to the costs wrought by America's bloody internecine struggle, but also to the conditions arising from the changing landscape of American medicine. The school's continued improvement of educational standards and intense competition with the growing number of medical schools in other states decreased student enrollments to the lowest point in its history. Debt mounted and financial problems were nearly constant. A lack of support from Yale College—both financial and institutional—seemed to augur oblivion for the medical school. But this period also marked the first steps toward the new ideal in American medical education—an ideal that rejected the old system of apprenticeship, embraced science rooted in the experimental method, and affirmed the importance of scientific research in medicine.

1886–1910



Major advances with the dawn of a new century

In 1886, Herbert E. Smith, M.D., began his second year as dean of the medical school (by then known as the Medical Department of Yale College). It was not an auspicious time to lead the school: Yale's Medical Department had hit bottom in both student enrollment and financial resources. Having studied at the University of Heidelberg, Smith was a proponent of the German approach to medical education, with its heavy emphasis on research. During Smith's years as dean (1885–1910), professor Arthur W. Wright, Ph.D., who in 1861 had been one of three Yale students to receive the first Ph.D. degrees conferred in the United States, published *the first X-ray image in America*. The Medical Department made educational requirements for admission more stringent, lengthened the course of study, and expanded the curriculum to more closely model the German example by emphasizing research and clinical instruction. With clinical education an increasingly important feature of medical education, Smith began the process by which the medical school became intimately connected with the New Haven Hospital (now Yale-New Haven Hospital), as it remains today.

e at Yale



1911–1935



The Flexner Report and the debut of the 'Yale System'

The 1910 Flexner report, an unsparing assessment of medical education in America, caused upheaval in medical schools, with many struggling to adapt to the report's recommendations or die: By 1920, nearly half of the 155 schools in North America were gone. At Yale, the report was instead the prelude to a vast transformation. The University made a financial commitment to its medical school unprecedented in its 100-year history. Under the visionary leadership of Dean Milton C. Winternitz, M.D., the School of Medicine refashioned itself and rose to national prominence. Winternitz outlined the school's modern footprint and instituted the "Yale System" of medical education, which prizes students' independence and their original research. A symbol of the new optimism, *Sterling Hall of Medicine* was dedicated on February 23, 1925. Key funds from the Rockefeller Foundation remade the school's clinical departments, making Yale one of only a few medical schools at the time to adopt the "full-time" system, in which faculty received salaries to support themselves without relying on income from private practices.

1936–1960



Wartime spurs a national commitment to science

The Yale Poliomyelitis Study Unit (YPSU), formed in 1931, took a community-based approach to unraveling the causes of polio, then an epidemic disease. The YPSU's John R. Paul, M.D., and James D. Trask, M.D., were the first to isolate poliovirus from living patients in several decades, which opened a new stage in polio research. Another YPSU member, Dorothy M. Horstmann, M.D., made the important discovery that the virus is present in the blood in the disease's early stages, thereby enabling researchers to develop a vaccine for the disease. With America's entry into World War II, President Franklin D. Roosevelt instituted the Office of Scientific Research and Development (OSRD) to harness research in support of the Allied effort. With OSRD support, Louis S. Goodman, M.A., M.D., and *Alfred Gilman*, PH.D., were studying chemical warfare agents, and serendipitously discovered that nitrogen mustards used in chemical warfare were remarkably good at killing certain cancerous tumors. In 1942, this work led to the first intravenous chemotherapy treatment of a cancer patient, marking the birth of medical oncology.

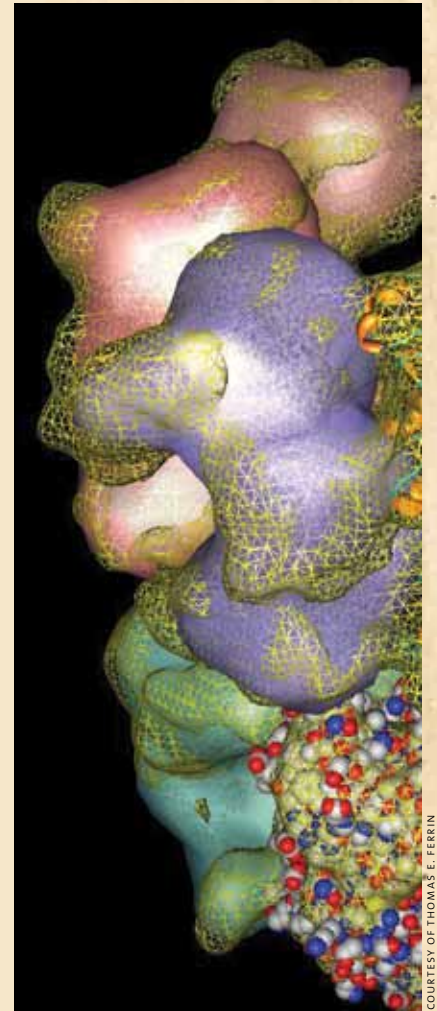
1961–1985



The birth of Medicare, and the rise of molecular biology

Following World War II, federal funding for biomedical research exploded, and in 1965, the U.S. government's Medicare program provided millions of Americans lacking health insurance with access to medical care. At the School of Medicine, a huge influx of grants from the National Institutes of Health, combined with a significant increase in clinical income, drove a massive expansion in which existing departments grew and new ones were formed. After Watson and Crick discovered the structure of DNA in 1953, medical research was rapidly and utterly transformed by molecular biology, which offered powerful new tools to identify cellular mechanisms at work in health and disease. In 1979, *Joan A. Steitz*, PH.D., discovered snRNPs ("snurps"), RNA-protein complexes in the cell's nucleus that perform a crucial step in the transfer of DNA information into messenger RNA (mRNA). Besides illuminating how mRNA is spliced together to create proteins, Steitz's research on snRNPs has thrown new light on autoimmune diseases, and has helped to clarify how splicing lends extra versatility to genes, a process that is essential in the immune system.

