School of Medicine
2015–2016

BULLETIN OF YALE UNIVERSITY
Series 111 Number 8 July 30, 2015

BULLETIN OF YALE UNIVERSITY *Series 111 Number 8 July 30, 2015* (USPS 078-500) is published seventeen times a year (one time in May and October; three times in June and September; four times in July; five times in August) by Yale University, 2 Whitney Avenue, New Haven CT 06510. Periodicals postage paid at New Haven, Connecticut.

Postmaster: Send address changes to Bulletin of Yale University,
PO Box 208227, New Haven CT 06520-8227

Managing Editor: Kimberly M. Goff-Crews
Editor: Lesley K. Baier
PO Box 208230, New Haven CT 06520-8230

The closing date for material in this bulletin was June 30, 2015.
The University reserves the right to withdraw or modify the courses of instruction or to change the instructors at any time.

Web site
http://medicine.yale.edu

♲ The School of Medicine Bulletin is primarily a digital publication, available in both html and pdf versions at www.yale.edu/bulletin. A limited number of copies were printed on 50% postconsumer recycled paper for the School of Medicine and the permanent archive of the Bulletin of Yale University. Individual copies may also be purchased on a print-on-demand basis; please contact Yale Printing and Publishing Services, 203.432.6560.

School of Medicine 2015–2016

BULLETIN OF YALE UNIVERSITY
Series 111 Number 8 July 30, 2015

Contents

Calendar

TWO HUNDRED AND FOURTH SESSION

FALL 2015

June 1–July 31	M–F	Registration for third- through fifth-year students
June 15	M	Clinical year, first term, begins for third- through fifth-year students
		Matriculation for first-year students in the START@Yale Program, 8:30 a.m.–12:15 p.m.
July 1–Aug. 25	W–T	Registration for second-year students
Aug. 13	TH	Matriculation for first-year students, 8–11 a.m.
Aug. 17	M	First term begins for first-year students
Aug. 25	T	First term begins for second-year students
Sept. 7	M	Labor Day. No classes or clerkships
Nov. 2	M	Registration begins for all students for spring term
Nov. 21–29	SA–SU	Fall recess for first- and second-year students
Nov. 28	SA	Winter recess begins for third- through fifth-year students
Dec. 23	W	Winter recess begins for first- and second-year students

SPRING 2016

Jan. 4	M	Last day of registration for all students
		Clinical year, second term, begins for third- through fifth-year students
		Second term begins for first- and second-year students
Jan. 18	M	Martin Luther King, Jr. Day. No classes for first- and second-year students
Mar. 12	SA	Spring recess begins for first- and second-year students
Mar. 18	F	Match Day
Mar. 20	SU	Spring recess ends
Apr. 1	F	Classes end for second-year students
May 3	T	Student Research Day. No afternoon classes for first-year students
May 20	F	Clinical year ends for fourth-year students
May 23	M	University Commencement
May 27	F	Classes end for first-year students
June 17	F	Clinical year ends for third- and fifth-year students

The President and Fellows of Yale University

President
Peter Salovey, A.B., M.A., Ph.D.

Fellows
His Excellency the Governor of Connecticut, *ex officio*
Her Honor the Lieutenant Governor of Connecticut, *ex officio*
Joshua Bekenstein, B.A., M.B.A., Wayland, Massachusetts
Jeffrey Lawrence Bewkes, B.A., M.B.A., Old Greenwich, Connecticut
Maureen Cathy Chiquet, B.A., Purchase, New York
Francisco Gonzalez Cigarroa, B.S., M.D., San Antonio, Texas (*June 2016*)
Peter Brendan Dervan, B.S., Ph.D., San Marino, California
Donna Lee Dubinsky, B.A., M.B.A., Portola Valley, California
Charles Waterhouse Goodyear IV, B.S., M.B.A., New Orleans, Louisiana
Catharine Bond Hill, B.A., B.A., M.A., Ph.D., Poughkeepsie, New York (*June 2019*)
Paul Lewis Joskow, B.A., Ph.D., New York, New York
William Earl Kennard, B.A., J.D., Charleston, South Carolina
Margaret Hilary Marshall, B.A., M.Ed., J.D., Cambridge, Massachusetts
Gina Marie Raimondo, A.B., D.Phil., J.D., Providence, Rhode Island (*June 2020*)
Emmett John Rice, Jr., B.A., M.B.A., Bethesda, Maryland (*June 2017*)
Eve Hart Rice, B.A., M.D., Bedford, New York (*June 2021*)
Kevin Patrick Ryan, B.A., M.B.A., New York, New York (*June 2018*)
Douglas Alexander Warner III, B.A., Hobe Sound, Florida

The Officers of Yale University

President
Peter Salovey, A.B., M.A., Ph.D.

Provost
Benjamin Polak, B.A., M.A., Ph.D.

Secretary and Vice President for Student Life
Kimberly Midori Goff-Crews, B.A., J.D.

Vice President for New Haven and State Affairs and Campus Development
Bruce Donald Alexander, B.A., J.D.

Vice President for Finance and Business Operations
Shauna Ryan King, B.S., M.B.A.

Vice President for Human Resources and Administration
Michael Allan Peel, B.S., M.B.A.

Vice President for Alumni Affairs and Development
Joan Elizabeth O'Neill, B.A.

Vice President and General Counsel
Alexander Edward Dreier, A.B., M.A., J.D.

Administration and Faculty

General Administration

As one of the coordinate schools of the University, the general administration of the School of Medicine is conducted in accordance with the bylaws of the Yale Corporation. The affairs of the School are under the direction of the dean and the faculty, subject to the approval of the Corporation.

Administration

Peter Salovey, Ph.D., President of the University
Benjamin Polak, Ph.D., Provost of the University
Robert J. Alpern, M.D., Dean of the School of Medicine
Paul D. Cleary, Ph.D., Dean of the School of Public Health
Richard Belitsky, M.D., Deputy Dean for Education
Carolyn W. Slayman, Ph.D., Deputy Dean for Academic and Scientific Affairs
Cynthia L. Walker, M.B.A., CPA, Deputy Dean for Finance and Administration
Richard P. Lifton, M.D., Ph.D., Special Adviser to the Dean
Linda C. Mayes, M.D., Special Adviser to the Dean
Paul Taheri, M.D., M.B.A., Deputy Dean for Clinical Affairs and Chief Executive Officer of Yale Medical Group

Nancy R. Angoff, M.D., M.P.H., M.Ed., Associate Dean for Student Affairs
Daniel J. Barchi, M.E.M., Chief Information Officer for the School of Medicine and Yale New Haven Health System
Linda K. Bockenstedt, M.D., Associate Dean for Faculty Development and Diversity
Frederick J. Borrelli, M.B.A., M.S., Chief Operating Officer, Yale Medical Group
Carrie P. Capezzone, M.B.A., Associate Dean for Finance
James P. Comer, M.D., M.P.H., Associate Dean for Student Progress
Roger J. Deshaies, M.A., M.B.A., Chief Financial Officer, Yale Medical Group
Michael H. Ebert, M.D., Associate Dean for Veterans' Affairs
Rosemarie L. Fisher, M.D., Associate Dean for Graduate Medical Education
John N. Forrest, M.D., Director, Office of Student Research
John Gallagher, M.L.S., Interim Director, Medical Library
Susan H. Gudin, M.B.A., Director of Financial Aid
Janet Hafler, Ed.D., Assistant Dean for Educational Scholarship
Michael F. Hoepp, M.B.A., Chief of Staff, Office of the Dean
Mary J. Hu, M.B.A., Director of Institutional Planning and Communications
Anna Maria L. Hummerstone, M.H.A., Director of YSM Faculty Support
Robert G. Kanoff, B.S., Assistant Dean for Finance and Administration, School of Public Health
Barbara I. Kazmierczak, Ph.D., M.D., Director, M.D./Ph.D. Program
Martin Klein, Ph.D., M.P.H., Associate Dean for Development and External Affairs, School of Public Health
Anthony J. Koleske, Ph.D., Director, Combined Program in the Biological and Biomedical Sciences

Brian P. Leaderer, Ph.D., M.P.H., Deputy Dean of Public Health
Jack LeConche, M.S.M., Director of Student Affairs and Senior Registrar
Forrester A. Lee, M.D., Associate Dean for Multicultural Affairs
Laura R. Ment, M.D., Associate Dean for Admissions and Financial Aid
Kimbirly A. Moriarty, M.S., Chief of Network Strategy, Yale Medical Group
Melinda M. Pettigrew, Ph.D., Associate Dean for Academic Affairs, School of Public Health
Anne F. Pistell, M.B.A., Associate Dean for Student Affairs, School of Public Health
Michael L. Schwartz, Ph.D., Associate Dean for Curriculum
Richard A. Silverman, Director, Office of Admissions
Geraldine A. Sullivan, Director of Staff Employee Relations
Terri L. Tolson, Registrar for Student Affairs
Charles F. Turner, M.S.S.A., Associate Vice President for University Development and Director of Medical Development and Alumni Affairs
James Van Rhee, M.S., P.A.-C., Director, Physician Associate Program
Ronald J. Vender, M.D., Associate Dean for Clinical Affairs
Merle Waxman, M.A., Associate Dean, Ombudsperson, and YSM Title IX Coordinator
George Zdru, B.Arch., Director, University Planning

Faculty

Faculty listings for the School of Medicine can be found within each department's write-up in this bulletin. See individual departments, under Departments and Sections. The closing date for departmental faculty lists was April 5, 2015.

History, Mission, and Facilities

HISTORY

The School of Medicine was established following passage of a bill in the Connecticut General Assembly in 1810 granting a charter for "The Medical Institution of Yale College," to be conducted under the joint supervision of the college and the Connecticut State Medical Society. The institution was formally opened in 1813, and the first degrees were conferred the following year. In 1884, with the approval of the Medical Society, the original charter was amended to place the School definitely in the control of the College as the Medical School of Yale College. The name Yale College was changed to Yale University in 1887, and the name of the Medical School was automatically changed. The present name was adopted in 1918.

Shortly after the establishment of the School, members of its faculty and physicians in the state joined with other citizens in raising funds for a hospital in New Haven to provide, among other services, clinical facilities for the instruction of medical students. The outcome of these efforts was the incorporation of the General Hospital Society of Connecticut in 1826, and the opening of the New Haven Hospital in 1832. The New Haven Dispensary was founded in 1872 and later became a division of the New Haven Hospital. Instruction in clinical medicine has been conducted in the hospital continuously since its establishment.

A merger was effected in 1945 between the New Haven Hospital and Grace Hospital to form the Grace-New Haven Community Hospital. The affiliation agreement between the hospital and University was revised in 1965 and the name of the institution changed to Yale-New Haven Hospital (YNHH). In 1999, a separate affiliation agreement was adopted by the University and the Yale New Haven Health System.

Members of the professional staffs of the VA Connecticut Healthcare System, West Haven, and the Connecticut Mental Health Center, 34 Park Street, hold appointments in Yale University.

MISSION

As a preeminent academic medical center that supports the highest-quality education, research, and patient care, the Yale School of Medicine will (1) educate and inspire scholars and future leaders who will advance the practice of medicine and the biomedical sciences; (2) advance medical knowledge to sustain and improve health and to alleviate suffering caused by illness and disease; and (3) provide outstanding care and service for patients in a compassionate and respectful manner.

FACILITIES

Located southwest of the New Haven Green and Yale's Old Campus, Yale-New Haven Medical Center includes the School of Medicine, School of Public Health, Yale-New Haven Hospital (YNHH), Smilow Cancer Hospital, Connecticut Mental Health Center, and the John B. Pierce Laboratory. In 2013 the School of Nursing moved to Yale West Campus in Orange, Connecticut.

The School of Medicine's Sterling Hall of Medicine, 333 Cedar Street, is the central building. This handsome limestone structure with domed roof includes administrative offices, the 450-seat Mary S. Harkness Auditorium, the Child Study Center, the departments of Cellular and Molecular Physiology, Pharmacology, Molecular Biophysics and Biochemistry, Genetics, Cell Biology, Neurobiology, Yale Cancer Center, and History of Medicine.

The Harvey Cushing/John Hay Whitney Medical Library, also located in Sterling Hall of Medicine, houses approximately 467,000 volumes and subscribes to more than 15,000 electronic journals and 33,000 electronic books.

Connected to the south end of Sterling Hall is the Jane Ellen Hope Building, a teaching facility of conference rooms and lecture halls. At Sterling's north end is the Nathan Smith Building, which spans Cedar Street, joining the School of Medicine and YNHH patient-care facilities, including the Hunter Building, which houses research laboratories for Therapeutic Radiology and Dermatology. The Nathan Smith Building contains offices and laboratories of Yale Cancer Center and the department of Genetics. Entrances to the Hope and Nathan Smith buildings are at 315 Cedar Street and 333 Cedar Street, respectively.

Yale-New Haven Hospital (YNHH) is a nationally recognized, 1,541-bed, not-for-profit hospital serving as the primary teaching hospital for the Yale Schools of Medicine and Nursing. YNHH was founded as the fourth voluntary hospital in the United States in 1826. Today YNHH includes a Children's Hospital, a Psychiatric Hospital, Smilow Cancer Hospital, and the Saint Raphael Campus. YNHH has a combined medical staff of about 4,118 University and community physicians practicing in more than one hundred specialties. Last year, YNHH cared for 78,529 inpatients and handled more than 1.2 million outpatient encounters. YNHH (www.ynhh.org) is the flagship hospital of the Yale New Haven Health System, an integrated delivery system that includes Bridgeport Hospital, Greenwich Hospital, and their affiliated organizations.

The Laboratory of Epidemiology and Public Health is the School's other major teaching facility and is home to the nationally accredited Yale School of Public Health. The nine-story building at 60 College Street contains classrooms, laboratories, an auditorium, and the office of the dean of Public Health. (Additional administrative offices are housed on the second floor of 135 College Street.) It also is the site of a World Health Organization Collaborating Center, focusing on health promotion policy and research.

Laboratories and offices for the School's clinical departments are located in contiguous buildings across Cedar Street from Sterling Hall. The Anthony N. Brady Memorial Laboratory and Lauder Hall provide offices and laboratories for the departments of Surgery, Pathology, Urology, Comparative Medicine, and Anesthesiology. The Boardman Building houses offices for the departments of Surgery and Internal Medicine. Farnam Memorial Building (FMB) and the Laboratory of Surgery, Obstetrics and Gynecology (LSOG) provide facilities for the departments of Surgery; Orthopaedics and Rehabilitation; Obstetrics, Gynecology, and Reproductive Sciences; Neurosurgery; Neurobiology; Internal Medicine; Pediatrics; and Comparative Medicine.

The YNHH Clinic Building connects Farnam with the Laboratory for Medicine and Pediatrics (LMP). Adjacent to the Clinic Building are Tompkins Memorial Pavilion (TMP) and Fitkin Memorial Pavilion (FMP), facilities shared by the hospital and the

School. They contain the departments of Anesthesiology, Diagnostic Radiology, Laboratory Medicine, Neurology, Neurosurgery, Orthopaedics and Rehabilitation, Pathology, and Urology; the Cardiology section; offices for the Cancer Center; and laboratories and offices for the Department of Pediatrics. On the other side of the Clinic Building are Fitkin Amphitheater, the LMP, and the Lippard Laboratory for Clinical Investigation (LLCI), where research is conducted in the departments of Dermatology, Neurology, Pediatrics, Pharmacology, and Therapeutic Radiology.

Laboratories of the departments of Ophthalmology and Visual Science and Neurology; the Cardiology section; the Cancer Center; the Keck Foundation Biotechnolgy Resource Laboratories, and the Human and Translational Immunology Program; offices for the Geriatric section; and laboratories and offices of the Department of Psychiatry are located at 300 George Street. Many of the Psychiatry department's teaching, research, and patient-care activities are conducted at the Connecticut Mental Health Center and the Yale-New Haven Psychiatric Hospital.

The Yale Physicians Building (YPB), a four-story structure on the southwest corner of Howard and Davenport avenues, contains outpatient specialty and consultative services, X-ray, laboratories, and a pharmacy. It also houses academic offices for Orthopaedics and Rehabilitation and Otorhinolaryngology. Ophthalmology clinical services and offices moved in 2007 to 40 Temple Street.

The Magnetic Resonance (MR) Center, on the corner of Davenport and Howard avenues, operated by the Department of Diagnostic Radiology, maintains three MR imaging systems for clinical examination. A new Positron Emission Tomography (PET) Center, also operated by the Department of Diagnostic Radiology, maintains a cyclotron radioisotope system for imaging research.

The Boyer Center for Molecular Medicine, at the intersection of Congress Avenue and College Street, houses multidisciplinary programs in Molecular Genetics, Cell Biology, Microbial Pathenogenesis, and the interdepartmental Program in Cellular Neuroscience, Neurodegeneration, and Repair.

College Place, a series of buildings at 37–55 College Street, houses a number of administrative offices for the School of Public Health and the Office of Research Administration.

The medical school's newest research building, at 10 Amistad Street, is home to three interdisciplinary groups: the Interdepartmental Program in Vascular Biology and Therapeutics, the Human and Translational Immunology Program, and the Yale Stem Cell Center.

The Anlyan Center for Medical Research and Education is the medical school's largest state-of-the-art research and educational facility. Completed in November 2002, this outstanding facility is located on the corner of Cedar Street and Congress Avenue and encompasses a full city block. The building includes six floors of laboratories for disease-based research, core facilities for genomics and magnetic resonance imaging, and state-of-the-art teaching space for anatomy and histology. This facility provides laboratories and offices for the departments of Internal Medicine, Genetics, Immunobiology, Laboratory Medicine, and Diagnostic Radiology.

Edward S. Harkness Memorial Hall, 367 Cedar Street, is a student dormitory with the Nicholas P. R. Spinelli student lounge, the Class of 1958 Fitness Center, dining facilities, and the Phyllis Bodel Childcare Center. The School of Medicine offices of admissions,

student affairs, financial aid, and international health and student programs are located on the second floor. The offices of education, student research, M.D./Ph.D. Program, and multicultural affairs are located on the third floor.

A number of other spaces in the vicinity of the School are leased rather than owned by Yale University.

The VA Connecticut Healthcare System, West Haven, a major teaching affiliate of the School of Medicine, is the site of the Paralyzed Veterans of America/EPVA Center for Neuroscience and Regeneration Research of Yale University.

Harvey Cushing/John Hay Whitney Medical Library

http://library.medicine.yale.edu

John Gallagher, M.L.S., Interim Director	SHM L110
Janene Batten, M.L.S., Nursing Librarian	SHM L107
Melissa Funaro, M.L.S., Evening/Weekend Supervisor and Reference Librarian	SHM L104A
Rolando Garcia Milian, M.L.S., Biomedical Sciences Research Support Librarian	SHM L111
Mark Gentry, M.L.S., Clinical Support Librarian and Head, Library Technology Services and Support	SHM L113B
Jan Glover, M.L.S., Education Services Librarian	SHM L111
Melissa Grafe, M.L.S., Ph.D., Bumstead Librarian for Medical History	SHM L118
Holly Grossetta Nardini, M.L.S., Coordinator of Liaison Activities	SHM L107
Denise Hersey, M.L.S., Clinical Support Librarian	SHM L107
Andrew Hickner, M.L.S., Web Services Librarian	SHM L015
Robert Hughes, Business Manager	SHM L110
Melanie Norton, M.L.S., Access and Delivery Services Librarian	SHM L104A
Nathan Rupp, M.L.S., Head, Collection Development and Management	SHM L015
Judy Spak, M.L.S., Curriculum Support Librarian	SHM L107
Lei Wang, M.L.S., Instructional Design Librarian	SHM L111
Susan Wheeler, Curator, Prints and Drawings	SHM L118

MISSION

The Harvey Cushing/John Hay Whitney Medical Library strives to be a center of excellence that develops and sustains services and resources to support the biomedical, health, and public health care information needs of Yale University and the Yale-New Haven Medical Center.

HISTORY

Elihu Yale himself donated Yale College's first two medical volumes. A century later, in 1813, the Medical Institution of Yale College was opened with the help of Yale president Timothy Dwight and the Connecticut State Medical Society. By 1865, when a catalog was made of the collection, it numbered 1,200 volumes and was integrated with the College Library. It was not until 1917 that the professors of the medical school began another separate medical library.

Situated in the center of the Sterling Hall of Medicine, the current Medical Library was completed in 1940. The library was designed in the shape of a Y with two wings, one for the Historical Library reading room and one for what was then the periodical room, with stacks below for books and journals. The central rotunda honors Dr. Harvey

Cushing (1869–1939), a neurosurgeon and pioneer of brain surgery, who graduated from Yale College in 1891 and returned to Yale in 1934.

A generous gift from Mrs. John Hay Whitney, daughter of Dr. Harvey Cushing, enabled a major renovation and expansion of the Medical Library that included the addition of a skylit Information Room and increased study and stack space. Upon completion of the renovations in June 1990, the library was officially renamed the Harvey Cushing/John Hay Whitney Medical Library, honoring both Cushing and John Hay Whitney (1904–1982), Yale graduate, editor of the *Herald Tribune,* and patron of the arts.

SERVICES

During orientation week, first-year students are introduced to the library, the Personal Librarian Program, and their "personal librarian." Librarians become personal librarians for approximately twenty students each year and maintain contact with the same students throughout their four years in medical school. A personal librarian is able to recommend resources best suited for individual research needs, provide instruction in new technologies and resources, and guide students to specific resources as their research and learning needs change.

Students have access to library resources beyond the Medical Library's vast collections. Interlibrary Loan obtains and delivers materials not owned by the Yale University Library through cooperative agreements with other libraries around the world. Document Delivery obtains and delivers materials from collections at most Yale University libraries, in whatever format the student requires.

Library guides and video tutorials provide 24/7 help on a wide range of targeted library topics, from beginning thesis research to how to use a specific library resource. Most questions about the library can be answered by the Medical Library Web site, but students should not hesitate to contact their personal librarian for assistance.

SPACES TO COLLABORATE AND STUDY

Students will find myriad options available for group or individual study space throughout the Medical Library. On the main floor, group study rooms include the Gordon Conference Room and the Simbonis Conference Room. The Betsey Cushing Whitney Group Study Center, located on the lower level, consists of a lounge area and two group spaces. A conference room located in the Cushing Center is equipped with a computer, large monitor, Internet access, and teleconferencing capabilities. All of the library's group study and conference rooms contain either large plasma monitors or data projectors for group display. Details can be found at http://library.medicine.yale.edu/about/places. Individual study carrels and tables are located on all levels of the library. The Morse Reading Room is designated as quiet study space.

COMPUTING IN THE MEDICAL LIBRARY

The Cushing/Whitney Medical Library provides Windows and Macintosh computers in the Information Room and the 24/7 Computer & Study Space (http://library.medicine.yale.edu/services/computing/computers). All computers have access to the Internet, and many include productivity software such as Microsoft Office, EndNote, and other tools

including desktop publishing software, statistical and mapping software (SAS, SPSS, ArcGIS, etc.), database management software, and medical education software. Black-and-white and color printers/copiers/scanners are available in both spaces. In addition, the library offers two scanning stations (Windows and Macintosh) in the 24/7 space. Software on these computers includes a variety of Adobe graphics applications and Final Cut for video editing and production.