1986–2010



Laying the groundwork for the medicine of tomorrow

The last 20 years have seen breathtaking advances in molecular biology and genetics—most notably the publication of the complete sequence of the human genome in 2001—achievements that promise to lead to important insights into human disease and new, targeted therapies. Today, the ability to quickly and inexpensively sequence complete human genomes heralds the dawn of a long-awaited "personalized" approach to medicine, in which a patient's genetic makeup helps to determine optimal treatment strategies. Among the important recent discoveries of School of Medicine faculty is the 1997 publication by Arthur L. Horwich, M.D., and colleagues of the atomic structure of a molecular *protein-folding machine* that is essential to normal cell function. Faulty protein folding is a feature of neurodegenerative diseases such as Alzheimer's disease. In 2007, Yale University acquired the 136-acre West Campus. With 20 buildings and over 1.5 million square feet of space, nearly a third of which is devoted to laboratories, West Campus will be home to five new scientific institutes, and state-of-the-art facilities for genomics, gene expression analysis, and drug discovery.

Grants and contracts awarded to Yale School of Medicine

November 2009 – February 2010

Federal

Karen Anderson, NIH, *Exploring Novel Targeting Strategies for AIDS Protozoal Pathogens*, 4 years, \$1,655,000 • **Susan Baserga**, NIH, *The Architecture and Function of RNPs Required for Ribosome Biogenesis*, 4 years, \$1,779,285 • **Christopher Breuer**, NIH, *Investigating the Mechanisms of Vascular Neotissue Formation in Engineered Tissue*, 5 years, \$2,068,750 • **Arthur Broadus**, NIH, *Ihh and PTHrP Regulate Articular Chondrocyte Maintenance*, 2 years, \$409,613 • **Paul Cleary**, NIH, *National AIDS Prevention Research Centers Proposed Multi-Level Intervention Planning Workshop*, 1 year, \$88,835 • **Marie Egan**, NIH, *CFTR and the Immune Response*, 5 years, \$2,068,750 • **Barbara Ehrlich**, Department of the Army, *Strategies to Prevent Chemotherapy-Induced Peripheral Neuropathy*, 2 years, \$620,625 • **Jack Elias**, NIH, *BRP-39/YKL-40 in TH2 Inflammation and Asthma*, 4 years, \$1,655,000 • **Erol Fikrig**, NIH, *Interactions between Anaplasma phagocytophilum and Ixodes scapularis*, 5 years, \$2,068,750 • **John Hwa**, NIH, *Pharmacogenetics of the Human Prostacyclin Receptor*, 4 years, \$1,656,491 • **Dewan Hyder**, NIH, *Energetics of Neuronal Populations by fMRI*, 5 years, \$2,068,750 • **Celina Juliano**, NIH, *Determining piwi Function using in vivo Imaging of Stem Cells in Hydra*, 3 years, \$143,670 • **Susan Kaech**, NIH, *Cyt Reflection Cell-Sorter: High-End Instrumentation Grant Program*, 1 year, \$898,724 • **Cathryn Kubera**, NIH, *Role of GLU_{K6} in Cerebellar Circuitry Development*, 3 years, \$137,330 • **Brett Lindenbach**, NIH, *Molecular Determinants of Hepatitis C Virus Assembly*, 5 years, \$2,068,750 • **Laura Niklason**, NIH, *Lung Tissue Engineering*, 4 years, \$2,577,329 • **Pasko Rakic**, NIH, *Neurogenetic Processes in the Fetal Brain*, 5 years, \$5,406,186 • **Nancy Ruddle**, NIH, *Lymphatic Vessel Imaging*, 2 years, \$455,125 • **Kristin Rudenga**, NIH, *Influence of Physiological Significance, Preference, and Stress on Taste Coding*, 2 years, \$51,210 • **Gary Rudnick**, NIH, *Neurotransmitter Transporters*, 5 years, \$1,655,000 • **Joseph Santos-Sacchi**, NIH, *Structural Correlates of Prestin Activity*, 5 years, \$1,758,440 • **Mark Shlomchik**, NIH, *Mechanisms of Autoimmune Activation and Regulation by Innate Immune Receptors*, 5 years, \$768,890; NIH, *Image Stream Analyzer*, 1 year, \$455,000 • **Karen Smith**, NIH, *The Role of Astrocytes in*

Cortical Interneuron Development, 4 years, \$676,869 • **Dieter Söll**, NSF, *Expanding the Genetic Code with Phosphoserine and Phosphotyrosine*, 3 years, \$555,397 • **Jane Taylor**, NIH, *Cognitive Dysfunction after Chronic Cocaine Use*, 5 years, \$1,415,000 • **Susumu Tomita**, NIH, *Mechanism for Regulating Kainate-Type Glutamate Receptor Activity*, 5 years, \$2,068,750 • **Anthony Van den Pol**, NIH, *Response Properties of Hypothalamic mCh Neurons*, 5 years, \$1,810,155

Non-Federal

Vikki Abrahams, Burroughs Wellcome Fund, *The Role of Placental Nod-Like Receptors in Infection-Associated Preterm Labor*, 1 year, \$50,000 • **Kyung-Heup Ahn**, NARSAD, *GABA–Dopamine Interactions and Psychosis*, 2 years, \$59,310 • **Emily Ansell**, American Foundation for Suicide Prevention, *Personality Disorders and Suicidal Behaviors: A Prospective Study of Associations, Mediators, and Moderators*, 2 years, \$85,000 • **Xiaoxiao Bai**, Epilepsy Foundation of America, *Neuroimaging Biomarkers of Network Dysfunction in Childhood Absence Epilepsy*, 1 year, \$45,000 • **Mounira Banasr**, NARSAD, *Implications of Glial Changes in the Development of Depressive-Like Behaviors*, 2 years, \$60,000 • **Diana Beardslley**, ITP Foundation, *Fcy Balance in Immune Thrombocytopenia*, 1 year, \$19,110 • **Vineet Bhandari**, Washington University in St. Louis, *Screening for Genetic Causes of Neonatal Respiratory Distress*, 1 year, \$10,450 • **Thomas Biederer**, NARSAD, *Neuronal Functions and Biochemical Pathways of SynCAM-Mediated Synapse Organization*, 2 years, \$60,000 • **Michael Bloch**, NARSAD, *Pilot Study of a Potent NMDA Receptor Antagonist in the Treatment of Obsessive-Compulsive Disorder*, 2 years, \$59,890 • **Angelique Bordey**, McKnight Endowment Fund for Neuroscience, *Cognitive Deficits in Tuberous Sclerosis Complex*, 3 years, \$300,000 • **Elizabeth Bradley**, Avram Corporation, *Master in Healthcare and Hospital Administration (MHA) Program, Ethiopia*, 1 year, \$324,195 • **Sonia Caprio**, American Diabetes Association, Inc., *Insulin Resistance in Obese Youth with Prediabetes*, 4 years, \$144,000 • **Richard Carson**, Wyeth Pharmaceuticals Inc., *Receptor Occupancy Assessed with PET in Nonhuman Primates II*, 7 months, \$348,339 • **Heidi Chen**, American

Urogynecologic Society, *Using Quantitative Sensory Testing of the Sensory Distribution of the Pudendal Nerve in Predicting Success of Sacral Neuromodulation*, 1 year, \$10,000 • **Jersey Chen**, American Heart Association, *Geographic Variation in Imaging with Cardiac Stress Testing*, 2 years, \$104,720 • **Lara Chepenik**, NARSAD, *Interhemispheric Connectivity and Rapid Cycling in Bipolar Disorder*, 2 years, \$60,000 • **Jaehyuk Choi**, American Skin Association, *A Forward Genetic Screen for Tumor Suppressor Genes using Transposon Mutagenesis in Mouse Skin*, 1 year, \$15,000 • **Young Choi**, Dong-A Pharmaceutical Company, *Emerging Role of Estrogen Receptor and Isoforms in Breast Cancer*, 3 years, \$105,000 • **Joseph Craft**, American Autoimmune Related Diseases Association, Inc., *Follicular Helper T Cells in SLE*, 1 year, \$10,000 • **Pietro De Camilli**, Lowe Syndrome Trust, *Novel Interactors of the Lowe Syndrome Protein ocr1*, 2 years, \$120,000 • **Sachin Desai**, Gerber Foundation, *The Effectiveness of Rotavirus Vaccine in Preventing Hospitalization of Young Children*, 1 year, \$20,000 • **Ronald Duman**, Hope for Depression Research Foundation, *Influence of Isolation Stress on Cell Proliferation and Neurotrophic Factor Signaling: Reversal by Opiate Drug Treatments*, 2 years, \$110,000 • **Andrew Epstein**, University of Pennsylvania, *Comparative Effectiveness of Cardiovascular Devices and Medicare Cost Growth*, 3 years, \$34,268 • **David Feliciano**, Epilepsy Foundation of America, *Electrophysiological Analysis of a Malformation of Cortical Development*, 1 year, \$45,000 • **John Geibel**, Institute for OneWorld Health, *Proposed Research to be Conducted in Preliminary Phase of the Joint Yale/IOWH Program on Employment of Calcimimetics as a Treatment for ADI*, 1 year, \$120,000 • **Joel Gelernter**, Butler Hospital, *Childhood Maltreatment: Risk and Resilience*, 4 years, \$55,871 • **John Giuliano Jr.**, Children's Hospital Corporation, *Novel Influenza A (H1N1) Surveillance Registry*, 9 months, \$21,600 • **Rosana Gonzalez-Colaso**, Physician Assistant Education Association, *Putting Physician Assistants on the Map: Geographic Analysis of Workforce Capacity*, 1 year, \$7,000 • **Bonnie Gould Rothberg**, LAM Treatment Alliance, *Mechanisms of Benign Metastasis in Kidney AMLs*, 1 year, \$60,000 • **David Hafler**, National Multiple Sclerosis Society, *Collaborative Multiple Sclerosis Research Center Award*, 5 years, \$742,500; University of California, San Francisco, *A Haplotype Map for Multiple Sclerosis*, 18 months, \$142,624 • **Jonas Hannestad**, NARSAD, *The Effect of Citalopram on Inflammation-Induced Depressive Symptoms*, 2 years, \$45,850 • **Robert Heimer**, State of CT Department of Public Health, *Emerging Infections*, 2 years, \$3,922,258 • **Erica Herzog**, Scleroderma Foundation, *Semaphorin 7A Mediated Effects on Fibrocyte Biology*, 2 years, \$150,000 • **Mark Horowitz**, Maine Medical Center Research Institute, *Interdisciplinary Study of Marrow Adiposity, Mineral Metabolism, and Energy Balance*, 1 year, \$124,125 • **Steven Kerfoot**, Multiple Sclerosis Society of Canada, *Identification of Cellular Interactions through which B Cells Drive Central Nervous System Autoimmune Disease in vivo*, 6 years, \$260,000 • **Tae Hoon Kim**, Harvard University, *Integrative Systems Biology Approaches to Auditory Hair Cell Regeneration*, 5 years, \$413,750 • **Anthony Koleske**, Breast Cancer Alliance, Inc., *Inhibition of Breast Cancer Invasiveness via Targeting of an Arg Contactin Switch*, 1 year, \$100,000 • **Diane Krause**, Community Foundation for Southeast Michigan, *SRF and Myelodysplasia*, 2 years, \$50,000 • **Gary Kupfer**, St. Baldrick's Foundation, *The Yale Pediatric Oncology Psychological Service*, 1 year, \$50,000 • **Tukiet Lam**, University of Chicago, *Proteomic Assays of Neuronal Protein Palmitoylation*, 1 year, \$24,337 • **Forrester Lee**, Robert Wood Johnson Foundation, *Summer Medical and Dental Education Program*, 2 years, \$567,686 • **Soo Hee Lee**, Jane Coffin Childs Memorial Fund, *Function and Mechanism of Action of a Novel Argonate-Like Protein in the Mitochondrion of Trypanosoma brucei*, 21 months, \$82,000 • **Chiang-Shan Li**, NARSAD, *Neural Predictors of Anti-Depressant Efficacy in Obsessive-Compulsive Disorder*, 2 years, \$60,000 • **John MacMicking**, Burroughs