A mix of Windows and Mac laptops are available for Medical Center students needing a computer for short-term, temporary use. Equipment including digital cameras, HD digital video cameras, and related video accessories is available from the Circulation Desk. Also available are chargers for common models of phones, iPads, and both Dell and Apple computers. This equipment may be borrowed by anyone with a valid Yale ID.

LIBRARY COLLECTIONS

The Medical Library provides a comprehensive collection of clinical reference tools, databases, evidence-based practice resources, image collections, educational software, and books and journals in support of programs in medicine, nursing, public health, and the basic sciences. The library includes more than 33,000 electronic books, 15,000 electronic journals, and 92 databases, in addition to more than 250,000 print textbooks and books available for circulation or on reserve. Yale affiliates have access to the library's electronic collections from any remote computer using VPN software.

The Historical Library contains one of the world's finest collections of rare medical books, journals, prints, posters, and photographs, as well as current works in the history of medicine. There are 325 medical incunabula, more than 75 manuscript volumes from the twelfth through sixteenth century, and one of the best study collections of weights and measures in the world. Its holdings also include Yale medical theses to 1900, catalogs, yearbooks, photographs, and other publications and ephemera related to the Yale School of Medicine. In addition, an outstanding selection of photographs, posters, and other images is available in the Cushing/Whitney Medical Library Digitized Collections.

The Cushing Center houses a unique collection of materials owned by Dr. Harvey Cushing. The center is the home of the Harvey Cushing Brain Tumor Registry, which consists of approximately 400 brain specimens, glass-plate negatives, and accompanying patient files from the early twentieth century. The space also displays a portion of his rich collection of anatomical and surgical books.

MEDICAL LIBRARY ASSOCIATES

Michael Kashgarian, M.D., Chair
Melissa Grafe, Secretary
Telephone: 203.785.5352

The Associates of the Cushing/Whitney Medical Library were formed in 1948 to assist in augmenting the library's services and collections. Membership information is available online at http://associates.medicine.yale.edu.

Degree Programs

Students at the School of Medicine are candidates for the degree of Doctor of Medicine (M.D.). Students receiving competitive fifth-year research fellowships are eligible for the combined degree M.D./M.H.S. (Master of Health Science). Students completing a curriculum of didactic, research, and clinical experiences in global health are eligible for the Certificate in Global Medicine. Jointly with the School of Public Health, the School of Medicine administers a program leading to the degrees of Doctor of Medicine (M.D.) and Master of Public Health (M.P.H.). Jointly with the Graduate School, the School of Medicine also administers the combined degrees of Doctor of Medicine (M.D.) and Doctor of Philosophy (Ph.D.). In addition, special arrangements may be made with the appropriate associate deans to receive the combined Doctor of Medicine (M.D.) and Doctor of Jurisprudence (J.D.) degrees, the combined Doctor of Medicine (M.D.) and Master of Divinity (M.Div.) degrees, and the combined Doctor of Medicine (M.D.) and Master of Business Administration (M.B.A.) degrees. The School of Medicine also offers a Physician Associate program leading to a Master of Medical Science (M.M.Sc.) degree. Jointly with the School of Public Health, the School of Medicine also administers the PA/M.P.H. program leading to the combined Master of Medical Science (M.M.Sc.) and Master of Public Health (M.P.H.) degrees.

DOCTOR OF MEDICINE

The degree of Doctor of Medicine is conferred upon students who have satisfactorily completed the requirements stated below.

1. Pass all of the required basic science courses.
2. Pass all of the required clinical clerkships.
3. Pass the examinations of the United States Medical Licensing Examination (USMLE), Steps I and II.
4. Submit an approved dissertation by mid-March of the year of graduation.
5. Pass the clinical skills assessment, performed at the University of Connecticut (UConn 4) at the end of Year 3 or early in Year 4.
6. Meet all of the requirements of the Progress Committee and Board of Permanent Officers concerning academic standing, moral and ethical character, emotional stability, and professional conduct.

Because of the heavy demands in terms of time and energy required for the study of medicine, the Yale School of Medicine discourages students from assuming extracurricular activities that may prove burdensome. Such extracurricular work and/or professional activity will not justify inadequate academic performance. Any student wishing to work or pursue a professional activity other than medicine that would consume a significant amount of time must have the permission of the associate dean for student affairs.

Admissions

The Yale School of Medicine seeks to provide an education in the scholarly and humane aspects of medicine and to foster the development of leaders who will advance medical practice and knowledge. The Committee on Admissions, in general, seeks to admit

students who seem best suited for the educational programs and aims of the School. In particular, the committee looks for intelligent, mature, and highly motivated students who show the greatest promise for becoming leaders and contributors in medicine. The Committee on Admissions also considers very carefully personal qualities necessary for the successful study and practice of medicine. These include maturity, integrity, common sense, personal stability, dedication to the ideal of service, and the ability to inspire and maintain confidence.

School of Medicine graduates must have the knowledge and skills to function in a broad variety of clinical situations and to render a wide spectrum of patient care. In addition to scholastic accomplishments and potential, applicants must have the physical capacities and personal characteristics to meet the full requirements of the School's curriculum and to graduate as skilled and effective practitioners of medicine. The policy of the School of Medicine regarding nonacademic considerations in the admissions process is available upon request from the Office of Admissions.

The School also attempts to ensure adequate representation of women and all minority groups and a diversity of interests and backgrounds. All applications to the Yale University School of Medicine are given careful consideration without regard to sex, race, age, religion, national origin, sexual orientation, or financial status. For a complete statement of the Yale University policy on nondiscrimination, refer to www.yale.edu/equalopportunity/policies.

In evaluating candidates, the committee takes into consideration many factors including academic record; MCAT scores; medical experience; research experience; extracurricular and community activities and accomplishments; leadership potential; recommendations from premedical committees, individual science teachers, or research mentors; and personal interviews.

It is recommended that students enter medical school after four years of study in a college of arts and sciences. Students holding advanced degrees in science or other fields are also considered. International students (other than Canadians) must have completed at least one year of study in an American college prior to application. Students who have been refused admission on three prior occasions are ineligible to apply for admission to the first-year class.

The minimum requirements for admission to the first-year class are:

1. Attendance for three academic years, or the equivalent, at an accredited college of arts and sciences or institute of technology.
2. Satisfactory completion of the following courses including laboratory work:
   General Biology or Zoology (one year)
   General Chemistry (one year)
   Organic Chemistry (one semester)
   Biochemistry (one semester)
   General Physics (one year)

(Acceptable courses in these subjects are usually given six to eight hours credit per year, or three to four term hours credit per semester.) These courses should be completed in a U.S., Canadian, or U.K. college or university. Advanced courses may be substituted for introductory-level courses in each of these subjects.

The Committee on Admissions has no preference as to a major field for undergraduate study and leaves this decision to students, with the advice that they advance beyond the elementary level in the field of their choice rather than pursue an undirected program. A liberal education is the supporting structure for graduate study and must encompass understanding of the humanities, arts, and society as well as the scientific foundations of technology and civilization. The student of medicine enters a profession closely allied to the natural sciences and must be prepared to cope with chemistry and biology at the graduate level. Students entering college with a strong background in the sciences, as demonstrated by Advanced Placement courses, are encouraged to substitute advanced science courses for the basic requirements listed above.

Application Process

The Yale School of Medicine participates in the "common" application process of the American Medical College Application Service (AMCAS). Applicants must first submit their AMCAS application, on which they indicate that they wish to apply to the Yale School of Medicine. After submitting the AMCAS application, applicants must complete the Yale Supplemental Application, which must be submitted online (see below for details).

Inquiries regarding AMCAS should be addressed to the American Medical College Application Service, 2501 M Street NW, Lobby 26, Washington DC 20037-1300. AMCAS can also be reached by telephone at 202.828.0600 or by e-mail at amcas@aamc.org. Extensive information can also be obtained at the AMCAS Web site: www.aamc.org.

Inquiries to the Yale School of Medicine regarding the degree of Doctor of Medicine should be addressed to the Office of Admissions, Yale University School of Medicine, Edward S. Harkness Memorial Hall D, 367 Cedar Street, New Haven CT 06510. The e-mail address of the admissions office is medical.admissions@yale.edu. Information and a link to the Yale Supplemental Application can also be obtained online at http://medicine.yale.edu/admissions. Inquiries are welcome at any time.

AMCAS applications must be submitted no later than October 15 of the year prior to the fall in which enrollment is sought. Yale Supplemental Applications must be submitted online no later than November 15. Applicants seeking admission under the Early Decision Plan must submit the AMCAS application by August 1 and the Yale Supplemental Application by August 31. The number of students admitted each year for studies leading to the M.D. degree is approximately 100.

A complete application consists of the following components:

1. AMCAS application and all required components of the application (see 2 and 5 below).
2. Complete official transcripts from all colleges attended. Transcripts should be sent from the colleges directly to AMCAS.
3. Yale Supplemental Application submitted online no later than November 15. The Supplemental Application may be found at http://medicine.yale.edu/admissions.
4. An evaluation from the applicant's Premedical Advisory Committee or individual letters from three of the applicant's instructors, two of whom should be in science fields. These evaluations must be sent to the Office of Admissions, either directly or (preferably) via AMCAS Letter Service. Detailed instructions regarding electronic

transmission of evaluation letters will be found in the General Information section of the Supplemental Application.

5. Scores from the Medical College Admission Test (MCAT) must be submitted in conjunction with the AMCAS application. For information on the MCAT, applicants should communicate directly with the MCAT Program Office, PO Box 4056, Iowa City IA 52243. Information on the MCAT can also be obtained online at www.aamc.org. Scores of tests taken earlier than three years prior to submitting an application will not be accepted.
6. A fee of $95 or an AMCAS fee waiver must accompany the Yale Supplemental Application. The fee is not refundable.

During the course of the admissions process, selected applicants will be invited for personal interviews with members of the Committee on Admissions at Yale. Regional interviews can be arranged when necessary.

Early Decision Program

The Yale School of Medicine participates in the AMCAS Early Decision Program (EDP). Under EDP, a student may make a single early application to the school of his or her choice and is guaranteed a prompt decision by the school. AMCAS applications for the EDP program must be submitted by August 1. Yale Supplemental Applications must be submitted by August 31. EDP applicants will be notified of the decision of the Committee on Admissions no later than October 1.

Admission to Advanced Standing (Transfer Admissions)

Because of a limited number of available positions, the Yale School of Medicine does not routinely consider requests for transfer with advanced standing. The only exception to this policy is that the School will consider applications into the second-year or third-year class from students who are enrolled in LCME-accredited medical schools in the United States or Canada and who have a compelling personal need to be at Yale.

The following three circumstances constitute "compelling personal need" under this policy:

1. The applicant's spouse, or partner in a same-sex marriage or civil union, holds, or has been accepted for, a position in the Yale-New Haven Medical Center community as a student, a member of the house staff at Yale-New Haven Hospital, a postdoctoral fellow, or a faculty member.
2. There is a serious illness in the immediate family of the applicant, requiring the ill person to be in New Haven for treatment and the applicant to be in New Haven as the primary supportive member of the family during the time of the illness.
3. In collaboration with a faculty member of the Yale School of Medicine, the applicant has completed exceptional biomedical research, which both the applicant and the faculty member wish to continue. Completing medical studies at Yale would enable the applicant to pursue this collaborative research and achieve important and unique educational and scientific objectives that would not be possible at the original medical school.

The distance of the applicant from New Haven will also be taken into consideration. Regardless of other factors, students attending medical school in New York City, Connecticut, or Rhode Island will not normally be eligible to apply for advanced standing.

Transfer into the second-year class is possible only from medical schools with a basic science curriculum compatible with that at Yale. Transfer into the third-year class is contingent upon passing Step I of the United States Medical Licensing Examination (USMLE). An applicant who fails USMLE Step I will not be considered for admission under any circumstances. Transfer into either the second- or third-year class is also contingent upon successful completion of courses being taken at the current medical school and upon the availability of space at Yale.

Eligible applicants will be evaluated competitively by the School's Committee on Admissions, with decisions based on academic credentials, supporting material, interviews, and the urgency of the personal need to transfer. Overall qualifications are expected to be comparable to those of Yale students admitted through the regular admissions process.

All accepted applicants must matriculate in the year accepted. Applicants whose eligibility is established by marriage must be married at the time of matriculation, and the applicant's spouse must be in residence in New Haven and holding a position in the Yale-New Haven Medical Center community. Transfer students must complete all required clinical clerkships (including the fourth-year Primary Care Clerkship and the Integrative Clinical Medicine Clerkship) and the thesis requirement at the Yale University School of Medicine. If a transfer student wishes to spend an extra (fifth) year at Yale, the tuition for that year will be waived.

Completed transfer applications consist of Yale School of Medicine application forms, letters of recommendation, MCAT scores, college transcripts, a transcript from the current medical school, and a letter from the dean of students (or comparable official) at the current medical school. Inquiries regarding transfer applications should be addressed to the Office of Admissions, Yale University School of Medicine, 367 Cedar Street, New Haven CT 06510 or medical.admissions@yale.edu. Transfer applications, including all supporting credentials, must be submitted by April 1 of the year the student wishes to enter Yale.

Educational Objective

The mission of Yale School of Medicine is to educate and inspire scholars and future leaders who will advance the practice of medicine and the biomedical sciences. The educational program is designed to develop physicians who are highly competent and compassionate practitioners of the medical arts, schooled in the current state of knowledge of both medical biology and patient care. It is expected that Yale-trained physicians will establish a lifelong process of learning the medical, behavioral, and social sciences by independent study. The aim is also to produce physicians who will be among the leaders in their chosen field, whether it be in the basic medical sciences, academic clinical medicine, or medical practice in the community. Belief in the maturity and responsibility of students is emphasized by creating a flexible program through anonymous examinations and the elimination of grades in pre-clerkship courses, and by encouraging independent study and research.

Educational Philosophy: The Yale System

The Yale System of Medical Education remains unique among medical schools. It has been an important part of life at the Yale School of Medicine since 1931. Although it has undergone modifications in the intervening years, its essential spirit has remained intact, and it is a major reason why many students choose to come to Yale for their medical education.

The fundamental element of the system is the concept that Yale medical students are mature individuals, strongly motivated to learn, requiring guidance and stimulation rather than compulsion or competition for relative standing in a group. The corollary of this concept is that students must assume more than usual responsibility for their education. Students should be considered adults in a graduate school and be permitted to enjoy as much freedom as is consistent with the fulfillment of requirements for the degree of Doctor of Medicine. Memorization of facts should be far less important than a well-rounded education in fundamental principles, training in methods of investigation, and the acquisition of the scientific habit of mind.

During the pre-clerkship years, the students acquire knowledge and develop clinical skills. In the integrated basic and clinical science courses, lectures are held to a minimum, and there is a focus on interactive learning in small-group workshops and conferences. Students are evaluated through examinations that they take anonymously. Performance is assessed by the faculty based upon participation in small-group sessions, by anonymous qualifying examinations at the end of each course, and by passing of the United States Medical Licensing Examinations. Competency in performing a complete history and physical examination is assessed at the end of the pre-clerkship period using standardized patients in an observed structured clinical examination (OSCE). Student attendance is expected in all skill- and team-building sessions.

In the pre-clerkship period (first eighteen months) there are no grades, and there is no class ranking throughout medical school. While grades are not given and rank order not established, evaluation of students is an important part of the educational process. The faculty considers small-group teaching with formative feedback interchanges between faculty and students to be the most effective means of teaching and evaluation. Students should expect direct questioning in workshops and labs as an important adjunct to the evaluation process. The final decision of acceptable performance for a given course or clerkship is determined by the course/clerkship director based upon the successful completion of the assessments described above. Freed from the usual anxieties provoked by high-stakes summative examinations, students tend to learn for their future rather than for tests. Competition for grades is eliminated and students are eager to help one another. Class spirit is remarkably high year after year. Upon completing a course, all students are expected to submit a programmatic evaluation so that course/clerkship directors can make changes based on student feedback.

Finally, the Yale System requires each student to design, carry out, and successfully complete a research thesis, intended to foster the development of a lifelong commitment to learning (see Required Thesis, in the chapter Degree Programs).

Pre-Clerkship Curriculum

The entering class in fall 2015 (Class of 2019) will begin the Yale School of Medicine's new curriculum. The first eighteen months of the new curriculum focus on providing students with a foundation in the basic and clinical sciences and the art of medical practice. During this period, students engage in eleven Integrated Courses and the Clinical Skills Program. The course work includes eight integrated master courses (Introduction to the Profession, Scientific Foundations, Genes and Development, Attacks and Defenses, Connection to the World, Homeostasis, Energy and Metabolism, and Across the Lifespan); and three longitudinal courses: (Ethics, Professionalism, and Health Care Systems; Human Anatomy; and Scientific Inquiry).

The Clinical Skills Program (CS) introduces students to the principles and skills of medical interviewing and physical examination. CS course sessions and tutorials meet weekly and provide an opportunity for students to observe and develop clinical skills. In addition to didactic sessions, this course provides weekly opportunities throughout the first year and a half for students to see patients and practice skills under the observation of a clinical tutor. During clinical tutorials, groups of four students work closely with a clinician to practice performing clinical histories and physical exams. Students will also have the opportunity to participate in a pilot program, the Longitudinal Clinical Experience, where students will work in interprofessional teams in a clinical setting to practice clinical skills in lieu of the clinical tutorials program.

Current second-year students (Class of 2018) will continue with the former curriculum in their second year. The courses and modules in this year emphasize abnormal human biology and pathophysiology. During the fall term, the major courses are Epidemiology and Public Health, Medical Microbiology, and Pharmacology. Instruction in pathology for the second year builds on the content learned in the first year in a series of Pathology Tutorials that are spread across the second year. Throughout the year, students participate in a large interdisciplinary course, The Modules. In the modules, content from the disciplines of pathology, pathophysiology, pharmacology, clinical examination, laboratory medicine, and diagnostic radiology is integrated and taught in the context of organs and systems. The individual modules are Blood/Hematology, Cardiovascular, Clinical Neurosciences, Clinical Sciences of Psychiatry, Digestive, Endocrine, Musculo-Skeletal, Oncology, Ophthalmology, Renal and Urinary Tract, Reproductive Medicine, Respiratory, and Skin/Dermatology. Teaching the art of medicine continues throughout the second year in the Pre-Clinical Clerkship (Clinical Skills Program), which emphasizes developing advanced skills in history taking, clinical reasoning, and physical examination. Students will continue to meet in small groups with their clinical tutors. In the second year, students are assessed on their acquired clinical skills utilizing a two-case Observed Structured Clinical Exam (OSCE).

Pre-Clerkship Requirements

In order to proceed to the clerkship year, a student must satisfy the following requisites:

1. Pass the mandatory qualifying examinations for all first- and second-year courses.
2. Pass the Pre-Clinical Clerkship (Clinical Skills) course by attending all didactic, tutorial, or Longitudinal Clinical Experience (LCE) sessions.

3. Achieve clinical competence (as ascertained by the OSCE assessment).
4. Comply with all immunization requirements.
5. Evaluate all of the basic science required courses and modules.

The Clerkship Year

CLINICAL CLERKSHIPS

The class entering their clerkships in June 2015 (Class of 2017) will begin the new clerkship curriculum, which consists of four twelve-week integrated clerkship blocks:

- The Medical Approach to the Patient (Internal Medicine and Neurology)
- The Surgical Approach to the Patient (Surgery and Emergency Medicine)
- Women's and Children's Health (Obstetrics & Gynecology and Pediatrics)
- Primary Care and Psychiatry (Ambulatory Internal Medicine, Psychiatry, Family Medicine, Pediatrics, Obstetrics & Gynecology)

Clerkship scheduling will be arranged through the registrar in the Office of Student Affairs. There is no required order for taking clerkships, and there is no advantage to any particular order. Students are required to complete and pass all clerkships before proceeding to the Advanced Clinical Training and Research period.

Advanced Clinical Training and Research

The final phase of the curriculum includes a time of maximum flexibility and choice for students to engage in a variety of clinical electives and subinternships, research, thesis preparation, and residency preparation.

The Office of Student Affairs holds a meeting in the spring of the third year to discuss the fourth year. The meeting is focused on the National Residency Matching Program (NRMP), Electronic Residency Application Service (ERAS), and the Medical Student Performance Evaluation (MSPE), also known as the dean's letter. Scheduling subinternships, electives, and the thesis requirements are also addressed.

Graduating students are required to submit a thesis plan to the Office of Student Research prior to fall registration of their final year. Students must provide a tentative thesis title as well as identify their major activities of the fourth year.

Clinical Skills Assessment (UConn 4) Requirements

It is important to have a formal assessment of clinical skills to determine whether students have achieved the required level of competence in history taking, physical examination, communication, and clinical reasoning.

For Yale medical students, this formal assessment occurs in the clinical skills facility at the University of Connecticut. Students evaluate simulated patients, who portray patients with common clinical presentations, and rate the performance based on checklists and rating scales. All encounters are videotaped. Passing standards are determined with accepted procedures.

If a student fails the assessment, he or she meets with a member of the Yale Skills Assessment Team to review his or her performance based on established criteria and create an action plan for improvement. The student then returns to UConn for reassessment in six to eight weeks.

POLICY

1. Students must demonstrate competence in clinical skills, determined by passing the UConn 4 assessment, as a requirement for graduation.
2. UConn 4 is offered in the months of May, June, and July. Students will be scheduled to take it in one of those months as close to the completion of their clerkships as possible, recognizing that some students such as those who have postponed a clerkship will have to take the assessment before they have completed all of their clerkships.
3. If a student fails on his or her first attempt, the student and his or her academic adviser are notified and a plan is made for remediation. Two additional attempts to pass within the next twelve months are permitted.
4. Failure on three attempts results in dismissal. Based on extraordinary circumstances, the Progress Committee may direct the Clinical Skills Assessment Committee (CSAC) to independently evaluate the student's clinical skills, drawing upon observations in the two recent remediation periods and, if needed, new assessments. If the CSAC confirms insufficient clinical skills, the student will be dismissed. On the contrary, if the CSAC determines that the student demonstrates a minimum competence in clinical skills, the student will be credited for this graduation requirement.

United States Medical Licensing Examinations (USMLE) Requirements

USMLE STEP I

The Office of Student Affairs holds a USMLE Step I Fair and informational session in October. Students may apply for the USMLE online at the NBME (National Board of Medical Examiners) Web site at www.nbme.org. Information on how to register for the USMLE examination is available online at http://medicine.yale.edu/education/osa/registrar/Copy_of_index.aspx. The United States Medical Licensing Examination (USMLE) Steps I, II Clinical Knowledge, and III are computer-administered at Prometric Testing Centers. This system has given students considerable flexibility over choice of test time and place. Students should consult the USMLE Web site for more information (www.usmle.org).

Matriculation on or before 2014 All students are required to sit for Step I of the United States Medical Licensing Examination for the first time by December 31 of the third chronological year of medical school, but students are strongly encouraged to take it before starting clinical clerkships in June of the third year.

Matriculation on or after 2015 All students are required to sit for Step I of the United States Medical Licensing Examination for the first time by December 31 of their fourth year of medical school, but students are strongly encouraged to take it after they complete their clinical clerkships.

USMLE STEP II

Passing USMLE Step I and both parts of Step II is required for graduation from Yale School of Medicine.

The written Step II exam is called Step II Clinical Knowledge (Step II CK). Step II CK must be taken by December 31 of the final year, and it is strongly recommended that

students take it early in the fourth year immediately after completing the clinical clerkships, when the information is fresh. Like Step I, this computer-based exam is administered at Prometric Test Centers throughout the world.