Wellcome Fund, *Support to Present Seminar Speaker, Harmit Malik*, 6 months, \$1,000 • **Mark Mamula**, Genentech Foundation for Biomedical Sciences, *Molecular Probes for the Detection of Isoaspartyl in Proteins*, 1 year, \$80,000 • **David Matuskey**, NARSAD, *Genetic Vulnerability to Paranoia: An [11 C]PHNO D2High PET Study in Human Cocaine Use*, 2 years, \$60,000 • **James McPartland**, NARSAD, *Neural Correlates of Social Perception in Autism*, 2 years, \$60,000 • **Prasad Mistry**, Shire Human Genetics Therapies, Inc., *Mechanisms of the Effect of Velaglucetase vs. Imiglucetase Enzyme Replacement Therapy in Authentic Mouse Model of Type 1 Gaucher Disease*, 2 years, \$393,506 • **Deepak Narayan**, American Society of Maxillofacial Surgeons, *Hemangiomas are Stem Cell Tumors of Pericyte Origin*, 1 year, \$6,390 • **Joseph Piepmeier**, Voices Against Brain Cancer, *Targeted Delivery of Nanoparticle-Based Combination Therapy for Glioblastoma*, 1 year, \$50,587 • **Christopher Pittenger**, NARSAD, *Deconstructing Habits: The Differential Contributions of Striatal Subregions to Procedural Learning*, 2 years, \$60,000 • **Valerie Reinke**, Stanford University, *Global Identification of Transcription Factor Binding Sites in C. elegans*, 9 months, \$1,590,767 • **Lawrence Rizzolo**, International Retinal Research Foundation, *Co-Maturation RPE and Retinal Neurons Derived from Stem Cells*, 1 year, \$100,000 • **Frederick Romberg**, American Heart Association, *High-Resolution Time-Frequency Analysis of Neurovascular Responses to Ischemic Challenges*, 6 months, \$11,000 • **Carla Rothlin**, Crohn's & Colitis Foundation of America, *Role of TAM Receptor Signaling in Intestinal Mucosal Homeostasis*, 3 years, \$386,100 • **Gerard Sanacora**, Merck Sharp & Dohme, *In vivo Evaluation of Drug Effects on Glutamate Neurotransmission using Magnetic Resonance Spectroscopy*, 2 years, \$483,403 • **Mark Shlomchik**, University of Florida, *B Cell Developmental Defects in Murine Memory*, 1 year, \$280,793; University of Massachusetts, *Activation and Regulation of Autoimmunity by Innate Immune Sensing Pathways*, 5 years, \$2,247,390 • **Patrick Skosnik**, NARSAD, *Cannabis Use and Schizophrenia-Related Biomarkers: A Longitudinal Study*, 2 years, \$60,000 • **Karen Smith**, NARSAD, *Postnatal Inhibitory Neuron Maturation*, 2 years, \$60,000 • **Michael Stankewich**, National Ataxia Foundation, *Molecular Mechanisms of Beta 3 Spectrin in Spinocerebellar Ataxia 5 (SCA5)*, 1 year, \$35,000 • **Philip Stein**, Genzyme Corporation, *Comprehensive Fellowship Training in Lysosomal Diseases*, 18 months, \$106,438 • **Hanna Stevens**, NARSAD, *Prenatal Stress and the Development of Inhibitory Interneurons*, 2 years, \$60,000 • **Stephen Strittmatter**, Christopher and Dana Reeve Foundation, *PET Imaging of Axonal Regeneration after Spinal Cord Injury*, 1 year, \$62,334 • **Dorothy Stubbe**, Campagna Associates, LLP, *Forensic Evaluations*, 7 months, \$17,250 • **Suman Tandon**, American Heart Association, *Effect of Cardiac Resynchronization Therapy on Myocardial Mechanics and Flow: Evaluation with 3D 82Rb PET/CT*, 2 years, \$110,000 • **Cenk Tek**, NARSAD, *A Pilot Trial of Acute N-Acetylcysteine Effects on Working Memory in Schizophrenia*, 2 years, \$60,000 • **Whitney Tolpinrud**, American Skin Association, *Mechanistic Elucidation of Photopheresis, A Treatment of Cutaneous T Cell Lymphoma*, 1 year, \$7,000 • **Tamara Vnderwal**, American Academy of Child and Adolescent Psychiatry, *Neurophysiological Correlates of Treatment with Guanfacine in Children with ADD*, 6 months, \$9,000 • **Hongwei Wang**, Richard & Susan Smith Family Foundation, *Structure and Mechanism of the Human rISC-Loading Complex*, 3 years, \$300,000 • **Sherman Weissman**, University of Massachusetts, *Gene Expression in Mature Neutrophils*, 1 year, \$49,999 • **Yong Xiong**, March of Dimes, *Molecular Dissection of Fanconi Anemia*, 2 years, \$150,000 • **Qin Yan**, Breast Cancer Alliance, Inc., *Roles of Histone Demethylase JARID1B in Breast Cancer*, 2 years, \$125,000 • **Xiaoyong Yang**, American Diabetes Association, Inc., *Regulation of Metabolic Homeostasis by Cyclic O-GlcNAc Modification*, 3 years, \$400,200 • **Yawei Zhang**, American Cancer Society, Inc., *Epidemiology Study of Thyroid Cancer*, 5 years, \$1,020,000



There was a special touch in this year's White Coat Ceremony, a traditional ritual in which members of the School of Medicine faculty present incoming medical students with physician's coats to mark their entry into the profession of medicine. The Class of 2014, as the first class of the medical school's third century, received coats embroidered not only with their names, but bearing a patch with the school's Bicentennial motif. Each new student also received a stethoscope, provided through a fund created by School of Medicine alumni. Serene Chen '14, of Columbia, S.C., and her mother, Rita Chou, celebrated after the ceremony.

'Exceptional creativity' garners NIH award for two researchers

Tamas L. Horvath, D.V.M., PH.D., chair and professor of comparative medicine, and Haifan Lin, PH.D., director of the Yale Stem Cell Center, have received 2010 Pioneer Awards from the National Institutes of Health (NIH).

The Pioneer Awards have been given annually since 2004 to scientists "of exceptional creativity who propose pioneering—and possibly transforming—approaches to major challenges in biomedical and behavioral research."

In contrast to other NIH programs, the Pioneer Award Program aims to support a very small number of applicants. Horvath and Lin were among 17 scientists to be honored this year, and they join just 81 other researchers who have received the Pioneer Award since its creation. Each researcher will receive a \$2.5 million grant as well as additional

laboratory support over five years.

Lin, also professor of cell biology, is a world leader in understanding the role that bits of genetic material called small RNAs play in stem cell biology.

Until fairly recently, it was believed that an organism could not pass on changes in gene expression to future generations unless the DNA sequence of that organism's genome was somehow altered, usually by mutations. But in recent years, it has become clear that additional mechanisms, known as epigenetic factors, can directly interact with the genome to prevent or enhance gene expression even if the underlying DNA sequence remains unchanged.



Tamas Horvath



Haifan Lin

Epigenetic processes have been implicated in congenital diseases, cancer, and autoimmune diseases, among others.

With the new grant, Lin will study how piRNAs, a class of small RNAs discovered in his lab, guide epigenetic factors to specific points within the genome. He ultimately hopes to compile information on epigenetic effects of small RNAs in the first "functional epigenome map."

Horvath, co-director of the School of Medicine's recently launched Program in Integrative Cell Signaling and Neurobiology of Metabolism, is an expert on the effects of metabolism on higher brain functions. He has studied

neuroendocrine aspects of neurodegenerative diseases, and his research has also provided insight into metabolic disorders such as obesity and diabetes—his lab was the first to provide evidence that the brain uses fat as fuel.

Horvath has proposed that a small set of cells in the brain's hypothalamus known as AgRP neurons are master regulators of energy utilization in all the body's tissues. With his Pioneer Award, he will study how AgRP regulation of the cellular energy metabolism of various tissues affects the health and longevity of those tissues, and thus the life span of the entire organism.