Step II Clinical Skills (Step II CS) is a separate, required component of Step II and must be taken by December 31 of the final year as well; but again, it is to the student's advantage to take it as soon as possible after completing the clinical clerkships. Utilizing standardized patients, this exam is administered at regionally located centers operating year-round. Information on how to register for the USMLE examination is available online at http://medicine.yale.edu/education/osa/registrar/Copy_of_index.aspx

It is the student's responsibility to ensure that both parts of USMLE Step II are scheduled and taken by December 31. Disregarding this requirement is considered an unprofessional response and may be considered by the Progress Committee in deciding whether a student has satisfactorily completed the requirements to graduate. If a student schedules the exams but then fails to take them as scheduled, the Progress Committee and the dean of the medical school will be notified. In addition, the student may be prevented from putting in a match list, or the residency programs to which the student has applied may be notified that the student, in addition to behaving unprofessionally, may be in jeopardy of not graduating on time to start residency.

FAILURE OF USMLE STEP I, II CK, AND STEP II CS POLICY

Any failure of Step I, Step II CK, or Step II CS will be brought to the attention of the Progress Committee and the student's academic adviser. In general, a student in good standing will be allowed three attempts to take and pass each of these examinations. The timing of the repeat exams should be determined in consultation with the academic adviser. If a student fails an exam three times, the Progress Committee will review the student's overall academic progress. Under extraordinary circumstances, the Progress Committee may permit a fourth attempt, but barring that permission, the student will be dismissed from the medical school.

If a student who fails one of these exams is also experiencing other academic difficulties, including issues related to unprofessional behavior or failure to progress through the clinical clerkships, or is already on academic probation, the Progress Committee will review the student's overall academic progress. The Progress Committee will then determine how many times and under what circumstances that individual may be permitted to repeat these exams, which may be fewer than three times.

Course Schedules, 2015–2016

CLASS MATRICULATING IN 2015

Integrated Course Curriculum (eighteen months)
Introduction to the Profession
Scientific Foundations
Genes and Development
Attacks and Defenses
Connection to the World
Homeostasis
Energy and Metabolism

Across the Lifespan
Ethics, Professionalism, and Health Care Systems
Anatomy
Scientific Inquiry: Biostatistics, Research Method, and Responsible Conduct of Research
Clinical Skills Program

CLASS MATRICULATED IN 2014

Epidemiology and Public Health
Medical Microbiology
Pathology: Pathological Basis of Human Disease (Tutorials)
Pre-Clinical Clerkship
Pharmacology: Mechanisms of Drug Action
Advanced Cardiac Life Support
Universal Precautions
The Modules (including Clinical Examination, Diagnostic Radiology, Laboratory Medicine, Pathology, Pathophysiology, and Pharmacology):
Blood/Hematology
Cardiovascular System
Clinical Neurosciences
Clinical Science of Psychiatry
Digestive Diseases
Endocrine Systems
Musculoskeletal System
Oncology
Ophthalmology
Renal/Urinary Tract (including Male Reproductive System)
Reproductive Medicine
Respiratory
Skin/Dermatology

CLERKSHIP YEAR (ALL CLASSES)

Four required clerkship blocks:

- The Medical Approach to the Patient (Internal Medicine and Neurology)
- The Surgical Approach to the Patient (Surgery and Emergency Medicine)
- Women's and Children's Health (Obstetrics & Gynecology and Pediatrics)
- Primary Care and Psychiatry (Ambulatory Internal Medicine, Psychiatry, Family Medicine, Pediatrics, and Obstetrics & Gynecology)

ADVANCED CLINICAL TRAINING AND RESEARCH

Students matriculating in 2015 Students are required to take one four-week subinternship, thirty-three weeks of scheduled clinical electives or research time, and the capstone course at the end of the fourth year. Students will also schedule time for the USMLE Step I, Step II CK, and Step II CS board examinations and for interviewing and residency preparation.

Students matriculating in 2013 and 2014 Students are required to take one four-week clinical subinternship or elective and the three-week capstone course. Students will also schedule time for the USMLE Step II CK and CS board examinations and for interviewing and residency preparation.

Students matriculating in 2012 or earlier Students are required to take the Primary Care Clerkship and the three-week capstone course. Students will also schedule time for the USMLE Step II CK and CS board examinations and for interviewing and residency preparation

Required Thesis

Yale is the only medical school with a long tradition requiring a dissertation based on original research. The M.D. thesis, a requirement since 1839, is an essential part of the curriculum, designed to develop critical judgment, habits of self-education, and application of the scientific method to medicine. The thesis requirement gives students the opportunity to work closely with faculty who are distinguished scientists, clinicians, and scholars. The investigation may have its origins in basic science or in clinical, laboratory, epidemiology and public health, or medicine and the humanities (medical ethics, history of medicine, etc.). A hypothesis must be defined, experimental methods developed, and data gathered to prove or disprove the hypothesis. Students are expected to use state-of-the-art methods appropriate for research and scholarship in each discipline. Stipends are provided for summer and all other short-term research periods (four deadlines throughout the year). In addition there are many national (Howard Hughes Medical Institute, National Institutes of Health, Doris Duke Charitable Foundation, Sarnoff Foundation, American Heart Association) and Yale-sponsored one-year research fellowships available. Conduct of the research is begun in the summer following the first year and is continued during free periods in the third and fourth years, often over vacations. A significant percentage of students (currently 55 percent of Yale medical students) elect to take an additional year of medical school to pursue their research projects in greater depth, but this is not a requirement. These students are eligible for a joint M.D./Master of Health Science (M.H.S.) if all requirements for the joint degree are fulfilled.

A doctoral dissertation in the biological sciences previously accepted as a part of the requirements for the Ph.D. degree may be submitted in lieu of a School of Medicine dissertation at the discretion of the director of the Office of Student Research and the Thesis Committee. Information about the thesis and research opportunities and funding may be obtained from the Office of Student Research, at 203.785.6633 or on its Web site, http://medicine.yale.edu/education/osr.

JOINT ACADEMIC PROGRAMS

Students from the Yale School of Medicine accepted into another Yale degree program will be considered to be participating in a "Joint-Degree Program" and will receive the benefit of sharing tuition between the medical school and the other program's school so that each program gives up a half-year of tuition. For example, a student accepted to the M.D./J.D. Program will pay three and one-half years' tuition to the School of Medicine and two and one-half years' tuition to the Law School, completing seven years of school

in six. This arrangement holds for Yale schools only. A student wishing to create such an arrangement at a school outside of Yale must receive permission from the associate dean for student affairs at the School of Medicine and, of course, must have the consent of the other school.

School of Medicine students enrolled in a joint-degree program or in a program to obtain a degree at another school must complete three years in the School of Medicine and pass Steps I and II of the USMLE before beginning in the other program.

M.D./Ph.D. Program

A limited number of highly qualified students will be admitted into the M.D./Ph.D. Program each year. Students accepted into this program have an excellent academic record and a strong motivation toward a career in academic medicine and the biomedical sciences, and will have had previous research experiences of a high caliber.

The goal of the M.D./Ph.D. Program at Yale School of Medicine is to train physician-scientists and provide them with a broad exposure to human biology and medicine and to an in-depth and rigorous training in one of the scholarly disciplines relevant to medicine. It is expected that these individuals will develop into academic physicians capable of assuming faculty positions in either basic science or clinical departments of schools of medicine, and in these positions will provide leadership in academic medicine and in research related to medicine and human welfare.

The joint-degree program is intended for students who wish to obtain a research degree in an established Ph.D. program. Participating in the M.D./Ph.D. Program are the School of Public Health and the departments of Biomedical Engineering; Cell Biology; Cellular and Molecular Physiology; Chemistry; Experimental Pathology; Genetics; Immunobiology; Medical Anthropology; Microbiology; Molecular Biophysics and Biochemistry; Molecular, Cellular, and Developmental Biology; Neurobiology; Neuroscience; and Pharmacology. Students interested in taking the joint degree in another department may do so, provided they can work out, in advance, a program that is approved by the department concerned, the director of the M.D./Ph.D. Program, the dean of the School of Medicine, and the dean of the Graduate School.

Applicants to the M.D./Ph.D. Program should be U.S. citizens or permanent residents. Applications by foreign nationals will be considered on a case-by-case basis. All applicants selected for admission currently receive support from the program for stipend, tuition, and health fees for a maximum of five years. Funding is provided largely by the Medical Scientist Training Program (MSTP), a grant provided from the National Institute of General Medical Sciences. Continuing in the program is contingent on satisfactory progress in both the School of Medicine and the Graduate School. The average length of time students spend completing the requirements for the M.D./Ph.D. Program is seven and one-half to eight years.

REQUIREMENTS OF THE M.D./PH.D. PROGRAM

Students who have matriculated at Yale School of Medicine and are interested in applying to the M.D./Ph.D. Program should meet with Dr. Barbara Kazmierczak to discuss the internal application process. An important consideration for admission to the M.D./Ph.D. Program is an adequate research experience. This will be assessed on a case-by-case

basis. It may be necessary to complete a summer (or the equivalent in time) of research in a lab at Yale for an application to be considered. Applications for admission are reviewed by a special committee composed of faculty members from both schools.

Candidates for M.D./Ph.D. degrees will normally begin their thesis research after completing the first four and one-half terms of the School of Medicine curriculum. For example, students usually complete a series of clinical rotations at the end of the second year of medical school that will enable them to participate in longitudinal clinical experiences during their Ph.D. years; students following this schedule are expected to affiliate with a graduate program by the beginning of the third year of the program. During the first and second years of medical school, the majority of M.D./Ph.D. students take, for credit, graduate-level courses primarily designed for them. These courses supplement the core medical school curriculum and can be applied toward the course requirements of the student's chosen Ph.D. program. The summer between the first and second years is spent in lab rotation(s), the purpose of which is to orient students in the selection of a thesis mentor and research area. However, students must request affiliation with a particular department in the Graduate School by the middle of their third year of study in the joint-degree program. Any exceptions must be approved by the director of the M.D./Ph.D. Program and the dean of the Graduate School.

A student admitted to the combined-degree program must satisfy the Graduate School Honors requirement by the end of the second year of study and must complete all remaining predissertation requirements within four terms of affiliation with the Ph.D. department. These include course requirements, teaching requirements if applicable, a departmental qualifying examination, and the submission of an approved prospectus. At that point, the student is then admitted to candidacy. Students in the M.D./Ph.D. Program must be admitted to candidacy one full year before they expect to be awarded the Ph.D. degree. An average of three to four years is spent completing the Ph.D. requirements.

The remainder of the program encompasses clinical clerkships and electives. This advanced clinical work is best incorporated in the first six months of the student's third year and the last year of the program, after the doctoral dissertation has been submitted. Only under unusual circumstances will students be allowed to take more than six months of clerkships prior to the beginning of their Ph.D. work. Students are encouraged to take at least the eight-week Internal Medicine Clerkship and one other clerkship prior to beginning their research, which will enable them to participate in outpatient clinical activities during their dissertation work.

The Ph.D. dissertation will be accepted as the thesis requirement for the School of Medicine, providing the Ph.D. degree is received before or at the same time as the M.D. degree. If the M.D. degree is to be awarded before the Ph.D., an approved thesis must be submitted to the Office of Student Research at the School of Medicine by May 1 in order to meet the School of Medicine thesis requirement for graduation. Students will be eligible for the M.D. and Ph.D. degrees, provided the degree requirements for both the School of Medicine and the Graduate School have been fulfilled, usually at the end of seven years. If requirements have not been completed, additional time will be required.

Joint M.D./Master of Health Science (M.D./M.H.S.)

Yale School of Medicine has established a joint degree, the M.D./Master of Health Science (M.D./M.H.S.), for students completing a competitively funded full fifth year of research and other requirements. This program was approved by the Yale Corporation in January 2006.

There are two pathways to the M.D./M.H.S. degree for medical students: a clinical research pathway and a laboratory/translational research pathway. The M.D./M.H.S. degree is centered around a fifth-year pull-out supported by a fully funded one-year medical student research fellowship at Yale (currently funded by the Doris Duke Charitable Foundation, the Howard Hughes Medical Institute-Yale Program, Yale NIH TL1 grant, NIH-NIDDK fellowships, and Yale Endowment Fellowships).

The independent research project in the fifth year is the centerpiece of the M.D./M.H.S. degree program. In addition the following requirements apply:

1. The project mentor and a three-person thesis committee must be approved by the Office of Student Research and the M.D.-Master of Health Science Advisory Committee.
2. Additional course work is required:
   a. Clinical research pathway — Courses: Principles of Clinical Research; Introduction to Biostatistics; Organization and Leadership; Responsible Conduct of Research (during master's year)
   b. Laboratory/translational research pathway — Courses: Intensive Pedagogical Experience in Techniques and Strategies for Laboratory Research or Selected Seminars in Clinical and Translational Informatics; Introduction to Biostatistics; Organization and Leadership; Responsible Conduct of Research (during master's year)

      These courses can be taken prior to the research year or during the research year.

      Additional electives are also required.
3. Participation in monthly research-in-progress seminars, journal clubs, Leadership in Biomedicine Lecture Series and dinners, and other announced activities throughout the master's research year is required. Further information is available in the Office of Student Research or online at http://medicine.yale.edu/education/osr/mhs.

M.D./M.P.H. Program

Students enrolled for the M.D. degree at the School of Medicine may apply to the Yale School of Public Health for admission to a combined program leading to the degrees of Doctor of Medicine and Master of Public Health. This program (Advanced Professional Program) is designed for students with special interest in aspects of medicine dealing with biostatistics, epidemiology of acute or chronic disease, organization and management of health services, or aspects of preventive medicine and public health.

Normally the combined program requires five years of study. One thesis satisfies both degree requirements provided it is approved and carried out under the supervision of a faculty member of the School of Public Health and is in an appropriate subject area.

Applications for the M.P.H. portion of this combined degree program must be submitted through www.sophas.org. The SOPHAS application opens in the fall of each year, and medical students are encouraged to apply during their third year of study. The M.P.H. program is on rolling admissions, and the final application deadline is January 15. Medical students may contact the YSPH director of admissions at ysph.admissions@yale.edu or the director of the AP M.P.H. Program, Dr. Mayur Desai, for more detailed information regarding the curriculum and areas of study.

M.D./M.Div. Program

Students who have been admitted to the Yale School of Medicine and are enrolled for the M.D. degree may apply to the Divinity School for admission to a combined program leading to the award of the degrees of Doctor of Medicine and Master of Divinity. Students who apply to the joint M.D./M.Div. Program are expected to do so at the same time that they apply to the School of Medicine or by the end of their second year at the School of Medicine in order to qualify for the special tuition arrangement. Students enrolled in the program pay three and one-half years' tuition to the School of Medicine and two and one-half years' tuition to the Divinity School.

The joint program is tailored to the individual interests and needs of those students seeking professional education and training in a theological understanding of the self, society, and work; in bioethics; in international health and missions; in relating a ministry of healing to hospice or similar patient-care facilities; in a biblical understanding of person; or in academic work in teaching, counseling, and chaplaincy.

Six years are required for the combined M.D./M.Div. Program.

M.D./J.D. Program

The Yale School of Medicine has a formal relationship with the Law School to allow students to seek degrees from both schools. This can be done in six years instead of seven, as would be the case if these disciplines were studied separately. Students pay three and one-half years' tuition to the School of Medicine and two and one-half years' tuition to the Law School. Students interested in this program must confer early with the associate deans at both schools to plan curriculum and find out if they qualify for the special tuition arrangement.

Students who apply to the joint M.D./J.D. Program are expected to do so at the same time that they apply to the School of Medicine or by the end of their second year at the School of Medicine in order to qualify for the special tuition arrangement. Students must be found acceptable by both admissions committees. It is suggested that the student state on each application that he or she is applying to both schools in order to pursue the combined degree program.

M.D./M.B.A. Program

The purpose of the joint-degree program in medicine and management is to develop clinician-managers capable of pursuing careers that balance delivery of patient care with sound management in a changing health care environment. The joint-degree program normally requires five years of study and simultaneous award of the degrees of Doctor of Medicine and Master of Business Administration at the conclusion of the five-year

period. A joint-degree student pays three and one-half years' tuition to the School of Medicine and one and one-half years' tuition to the School of Management, in a pattern determined in advance by the two schools. Students interested in this program must discuss their intentions with the associate deans of student affairs at both schools and with Howard P. Forman, M.D., M.B.A., director of this joint-degree program.

SCHOOL OF PUBLIC HEALTH

The School of Public Health (YSPH) is an accredited school of public health where students may earn the Master of Public Health (M.P.H.) degree. The Doctor of Philosophy (Ph.D.) and Master of Science (M.S.) degrees in public health are awarded through the Graduate School of Arts and Sciences.

The M.P.H. degree program is available as a two-year program, an eleven-month program for individuals with a doctoral-level degree or for medical school students who have completed their third year in an accredited medical school in the United States, or a five-year joint B.A.-B.S./M.P.H. program with Yale College. See the YSPH Bulletin for details on each degree program.

THE YALE PHYSICIAN ASSOCIATE PROGRAM

The concept of a physician assistant (or Physician Associate) was first developed in 1965. Today the Physician Associate is a highly valued member of the health care team. Physician Associates are distinguished from other advanced health care practitioners by the extent to which they are given decision-making authority regarding patient care, diagnosis, and treatment. The twenty-eight-month Yale program, established in 1970, is committed to educating students for generalist medical practice. As of December 2014, the Yale Physician Associate Program has graduated 1,125 Physician Associates who are employed in a variety of settings throughout the nation. Graduates practice in rural as well as urban areas, in emergency rooms, health maintenance organizations, clinics, and solo and private practices. They possess a variety of skills, which enable them to take a medical history; perform a physical examination; diagnose illness and formulate patient treatment plans; counsel patients; perform medical procedures; and assist in surgery.

Mission of the Yale Physician Associate Program

The mission of the Yale School of Medicine Physician Associate Program is to educate individuals to become outstanding clinicians and to foster leaders who will serve their communities and advance the PA profession.

Curriculum Structure and Goals of the Yale Physician Associate Academic Program

The program is divided into a didactic phase of twelve months and a clinical phase of fourteen months. In addition, a research component is included in the clinical phase of the curriculum, with two one-month periods for research-related activities. The program provides a rich combination of medical courses and clinical experiences to ensure that Physician Associate students are prepared for their careers as professionals in interprofessional medical teams. Through problem-based learning, case studies, hands-on patient

care, and research, the Yale Physician Associate students are well prepared to join hospitalist teams and private practices in both primary care and specialties.

A Master of Medical Science (M.M.Sc.) degree is awarded upon completion of the program.

THE DIDACTIC PHASE

The first calendar year is devoted to course work in basic and clinical sciences. Courses include:
Anatomy I, II, III
Basic Science I, II, III
Behavioral Medicine I, II, III
Clinical Medicine I, II, III
Clinical Practicum
Diagnostic Studies I, II, III
History Taking and Physical Examination I, II, III
Pharmacology I, II, III
Preparing Future PA's I, II, III
Research I, II, III

THE CLINICAL PHASE

Each student completes fourteen four-week rotations, in a variety of medical specialties, in order to acquire broad experiences in primary, emergency, and surgical care. Two additional four-week blocks during the clinical phase are reserved as research/thesis months. Ten rotations are mandatory: Internal Medicine I, Internal Medicine II, General Surgery, Primary Care I, Primary Care II, Psychiatry, Pediatrics, Obstetrics and Gynecology, Geriatrics, and Emergency Medicine. The remaining four rotations are reserved for subspecialty electives.

Although many rotations are in the New Haven area, the experience of the student is expanded by exposure to rotations in other geographic settings. Consequently, students entering the program should expect to spend at least four weeks outside of New Haven or Connecticut. Students provide their own transportation and housing for all rotations away from New Haven. Students may also choose to broaden their experience by applying for international rotations. Students have chosen clerkships in China, Spain, Uganda, and Peru.

In order to graduate from the program, a student must successfully complete all rotations, summative evaluation using standardized patients, a written examination, and a thesis proposal. The thesis proposal must present a rationale for the topic of study, a comprehensive literature review, and a detailed description of the methodology to be used. A Yale School of Medicine faculty adviser serves as a thesis mentor to each student.

MANDATORY ROTATIONS

Emergency Medicine
General Surgery
Geriatrics
Internal Medicine I
Internal Medicine II
Obstetrics and Gynecology
Primary Care I
Primary Care II
Pediatrics
Psychiatry

ELECTIVE ROTATIONS

Ambulatory Medicine
Anesthesiology
Cardiology
Cardiothoracic Surgery
Dermatology
Diagnostic Imaging/Radiology
Gastroenterology
Gynecologic Oncology
Hematology
Hospitalist Medicine
Infectious Disease
International Medicine
Interventional Radiology
Medical Intensive Care
Neonatology
Nephrology
Neurology
Neurosurgery
Occupational and Travel Medicine
Oncology
Ophthalmology
Orthopedics
Otolaryngology
Pediatric Cardiology
Plastic Surgery
Surgical Intensive Care
Thoracic Surgery
Transplant Surgery
Trauma Surgery
Urology

Tuition and Fees

Tuition for the Physician Associate program for the 2015–2016 academic year is $37,440 for first- and second-year students, and $12,450 for third-year students. Fees and other expenses—including books, supplies, and equipment; room and board; personal expenses and transportation; Yale Health Hospitalization coverage; and travel to rotations—are estimated at an additional $28,575 for first-year students, $29,735 for second-year students, and $10,050 for third-year students. For more information, see http://medicine.yale.edu/pa/life/tuition.aspx.

Admission to the Yale Physician Associate Program

The admissions process is highly selective and the competition each year is keen. Selection is based on three fundamental criteria: academic history, patient care experience, and interpersonal effectiveness. For additional information regarding admissions, please visit the PA Program Web site at http://medicine.yale.edu/pa.

ACADEMIC

Students must have a baccalaureate degree prior to commencing the program. The Admissions Committee closely examines applicant records for evidence that individuals are capable of successfully completing graduate-level science work. An undergraduate science major is not required, but applicants must have completed, prior to application, the following prerequisites: one semester of statistics or calculus, one semester of organic or biochemistry, one semester of anatomy with or without lab, one semester of animal or human physiology, one semester of microbiology, and one semester of genetics. A cumulative science grade point average of 3.0 is required. The program considers Graduate Record Exam (GRE) scores (required) and performance in science courses as indicators of academic ability in light of applicants' past records.

EXPERIENCE

Applicants must have some awareness of the intricacies of medical care delivery as it exists today and demonstrate their commitment to a profession that helps the sick and injured. The majority of the PA Program's students have had one year of direct patient contact experience in a variety of health care roles such as orderly, nurses' aide, military corpsman, nurse, surgical technician, or emergency medical technician. Experience need not be in a hospital setting. One thousand hours of direct, hands-on patient care experience is recommended to be considered for admission.

INTERPERSONAL

The program values ability to work skillfully, thoughtfully, responsibly, and constructively with people. The Admissions Committee screens applicants to determine their career commitment, interpersonal skills, and willingness to work with the supervision of a physician.

In addition to scholastic potential and interpersonal skills, applicants must have the physical capacities and personal characteristics necessary to meet the full requirements of the program's curriculum and to graduate as skilled and effective physician assistants. Policy on nonacademic considerations is outlined in our Technical Standards, which are available on the Web site.

APPLICATION FOR ADMISSION

The application deadline for the class entering in August 2016 is October 1, 2015. Program information is available on the PA Program Web site, http://medicine.yale.edu/pa. Online applications for admission are processed through the Centralized Application Service for Physician Assistants (CASPA) at www.caspaonline.org. The program also requires a supplemental application.

M.M.Sc./M.P.H. Joint-Degree Program

The M.M.Sc./M.P.H. joint-degree program at Yale School of Medicine affords individuals interested in pursuing clinical and public health training a unique opportunity to complete both degree programs in thirty-nine months. The goal of this program is to expose students to the core competencies needed for shaping both local and global health systems as physician assistants and policy makers. Students must choose the area of academic concentration for the public health portion of their training from among the following: Epidemiology of Microbial Diseases, Chronic Disease Epidemiology, Social and Behavioral Sciences, and Health Policy.

Applicants must apply for admission and be accepted to both the Physician Associate Program and the Yale School of Public Health during the programs' admissions cycles. Although the deadline for application to the School of Public Health is January 15, individuals interested in the joint-degree program should apply to the PA Program and the School of Public Health as early as possible. For individuals granted an interview with the PA Program, the School of Public Health will expedite the review of the application.

Tuition and fees are billed to the student by the corresponding school during matriculation. Satisfactory academic progress is required for continued matriculation in both schools. Only students who have begun their studies at Yale are eligible for the joint degree.

CERTIFICATE IN GLOBAL MEDICINE

The Certificate in Global Medicine is awarded upon graduation to Yale School of Medicine students who demonstrate competence in global health and provides recognition that a student has completed required didactic course work, scholarly work, international clinical experience, and language, culture, and leadership activities relevant to global health. This certificate allows students to develop expertise and prepares students for leadership in global health by providing the knowledge, skills, and attitude essential for success in this field. In addition to directly benefiting students at Yale, this program will establish the Yale School of Medicine as a model for excellence in global health education. Requirements for earning the certificate can be completed over four (or five) years, while maintaining flexibility in terms of both the timing and content of these opportunities. It is expected that students pursuing the certificate will engage with the community of practitioners and scholars working on global health at Yale and around the world. International field experience in global health is an integral part of the program.

Additional information is available at http://medicine.yale.edu/globalhealth/yale/global-certificate.aspx.

Expenses and Financial Aid

TUITION AND SPECIAL FEES

Tuition for candidates for the M.D. degree (per academic year)	$55,680
Yale Health Hospitalization coverage (includes prescription coverage)	$2,102

Examination fees for candidates for the M.D. degree, United States Medical Licensing Examination:	*2015*	*2016*
Step I	$590	$600
Step II – Clinical Knowledge	$590	$600
Step II – Clinical Skills	$1,250	$1,260

Student accounts, billing, and related services are administered through the Office of Student Financial Services; see Student Accounts and Bills, below.

Students must pay four full years of tuition. Students who spend five years in medical school at Yale either take a fifth year to do extended study or may request to take a leave of absence. Both require the approval of the associate dean for student affairs.

Tuition payment options for fifth-year students (Extended Study) (1) pay full tuition for four consecutive years and a registration fee for the chronological fifth year; (2) pay split tuition and the registration fee over a two-year period. Students will pay one-half of the current rate of tuition and one-half of the registration fee each year. The total amount will be charged in two installments, for each term; (3) students enrolled in a joint-degree program at another Yale professional school will pay the required tuition of the other degree program to that school and no tuition or registration fee to the School of Medicine. Students will pay the required amount of tuition to the School of Medicine in the next academic year. Students will apply for financial aid at the other school; (4) students enrolled in a dual-degree program at an away institution will pay the required tuition of the other degree program to the away school and pay the registration fee to the School of Medicine. Students will pay full tuition to the School of Medicine in the next academic year. Students will apply for financial aid at the away institution.

Tuition payment options for students who take a leave of absence Students who take a leave of absence pay a registration fee for the year(s) on leave. They pay full tuition for the four years they are in residence. If a student decides to begin his or her leave of absence in the middle of any year, he or she pays full tuition for that year and a registration fee for the following year.

The following tuition arrangements for joint-degree programs apply only if the student is enrolled at Yale University for both degrees. It is strongly suggested that students interested in any joint program make an appointment to speak with the registrar at each school to discuss the tuition payment schedule.

Students who spend five years in the School of Medicine in order to receive an M.D./M.P.H. joint degree pay four years of full tuition to the School of Medicine. In addition, they pay half of the School of Medicine tuition to the School of Public Health during the year in which they are enrolled in YSPH.

M.D./Ph.D. students pay three and one-half years' tuition to the School of Medicine and two and one-half years' tuition to the Graduate School of Arts and Sciences. If a student is in the program after six years, he or she pays a minimal registration fee to the school he or she is attending. (The student is responsible for his or her own health insurance.)

Students who apply to one of the joint M.D./J.D., M.D./M.B.A., or M.D./M.Div. programs at Yale are expected to do so at the same time that they apply to the School of Medicine or by the end of their second year at the School of Medicine in order to qualify for the special tuition arrangements. Students in the M.D./J.D. Program pay three and one-half years' tuition to the School of Medicine and two and one-half years' tuition to the Law School. Students enrolled in the M.D./M.Div. Program pay three and one-half years' tuition to the School of Medicine and two and one-half years' tuition to the Divinity School. Students in the M.D./M.B.A. Program pay three and one-half years' tuition to the School of Medicine and one and one-half years' tuition to the School of Management.

If a student is asked to repeat one or more years of course work because of academic failure in curriculum requirements, he or she pays full tuition for each additional year of study.

Enrollment in courses in other schools at the University may subject the student to additional fees.

First-year students should anticipate a cost of $78,965, including tuition, for necessary expenses in an academic year. Married students and/or students with dependents have a federally established standard maintenance allowance deducted from their income.

First-year students may wish to purchase some of their equipment, such as an ophthalmoscope. Each medical student must have special equipment for individual courses.

All students are required to pay a $540 Activity Fee. If a student is enrolled beyond the fourth year, a $270 Activity Fee is charged. All students are required to pay an annual $425 Technology Fee.

Upperclassmen are reminded that they should anticipate the expenses of travel for interviews related to internship applications and also the cost of binding their theses.

STUDENT ACCOUNTS AND BILLS

Student accounts, billing, and related services are administered through the Office of Student Financial Services, which is located at 246 Church Street. The telephone number is 203.432.2700, or visit www.yale.edu/sfs/contactus.

Bills

Yale University's official means of communicating monthly financial account statements is through the University's Internet-based system for electronic billing and payment, Yale University eBill-ePay. Yale does not mail paper bills.

Student account statements are prepared and made available twelve times a year at the beginning of each month. Payment is due in full by 4 p.m. Eastern Time on the first business day of the following month. E-mail notifications that the account statement is available on the University eBill-ePay Web site (www.yale.edu/sis/ebep) are sent to all students at their official Yale e-mail addresses and to all student-designated authorized payers. From the eBill-ePay Web site, students can designate up to three authorized

payers to access the eBill-ePay system in order to view the monthly student account statements and make online payments.

Bills for tuition, room, and board are available during the first week of July, due and payable by August 1 for the fall term; and during the first week of November, due and payable by December 1 for the spring term. The Office of Student Financial Services will impose late fees of $125 per month (up to a total of $375 per term) if any part of the term bill, less Yale-administered loans and scholarships that have been applied for on a timely basis, is not paid when due. Nonpayment of bills and failure to complete and submit financial aid application packages on a timely basis may result in the student's involuntary withdrawal from the University.

No degrees will be conferred and no transcripts will be furnished until all bills due the University are paid in full. In addition, transcripts will not be furnished to any student or former student who is in default on the payment of a student loan.

The University may withhold registration and certain University privileges from students who have not paid their term bills or made satisfactory payment arrangements by the day of registration. To avoid delay at registration, students must ensure that payments reach Student Financial Services by the due dates.

Payments

There are a variety of options offered for making payments. Yale University eBill-ePay (www.yale.edu/sis/ebep) is the *preferred* means for payment of your monthly student account bill. The ePayments are immediately posted to the student account. There is no charge to use this service. Bank information is password-protected and secure, and a printable confirmation receipt is available. On bill due dates, payments using the eBill-ePay system can be made up to 4 p.m. Eastern Time in order to avoid late fees.

For those who choose to pay the student account bill by check, remittance advice with mailing instructions is available on the eBill-ePay Web site. All bills must be paid in U.S. currency. Checks must be payable in U.S. dollars drawn on a U.S. bank. Payments can also be made via wire transfer. Instructions for wire transfer are available on the eBill-ePay Web site.

Yale does *not* accept credit card payments.

A processing charge of $25 will be assessed for payments rejected for any reason by the bank on which they were drawn. In addition, the following penalties may apply if a payment is rejected:

1. If the payment was for a term bill, a $125 late fee will be charged for the period the bill was unpaid.
2. If the payment was for a term bill to permit registration, the student's registration may be revoked.
3. If the payment was given to settle an unpaid balance in order to receive a diploma, the University may refer the account to an attorney for collection.

Yale Payment Plan

The Yale Payment Plan (YPP) is a payment service that allows students and their families to pay tuition, room, and board in ten equal monthly installments throughout the year based on individual family budget requirements. It is administered by the University's

Office of Student Financial Services. The cost to enroll in the YPP is $100 per contract. The deadline for enrollment is June 25. For additional information, please contact Student Financial Services at 203.432.2700 and select "Press 1" from the Main Menu. Details concerning the Yale Payment Plan are available at www.fc.campusoncall.com/ypp/intro.asp.

FINANCIAL AID

Yale University recognizes the increasing cost of acquiring a medical education and wants students to pursue their medical studies at Yale as free of financial concerns as possible. Therefore, since the amount of funds available to the School is limited, and in order to meet the financial needs of students in a fair and equitable manner, the method for determining the financial aid for individual students is as follows.

In the spring of each year the budgets for students are established. These budgets include all projected expenses, including tuition, books and supplies, health insurance, personal and transportation, technology fee, student activity fee, and living expenses. They do not include the cost of purchasing, maintaining, or insuring an automobile.

The Federal Selective Service law was amended in 1982 to provide that no student receive Title IV funds (Federal Direct Unsubsidized Loan) unless he or she has executed a Statement of Registration Compliance (SRC) that either confirms that the individual has registered for Selective Service or states the reason why he or she is not required to do so. Because most of the school's financial aid awards include funds from at least one Title IV program, failure to execute a Statement of Registration Compliance will render students ineligible for that portion of the financial aid award that would normally be provided through these programs. Students for whom this law presents special problems, and who are subject to Selective Service, should consult the financial aid officer.

All student financial assistance is need based. The amount of the budget considered the student's responsibility is determined using the Free Application for Federal Student Aid (FAFSA) and the Need Access Application, and includes money from the student's own resources (assets, salaries, etc.), from the spouse and/or fiancé's income, when applicable, and from a parent contribution. The difference between the amount for which the family is responsible and the basic budget constitutes the financial support for which each student is eligible.

The availability of financial aid is dependent on a student's status.

(a) Full-Time. An individual who has matriculated at this school and is pursuing a full course of studies as outlined in this catalogue is a full-time student. This includes the required basic science courses in the first and second years and the required clinical clerkship in the third year. In addition, during the fourth year the student works on and completes a required thesis, and completes an adviser-approved schedule of electives. This student is charged full tuition, and financial aid is available if the student completes all the necessary forms and a need for aid has been determined.

(b) Leave of Absence. No financial aid is available to students not attending classes or working toward the requirements of the M.D. degree at Yale or elsewhere. This student is charged a registration fee. If a student is studying at another Yale graduate or professional school, that student is charged tuition by the school he or she is attending.

(c) Extended Study. A student who is not taking a full course load but is attending at least one class at Yale, or elsewhere, and/or is doing research toward the thesis

requirement is charged a registration fee and is eligible for financial aid only in the form of a Federal Direct Student Loan. Students on leave of absence or extended study programs may have this option for only one year unless there are exceptional circumstances. Students must be back in school full time at the end of one year.

(d) Satisfactory Academic Progress. In order to be considered eligible for any type of financial assistance, a student must be in good academic standing and making satisfactory progress. At appropriate evaluation intervals, the student must be approved for continued enrollment by the Progress Committee of the School of Medicine. It is this committee's responsibility to require a student to finish incomplete work and/or complete any required remedial study prior to advancement to the next academic year. If the student fails to finish incomplete work and/or remedial study within one year, the student is not considered in good standing and is ineligible for any type of financial aid. Students are expected to complete the requirements of the M.D. degree within four years. With the approval of the Progress Committee of the School of Medicine or the Office of Student Affairs, a student may remain up to six years.

When a student is no longer in residence and has failed to complete required course work needed to receive the M.D. degree, the student's enrollment status is in absentia to submit. Failure to complete requirements includes not completing the dissertation, not passing the USMLE Step I or Step II, or not satisfactorily completing a required clerkship. The student is not charged a tuition fee and is not eligible for any financial assistance, University services, and/or loan deferments. Once the student has completed all of the requirements for graduation, his or her name is presented to the Board of Permanent Officers and to the Yale Corporation for the awarding of the M.D. degree.

Consistent with student status, satisfactory academic progress, and available funds, the need for financial aid is met by: (1) loans, made up of monies from various loan sources, and (2) scholarship, when eligibility for financial aid is determined using a parent contribution. This includes scholarship money supplied directly to the student from non-Yale sources. The maximum scholarship awarded to a married student never exceeds the amount calculated for a single student with no resources. The total scholarship support for all students is, of course, limited by the availability of funds. Should scholarship need exceed the supply of funds, additional loans are made available.

It is the policy of the School of Medicine to abide by the FAFSA and Need Access calculation of the student's and parents' contribution.

Additional financial support in the form of loans, scholarships, or employment must be made known to the student financial aid officer and may result in a proportionate reduction of School support. If a student does not report changes, his or her financial aid file is subject to review by a Disciplinary Committee and all financial aid may be canceled and the incident reported.

Signed copies of parents' and student's (and spouse/fiancé's, if applicable) tax returns, including all schedules and W-2 forms or a statement of earnings for the previous fiscal year are required for all students applying for Yale Loans and Scholarships. Copies of Social Security benefits, unemployment compensation, and retirement benefits of both student and parents are also required. All information is verified in accordance with federal regulations. If the parents are divorced, the student must provide information on the custodial parent. The custodial parent will remain the same for all subsequent years; a

student cannot change custodial parents unless the original custodial parent dies. If the custodial parent is remarried, the stepparent's information is also required.

All information in individual student financial aid applications is strictly confidential and is used only for the purpose of determining and administering the student's aid.

It is understood that allocations of financial aid are held as binding commitments only insofar as the original data on which these allocations were based are correct.

For 2015–2016 all students who have a calculated loan need and who are U.S. citizens or permanent residents of the United States may borrow through the Federal Direct Unsubsidized Loan program. They may also receive a Yale Medical School Loan. The combination of these loans will cover a part of their educational expenses. These loans are normally repaid over a ten-year period beginning six months after borrowers complete their education.

Additional information concerning educational loans available to students of the School of Medicine may be obtained from the Student Financial Aid Office, Room 202, Edward S. Harkness Memorial Hall, 367 Cedar Street, or from our Web site at www.medfinaid.yale.edu.

TUITION REBATE AND REFUND POLICY

On the basis of the federal regulations governing the return of federal student aid (Title IV) funds for withdrawn students, the following rules apply to the rebate and refund of tuition.

1. For purposes of determining the refund of federal student aid funds, any student who withdraws from the School of Medicine for any reason during the first 60 percent of the term will be subject to a pro rata schedule that will be used to determine the amount of Title IV funds a student has earned at the time of withdrawal. A student who withdraws after the 60 percent point has earned 100 percent of the Title IV funds. In 2015–2016, the last days for refunding federal student aid funds will be October 26, 2015 (Year 1), October 29, 2015 (Year 2), and October 14, 2015 (Years 3 and 4) in the fall term, and April 2, 2016 (Year 1), May 14, 2016 (Year 2), May 11, 2016 (Year 3), and March 25, 2016 (Year 4) in the spring term.
2. For purposes of determining the refund of institutional aid funds and for students who have not received financial aid:
   a. 100 percent of tuition will be rebated for withdrawals that occur on or before the end of the first 10 percent of the term: August 28, 2015 (Year 1), September 4, 2015 (Year 2), and August 20, 2015 (Years 3 and 4) in the fall term, and January 17, 2016 (Years 1 and 4), January 24, 2016 (Year 2), and January 25, 2016 (Year 3) in the spring term.
   b. A rebate of one-half (50 percent) of tuition will be granted for withdrawals that occur after the first 10 percent but on or before the last day of the first quarter of the term: September 15, 2015 (Year 1), September 21, 2015 (Year 2), and September 6, 2015 (Years 3 and 4) in the fall term, and February 6, 2016 (Year 1), February 24, 2016 (Year 2), February 26, 2016 (Year 3), and February 7, 2016 (Year 4) in the spring term.

   c. A rebate of one-quarter (25 percent) of tuition will be granted for withdrawals that occur after the first quarter of the term but on or before the day of midterm: October 15, 2015 (Year 1), October 19, 2015 (Year 2), and October 3, 2015 (Years 3 and 4) in the fall term, and March 11, 2016 (Year 1), April 24, 2016 (Year 2), April 20, 2016 (Year 3), and March 12, 2016 (Year 4) in the spring term.
   d. Students who withdraw for any reason after midterm will not receive a rebate of any portion of tuition.
3. The death of a student shall cancel charges for tuition as of the date of death, and the bursar will adjust the tuition on a pro rata basis.
4. If the student has received student loans or other forms of financial aid, funds will be returned in the order prescribed by federal regulations; namely, first to Federal Direct Unsubsidized Loans, if any; then to Federal Perkins Loans; Federal Direct Graduate PLUS Loans; next to any other federal, state, private, or institutional scholarships and loans; and, finally, any remaining balance to the student.
5. Recipients of federal and/or institutional loans who withdraw are required to have an exit interview before leaving Yale. Students leaving Yale receive instructions on completing this process from Yale Student Financial Services.

This schedule applies only to the School of Medicine. Contact the School of Public Health and the Physician Associate Program for their schedules and policies.

SCHOLARSHIPS

All scholarships listed below are administered by the Financial Aid Office and are awarded to students based on need and interests. Students who apply for financial aid are automatically applying for these scholarships.

The Jan Paul Abshire Scholarship Fund Established in 2014 by Jonathan Abshire preference for veterans of the United States Navy, Air Force, Army, or Marines, or mid-career students who are studying epidemiology.

The Robert Campbell Adams and Claire Adams Scholarship Fund Established in 1981 by bequest from the Estate of Estelle B. Spinney in memory of her sister and brother-in-law, who graduated from Yale University with the Class of 1899. Preference given to students who plan to practice in rural areas.

The Ludwig Adler Scholarship Fund Established in 1981 by bequest from Hedwig (Mrs. Ludwig) Adler in memory of her husband. To be used for scholarships to needy men and women medical students.

The Arthur N. Alling Scholarship Fund Established in 1986 by bequest from Helen F. Alling in memory of her father, Arthur N. Alling. To be used for scholarships for women medical students.

The Edward Ames Scholarship Fund Established in 1940 by bequest from Edward Ames, M.D. 1874.

The Anonymous Public Health Scholarship Fund Established in 2014 by an anonymous donor to provide scholarships for students within the Yale School of Public Health with a preference for students interested in public health policy and law.

The Waldo Avery Scholarship Fund Established in 1979 by Waldo Avery, B.A. 1936.

The John Kenly Bacon Fund Established in 1994 by the Estate of Elsie L. Bacon in memory of her husband, John Kenly Bacon, Yale College Class of 1925, to provide scholarship assistance for worthy students attending the Yale University School of Medicine.

The Muriel Frances Hanley Bagshaw, M.D., Scholarship Established in 2000 by Malcolm A. Bagshaw, M.D. 1950, in memory of his wife, to assist one or more women students enrolled in the Yale University School of Medicine.

The Donald S. Baim, M.D. 1975, Scholarship Established in 2011 by Boston Scientific Corporation in memory of Donald S. Baim, M.D. 1975, to provide scholarship assistance for Yale School of Medicine students pursuing medical doctor degrees.

The Judson Bardwell, 1891 M.D., Memorial Scholarship Established in 1935 from a gift made in 1927 by Harry J. Bardwell, B.A. 1890, in memory of his brother.

The Horace D. Bellis Scholarship Fund Established in 1966 by bequest from Horace D. Bellis, M.D. 1907. Income to be used for scholarships to worthy students in the School of Medicine.

The Bigwood Memorial Fund Established in 2002 by bequest from the estate of Gertrude L. Bigwood, M.A. 1932, for student scholarships and/or loans to young students planning careers in the health care profession.

The Eugene M. Blake Fund Established in 1984 in a bequest by Eugene Maurice Blake, M.D. 1906, M.S. 1929. To provide scholarship funds for the benefit of a medical student.

The M. Grant Blakeslee Memorial Scholarship Established in 1966 by bequest from Catherine Woodruff Blakeslee in memory of her husband, M. Grant Blakeslee, Ph.B. 1912. To be used for scholarships for worthy students in the School of Medicine.

The Sanfurd G. Bluestein, M.D. 1946, Scholarship Established in 1996 on the occasion of his fiftieth reunion from Yale School of Medicine, to support upstanding medical students with need for financial aid.

The Bohmfalk Scholarship Fund The John Frederick Bohmfalk Scholarship Fund and the Alice Bohmfalk Scholarship Fund. For students planning careers in general practice or the equivalent.

The Harold D. Bornstein, Jr., MD '53, Medical Scholarship Established in 2011 by Harold D. Bornstein, Jr., M.D. '53, to provide scholarships for Yale School of Medicine students in good academic standing with need for financial aid.

The John E. Borowy, M.D. '50, and Ruth Borowy Scholarship Established in 2006 by the bequest of John E. Borowy, M.D. '50, to support students in the M.D. program with demonstrated need within the School of Medicine.

The Brace Ogilvie Financial Assistance Fund Established in 1997 by Donna Brace Ogilvie in honor of her husband John B. Ogilvie, B.S. 1931, M.D. 1934. The Fund supports scholarships for Yale School of Medicine students.

The David L. Brook, Class of 1945S, M.D. 1947, Memorial Scholarship Fund Established in 1995 through a gift of his family upon his death. Income to be used to assist worthy medical students who are in need of financial assistance.

The Victor Joseph Burner Scholarship in Medicine Established in 2003 by bequest from Victor Joseph Burner, B.A. 1959, M.D. 1965, to be awarded to any qualified students attending the Yale School of Medicine who meet the requirements for need-based financial aid.

The Edward Thomas Calhoun Scholarship Established in 1928 by Lida T. Calhoun in memory of her son, Edward Thomas Calhoun, M.D. post-obit 1927. For work in pathology.

The Robert E. Carroll, M.D., '38 B.A., '42 M.D. Yale School of Medicine Scholarship Established in 2007 with a gift from Robert E. Carroll, M.D., '38 B.A., '42 M.D., to provide scholarship assistance to a student, with preference given to a graduate of Yale University.

The Ettore Ciampolini Medical Scholarship Fund Established in 1968 by bequest from the Estate of Helen A. Ciampolini in memory of her late husband, Ettore Ciampolini, M.D., Ph.D. 1923. Income from the fund to be awarded to a deserving male student who is in need of funds to help pay his tuition.