Perturbations in AgRP function could contribute to many of late-onset chronic diseases, such as Alzheimer's and Parkinson's disease, diabetes, cardiovascular disorders and cancer.

// Story (from page 3) After earning his medical degree in 1959, he completed residencies at the Roosevelt Hospital in New York and at Yale. Keggi then served in a U.S. Army MASH unit in Vietnam, as chief of orthopaedic surgery at Third Surgical Hospital. His treatment of wounded soldiers there prompted him to develop novel techniques for the treatment of traumatic injuries.

He returned to Yale as an assistant professor in 1966 to work in orthopaedic trauma surgery and emergency care. Keggi was appointed clinical professor of orthopaedics and rehabilitation in 1989 and became professor in the Department of Orthopaedics and Rehabilitation in 2008.

At Yale, Keggi took part in the launch of both the Physician Associate Program and the trauma program

in the Department of Surgery. He also helped establish the Keggi-Berzins Latvian Baltic Studies Fund at Yale University, as well as the Baltic Internship Program for the Yale University Library's Slavic and East European Collections.

In the course of his long career, Keggi has earned many honors. He is a six-time winner of the Yale Orthopaedic Teaching Award. In 2005, he received the George Herbert Walker Bush Lifetime of Leadership Award from Yale University Athletics. He is the recipient of Latvia's Karlis Ulmanis Medal, the Latvian Order of the Three Stars, and the Knights of Lithuania Friend of Lithuania Award. He has been president of the Yale Fencing Association and a member of the Yale Athletic Federation.



At a September 23 reception in the medical school's Historical Library, friends and colleagues celebrated the appointment of surgeon Kristaps Keggi (seated in front row with hand on chin) as the first Elihu Professor of Orthopaedics. Dean Robert Alpern (at podium) was on hand to congratulate Keggi, as was Keggi's longtime colleague Gary E. Friedlaender, chair and Wayne O. Southwick Professor of Orthopaedics and Rehabilitation (seated in armchair at left).

"Medicine has changed for the better," Keggi has said, adding that today's patients have high

expectations. "We can deliver most of them. Thirty or 40 years ago we delivered half of them."

// Story (from page 8) for cancer and other diseases, was acquired last year by Swiss pharmaceutical giant Roche for about \$50 billion.)

In gratitude to Yale for helping him start his research career, Boyer gave the School of Medicine \$10 million to endow the center that was then named in his honor. In a 1995 article on the Boyer Center, Vincent T. Marchesi, M.D., PH.D., the Anthony N. Brady Professor of Pathology and professor of cell biology, wrote, "The power of [molecular genetics] has already exceeded even the most optimistic expectations." Marchesi has served as the Boyer Center director since its inception.

JOHN AND BETTY ANLYAN

As the new millennium began, there was a pressing need at the medical school for both laboratory space and classrooms. Just up the street, at the corner of Congress Avenue and Cedar Street, construction was taking place on the largest, most expensive building in the School of Medicine's history. With the opening of the Anlyan Center for Medical Research and Education in 2003, research space increased by 25 percent overnight. The building was named in recognition of major donors

John Anlyan, M.D., a retired cancer surgeon who received his Yale medical degree in 1945, and his wife, Betty. The Anlyans bequeathed their entire estate, estimated to be worth more than \$50 million, to the medical school.

The \$176 million structure, designed by Robert Venturi, was the largest capital project ever undertaken in Yale's history. With 457,000-square-feet of space, the center occupies a full city block. A six-story south wing is devoted to research, including internal medicine, genetics and immunobiology, and is home to about 700 investigators. The three-story education wing on the northern side has innovative facilities for the teaching of anatomy and histology, plus a 150-seat auditorium. The Anlyan Center also houses the W.M. Keck High Field Magnetic Resonance Research Center. The two wings are linked by a spacious three-story atrium funded by the Starr Foundation. As part of the gift, John Anlyan even included a collection of his own paintings to brighten the building.

JOEL AND JOAN SMILOW

Artwork also figures heavily into the ambience—and perhaps the healing power—of the newest building at the

medical center, Smilow Cancer Hospital at Yale-New Haven, a \$467 million, 168-bed hospital in which interdisciplinary teams of specialists are offering state-of-the-art treatment options for patients with cancer.

The 14-story, 500,000 square-foot-hospital, which opened in October 2009, was named in honor of business executive Joel E. Smilow—who graduated from Yale College in 1954 and went on to lead Playtex Products—and his wife, Joan.

The Smilows, longtime Yale University benefactors, particularly in athletics, made a major philanthropic gift to help fund the hospital, which is replete with paintings, photographs, and sculpture, large salt-water fish tanks, and an outdoor "healing garden," all creating an atmosphere one reporter described as a "carefully calibrated calm designed to soothe, allay fears, and encourage hope."

In a dedication speech, Joel Smilow used the language of business to sum up the value of his gift, the latest in the long line of philanthropic donations for brick-and-mortar projects at the School of Medicine. His gift "will pay dividends every year," he said. "Every year, thousands of patients will benefit."

Awards and Honors



Clarence T. Sasaki, M.D., the Charles W. Ohse Professor of Surgery, has received the 2010 ALA Award from the American Laryngological

Association for unique and significant contributions to the advancement of medicine. The award was presented to Sasaki at the ALA's 131st Annual Meeting, held this April in Las Vegas, Nev.

The American Bronchoesophagological Association (ABEA) also honored Sasaki with the 2010 Chevalier Jackson Award for lifelong outstanding advancement of bronchoesophagology. Named for an eminent laryngologist who founded the ABEA, the award is the association's highest recognition. Sasaki received the award at the ABEA's 2010 Scientific Program, also held in April in Las Vegas.

Sasaki is the past president of the ABEA and president-elect of the ALA.

Chief of the Section of Otolaryngology and director of Yale's Laryngeal Physiology Laboratory, Sasaki also leads the Head and Neck Program at Yale Cancer Center.

The People Behind the Plaques

Throughout the School of Medicine's 200-year history, innumerable individuals have helped shape the institution. But a handful of people have actually built the school in an almost literal sense by providing major gifts to the medical school to construct the landmark buildings that today bear those donors' names.

JOHN WILLIAM STERLING

The Sterling Hall of Medicine, dedicated in 1925, is named in honor of philanthropist John William Sterling (1844–1918), a New York City corporate attorney who graduated from Yale College in 1864, amassed a substantial fortune advising the likes of Standard Oil and the National City Bank of New York, and left the bulk of it, \$18 million, to Yale University.

In his will, Sterling requested that some of the money be used to build “at least one enduring, useful, and architecturally beautiful edifice.” His wish was fulfilled, and then some: today, seven campus buildings carry the Sterling name, along with the professorships that are among Yale's highest academic honors, and numerous scholarships, programs, and collections.

A graceful Renaissance Revival structure at 333 Cedar Street, Sterling Hall was funded initially with about \$1.3 million from the Sterling bequest. In a 1991 history, the late Yale neurosurgeon William F. Collins Jr., M.D., called it the medical school's “geographical and spiritual center.”

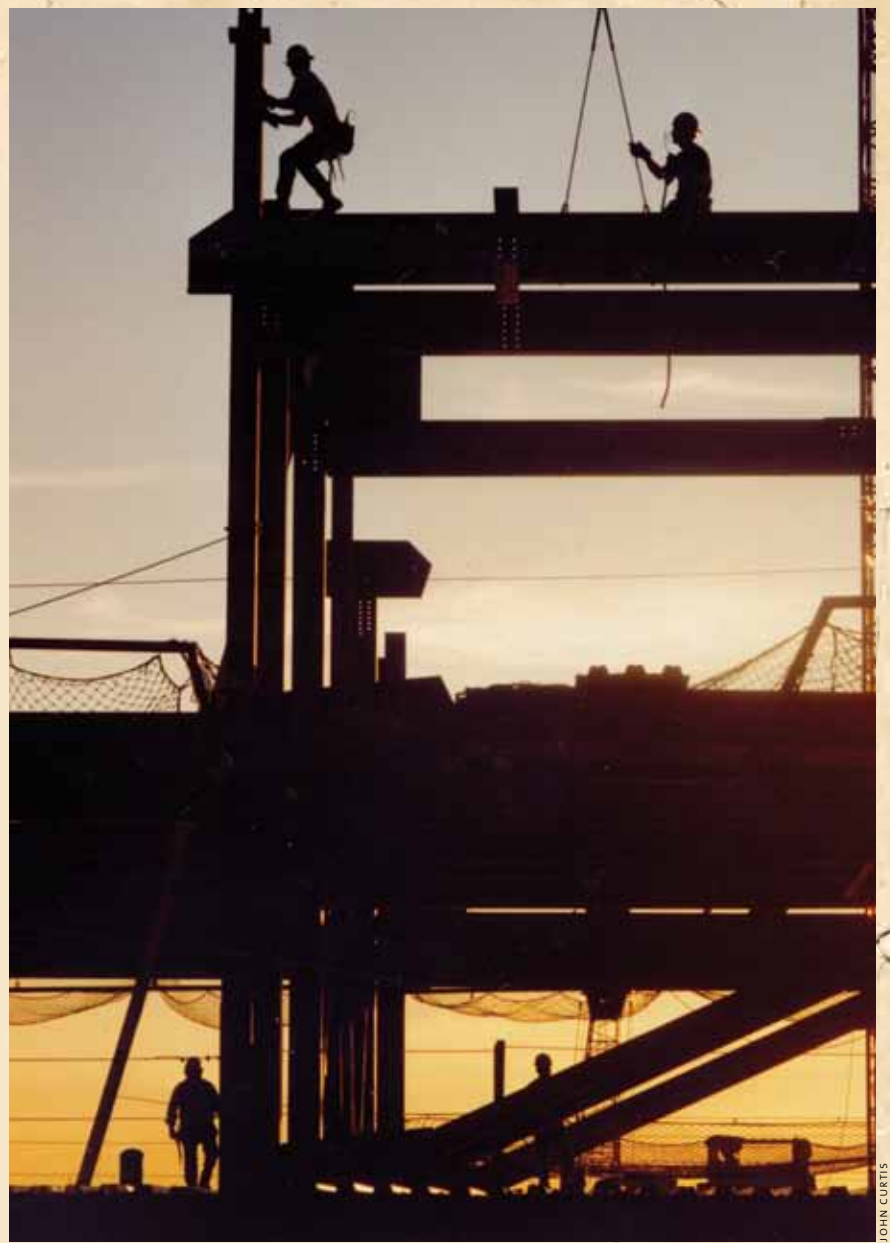
The sprawling building, which included administrative offices, a library, and state-of-the-art laboratories, helped bring most of Yale's far-flung medical operations under one roof in a location close to New Haven Hospital.