The Class of 1944 Medical Student Scholarship Fund Established in celebration of the fiftieth reunion of the Class of 1944 Medicine, by all the members of the Class of 1944 Medicine. To provide scholarship assistance for the benefit of medical students.

The Class of 1948 Scholarship Established by members of the Class of 1948 Medicine, in honor of their fiftieth reunion, to provide financial aid to outstanding medical students who demonstrate need for support.

The Class of 1950 Endowed Scholarship Fund Established in 2001 by members of the Class of 1950 Medicine to provide scholarships to medical students.

The Class of 1954 Scholarship Fund Established in 2004 by members of the Class of 1954 Medicine, in honor of their fiftieth reunion, to provide support for medical students.

The Class of 1955 Scholarship Established in 2011 by David R. Kessler, M.D. '55, in honor of his classmates, to provide scholarships for Yale School of Medicine students pursuing an M.D. degree.

The Class of 1956 Scholarship Established in 2006 by members of the Class of 1956 Medicine, in honor of their fiftieth reunion, for students with demonstrated need for financial aid in the M.D. program.

The Class of 1957 Scholarship Established in 2007 by members of Yale School of Medicine's Class of 1957, in honor of their fiftieth reunion, to provide financial aid to outstanding medical students who demonstrate need for support.

The Class of 1958 Medical School Scholarship Established in 2014 by members of the Class of 1958 Medicine to provide scholarship support for one or more outstanding students in the M.D. program with need for financial aid.

The Class of 1959 Scholarship Fund Established by members of the Class of 1959 Medicine to provide financial aid to outstanding medical students who demonstrate need for support.

The Class of 1961 Medical School Scholarship Established in 2002 by members of the Class of 1961 Medicine to support medical students.

The Class of 1963 Scholarship Established in 2008 by members of the Class of 1963 Medicine in celebration of their thirty-ninth reunion for one or more outstanding students in the M.D. program with need for financial aid.

The Class of 1967 Memorial Scholarship Established in 2002 by members of the Class of 1967 Medicine in memory of their classmates.

The Class of 1972 Scholarship Fund Established in 1998 by members of the Class of 1972 Medicine, in honor of their twenty-fifth reunion, to provide scholarship support for one or more outstanding students in the M.D. program with need for financial aid.

The Sidney M. and Phyllis D. Cohen Scholarship Fund Established in 2012 by Sidney M. Cohen, M.D., for Yale School of Medicine students pursuing an M.D. degree.

The Jack W. Cole Scholarship Established in 2010 in memory of Dr. Jack W. Cole, founder of the Physician Associate Program at Yale, by his wife and family to provide scholarships for Yale School of Medicine students enrolled in the Physician Associate Program.

The Thomas J. Coleman III, M.D. and Bebette Gualano Coleman Scholarship Established in 2000 by Dr. and Mrs. Thomas J. Coleman III in support of scholarships for Yale medical students who plan a practice that will prohibit abortion and euthanasia.

The Courture Family Scholarship for Yale College/Public Health Established in 2012 by Peter J. Courture to provide scholarships to outstanding students, with a preference for students in the Yale B.A./B.S.-M.P.H. Program in Public Health or other Yale College graduates.

The Julian Czamanski Scholarship Established in 2002 by bequest from Julian Czamanski of Hamden, Connecticut, to be used for scholarships for students with financial need.

The Lycurgus M. Davey Scholarship Fund This endowed fellowship was established in 1986 as a gift from Lycurgus M. Davey, M.D. 1943. To be used for financial aid to gifted and needy medical students.

The Edwin P. and Eleanor H. Dawson Scholarship Fund Established in 1971 to be used for the benefit of medical students who are in need of financial assistance.

The Donabedian Family Term Scholarship Established in 2003 by Richard Kaspar Donabedian, M.D., in honor of his parents, Rose and Martin Donabedian, to support an incoming student of outstanding merit who will personify both scholarly achievement and other qualities of strong character and leadership potential.

The Franklin M. Doolittle and Frances C. Doolittle Scholarship Fund Established in 1959 by a gift from Franklin M. Doolittle, Ph.D. 1915. To be used to provide financial assistance to one or more needy and deserving students enrolled in the School of Medicine.

The Thomas H. and Mary Jones Drews Scholarship Established in 2003 by John A. Drews, M.D. 1967, in honor of his parents, to provide financial assistance each year to medical students.

The John Sinclair Dye Memorial Scholarship Established in 1971 by a gift from Lucy Wade Dye in memory of her husband, Dr. John Sinclair Dye. Income to be used for scholarships to worthy students in the School of Medicine.

The Richard N. and Catherine Foster M.D./Ph.D. Scholarship Established in 2012 by an anonymous donor. To provide scholarships and stipend support for medical students who are jointly pursuing the M.D./Ph.D. degrees at Yale. Preference is given to students planning to pursue careers as physician scientists making use of both their clinical and scientific training.

The Alvin E. Friedman-Kien M.D. 1960 Scholarship Established in 2006 by a gift from Alvin E. Friedman-Kien, M.D. 1960, to support outstanding students in the M.D. and/or M.D./Ph.D. program.

The Carl Gade Fund Established in 1955 by bequest from Carl Gade, M.D. 1910. To be used to provide assistance for needy and deserving students at the Yale University School of Medicine.

The J. Roswell Gallagher Scholarship Established by J. Roswell Gallagher, Yale College Class of 1925 and Yale School of Medicine Class of 1930, to provide scholarship assistance to medical students in need.

The John Currier Gallagher Memorial Scholarship Established in memory of John Currier Gallagher, Yale College Class of 1954 and Yale School of Medicine Class of 1958, by his parents and friends, to provide scholarship assistance to medical students in need.

The Anne G. K. Garland Memorial Scholarship Established in 1930 by gift from William J. Garland in memory of his wife. Awarded to students in the graduate and professional schools of the university who are chosen because of their ability, character, and promise of future usefulness and the quality of their work.

The Robert H. Gifford, M.D., Medical Scholarship Established in 2006 by students, colleagues, and friends of Dr. Robert H. Gifford, in honor of his retirement and to provide financial aid for outstanding medical students with the greatest need for support.

The Maurice H. Givens Scholarship Fund Established in 1974 by bequest from the Estate of Maurice H. Givens, Ph.D. 1909. Income to be used to provide scholarships for financially needy second-year medical students who have excelled in biochemistry.

The Gladys Godfried Scholarship Established in 2006 by bequest of Milton S. Godfried, B.A. 1934, M.D. 1936, in memory of his wife, Gladys Godfried, to provide financial assistance to medical students in good standing entering the third and fourth years.

The Gold Family Yale Medical Scholarship Established in 2011 by Janice R. Gold, '78 M.P.H., and Mark S. Gold, M.D., to provide scholarships for Yale School of Medicine students in good academic standing with need for financial aid.

The James Raymond Goodrich Memorial Scholarship Scholarships are available in the School of Medicine from the income of a university scholarship fund established in 1923 by gift from Charles Stillman, B.A. 1882, in memory of his uncle, James Raymond Goodrich, B.A. 1853.

The Jack Peter Green, M.D. '57, Ph.D. '52, and Arlyne Frank Green Scholarship Established in 2007 from the estate of Jack Peter Green, '52 Ph.D., '57 M.D., and his wife to support promising M.D./Ph.D. students at Yale School of Medicine.

The Maurice R. Greenberg Scholarship Fund Established in 2014 by the Starr Foundation, in honor of Maurice R. Greenberg, to award scholarships to students with demonstrated financial need at Yale School of Medicine.

The George D. Gross, M.D., Scholarship Established in 2004 by the Esther S. Gross Trust to support medical students interested in internal or family medicine.

The Esther S. Gross, M.D., Scholarship Established in 2004 by the Esther S. Gross Trust to support medical students interested in pursuing a career in pediatrics.

The GTE Corporation Scholarship Fund Established in 1986 by the GTE Corporation on behalf of GTE operating companies throughout the United States. To be used for scholarships for minority medical students.

The Dixon Hall Scholarship Fund Established in 1965 by bequest of John Dixon Hall, B.A. 1881, in memory of his father, Dixon Hall, M.D. 1850. Income to be used for assistance to students or in investigation of diseases.

The Winfred Morgan Hartshorn Memorial Scholarship Fund Established in 1992 by the Estate of Edith H. Woodruff in honor of her father, Winfred Morgan Hartshorn, M.D., Yale College Class of 1898, to provide scholarship assistance to medical students in need.

The Abner Hendee Scholarship Fund Established in 1949 by bequest from Nellie E. Hendee in memory of her husband, Abner Hendee.

The Susan and William H. Hindle, M.D., Scholarship Established in 2010 by William H. Hindle, M.D. 1956, and his wife, Susan, to provide scholarship assistance to Yale School of Medicine students pursuing an M.D. degree.

The Muriel Hirshfield Memorial Scholarship Established in 1964 by a gift of Jack Hirshfield in memory of his wife. Income from this fund to be used to assist needy medical students who are residents of the state of Connecticut, with preference given to students who are residents of the greater New Haven area.

The John A. Hoober Memorial Fund Established in 1952 by Sarah A. K. Hoober. Income to be used for a scholarship for a student living in the vicinity of York County, Pennsylvania. Selection of recipient is based on need, character, integrity, personality, and general ability.

The Howey Fund Established in 1945 by bequest from Ennes G. Howey of New Haven. Income awarded to needy and deserving students of good standing and of high moral character.

The Marion E. Hyde Fund Established in 1974 by bequest of Marion E. Hyde in memory of Charles E. Hyde, M.D. 1910. To be used for scholarships for worthy students in the Yale School of Medicine.

The Harold W. and Helen M. Jockers Fund for Medical School Financial Aid Established in 1999 by Mrs. Harold Jockers in support of scholarships for Yale School of Medicine students.

The Thomas J. Keenan, M.D., Scholarship Fund Established in 1997 by the bequest of Thomas J. Keenan, M.D., to provide financial aid to outstanding medical students who demonstrate the need for support.

The Kehayes Memorial Scholarship Fund Established in 2012 by Philip Head and I. Naya M. Kehayes to provide scholarships for outstanding students, with a preference for students in the Division of Health Policy and Administration.

The Hans A. and Elizabeth R. Klagsbrunn Scholarship and Loan Fund Established by a bequest from Elizabeth Ramsey, M.D. 1932, and her husband, Hans A. Klagsbrunn, LL.B. 1932, for promising medical students who need financial assistance.

The Louise F. Klock Scholarship Established in 2011 with a gift from the Salem Shuchman and Barbara Klock Family Foundation to provide scholarships for Yale School of Medicine students pursuing an M.D. degree, with a preference first for students who are parents themselves while attending medical school.

The Dr. David and Colleen Leof Scholarship Established in 2010 by David Leof, M.D. 1964, and his wife, Colleen, to provide financial support for a Yale School of Medicine student, preferably with distinction in the humanities or the arts.

The Marguerite Rush Lerner Award Fund Established in memory of his wife by Dr. Aaron B. Lerner, to be directed toward financial aid and awarded to a deserving student in the School of Medicine.

The Professor Lafayette B. Mendel Scholarship Fund Established in 1974 by bequest from the Estate of Maurice H. Givens, Ph.D. 1909, as a memorial to Professor Mendel, whom Mr. Givens continuously admired throughout the years. Income to be used to provide scholarships for financially needy first-year medical students who have demonstrated, at the time of matriculation, a proficiency and interest in biochemistry or physiological chemistry.

The Howard A. Minners, M.D. 1957, and Family Scholarship Established in December 2003 by Howard A. Minners, M.D. 1957, for students attending Yale School of Medicine.

The Anoush Miridjanian, M.D., Scholarship Established in 2011 by Anoush Miridjanian, '61 M.D., to provide scholarships for Yale School of Medicine students, with a preference first for students of Armenian descent.

The Bernadette M. Mosellie Scholarship Established in 2009 by Bernadette M. Mosellie, M.P.H. 1986, to provide scholarships for the Master of Public Health tuition for Yale medical students of United States citizenship with outstanding academic achievement and with demonstrated financial need, who are also pursuing a Master of Public Health degree at Yale in the areas of health policy or health management.

The Professor Ernest Mylon and Hildegard Mylon Scholarship Fund Established in 1984 by bequest from Peter Mylon in honor of his parents, Professor Ernest Mylon, M.D., and Hildegard Mylon. To be used for scholarships for medical students.

The Leona R. M. Normandie Scholarship Fund Established in 1994 by the Estate of Leona R. M. Normandie to provide scholarship assistance to medical students.

The Julian J. Obermann Fund Established in 1959 by bequest from Julian J. Obermann, honorary M.A. 1935. To be used and applied, from time to time, to defray the costs of tuition and expenses of needy and deserving students in the School of Medicine and those studying in the fields of Oriental, Epigraphic, and Arabic studies in the Graduate and Divinity schools.

The John and Jessie Ogilvie Memorial Scholarship Established in 1968 by gifts from John B. Ogilvie, B.S. 1931, M.D. 1934, in memory of his parents. Awarded to a medical student in the third- or fourth-year class who shows ability, character, and promise for a career in surgery.

The Ogilvie Family (John B., B.S. 1931, M.D. 1934; John G., B.A. 1964; Donald G., B.A. 1965; Jennifer B., B.A. 1991; and Adam, B.A. 1993) Financial Aid Fund Established in 1989 by a gift from John B. Ogilvie. The income is to be used to assist worthy students who are in need of financial help.

The Raymond E. Parks, M.D. 1945, Medical Scholarship Fund Established in 2014 by the bequest of Mrs. Raymond E. Parks, in honor of her late husband, Raymond E. Parks, M.D. This fund shall be used to provide scholarships for Yale School of Medicine students, pursuing an M.D. degree, in good academic standing with the need for financial aid.

The David V. Pecora, M.D. 1941, and Dorothy E. Pecora, R.N., Scholarship Created in 2007 from their gifts, the fund is to support students at the Yale School of Medicine.

The Frank Elmer Phillips, M.D. 1901, Scholarship Fund Established in 1992 by his daughter, Anne P. Whistler, to benefit medical students in need of financial assistance.

The Carrie T. B. Purinton Scholarship Fund Established in 1965 by bequest from Carrie T. B. Purinton. Income to be used for scholarship purposes in the School of Medicine.

The Puzak-Kurtz Student Scholarship Fund Established in 1962 as a gift from Michael Puzak, M.D. 1942, and Mrs. Puzak (Elizabeth Kurtz, M.N. 1941).

The Mila Rainof, M.D., Memorial Scholarship Established in 2010 by family and friends to provide financial aid for an outstanding medical student with demonstrated financial need. It memorializes Mila Rainof, M.D., a member of the class of 2008, who

died in a tragic accident weeks before she would have graduated. She had planned on a career in emergency medicine.

The Henry and Dorothea Riedel Scholarship Established in 2003 from the trust of Henry A. Riedel, M.D. 1943, and his wife Dorothea Riedel to benefit promising medical students.

The Nathan E. and Hilda M. Ross Scholarship Established in 2002 from the trust of Nathan E. Ross, B.S. 1925, M.D. 1928, and his wife Hilda M. Ross to benefit needy medical students.

The Dr. Salvatore Sannella and Dr. Lee Sannella Endowment Fellowship Fund Established in 1991 in memory of Salvatore Sannella and in honor of his son, Lee Sannella, M.D. 1940, to benefit needy medical students with preference given to those with an interest in the physiological, psychological, and spiritual qualities of the human being as described by Dr. Lee Sannella in his book *The Kundalini Experience.*

The Schley Family Scholarship Established in 2011 by Mary Wheatland Schley, M.D. 1952, to provide scholarships for Yale School of Medicine students pursuing an M.D. degree.

Scholarships for Disadvantaged Students Established by the university to provide financial assistance to needy medical students.

The Donald H. Sheriden Scholarship Fund Established in 1986 by bequest from Kathryn Whitelam Wynn in memory of her husband, Donald H. Sheriden. To be used for scholarships to needy medical students.

The Robert S. Sherwin, M.D., Term Scholarship Established in 2007 by anonymous donors in honor of and appreciation to Dr. Robert S. Sherwin, in order to provide financial aid for a deserving medical student.

The C. V. Starr Scholarship Fund Established in 1991 by the Starr Foundation to provide financial assistance to medical students.

The Ruth and Milton Steinbach Scholarship Fund Established in 1991 through a trust by Milton Steinbach, Class of 1924S. This fund to be used to benefit needy men and women in the Epidemiology and Public Health, Medicine, and Physician Associate programs.

The Reuben E. Thalberg Scholarship Awarded annually by the Reuben E. Thalberg Foundation of Southington, Connecticut, in memory of Dr. Reuben E. Thalberg, to a medical student in need of financial aid while attending the Yale University School of Medicine.

The Charles Henry Thomas Scholarship Established in 1940 by Georgine H. Thomas in memory of Dr. Charles Henry Thomas, Class of 1873.

The Lois E. and Franklin H. Top, Jr., M.D. 1961, Scholarship Established in 2001 by Dr. and Mrs. Top to be awarded each year to one or more medical students.

The Joseph Hendley Townsend Scholarship Established in 1928 by bequest from Emily Allison Townsend in memory of her brother, Joseph Hendley Townsend, B.A. 1885, M.D. 1887, the income to be used for the payment of tuition and other expenses of a New Haven resident.

The Tremonti Family Scholarship Established in 2010 by Lawrence Tremonti, M.D. 1963, to provide scholarships for Yale School of Medicine students pursuing an M.D. degree, with preference for a student from a small liberal arts school.

The Myra Tyler Student Financial Aid Fund Established in 1998 by the bequest of Myra D. Tyler, Class of 1950, in support of scholarships for Yale School of Medicine students.

The Flora Adler Ullman Memorial Fund Founded in 1927 by gifts from Joseph C. Johnson and other friends of Flora Adler Ullman, for scholarship aid. The fund was increased in 1935 by bequest from her husband, Isaac M. Ullman.

The Rosa Verdi Scholarship Established in 1927 by gift from William F. Verdi, M.D. 1894, in memory of his mother.

The Robert R. and Mary B. Wagner Scholarship Established in 2014 by Robert R. Wagner. This scholarship shall be awarded to a School of Medicine student each year.

The Alfred Eastman Walker Scholarship Established in 1951 by bequest from Frances E. Walker in memory of her brother, Alfred Eastman Walker, B.A. 1864, M.D. 1867. Income awarded to that student in the second year who has made the most satisfactory progress during the first year.

The Bernice L. Walker Scholarship Established in 2005 from the Estate of Bernice L. Walker to provide support for medical students.

The Arthur Watson Scholarship Fund Established in 1984 by bequest from Arthur Watson, M.D. 1942. To be used for scholarships for medical students.

The Andrew Judson White Scholarship Established in 1951 by Margaret White (Mrs. Chauncey S.) Truax in memory of her grandfather, Andrew Judson White, M.D. 1846, honorary M.A. 1894. Tuition aid for a student whose character, personality, and record give promise of fine professional service, and who otherwise would be unable to acquire a medical education. May be held by the same student for four years if the student remains eligible.

The Dr. Colin White Memorial Scholarship Fund Established in 2012 by Allan G. White, in memory of his father, to provide scholarships for outstanding students, with a preference for students in the Division of Biostatistics in the School of Public Health.

The William M. Wiepert and Lucille Reed Wiepert Scholarship Fund Established in 1974 by a gift from an anonymous donor in honor of William M. Wiepert, B.A. 1933, M.D. 1937, and Lucille Reed Wiepert, Ph.D. 1930, M.D. 1937. Income to be used to provide scholarship aid for a financially needy student who has demonstrated scholastic achievement.

The Dr. Amy Hunter Wilson Scholarship Established in 1990 by Amy Hunter Wilson, M.D. 1930, Dr.P.H. 1934, and Frederick C. Wilson to provide financial assistance to needy medical and public health students.

The Louise Farnam Wilson Memorial Scholarship Established in 1955, by a gift from Mrs. Samuel Clark Harvey in memory of her sister, Louise Farnam Wilson, Ph.D. 1916. Income to be used to provide scholarship aid for a financially needy student who has demonstrated scholarship. Preference is given to a woman student.

The Donald D. Wright, 1930 B.A., Yale College, 1933 Ph.D. (Chemistry) Scholarship Established in 1998 by a gift from M. Felix Freshwater, M.D. 1972, in honor of Donald D. Wright, B.A. 1930, Ph.D. 1933 (Chemistry), the chemistry major adviser at Brooklyn College, who took special interest in encouraging the best and brightest Brooklyn College students to apply to Yale School of Medicine. To provide financial aid to medical students with a preference to a graduate of Brooklyn College or a graduate of any college part of the City University of New York system.

The Yale Club of Central New Jersey Scholarship Fund

Armed Forces Scholarships are available upon application.

LOAN FUNDS

All loans listed below are administered by the Financial Aid Office and are awarded to students based on need and interests. Students who apply for financial aid are automatically applying for these loans.

The Alumni Revolving Loan Fund Established in 1981 by gifts from alumni.

The Katharine C. Angell Revolving Loan Fund Established in 1982 to honor Katharine C. Angell to help recognize her contributions to the School of Medicine.

The Jack R. Aron Loan Fund Established by gift in 1980 from Jack R. Aron, B.A. 1928. To be used to provide financial aid to minority students in the School of Medicine.

The Harry J. Bardwell Loan Fund Established 1928 by gift from Harry J. Bardwell, B.S. 1890.

The Leona Baumgartner Student Revolving Loan Fund Established in 1981 by a gift from Leona Baumgartner Langmuir, M.D. This loan is in honor of a distinguished Yale alumna, Leona Baumgartner, Ph.D. 1931, M.D. 1934.

The William C. and Grace W. Beckert Loan Fund Established in 1983 by Grace W. Beckert to be used for loans to students in medicine.

The David Challinor Student Loan Fund Established in 1973 by Mr. and Mrs. David Challinor to be used for student loans at the discretion of the director of student aid.

The Class of 1922 Medical Student Loan Fund Established in 1922 by gifts from the Class of 1922 Medicine.

The Class of 1923 Medical Student Loan Fund Established in 1923 by gifts from the Class of 1923 Medicine.

The John Duberg Loan Fund Established in 1980 by gift from H. P. J. Duberg, B.A. 1930.

The Harry Gray Memorial Loan Fund Established in 1982 by a gift from Jesse G. Rubin, M.D. 1957, and Mrs. Rubin.

The C.S.M.S. David A. Grendon Memorial Student Loan Fund Established in 1972 to provide supplementary loans up to the amount of $500. Financial need of recipient will be established in accordance with the criteria that the School of Medicine uses for determining the financial resources and needs of its students.

The Health Professions Student Loan Fund Established in 1964 by the Department of Health, Education, and Welfare under the Health Professions Educational Assistance Act of 1963 (as amended).

The Howard Heinze Student Educational Fund Established in 1927. Income to be used to aid deserving students at the Yale School of Medicine.

The Kaiser Loan Fund Established in 1980 to be used for student loans at the discretion of the director of student aid.

The Wood Kalb Foundation Loan Fund Established in 1970 as a gift from the Wood Kalb Foundation to provide loans to students of the School of Medicine.

The Bernard L. Kartin Memorial Loan Fund Established in 1968 by friends and associates of Bernard L. Kartin, M.D., for loans to students in medicine.

The W. K. Kellogg Foundation Loan Fund Established in 1942 by grants from the foundation, for loans to students in medicine and public health.

The Kinney Memorial Loan Fund Established in 1955 by his friends in memory of Gilbert Kinney, B.A. 1905.

The Eli Lilly Loan Fund Established in 1980. To be used as a revolving loan fund for the benefit of the senior medical students.

Loans for Disadvantaged Students Established by the university to provide financial assistance to needy medical students.

The George W. Merck Memorial Loan Fund Established in 1959 by the Merck Company Foundation in memory of George W. Merck, for loans to medical students.

The Harry G. Moss Memorial Loan Fund Established in 1972 in memory of Dr. Harry G. Moss by his friends and colleagues to provide financial assistance for students in the School of Medicine, thus enabling the needy among them to complete their medical education.

The William Herbert Ordway Memorial Fund Established in 1956 by Mrs. Ordway in memory of her husband, William Herbert Ordway, M.D. 1912.

The Primary Care Loan Established in 1993 by the Department of Health and Human Services under the Health Professions Educational Assistance Act of 1993. To be used as a revolving loan fund to assist needy medical students interested in Primary Care Medicine.

The Marion Leonard Robbins Loan Fund Established in 1962 by bequest from Marion Leonard Robbins, M.S. 1929, M.D. 1931, for loans to students in the School of Medicine.

The Frederick W. Roberts Loan Fund Established in 1961 in memory of Dr. Frederick W. Roberts, Ph.D. 1920, to provide loans to needy and deserving members of the residency staff of affiliated hospitals.

The School of Medicine Loan Fund A limited amount of money is available for aiding deserving students during their medical course.

The Anson Frederick Smolowe Memorial Student Loan Fund Established in 1976 by Mr. and Mrs. Philip Smolowe for medical students in need of financial aid while attending the Yale University School of Medicine, in memory of their son, Anson Frederick Smolowe, B.S. 1964.

The Wayne O. Southwick Resident Loan Fund Established in 1965 by gifts from an anonymous donor to provide loans to medical students in need of financial aid.

The Phebe Vail Tate Memorial Student Loan Fund Established in 1956 by Dale S. Tate, B.A. 1897, in memory of his wife, Phebe Vail Tate.

The Reuben E. Thalberg Foundation Loan Fund Established in 1972 by the Reuben E. Thalberg Foundation for medical students in need of financial aid while attending the Yale University School of Medicine.

The Lewis Thorne Memorial Fund Established in 1956 by anonymous gifts in memory of Lewis Thorne, B.A. 1931, M.D. 1936.

The Woods Student Loan Fund Established in 1955 by a grant from the Woods Charitable Fund, Inc.

The Yale Men in Medicine Fund Contributions have been made since 1931 for loans to meritorious students.

FELLOWSHIPS

The Arons-Millard Student Research Fund for Surgery Established in 2014 by M. Felix Freshwater, M.D., for medical student summer thesis research fellowships with a priority first in the history of surgery, then in clinical aspects of plastic surgery. If no student is interested in writing a thesis in these two areas, then funds are to be used by the Historical Library to maintain the collection.

The James Hudson Brown Memorial Fund Established in 1944 by bequest of Marie B. C. Brown in memory of her husband. The income provides for research fellowships. The latter are open to promising investigators for pursuit of research in the medical sciences, including clinical medicine and public health. Open to holders of the M.D. or Ph.D. degree who have demonstrated their fitness to carry on original research of high order.

The Alexander Brown Coxe Memorial Fellowships in the Biological Sciences Established in 1927 by a gift from the family of the late Alexander Brown Coxe, B.A. 1887. The income may be awarded annually to an investigator of promise in the comprehensive field

of the biological sciences. Preference is given to university graduates who have already obtained the M.D. or Ph.D. degree and who have demonstrated their fitness to carry on original research of a high order.

The William Harvey Cushing Memorial Fellowship Established in 1928 by Dr. Harvey Cushing, B.A. 1891, as a memorial to his son, William Harvey Cushing, of the Class of 1927, Yale College, for research in surgery.

The Wilbur G. Downs, M.D., International Health Travel Fellowship The Committee on International Health was established by the Department of Epidemiology and Public Health in 1965. In 1984, this fellowship was named in honor of Wilbur G. Downs, M.D., M.P.H., an eminent medical scholar, renowned for his work in international health. The Committee on International Health selects students studying diseases such as malaria; the fund provides travel fare and a small stipend to students, who are asked to report on their research and experiences upon their return.

The Mitchel Edson, M.D. 1956, International Clinical Rotation Fund Established in honor of his fiftieth reunion to support the travel for an international clinical rotation of a highly motivated medical student in an underdeveloped country or a country where there is a pressing health care need.

The Joseph W. Eichenbaum, M.D. '73, Endowment for Student Research Established by Joseph W. Eichenbaum, M.D., to support the short-term (summer) research of a highly motivated M.D. student with an interest in the basic sciences, and under the direction of an established faculty member who has a history of providing an extraordinary mentoring and research experience for M.D. students.

The John F. and Carolyn B. Enders Research Fund Established in 1986 by bequest from the estate of John F. Enders, Yale Class of 1919, Ph.D. and Nobel Laureate in Medicine, to support fellowships for medical research.

The William U. Gardner Memorial Research Fund Established by Katherine H. Gardner in memory of her husband William U. Gardner, Ph.D., Ebenezer K. Hunt Professor of Anatomy and Professor Emeritus of Anatomy at Yale, to support research projects related to endocrinological aspects of cancer.

The Richard K. Gershon, M.D., Student Research Fellowship Established in 1986 by the faculty and friends in honor of Richard K. Gershon, M.D. 1959, to support a medical student for a fifth year of medical school in order to be able to carry out research in immunology or a related discipline.

The Samuel Jordan Graham Fellowship Established in 1961 in memory of Judge and Mrs. Samuel Jordan Graham by the Estate of E. Norma P. (Mrs. S. J.) Graham. To be used to assist students who are pursuing postgraduate study or research in the School of Medicine, preferably those specializing in surgery.

The James G. Hirsch, M.D., Endowed Medical Student Research Fellowship Established in 1988 by the Josiah Macy, Jr. Foundation as a tribute to its late president and member of the Yale Corporation, James G. Hirsch, Class of 1943S, M.D., to support medical students extending their course of study to pursue research projects from four to five years.

The Richard Alan Hirshfield Memorial Fellowship Established in 1961 by Mr. and Mrs. Jack Hirshfield in memory of their son. To be awarded to a student doing research in ulcerative colitis or related diseases or other research projects.

The G.D. Hsiung, Ph.D., Student Research Fellowship Fund Established in 1989 by colleagues and friends to honor Gueh Djen Edith Hsiung, Ph.D., Professor Emeritus of Laboratory Medicine, and to provide medical students who are promising scientists with research fellowships in clinical virology and related projects in viral pathogenesis.

The Charles Linnaeus Ives Fellowship Founded in 1924 by bequest from the widow of Charles Linnaeus Ives, B.A. 1852, for research in pathology.

The Eric P. Kindwall, M.D. 1960, International Clinical Rotation Fund Established to support the travel for an international clinical rotation of a highly motivated medical student in an underdeveloped country or a country where there is a pressing health care need.

The Francis G. Kingsley Memorial Fellowships Established in 1986 by friends and family to honor Francis G. Kingsley, a special friend to the Yale School of Medicine. To be awarded for one to three years to young investigators at Yale whose research shows great promise.

The Geraldine Lambert Fellowship Fund Established in 2014 by Caren S. Lambert '89 B.A. to create and support a fellowship program to train the next generation of physicians/physician scientists who will devote their energies to the clinical and scientific understanding of dyslexia and its treatment, especially dyslexia in children.

The Paul H. Lavietes, M.D., Summer Research Fellowship Fund Established in 1991 in honor of Paul H. Lavietes, B.S. 1927, M.D. 1930, former Clinical Professor of Medicine and Public Health at the Yale School of Medicine and Medical Director of Community Health Care Plan, by his friends and family. To provide significant support for summer research fellowships for promising medical students.

The Vernon W. Lippard, M.D., Student Summer Research Fellowship in Pediatrics Established in 1985 by the William T. Grant Foundation to honor former dean of the Yale School of Medicine, Vernon William Lippard, M.D., Sc.D., Dean Emeritus and Professor Emeritus of Pediatrics. To be awarded annually to students working in the area of children's behavior within the Department of Pediatrics or the Child Study Center.

The Lo Family Graduate Fellowship Established in 2011 by Dr. Ka Shui Lo P'05 and Dr. Feili Lo P'05 for the benefit of one or more senior graduate students pursuing stem cell research at Yale School of Medicine. He/she should be a Ph.D. or an M.D./Ph.D. candidate.

The Richard A. Moggio, M.D., Student Research Fellowship Established in 1996 by Richard A. Moggio, M.D., to support medical students in their original research efforts toward the completion of their thesis requirement.

The Howard A. Pearson Fellowship in Pediatric Hematology/Oncology Established in 2000 to support fellows in pediatrics.

The George G. Posener Endowed Fellowship for Education and Training and Stem Cell Research in Trauma and Surgical Critical Care Established in 2002 by George G. Posener as a memorial to his beloved wife, parents, four sisters, brother (Morris, Yale Class of 1938), and his two precious sons, and to honor Dr. Reuven Rabinovici of the Trauma and Surgical Critical Care Section of the Department of Surgery at the Yale School of Medicine. The fund is to educate and train residents and fellows and to support stem cell research at the Yale School of Medicine in the Trauma and Surgical Critical Care Section of the Department of Surgery.

The George G. and Leah E. Posener Memorial Fellowship in Hematology and Stem Cell Research Established in 1995 by the generosity of George G. Posener in memory of his beloved wife Leah E. Posener and his brother Morris M. Posener (Yale Class of 1938) who received care at Yale-New Haven Hospital. To be awarded annually to assist financially a young physician/scientist whose research focuses on polycythemia vera and related blood diseases and also to support stem cell research.

The Bertran Roberts Memorial Fund Originally established in 1955 by family members, friends, and colleagues, as an annual lecture in the field of psychiatry. In 1973 the family decided to use these funds not only for lectures, but also to assign summer stipends to medical students interested in field study or other projects in the field of social psychiatry.

The Leon Rosenberg Medical Student Research Fund in Genetics Established in 2004 by Leon E. Rosenberg, M.D., former Dean of Yale School of Medicine, to be awarded to one medical student who elects to spend a fifth year at Yale School of Medicine engaged full time in research in the Department of Genetics.

The Robert Shapiro, M.D., Memorial Fellowship in Diagnostic Radiology Established in 2000 to provide research support in all diagnostic interventional procedures for postdoctoral fellows in diagnostic radiology.

The Daniel B. Stryer, M.D. 1990, Class of 1990 International Clinical Rotation Fund Established in memory of Daniel Stryer to support the travel for an international clinical rotation of a highly motivated medical student in an underdeveloped country or a country where there is a pressing health care need.

The Taylor Opportunity Student Research Fellowship Established in 2007 by Robert F. Taylor, M.D., to support the short-term or summer research of a highly motivated medical student with an interest in the basic and/or clinical sciences, under the direction of a dedicated faculty member who is committed to providing an extraordinary mentoring and research experience for medical students.

The Thudichum Post-Doctoral Research Fellowship in Neuro-oncology Established in 2005 by Irene M. Voynick in honor of the nineteenth-century German medical practitioner and surgeon Johann Ludwig Wilhelm Thudichum (1828–1901), who characterized the chemical composition of the brain and is regarded as the pioneer of neurochemistry. This postdoctoral fellowship supports a Ph.D. or M.D./Ph.D. student for the study of brain tumors utilizing such areas as cell biology, neurochemistry, and adult stem cell research.

The Michael S. Voynick Fellowship in Neuro-oncology Established in 1997 for an annual award in recognition of distinguished contributions in the field of neuro-oncology, to be presented during a symposium to promote education in such areas as oncogenesis, novel and effective therapies, and neuroscience.

The Voynick Visiting Fellowship in Neuro-oncology Established in 2001 to support a visiting fellow who will engage in such investigative areas as tumor excisions and innovative therapies based on tumor cell biology and genetics.

The Jane Danowski Weiss Family Foundation Fellowship Established in 2000 in memory of Dr. Thaddeus S. Danowski '36, Mr. Edwin F. Danowski (Yale studies interrupted by World War II, killed in action in 1941), and Pelagia V. Danowski Sellers. To support medical students in a fifth year of research investigations in the areas of diabetes, stroke, and heart disease.

The Susan Wolf, M.D. 1997, and William Greene, M.D., International Clinical Rotation Fund Established to support the travel for an international clinical rotation of a highly motivated medical student in an underdeveloped country or a country where there is a pressing health care need.

The Herman H. and Sarah Zusman Student Research Fellowship Established in 2009 by the Zusman family to support the short-term (Summer) research of a highly motivated M.D. student with an interest in the basic and/or clinical sciences with a focus on cardiovascular medicine/surgery/physiology.

Honors and Prizes

COMMENCEMENT AWARDS, MAY 2015

Cum laude The degree of Doctor of Medicine cum laude will be conferred on students whose academic performance shows unusual merit. Deepak S. Atri, Paul S. Bagi, Jacob F. Baranoski, Christopher M. Bartley, Daniel David Bohl, Emily Marie Bucholz, Allison M. Campbell, Anna Ruth Duncan, Dan Ang Gong, Abhijeet Gummadavelli, Akash Gupta, Stefan Gysler, Nour Kibbi, Joshua Ethan Motelow, James Edward Tooley III, Sebastian Urday, Chen Wang, Peter Yu Cheng Zhao

American Academy of Neurology Award Awarded to recognize a graduating medical student for excellence in clinical neurology. Andrew Christopher Young

ACP Internal Medicine Award Awarded to a graduating student who will be entering a categorical or primary care internal medicine residency in Connecticut and has demonstrated outstanding academic achievement and community service. Roger Yeon-Kyu Kim

Norma Bailey Berniker Prize Established in 1970 by bequest of John H. Bailey, B.A. 1900, M.D. 1903. To be awarded to members of the graduating class who give promise of best exemplifying the disciplines and precepts of the Oath of Hippocrates and the Prayer of Maimonides. Caroline Greenberg Falker, Songprod Jonathan Lorgunpai, Moustafa Khaled Moustafa, and Rebecca Vitale

The Campbell Prize Founded in 1900 by bequest from James Campbell, honorary M.A. 1891, Professor of Obstetrics and Gynecology from 1886 to 1899. Awarded to the graduating student who secures the highest score on Step II of the National Board Medical Examination. Vicki Zhu Jun Bing, Akash Gupta

Connecticut Academy of Family Physicians Award Established in 1994 to recognize outstanding students entering a career in Family Practice. Not awarded in 2015.

Connecticut Chapter of American College of Surgeons Prize Awarded to a graduating student for excellence in surgical sciences. James Edward Tooley III

The Cortlandt Van Rensselaer Creed Award Established in 1999 in honor of Cortlandt Van Rensselaer Creed, the first African American graduate of Yale School of Medicine in 1857. Awarded through peer nomination to a graduating, underrepresented, minority student in medicine and public health who has demonstrated outstanding academic achievement, exemplary leadership, and a significant commitment to the community at large. Jonathan Santiago

Miriam Kathleen Dasey Award Established in 1950 in honor of Miriam Kathleen Dasey, Registrar from 1921 to 1950. Awarded annually to students who by strength of character, personal integrity, and academic achievement give promise of fulfilling the ideal of the compassionate physician. Serene I. Chen, Susan Elizabeth Combs, Kate Davis, Caroline Greenberg Falker, Thomas Candler Gilliland, Jr., Akash Gupta, Moustafa Khaled Moustafa, Kai Erik Swenson, Emily Herron Thomas, and James Edward Tooley III

The Dean's Prize for Community Service This annual award recognizes the graduating student who, by leadership and service, has made major contributions to the School of Medicine, to the New Haven community, or to the community at large. Risa Liang Wong

Endocrinology Society Medical Student Achievement Award Established in 1997 to recognize a graduating student who has shown special achievement and interest in the general field of endocrinology. Not awarded in 2015.

The Selma and Karl Folkers Prize in Biomedical Research Awarded to graduating M.D./Ph.D. students whose thesis research has demonstrated excellence in basic cell and molecular biology. Christopher M. Bartley, Chen Wang

The Peter Grannum Prize Established in 1990. Awarded to an outstanding African American graduate. This annual award is supported by the Shirley, Maggie and Hugh Comer Fund. Amanda Rose Wallace

The Marguerite Rush Lerner Award Awarded to students for outstanding creative writing. Elizabeth Mirabito Becker, Allison M. Campbell

The M.D./Ph.D. Alumni Award Awarded to graduating M.D./Ph.D. students who have demonstrated outstanding academic achievements, leadership, and service. Barbara Hirschman Chaiyachati, Ken Yon Hui

The M.D./Ph.D. Award Awarded to outstanding members of the graduating M.D./Ph.D. class who have shown excellence in both research and clinical activities. Allison M. Campbell, Joshua Ethan Motelow

New England Pediatric Society Prize Awarded to that member of the graduating class entering pediatrics who in the opinion of peers and faculty best exemplifies those qualities one looks for in a pediatrician: "A competent, caring, good humored person whom I would want to take care of my children." Barbara Hirschman Chaiyachati

The Parker Prize Established in 1914 by bequest from Frank J. Parker, Ph.D. 1895, M.D. 1898. Awarded annually to the graduating students who, during the course, have shown the best qualifications for a successful physician. Thomas Candler Gilliland, Jr., Kai Erik Swenson

The Perkins Prize Awarded to the student who achieves the highest rank on Step I of the National Board Medical Examination. Thomas Candler Gilliland, Jr.

Mila Rainof Award The Mila Rainof Award will be given each year to a graduating Yale medical student entering the field of emergency medicine who, like Mila, has contagious enthusiasm for caring for patients, while bringing attention, kindness, and compassion to each interaction. Serene I. Chen

The Dr. David and Arthur Schuman Award of Excellence in Family Practice Awarded annually to recognize a student or resident in the State of Connecticut for his or her academic excellence and contributions to the Connecticut Academy of Family Physicians and other organizations that promote understanding of the specialty of Family Medicine. Not awarded in 2015.

The Society for Academic Emergency Medicine Award Awarded to the student who has demonstrated excellence in the specialty of emergency medicine. Zev Balsen

The Leonard Tow Humanism in Medicine Award Supported by the Arnold P. Gold Foundation Established to honor a graduating student who demonstrates the highest standard of compassion and sensitivity in his or her interaction with patients. Geoffrey Zhi-Je Liu

Lauren Weinstein Award Established in 1992 in memory of Lauren Weinstein (Yale medical student, 1988–1989). Given to a student who displays courage, perseverance, and compassion and has dared to reach for the best in herself or himself. Alexander James Kula

The Milton C. Winternitz Prize in Pathology Established in 1950 in honor of Milton Charles Winternitz, honorary M.A. 1917, Professor of Pathology and Bacteriology, 1917–1925, Anthony N. Brady Professor of Pathology, 1925–1950. Susan Elizabeth Combs

THESIS PRIZES, MAY 2015

The American Cancer Society Prize Given by the Connecticut Chapter of the American Cancer Society and awarded to a graduating student for an outstanding thesis in the area of cancer. Jacob F. Baranoski

The Association for Academic Surgery–Novartis Research Award Awarded to a graduating student entering a surgical field, who has done outstanding research during medical school. James Edward Tooley III

The Peter F. Curran Prize Established in 1976. To be presented to a graduating medical student for an outstanding thesis. Peter F. Curran was Professor of Physiology at Yale, 1967 to 1974. Dan Ang Gong

Wilber G. Downs, M.D., M.P.H., Prize for the Outstanding Thesis in International Health Established in 1988 for the best thesis in the area of international health. Akash Gupta

The Ferris Prize Established in 1934 and endowed in 1937 by anonymous donors in honor of Harry Burr Ferris, A.A. 1887, M.D. 1890. Awarded to a graduating student for an outstanding thesis. Daniel David Bohl

The William U. Gardner Thesis Prize Established in 1989 by Dr. Gardner's widow and awarded to the graduating student with the most outstanding thesis in the graduating class. Anna Ruth Duncan

The Nicholas J. Giarman Prize Established in 1976. Nicholas Giarman was Professor of Pharmacology, 1949 to 1968. To be presented to a student for an outstanding thesis. Allen D. Nicholson

The Keese Prize Established in 1880 by bequest from Mary M. Keese in memory of her son, Hobart Keese, M.D. 1855. Awarded annually to a student who presents an outstanding thesis. Stefan Gysler

The Dr. Harold H. Lamport Biomedical Research Prize Established in 1976. To be presented to a student for an outstanding thesis reporting original biomedical research. Nour Kibbi

The Lidz Prize in Psychiatry Awarded to a graduating student for an outstanding thesis in the field of psychiatry or neuroscience. Abhijeet Gummadavelli

The M.D./Ph.D. Thesis Prize Awarded to the graduating M.D./Ph.D. student with the most outstanding dissertation. Emily Marie Bucholz

Dr. Marvin Moser Prize Established in 2007 by Dr. Marvin Moser for a prize-winning thesis in preventive cardiology, lipid disorders, or hypertension. Deepak S. Atri

The Dr. Louis H. Nahum Prize Founded in 1973 by bequest from Louis H. Nahum, M.D. 1916. Awarded annually to a member of the graduating class who merits such award by virtue of the excellence of the thesis that the student has written as required for the medical degree. Sebastian Urday

The John P. Peters Prize Established in 1976. To be presented to students for an outstanding thesis in the area of internal medicine. John P. Peters was Professor of Medicine at Yale, 1927 to 1955. Jessica Becker, Chung Sang Tse

David and Harriet Seligson Thesis Prize Established in 2011 in honor of Dr. David Seligson for the best thesis in the area of laboratory medicine. Sponsored by the Department of Laboratory Medicine. Paul S. Bagi

The Louis G. Welt Prize Established in 1976. To be presented to a student for an outstanding thesis. Louis Welt was Chairman and Professor of Medicine at Yale, 1972 to 1974. Crystal Lynn Piper

The Abraham White Prize Awarded annually to a graduating student for outstanding research. Established in 2010, the prize is in memory of Dr. Abraham White, who served as a distinguished teacher and scholar of physiological chemistry at Yale from 1931 to 1948. Peter Yu Cheng Zhao

STUDENT RESEARCH DAY ORAL PRESENTATIONS, MAY 5, 2015

Daniel David Bohl. *Analysis of Adverse Event Rates Following Orthopaedic Surgery in the United States* (Dr. Jonathan Grauer, Orthopaedics and Rehabilitation)

Stefan Gysler. *Novel Mechanisms of Trophoblast Responses to Antiphospholipid Antibodies in Obstetric Antiphospholipid Syndrome* (Dr. Vikki Abrahams, Obstetrics, Gynecology, and Reproductive Sciences)

Sebastian Urday. *Targeting Secondary Injury in Intracerebral Hemorrhage—Perihematomal Edema* (Dr. Kevin Sheth, Neurology)

Anna Ruth Duncan. *The Heterotaxy Candidate Gene, TMEM195, Regulates Nuclear Localization of Beta-catenin* (Dr. Mustafa Khokha, Pediatrics)

Emily Marie Bucholz. *Sex and Race Disparities in Life Expectancy after Acute Myocardial Infarction* (Dr. Harlan Krumholz, Internal Medicine and School of Public Health)

AWARDS TO FACULTY AND HOUSE STAFF, MAY 2015

The Francis Gilman Blake Award Established in 1952 by Nu Sigma Nu. Endowed by Dr. Robert C. Kirk, B.S. 1930, as a memorial to his twin brother, Dr. Gilman D. Kirk, B.S. 1930. Awarded annually to that member of the faculty of the School of Medicine designated by the senior class as the most outstanding teacher(s) of the medical sciences. Geoffrey R. Connors, M.D.