The Sterling Hall of Medicine, wrote Collins, stands as “enduring evidence of the beginning of the modern era of medicine at Yale.”

NICHOLAS BRADY

Sterling Hall had distinguished company just across Cedar Street. In 1913, the medical school had secured a \$625,000 grant from the Anthony M. Brady Foundation to build the first stage of the laboratory complex now known as the Brady Memorial Laboratory. Anthony Brady (1841–1913) was a wealthy industrialist who collaborated with Thomas Edison and others to create key components of mass transit, automotive technology, and lighting systems for cities such as New York, Albany, Washington, D.C., and Paris, France. Brady added to his fortune through astute investments in tobacco companies.

Brady's son Nicholas, a philanthropist who graduated from Yale College in 1899, was instrumental in convincing his family's foundation to provide a gift to the School of Medicine in honor of his father. The building, completed in 1918, provided headquarters and lab space for the departments of pathology and bacteriology, “pathological chemistry,” obstetrics and gynecology, and internal medicine. According to a 1999 history by cardiologist and School of Medicine alumnus Jordan M. Prutkin, M.D., “the most important utilization of space in this new building was for the routine laboratory work of the hospital.” Thus, the Brady building helped to “integrate the hospital and medical school,” something then-dean George Blumer, M.D., and Abraham Flexner, whose landmark 1910 report set the agenda for American academic medicine, considered an “absolute requirement.”



In the fall of 2001, construction workers put steel girders in place for the Anlyan Center for Medical Research and Education. Occupying an entire city block, the \$176 million, 457,000-square-foot structure was the largest capital project ever undertaken in Yale's history.

EDWARD HARKNESS

Even though the Brady Laboratory included dormitories after it was expanded in the late 1920s, by mid-century the demand for student housing greatly exceeded the available space. In an address to medical school alumni in 1953, Yale University president A. Whitney Griswold, PH.D., noted, “students [were] scattered all over the city, in makeshift housing arrangements that imposed an unfair handicap on our medical school in competition with other leading schools.”

In the same speech, Griswold announced a solution to the housing dilemma: a \$2.5-million grant to build Edward S. Harkness Memorial Hall, a high-rise structure that would house at least 266 students.

Harkness (1874–1940), a member of the Yale College Class of 1897, was an American attorney and philanthropist whose father, Stephen, made his fortune by investing in a venture captained by John D. Rockefeller—a company that would become Standard Oil. Edward Harkness used his inherited wealth to endow numerous non-profit organizations, from Columbia-Presbyterian Hospital to the Metropolitan Museum of Art. Many colleges also benefited from Harkness grants, and the Yale University campus was utterly transformed by the millions of dollars he and his mother, Anna, provided to build the University's residential college system.

The grant for the medical school dormitory came through the Harkness-endowed Commonwealth Fund, and the effect was equally transformative.

When it was completed in 1955, E.S. Harkness Hall, which provided housing and dining facilities for single women and men as well as married students, would “provide those essential amenities that take the curse off institutional living and promote the social relationships in which true education flourishes,” said Griswold.

HERBERT BOYER

Four decades later, the Boyer Center for Molecular Medicine, with a distinctive César Pelli-designed façade that follows the curve of Congress Ave., opened its doors to an interdisciplinary cadre of researchers using the new tools of molecular biology to understand a wide array of human disorders, from cancer to heart disease to developmental defects.

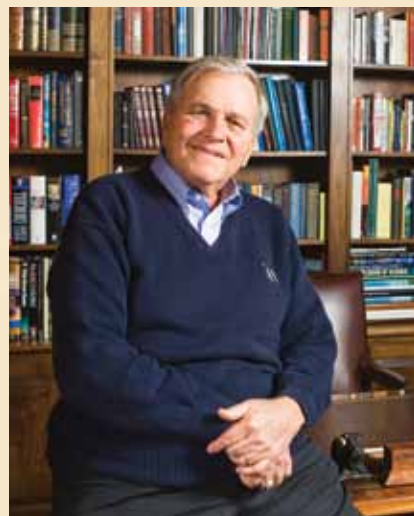
The new center, dedicated in 1991, was named for Herbert Boyer, PH.D., a scientist who was a postdoctoral fellow at the School of Medicine from 1963 to 1966. During his days at Yale, which Boyer recalls as a happy and exciting time, he started to develop a genetic engineering technology to splice genes from one organism into another. Several years later, as a professor at the University of California at San Francisco (UCSF), Boyer and colleagues patented this methodology, known as recombinant DNA, and founded, with about a thousand dollars, a company called Genentech. (UCSF would eventually reap more than \$50 million in royalties from this patent; Genentech, which used recombinant DNA techniques to mass-produce human insulin and create treatments // **People** (page 7)



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MARTIN KLIMEK



ROBERT LISAK

Major benefactors of School of Medicine building projects in modern times include (clockwise from top) Herbert Boyer, seen here in his University of California laboratory in 1977; Joel Smilow; and Betty and John Anlyan.