Charles W. Bohmfalk Prizes Established in 1989 under the terms of the Alice Bohmfalk Charitable Trust. Prestigious teaching prizes will be awarded annually to individuals who have made outstanding contributions to the teaching program, one in the basic sciences and one in the clinical sciences, as judged by the faculty and students. Basic Sciences: Ruslan M. Medzhitov, Ph.D. Clinical Sciences: Rachel B. Liu, M.D.

The Alvan R. Feinstein Award Presented to a Yale School of Medicine faculty member chosen as the outstanding teacher of the year of clinical skills by a committee of chairs of the clinical departments, associate chairs, and students. Leigh Evans, M.D.

The Leah M. Lowenstein Award Presented annually by the Office for Women in Medicine to faculty members who are models of a medical educator whose humane teaching reaches and influences all students regardless of gender, race, or socioeconomic background. These are the traits espoused by the late Leah Lowenstein, a medical educator and first female dean of a coeducational medical school. Karen Santucci, M.D., and Auguste Hector Fortin VI, M.D., M.P.H.

The Leonard Tow Humanism in Medicine Award Presented by the Arnold P. Gold Foundation Established in 1998 to honor the faculty member who demonstrates the highest standard of compassion and sensitivity in his or her interaction with patients. Benjamin Rolin Doolittle, M.D., M.Div.

The Betsy Winters House Staff Award Presented annually to that member of the House Staff of the Yale-New Haven Medical Center, designated by the graduating class, who has/have made the most significant contribution to the education of medical students. Ajul Shah, M.D.

General Information

HUMAN RELATIONS CODE OF CONDUCT

Yale University School of Medicine is committed to the promotion of personal and professional development of all individuals in its community, and encourages dialogue that will foster the growth, well-being, and dignity of all its members. In pursuit of these goals, the School is dedicated to maintaining an environment which places the highest priority on collegial relationships, mutual respect, and sensitivity among students, faculty, staff, and patients. An educational community functions best when there is civility and respect for the dignity and worth of each individual.

It must be ensured that our School is free from discrimination and acts of intolerance based on race, gender, sexual orientation, religion, national origin, ancestry, age, or physical handicap. This commitment remains consonant with the obligation to protect open and wide-ranging public discourse. The principle of freedom of expression that might otherwise protect even the most offensive public speech does not protect, nor does it even encompass, a right to threaten the dignity and privacy of an individual. Such personally directed behavior will not be tolerated; it is antithetical to academic values, debilitates its victims, compromises the offenders, and undermines the University's fundamental commitment to individual freedom and respect for all its members. Furthermore, acts of intolerance may destroy the very atmosphere wherein freedom of expression is otherwise tolerated and cherished.

GRIEVANCE PROCEDURES

The expectation at Yale School of Medicine is that all members of the community will conduct themselves professionally and respectfully. The following statement has been issued by the AAMC regarding institutional standards of behavior in the learning environment:

> The medical learning environment is expected to facilitate students' acquisition of the professional and collegial attitudes necessary for effective, caring, and compassionate health care. The development and nurturing of these attitudes is enhanced and, indeed, based on the presence of mutual respect between teacher and learner. Characteristic of this respect is the expectation that all participants in the educational program assume their responsibilities in a manner that enriches the quality of the learning process.
>
> While these goals are primary to a school's educational mission, it must be acknowledged that the social and behavioral diversity of students, faculty, residents, and staff, combined with the intensity of the interactions between them, will, from time to time, lead to alleged, perceived, or real incidents of inappropriate behavior or mistreatment of individuals.

At Yale there are several mechanisms in place to deal with such incidents, as follows.

Sexual Misconduct, Including Sexual Harassment and Sexual Assault

http://medicine.yale.edu/sha
http://smr.yale.edu

The School of Medicine and Yale University have established procedures and resources to prevent and address sexual misconduct, including sexual harassment and sexual assault. In this bulletin, the section on Resources on Sexual Misconduct in the chapter Yale University Resources and Services provides extensive information and guidance. Faculty, medical students, and postdoctoral fellows may opt to bring an informal or a formal complaint to the University-Wide Committee on Sexual Misconduct or to the Title IX Coordinator of the School of Medicine. The School of Medicine sponsors regular programming to reduce the harm of campus sexual misconduct. During orientation in the first year and again early in the third year before starting clinical rotations, students have mandatory training sessions in preventing and responding to sexual harassment and assault. Also, in the first and second years, the Office of Education sends students a harassment survey to fill out twice a year; and in the third and fourth years, the final clerkship and elective course evaluations have four questions under the learning environment section that inquire about sexual harassment, sexual assault, mistreatment, and abuse.

Racial and Ethnic Harassment

The Committee on Multicultural Affairs chaired by the assistant dean for multicultural affairs was created to combat racial and ethnic insensitivity and harassment throughout the School of Medicine. Vigorous steps are taken to investigate any allegation, to counsel the offender, and to recommend disciplinary action, if necessary. In addition, any student, employee, or applicant for programs or employment at Yale who is concerned about affirmative action, equal opportunity, sexual harassment, racial harassment, or fairness in admissions or employment at Yale, either in a general sense or with respect to his or her own situation, is encouraged to contact the Office for Equal Opportunity Programs (www.yale.edu/equalopportunity). A student who believes that he or she has been harassed on the basis of race, religion, or ethnic origin by any member of the Yale community can file a complaint with one of the University's human relations counselors, who will investigate the complaint. If a resolution has not been achieved and the student wishes to pursue the complaint further, he or she may request the President's Committee on Racial and Ethnic Harassment to consider the matter.

Peer Advocates

In addition to the above mechanisms for addressing harassment, there is a peer-advocate program. Two Peer Advocates are named by students in the second year, third year, fourth year, and fifth year; one Peer Advocate is named from the M.D./Ph.D. program, and one from the Physician Associate program. Peer Advocates' names and cell phone numbers are distributed to the student body on laminated cards that can be carried in the student's ID sheath and be consulted at all times. Students are encouraged to consult any of the Peer Advocates regarding issues of mistreatment, abuse, and harassment or to reality-check about incidents that they find disturbing or concerning. The Peer Advocates are

trained each year in sessions with the director of mental health services at Yale Health and with the director of SHARE. Confidentiality is assured to the extent allowed by law. Peer Advocates are available for thinking through options and helping the student decide on different levels of attention to a problem. Action can range from merely noting the problem to taking it to the department chair and the dean of the medical school. It is important to note that Peer Advocates are not mental health counselors, but they are trained in how to get help to a student who needs mental health services.

Power Day

Issues of abuse of power as experienced by students at all levels are made the topic of discussion at Power Day I early in the third year and again at Power Day II near the end of the third year. These discussions are held throughout the clinical year in the departments of Internal Medicine; Pediatrics; Obstetrics, Gynecology, and Reproductive Sciences; and Surgery.

Dean's Procedure for Students' Complaints

The dean's procedure governs most student complaints, including but not limited to complaints of discrimination on the basis of race, sex, color, religion, national or ethnic origin, disability, or sexual orientation, against a member of the faculty or administration of the complainant's School. Since an instructor's evaluation of the quality of a student's work is final, this procedure does not apply in any dispute about a grade assigned to a student by a member of the faculty, unless it is alleged that the determination of the grade resulted from discrimination based on race, sex, color, religion, national or ethnic origin, disability, or sexual orientation. Similarly, this procedure does not apply to any matter inherent in the academic freedom of an instructor, such as, for example, in regard to the syllabus or contents of a course of instruction. It is also not a procedure that may be used when there is a complaint about the quality of a course or the quality of instruction in a course; such concerns may be addressed directly to the department in question. If a student believes that he or she has been retaliated against as a result of filing a grievance under the dean's procedure, a separate complaint charging retaliation can be pursued by means of this procedure. Additional information is available online at www.yale.edu/equalopportunity/complaint/dean-student.html.

Complaints of sexual misconduct, including sexual harassment and sexual assault, may be brought to a Title IX Coordinator or to the University-Wide Committee on Sexual Misconduct (for inquiries or for informal or formal resolution). For more information on the University's Title IX Coordinators or the University-Wide Committee on Sexual Misconduct, please see Resources on Sexual Misconduct in the chapter Yale University Resources and Services.

Provost's Procedure for Students' Complaints

The provost's procedure governs most student complaints, including but not limited to complaints of discrimination on the basis of race, sex, color, religion, national or ethnic origin, disability, or sexual orientation, against a faculty member who is not a member of the faculty or administration of the School of Medicine and is, therefore, not subject

to discipline by the dean of the School of Medicine. This procedure is to be used for all complaints of discrimination on the basis of disability where structural modifications of University facilities is the remedy sought. This procedure is available online at www.yale.edu/equalopportunity/complaint/provost-student.html.

Complaints of sexual misconduct, including sexual harassment and sexual assault, may be brought to a Title IX Coordinator or to the University-Wide Committee on Sexual Misconduct (for inquiries or for informal or formal resolution). For more information on the University's Title IX Coordinators or the University-Wide Committee on Sexual Misconduct, please see Resources on Sexual Misconduct in the chapter Yale University Resources and Services.

CURRICULUM MANAGEMENT: EDUCATION COMMITTEE STRUCTURE

Curriculum Management and Integration

The Curriculum Committee and the School of Medicine's basic science and clinical departments share responsibility for the quality and excellence of our educational program.

The Curriculum Committee provides centralized oversight of the curriculum and is responsible for ensuring that it is integrated, coordinated, and designed to achieve the School's overall educational objectives.

The departments, through their faculty, provide the expertise needed to inform the content of specific components in the curriculum (design) and to teach it to the students (implementation).

Both the Curriculum Committee and the departments have a role in reviewing, assessing, and modifying the curriculum. The Curriculum Committee, through its review committee structure, comprehensively reviews each component of the curriculum and the curriculum as a whole on a regular basis in order to inform, monitor, update, and improve the curriculum. Departments, through their education leaders and teaching faculty, review data about the quality and effectiveness of their curricular and teaching efforts and make adjustments as needed to improve teaching and ensure consistency with the overall goals and guiding principles of the curriculum.

Educational Policy Committee

The Educational Policy Committee (EPC) considers policy issues of School-wide importance, including matters related to admissions, curriculum and graduation requirements, progress of students, joint-degree programs, student research and thesis, and multicultural affairs. The deliberations and recommendations of the EPC are guided by the School's Educational Mission Statement and the Overarching Goals of the Curriculum as well as the principles embodied in the Yale System of Medical Education. For example, the EPC might examine and advise the deputy dean for education about the impact of curriculum proposals and other medical school issues that:

- affect, modify, or change school policy regarding education
- fundamentally change or potentially disrupt the current curriculum's structure, schedule, content, or allocation of time

- potentially impact, challenge, or change the School's fundamental principles and core values as embodied in the Yale System of Education, the Overarching Goals of the Curriculum, or the Educational Mission Statement

The deputy dean for education, as chair of the EPC, makes final decisions on behalf of the committee, taking into account the opinions and recommendations that emerge from discussion and deliberation among committee members. There are eleven appointed members: associate dean for admissions and financial aid; associate dean for curriculum; associate dean for multicultural affairs; associate dean for student affairs; associate dean for educational scholarship and director, Teaching and Learning Center; director, international medical student education; director, student research; director, M.D./Ph.D. program; director, Physician Associate program; chair, Progress Committee; and alumni representative. In addition, five students are elected to the EPC, one representative from each year and one Medical Student Council officer.

The EPC meets once a month.

Curriculum Committee

The Curriculum Committee (CC) considers issues related to the central oversight of the curriculum, including the review process. The CC acts on recommendations for curriculum change made by its review committees as well as suggestions from students, faculty, and departments. The CC improves the curriculum by considering new ideas, developing specific proposals, setting priorities, and implementing changes that promote:

- integration and coordination across and throughout the curriculum
- attention to the Overarching Goals of the Curriculum
- formative assessment that provides students with frequent, reliable, and actionable feedback that can be used as a basis for improvement
- effective assessment of the curriculum based on analysis of reliable outcome measures
- use of new teaching approaches and effective use of technology that enhance and improve learning
- adherence to existing and new accreditation standards

The associate dean for curriculum, as chair of the CC, makes final decisions on behalf of the committee, taking into account the opinions and recommendations that emerge from discussion and deliberation among committee members. There are thirteen appointed members: associate dean for student affairs; associate dean for educational scholarship and director, Teaching and Learning Center (TLC); associate dean for graduate medical education; associate director for curriculum and educator assessment, TLC; associate director for student assessment, TLC; director of courses; director of modules; director of clerkships; director of electives; director of the Clinical Skills Program; director, M.D./Ph.D. Program; academic adviser (rotating); and curriculum support librarian. Four faculty members—course director; module director; clerkship director; and elective director—are elected by their respective directors' groups. In addition, five students are elected to the CC, one representative from each year and one Medical Student Council officer.

The CC meets twice a month.

Curriculum Review Committees

The four Curriculum Review Committees work collaboratively with departments, faculty, and students to review and improve individual courses, modules, clerkships, and electives. This includes gathering information, reviewing and analyzing data, and making recommendations that promote:

- use of student evaluations and performance outcome data to improve the curriculum
- use of reliable outcome measures to evaluate student achievement of the learning objectives
- congruence of course, module, and clerkship/elective objectives with the Overarching Goals of the Curriculum
- use of the most effective teaching methods to achieve the learning objectives
- effective use of formative and summative assessment methods

The Curriculum Review Committees, through their directors, report the results of curricular reviews to the Curriculum Committee on a regular basis. Recommendations of the Curriculum Review Committees for changes in the content or teaching methodology within a course, module, clerkship, or elective based on these reviews can be directly implemented by the course, module, clerkship, or elective director. However, changes that have broader impact across the curriculum must be brought to the Curriculum Committee for consideration and implementation.

COURSE REVIEW COMMITTEE

The Course Review Committee is charged with assessing each course in the curriculum at least once every four years. The reviews provide the course director with an evaluation of the course based on student feedback, analysis of course material and instructional sessions, alignment of assessment questions with learning objectives, and comparison of course goals with national standards. The committee also examines integration of course content with other courses within the curriculum and ensures that the School of Medicine is meeting LCME Educational Directives for accreditation.

The course review is a constructive process to help stimulate discussion between courses/modules on topics of intended and unintended content overlap and any omissions in content areas that may not be apparent when viewing courses in isolation. The process will also identify methods of curriculum delivery that are particularly effective and provide information on these practices to other courses.

The committee is chaired by the director of courses and administered by the manager of courses. There are five appointed members—four course directors and one member of the clinical faculty; a representative from the Teaching and Learning Center; and four to eight elected students, one or two from each class.

The committee meets at least once a month or more frequently as needed.

MODULE REVIEW COMMITTEE

The Module Review Committee is charged with assessing each module in the curriculum at least once every four years. The reviews provide the module director with an evaluation of the module based on student feedback, analysis of module material and instructional sessions, alignment of assessment questions with learning objectives, and comparison of course goals with national standards. The committee also examines integration of

module content with other courses and modules within the curriculum and ensures that the School of Medicine is meeting LCME Educational Directives for accreditation.

The module review is a constructive process to help stimulate discussion between modules/courses on topics of intended and unintended content overlap and any omissions in content areas that may not be apparent when viewing courses in isolation. The process will also identify methods of curriculum delivery that are particularly effective and provide information on these practices to other modules.

The committee is chaired by the director of modules and administered by the manager of modules. There are five appointed members – four module directors and one member of the clinical faculty; a representative from the Teaching and Learning Center; and four to eight elected students, one or two from each class.

The committee meets at least once a month or more frequently as needed.

CLERKSHIP REVIEW COMMITTEE

The Clerkship Review Committee is charged with assessing each clerkship in the curriculum at least once every four years. The goals of the review committee are threefold: (1) to ensure educational quality, innovation, and a supportive learning environment in each of the core clerkships, (2) to provide the clerkship director information regarding themes of student feedback and the integration of clerkship content with other components of the curriculum, and (3) to ensure compliance with LCME Educational Directives for accreditation.

The clerkship review is a constructive process that aims to stimulate productive discussion among clerkship directors, faculty, staff, students, and the leadership in order to support the highest quality educational experience. The review covers multiple aspects of the clerkship: organization, clinical and didactic teaching, patient care, the learning environment, and the clerkship director's analysis and outlook. The process also identifies methods of curriculum delivery that are particularly effective, which can then be provided to other clerkship directors for continuous clerkship improvement.

The committee is chaired by the director of clerkships and administered by the manager of clerkships. Additional members are the clerkship director/associate director; five appointed members – two from the clinical faculty, one from the basic science faculty, the curriculum support librarian, and the clerkship administrator/coordinator; a representative from the Teaching and Learning Center; a faculty member from the Physician Associate Program; and four to eight elected students, one or two from each class.

The committee meets at least once a month or more frequently as needed.

ELECTIVE REVIEW COMMITTEE

The Elective Review Committee is charged with assessing each elective in the curriculum at least once every four years. The goals of the review committee are threefold: (1) to ensure educational quality, innovation, and a supportive learning environment in each of the core electives, (2) to provide the elective director information regarding themes of student feedback and the integration of elective content with other components of the curriculum, and (3) to ensure compliance with LCME Educational Directives for accreditation.

The elective review is a constructive process that aims to stimulate productive discussion among elective directors, faculty, staff, students, and the leadership in order to

support the highest quality educational experience. The review covers multiple aspects of the elective: organization, clinical and didactic teaching, patient care, the learning environment, and the elective director's analysis and outlook. The process also identifies methods of curriculum delivery that are particularly effective, which can then be provided to other elective directors for continuous elective improvement.

The committee is chaired by the director of electives and administered by the manager of electives. Additional members are the registrar; eight appointed members – three elective directors, two clinical faculty, and three elective coordinators; a representative from the Teaching and Learning Center; associate director of the Office of Education; a representative of the medical curriculum administration; and four to eight elected students, one or two from each class.

The committee meets at least once a month or more frequently as needed

Thesis Committee

The Thesis Committee provides oversight of and recommends policy for all aspects of the medical student thesis program. This includes:

- setting rules and regulations for the thesis requirement
- establishing thesis deadlines
- determining the guidelines and processes for the awarding of thesis honors and graduation prizes, and choosing the recipients
- determining the selection of oral presentations given on Student Research Day

The Thesis Committee regularly reviews the curriculum to ensure that there is adequate time available for thesis research, evaluates the participation and effectiveness of faculty mentors, assesses the quality of the student's research experience, and makes stipend-supported research fellowships available.

The committee is chaired by the director of student research and includes approximately eighteen faculty from both basic science and clinical departments as well as the section of the history of medicine. There are no term limits. Changes in membership of the committee are made by the chair in consultation with the other members of the committee.

The committee meets at least once a year and may meet more often as needed.

Progress Committee

The Progress Committee reviews the academic performance of each student to determine suitability for continued advancement in the curriculum and for graduation. This review includes decisions about graduation, promotion, leaves of absence, special study, remediation, academic probation, suspension, and dismissal. The Progress Committee uses a single and uniform standard for the promotion and graduation of students.

The Progress Committee is chaired by a senior faculty member and includes approximately twelve faculty from both basic science and clinical departments. The associate dean for students affairs, senior registrar, and registrar are *ex officio* (non-voting) members. Faculty serving on the committee are familiar with the curriculum and graduation requirements and have demonstrated a deep interest in the well-being of the students. There are no term limits. Recommendations for changes in membership of the

committee are made by the chair in consultation with the deputy dean for education and other members of the Progress Committee. Those recommendations are submitted to the dean, who has final authority for committee membership.

The Progress Committee meets approximately monthly. When a question arises which cannot wait for the next full meeting of the Progress Committee, the chair may call an emergency meeting, convene a subcommittee, or poll the members of the Progress Committee for their opinions by phone or e-mail.

REVIEW OF STUDENTS

Each student's academic progress is reviewed annually, or more frequently as needed, as specified in the Yale School of Medicine Satisfactory Academic Progress Policy. In addition, the Progress Committee considers other relevant information in order to determine if the student is developing the professional attributes needed to become a safe and effective physician, including moral and ethical character, professional behavior, good judgment, sense of responsibility, sensitivity and compassion for individual needs, and emotional stability. In making its decisions, the committee takes into account the academic record of the student, including but not limited to information such as qualifier performance, standardized skills assessments, course commentaries, clerkship evaluations, performance on board exams, as well as letters and reports regarding incidents of unprofessional behavior, personal testimony and special circumstances.

COMMITTEE DECISIONS AND NOTIFICATION

In reviewing the academic progress of students, the Progress Committee makes one of the following determinations:

- Meeting the requirements for satisfactory academic progress
- Not meeting the requirements for satisfactory academic progress, whereby actions may include one of the following:
  Remediation
  Academic Probation
  Suspension
  Dismissal

Students who are making satisfactory progress will not hear directly from the Progress Committee.

If the Progress Committee determines that a student has not demonstrated satisfactory progress or performance in any aspect of the medical school curriculum, remediation will be required. This remediation is designed to provide the student with a structure to address any deficits with the goal of helping the student improve his or her performance to a satisfactory level. When remediation is required, the student will be notified in writing, including the specifics of the required remediation and the consequences of not successfully completing the remediation according to a specified timeline.

If there is a pattern of poor performance or serious violation of the School's code of conduct or professionalism standards, the student may be placed on academic probation concurrent with the remediation, or suspended. The student will be notified in writing of the terms of the academic probation or suspension, including the requirements for having the academic probation or suspension removed as well as the consequences of not meeting these requirements according to a specified timeline.

If a student is unable to meet the academic requirements of the School despite remediation efforts, he or she may be dismissed. Additionally, if at any time a student behaves in a manner that is considered incompatible with the ideals of a physician, he or she may be dismissed. If dismissal occurs, the student will be notified in writing of the decision.

A summary of the actions taken by the Progress Committee may appear in the student's MSPE, and the student will be notified of this in writing.

APPEAL PROCESS

A student may appeal the decision of the Progress Committee. The appeal process includes two steps:

Step 1 To begin the appeal process, the student must notify the chair of the Progress Committee in writing of his or her intention to appeal within seven (7) days from the date the student receives notification of the Progress Committee's decision. The student has the right to appear before the committee, and for support may bring an adviser who is a member of the School of Medicine community. The student may not bring legal representation. The committee will consider any additional information brought to its attention by the student in reaching a final decision.

Step 2 Final decisions of the Progress Committee may be appealed to the dean of the School of Medicine. A student wishing to take this step in the appeal process must submit to the dean (or the dean's designate) a written request describing the basis of the appeal within seven (7) days from the date the student receives notification of the Progress Committee's final decision. Appeals may be based on a claim that some pertinent evidence was not taken into account or that the Progress Committee's consideration was unfair, and must describe the basis for such a claim.

The dean (or the dean's designate) will review the appeal, and at his/her discretion may invite the student to meet. The dean (or the dean's designate) may either issue a final decision, or may remand the case back to the Progress Committee for reconsideration. The dean (or the dean's designate) shall communicate his/her decision in writing to the student and to the Progress Committee. The dean's decision is final.

ADVISING AT YALE SCHOOL OF MEDICINE

Every Yale School of Medicine student is randomly assigned a faculty academic adviser. The four advisers are highly regarded faculty members who have demonstrated dedication to and interest in students and their undergraduate medical education. Each adviser has 20 percent of his or her effort supported by the dean for this role. The advisers meet periodically with their advisees one-on-one and in groups to offer advice on navigating the journey through medical school and beyond and to help students having academic difficulties or questions. They are responsible for writing their advisees' MSPEs and other letters of support. A student may "opt out" of having his or her MSPE written by the assigned academic adviser, in which case it will be written by the associate dean for curriculum. In addition, the associate dean for student affairs is available to all students to assist with problems of any nature, especially personal issues that students may wish to keep separate from their academic progress. The associate dean meets one-on-one with every first-year student and any student requesting a meeting throughout medical

school. The associate dean meets weekly with the academic advisers to discuss themes that may emerge regarding students' academic problems in order to bring broader attention to these themes and issues.

LEAVES OF ABSENCE

Students are expected to follow a continuous course of study at the School of Medicine. However, a student who wishes or needs to interrupt his or her study temporarily may request a leave of absence. There are three types of leave—personal, medical, and parental—all of which are described below. The general policies that apply to all types of leave are:

1. Any student who is contemplating a leave of absence should see the associate dean for student affairs to discuss the necessary application procedures.
2. All leaves of absence must be approved by the associate dean. Medical leaves also require the written recommendation of a Yale Health physician, as described below.
3. A student may be granted a leave of absence of one year with possible extension for one additional year. Any approved leave will be for a specified period.
4. International students who apply for a leave of absence must consult with OISS regarding their visa status.
5. A student on leave of absence may complete outstanding work in any course for which he or she has been granted extensions. He or she may not, however, fulfill any other degree requirements during the time on leave.
6. A student on leave of absence is not eligible for financial aid, including loans; and in most cases, student loans are not deferred during periods of nonenrollment.
7. A student on leave of absence is not eligible for the use of any University facilities normally available to enrolled students.
8. A student on leave of absence may continue to be enrolled in Yale Health by purchasing coverage through the Student Affiliate Coverage plan. In order to secure continuous coverage from Yale Health, enrollment in this plan must be requested prior to the beginning of the term in which the student will be on leave or, if the leave commences during the term, within thirty days of the date when the leave is approved. Coverage is not automatic; enrollment forms are available from the Member Services department of Yale Health, 203.432.0246.
9. A student on leave of absence must notify the associate dean of student affairs in writing of his or her intention to return at least eight weeks prior to the end of the approved leave. In addition, if the returning student wishes to be considered for financial aid, he or she must submit appropriate financial aid applications to the School's financial aid office to determine eligibility.
10. A student on leave who does not return at the end of the approved leave, and does not request and receive an extension from the associate dean, is automatically dismissed from the School.

Personal Leave of Absence

A student who wishes or needs to interrupt study temporarily because of personal exigencies may request a personal leave of absence. A student who is in good standing is eligible

for a personal leave of absence. The general policies governing all leaves of absence are described above.

To request a personal leave of absence, the student must apply in writing, explaining the reasons for the proposed leave and stating both the proposed start and end dates of the leave and the address at which the student can be reached during the period of the leave. If the associate dean finds the student to be eligible, the leave will be approved. In any case, the student will be informed in writing of the action taken. A student who does not apply for a personal leave of absence, or whose application for a personal leave is denied, and who does not register, will be considered to have withdrawn from the School.

Medical Leave of Absence

A student who must interrupt study temporarily because of illness or injury may be granted a medical leave of absence with the approval of the associate dean, on the written recommendation of the director of Yale Health or the chief psychiatrist. The general policies governing all leaves of absence are described above. A student who is in good standing is eligible for a medical leave any time after matriculation. The final decision concerning a request for a medical leave of absence will be communicated in writing by the associate dean.

The School of Medicine reserves the right to require a student to take a leave for medical reasons when, on recommendation of the director of Yale Health or the chief of the Mental Health and Counseling department, the associate dean for student affairs determines that the student is a danger to self or others because of a serious medical problem, or that the student has refused to cooperate with efforts deemed necessary by Yale Health to determine if the student is such a danger. An appeal of such a leave must be made in writing to the dean of the School of Medicine no later than seven days from the date of withdrawal.

A student who is placed on medical leave during any term will have his or her tuition adjusted according to the same schedule used for withdrawals (see Tuition Rebate and Refund Policy). Before re-registering, a student on medical leave must secure written permission to return from a Yale Health physician.

Leave of Absence for Parental Responsibilities

A student who wishes or needs to interrupt study temporarily for reasons of pregnancy, maternity care, or paternity care may be granted a leave of absence for parental responsibilities. The general policies governing all leaves of absence are described above. A student who is in good standing is eligible for parental leave any time after matriculation.

Any student planning to have or care for a child is encouraged to meet with the associate dean for student affairs to discuss leaves and other short-term arrangements. For many students, short-term arrangements rather than a leave of absence are possible. Students living in University housing units are encouraged to review their housing contract and the related polices of the Graduate Housing Office before applying for a parental leave of absence. Students granted a parental leave may continue to reside in University housing to the end of the academic term for which the leave was first granted, but no longer.

U.S. Military Leave Readmissions Policy

Students who wish or need to interrupt their studies to perform U.S. military service are subject to a separate U.S. military leave readmissions policy. In the event a student withdraws or takes a leave of absence from Yale School of Medicine to serve in the U.S. military, the student will be entitled to guaranteed readmission under the following conditions:

1. The student must have served in the U.S. Armed Forces for a period of more than thirty consecutive days;
2. The student must give advance written or oral notice of such service to the associate dean for student affairs. In providing the advance notice the student does not need to indicate whether he or she intends to return. This advance notice need not come directly from the student, but rather, can be made by an appropriate officer of the U.S. Armed Forces or official of the U.S. Department of Defense. Notice is not required if precluded by military necessity. In all cases, this notice requirement can be fulfilled at the time the student seeks readmission, by submitting an attestation that the student performed the service.
3. The student must not be away from the School of Medicine to perform U.S. military service for a period exceeding five years (this includes all previous absences to perform U.S. military service but does not include any initial period of obligated service). If a student's time away from the School of Medicine to perform U.S. military service exceeds five years because the student is unable to obtain release orders through no fault of the student or the student was ordered to or retained on active duty, the student should contact the associate dean for student affairs to determine if the student remains eligible for guaranteed readmission.
4. The student must notify the School of Medicine within three years of the end of the U.S. military service of his or her intention to return. However, a student who is hospitalized or recovering from an illness or injury incurred in or aggravated during the U.S. military service has up until two years after recovering from the illness or injury to notify the School of Medicine of his or her intent to return; and
5. The student cannot have received a dishonorable or bad conduct discharge or have been sentenced in a court-martial.

A student who meets all of these conditions will be readmitted for the next term, unless the student requests a later date of readmission. Any student who fails to meet one of these requirements may still be readmitted under the general readmission policy but is not guaranteed readmission.

Upon returning to the School of Medicine, the student will resume his or her education without repeating completed course work for courses interrupted by U.S. military service. The student will have the same enrolled status last held and with the same academic standing. For the first academic year in which the student returns, the student will be charged the tuition and fees that would have been assessed for the academic year in which the student left the institution. The School of Medicine may charge up to the amount of tuition and fees other students are assessed, however, if veteran's education benefits will cover the difference between the amounts currently charged other students and the amount charged for the academic year in which the student left.

In the case of a student who is not prepared to resume his or her studies with the same academic status at the same point at which the student left or who will not be able to complete the program of study, the School of Medicine will undertake reasonable efforts to help the student become prepared. If after reasonable efforts, the School determines that the student remains unprepared or will be unable to complete the program or after the School determines that there are no reasonable efforts it can take, the School may deny the student readmission.

RESIDENCE AND DINING FACILITIES

Edward S. Harkness Memorial Hall

Harkness Hall, located only steps away from the School of Medicine and Yale-New Haven Hospital, houses students from the Schools of Medicine, Nursing, and Public Health, the Physician Associate program, and other graduate and professional schools at Yale. Residents of Harkness Hall live in a secure building with single-occupancy bedrooms. Yale administrative offices occupy the first through third floors of the building. The great advantages of living in Harkness Hall are its close proximity to classes, and the opportunity it provides in bringing together students from the various medical-related fields in a relaxed social setting. For additional information visit http://gradhousing.yale.edu.

Dining Services

The newly renovated Marigolds Dining, located in Harkness Hall at the School of Medicine, is open from 7:30 a.m. to 7 p.m., Monday through Friday. The menu has been revised to enhance convenience and choice, with a customizable salad, soup, and rice bar utilizing local and seasonal ingredients; specialty coffees and artisan pastries; an expanded grab-and-go selection of prepackaged salads, sandwiches, and entrées; and a daily hot food option. For additional information visit www.yale.edu/dining/locations/marigolds.

DISABILITY INSURANCE

Yale University School of Medicine provides a long-term disability program for each active medical student starting in the first year. (A student may not be on a leave of absence, suspended, or In Absentia to Submit.) Coverage applies regardless of any prior medical condition. During medical school, premiums are paid in full by the School. The policy provides options for expanding coverage after leaving the School of Medicine, but premiums then become the responsibility of the insured. Sign-up takes place during orientation in the first week of the first year. Representatives from the insurance company are present to explain and answer questions about the policy. They also make themselves available for an exit interview before graduation to discuss continuation of coverage after leaving medical school.

MEDICAL CENTER SECURITY

Yale University Security maintains a presence throughout the Medical Center area and across the Yale campus on a 24/7 basis, both through uniformed security officers and

centrally monitored electronic security systems that include video cameras, card readers, intercoms, emergency blue telephones, and intrusion alarm systems.

The Yale Security Department partners with the Yale Police Department by patrolling parking facilities, pedestrian areas, and buildings using marked vehicles, bicycles, and foot patrols. Security officers are also available to assist with lockouts, perform walking escorts, and provide safe rides.

The University Security Department can be reached twenty-four hours a day, seven days a week, by calling 203.785.5555. For additional information regarding public safety at Yale, or to request additional security services for special events, please visit our Web site at http://publicsafety.yale.edu.

THE YALE JOURNAL OF BIOLOGY AND MEDICINE

The *Yale Journal of Biology and Medicine* (YJBM) provides an educational opportunity for students in medicine, public health, nursing, and the biological sciences to gain experience in all aspects of academic publishing. The *Journal* publishes online four times a year through PubMed Central and receives manuscripts on a wide variety of topics in basic and clinical sciences from authors around the world. Alongside participating faculty members, students review and select articles for publication and have the opportunity to review books and write articles showcasing their research or sharing clinical experiences from Yale and abroad. Student editors are chosen each year from the School of Medicine and the Combined Program in the Biological and Biomedical Sciences. The editorial staff meets monthly. Jeffrey Bender, faculty liaison. Web site, http://medicine.yale.edu/yjbm

SPECIAL SUPPORT SERVICES

Office for Women in Medicine

The Office for Women in Medicine (OWM) serves as a focal point for a variety of concerns, both general and specific, within the School and the University. The OWM provides women students, house staff, and faculty access to advisers and mentors and facilitates access by students to professional women in an informal setting. Throughout the year, the office sponsors workshops and seminars on professional development and career opportunities for women in medicine and the sciences that address the broader concerns of women and men in the medical community. These programs are designed to provide an area for interchange, to increase the visibility of women in medicine, to introduce women at Yale School of Medicine to a spectrum of role models, to provide access to notable speakers, and to serve as a forum for relevant issues. The very existence of OWM demonstrates Yale's strong commitment to women and to the creation of a milieu where women at all levels (from beginning students to senior staff and faculty) can develop to full potential. For additional information please visit http://medicine.yale.edu/owm.

Office of the Ombudsperson

The Office of the Ombudsperson is an independent, confidential, neutral, and informal resource to which persons can bring issues with which they are concerned. The ombudsperson serves as a neutral complaint-handler who attempts to ensure that people are

treated fairly and equitably. Any matter in the Yale School of Medicine community may be discussed with the ombudsperson. Discussions are not limited in scope and all are held in strict confidence. The ombudsperson has broad powers of inquiry to resolve conflicts and solve problems through mediation, informal third-party intervention, and shuttle diplomacy. The Office of the Ombudsperson supplements, but does not replace, the existing resources for conflict resolution and fair practice available at the Yale School of Medicine. The ombudsperson follows no prescribed sequence of steps and does not participate in any formal grievance process; the function is to listen, advise, suggest options, make recommendations, and investigate informally with the goal of conflict resolution; to consider all sides of an issue; to remain neutral and impartial; and to protect confidentiality. The only exception to this privilege of confidentiality is where there appears to be imminent risk of serious harm. Discussions with the ombudsperson do not constitute formal notice to the School or University. The contact person is Merle Waxman and the office is located at Sterling Hall of Medicine (SHM L-202), 333 Cedar Street, New Haven, CT 06520; confidential line 203.737.4100. See also http://medicine.yale.edu/ombuds.

Office of Multicultural Affairs

The Office of Multicultural Affairs (OMCA) organizes and administers programs and initiatives designed to serve and advance the professional, social, and academic goals of students and faculty underrepresented in medicine. The office is actively involved in the recruitment and retention of students, house staff, fellows, and faculty. Through a number of educational programs, the OMCA works to increase sensitivity to and awareness of issues important to equitable health care in our multicultural society. The office provides outreach support to assist the New Haven school system in educating high school students for future careers in science and health care. The OMCA also administers yearly summer academic enrichment and research programs for college students. The OMCA works in conjunction with such medical student groups as the Student National Medical Association (SNMA), Latino Medical Student Association (LMSA), Asian Pacific American Health Students Association (APAHSA), and Gay Straight Medical Alliance (GSMA). Associate Dean Forrester A. Lee, M.D., heads the office. The contact person is Associate Director, Linda V. Jackson, 367 Cedar Street, Suite 320, New Haven CT 06511; telephone, 203.785.7545; fax, 203.737.5507; e-mail, omca@yale.edu; Web site, http://medicine.yale.edu/education/omca.

Computing at the School of Medicine

Computing assistance is available for Yale students, faculty, and staff by contacting the ITS Help Desk, Monday through Friday from 7 a.m. to 6 p.m. (203.432.9000, or helpdesk@yale.edu). Assistance is also available at the Sterling Hall of Medicine Walk-in Computer Support Center (WCS-SHM), Monday through Friday from 8:30 a.m. to 4:30 p.m., located on the lower level of the Medical Library.

For information on the extensive computer facilities in the Medical Library, see the chapter Harvey Cushing/John Hay Whitney Medical Library.

Computer facilities at the Anlyan Center include five teaching classrooms equipped with eight iMac computers for students and one for instructors. This facility allows

small-group teaching and interactive use of online resources such as the virtual microscope. The Gross Anatomy Laboratory at the Anlyan Center is also equipped with thirty-four Mac mini computers to provide online anatomy reference resources to complement traditional dissection.

All students can use their own personal computers at a variety of public, library, or teaching space locations that are equipped with wireless network access. Student residents in Harkness Dormitory can use their personal computers in the dorm, which is fully equipped with wired and wireless networking. Residents also have access to two computer clusters on the fifth and eighth floors. Both rooms have two Windows computers and a laser printer.

Yale Information Technology Services (ITS) has made special arrangement with vendors to provide discounted prices to Yale students, staff, and faculty. Information is available at http://its.yale.edu/software-technology/buying-guide. Students who are interested in buying a personal computer, or who simply want advice and information on personal computers or software packages and how to order them, can consult the staff of the Walk-in Computer Support Center.

School of Medicine ID Card Policy

School of Medicine ID cards are issued when a student registers for the first year during orientation. These ID cards open all perimeter doors to the School of Medicine, as well as some interior connector doors. They should be worn visibly at all times while in the Medical Center and presented, upon request, to University officials whose assigned responsibilities authorize them to seek proper identification.

To obtain a replacement ID card, you must go in person to the medical school ID Center. When an ID card is lost, stolen, or no longer functions, the ID Center issues a replacement card with the photograph on record. Malfunctioning ID cards that are returned to the ID Center are replaced at no charge. Lost, stolen, or deliberately damaged cards are replaced at a fee of $20.

Yale-New Haven Hospital Identification Badges

The Yale-New Haven Hospital (Y-NHH) ID badge allows access to areas of the hospital in order for the medical student to effectively carry out the duties expected of a clinical clerk. The Y-NHH ID badge allows entry to common, basic access points for students during the clinical years while completing clinical clerkships and electives at the hospital. Some clerkships allow access to additional areas of the hospital not covered by the basic access. For students doing more than two years of clinical rotations, such as students taking extended study or M.D./Ph.D. students, badges will be activated for a longer period.

The badge includes the student's photo, name, designation as a Yale School of Medicine student, and the date of expiration. The badges are the property of Y-NHH and must be returned to the ID Center by the student prior to graduation. The first ID badge is free; the replacement cost is $10. Worn out or defective badges are replaced free of charge.

For additional information, please see http://medicine.yale.edu/education/osa/registrar/YNHHBadge.aspx.

Yale University Resources and Services

A GLOBAL UNIVERSITY

The University's engagement beyond the United States dates from its earliest years. Yale has drawn students from abroad for nearly two centuries, and international issues have been represented in its curriculum for the past hundred years and more. Yale continues to evolve as a global university, educating leaders and advancing the frontiers of knowledge not simply for the United States, but for the entire world.

Today, Yale welcomes the largest number of international students and scholars in its history. The current enrollment of approximately 2,500 international students from more than 115 countries comprises 20 percent of the student body. Yale is committed to attracting the best and brightest from around the world by offering generous international financial aid packages. The number of international scholars (visiting faculty, researchers, and postdoctoral fellows) has also grown to nearly 2,500 every year.

Yale's globalization is guided by three overarching goals: prepare students for leadership and service in an increasingly interdependent world, attract the most talented students and scholars to Yale from around the world, and position Yale as a global university of consequence. These efforts are coordinated by several University-wide organizations, in addition to the work being done within the individual schools and programs.

The Whitney and Betty MacMillan Center for International and Area Studies (www.yale.edu/macmillan) is the University's focal point for teaching and research on international affairs, societies, and cultures.

The Jackson Institute for Global Affairs (http://jackson.yale.edu) seeks to institutionalize the teaching of global affairs throughout the University and to inspire and prepare Yale students for global citizenship and leadership.

The Office of International Affairs (http://world.yale.edu/oia) supports the international activities of all schools, departments, offices, centers, and organizations at Yale; promotes Yale and its faculty to international audiences; and works to increase the visibility of Yale's international activities around the globe.

The Office of International Students and Scholars (www.yale.edu/oiss) is a resource on immigration matters and hosts orientation programs and social activities for the University's international community.

The Yale Center for the Study of Globalization (www.ycsg.yale.edu) draws on the intellectual resources of the Yale community, scholars from other universities, and experts from around the world to support teaching and research on the many facets of globalization, and to enrich debate through workshops, conferences, and public programs.

The Yale World Fellows Program (http://worldfellows.yale.edu) hosts fifteen emerging leaders from outside the United States each year for an intensive semester of individualized research, weekly seminars, leadership training, and regular interactions with the Yale community.

The Association of Yale Alumni (www.aya.yale.edu) provides a channel for communication between the alumni and the University and oversees the direction of alumni organizations and programs around the world.

Yale's online international toolkit (http://world-toolkit.yale.edu) provides a central point of access to resources and assistance for Yale faculty, students, postdocs, and staff conducting international activities abroad or on campus. Additional information may be found on the "Yale and the World" Web site (http://world.yale.edu), including links to international initiatives across the University.

CULTURAL AND SOCIAL RESOURCES

There are many ways to keep up-to-date about campus news and events. These include the YaleNews Web site, which features stories, videos, and slide-shows about Yale people and programs (http://news.yale.edu); the interactive Yale Calendar of Events (http://events.yale.edu/opa); and the University's social media channels on Facebook, Twitter, Instagram, Tumblr, LinkedIn, and YouTube.

The collections of the Yale Peabody Museum of Natural History comprise more than thirteen million specimens and artifacts in twelve curatorial divisions: anthropology, archives, botany, cryo facility, entomology, historical scientific instruments, invertebrate paleontology, invertebrate zoology, mineralogy and meteorites, paleobotany, vertebrate paleontology, and vertebrate zoology.

The Yale University Art Gallery is the oldest college art museum in the United States, having been founded in 1832 when the patriot-artist John Trumbull gave more than one hundred of his paintings to Yale College. Since then its collections have grown to more than 200,000 objects ranging in date from ancient times to the present. In addition to its world-renowned collections of American paintings and decorative arts, the gallery is noted for outstanding collections of Greek and Roman art, including artifacts from the ancient Roman city of Dura-Europos; collections of early Italian paintings; the Société Anonyme Collection of twentieth-century European and American art; modern and contemporary art and design; Asian art; African art; art of the ancient Americas; and Indo-Pacific art. In December 2012 the gallery completed a comprehensive expansion and renovation project. The expanded museum unites all three buildings—the landmark Louis Kahn building (1953), the Old Yale Art Gallery (1928), and Street Hall (1866)—into a cohesive whole with a rooftop addition by Ennead Architects (2012). The gallery is both a collecting and an educational institution, and all activities are aimed at providing an invaluable resource and experience for Yale faculty, staff, and students, as well as for the general public. For more information, please visit www.artgallery.yale.edu.

The Yale Center for British Art is home to the largest and most comprehensive collection of British paintings, sculpture, prints, drawings, rare books, and manuscripts outside the United Kingdom. Presented to the University by Paul Mellon, Yale College Class of 1929, it is housed in a landmark building by Louis I. Kahn. The center will reopen in spring 2016 with newly installed galleries and updated facilities, upon completion of the second phase of its building conservation project. For more information, feature stories, videos, and news of ongoing and upcoming programs and events, visit http://britishart.yale.edu.

There are more than eighty endowed lecture series held at Yale each year on subjects ranging from anatomy to theology, and including virtually all disciplines.

More than five hundred musical events take place at the University during the academic year. In addition to recitals by graduate students and faculty artists, the School of

Music presents the Philharmonia Orchestra of Yale, the Oneppo Chamber Music Series at Yale, the Duke Ellington Jazz Series, the Horowitz Piano Series, New Music New Haven, Yale Opera, and concerts at the Yale Collection of Musical Instruments, as well as performances by the professional Yale Choral Artists and the postgraduate Yale Baroque Ensemble. The Yale Summer School of Music/Norfolk Chamber Music Festival presents the New Music Workshop and Chamber Choir and Conducting Workshop along with its six-week chamber music session. Many of these concerts stream live on the School's Web site (http://music.yale.edu) and the Norfolk Web site (http://norfolk.yale.edu). Additionally, the School presents the Iseman Broadcasts of the Metropolitan Opera Live in HD free to members of the Yale community. Undergraduate organizations include the Yale Concert Band, the Yale Glee Club, the Yale Symphony Orchestra, and numerous other singing and instrumental groups. The Department of Music sponsors the Yale Collegium, Yale Baroque Opera Project, productions of new music and opera, and undergraduate recitals. The Institute of Sacred Music presents Great Organ Music at Yale, the Yale Camerata, the Yale Schola Cantorum, and many other special events.

For theatergoers, Yale and New Haven offer a wide range of dramatic productions at the University Theatre, Yale Repertory Theatre, Yale School of Drama, Yale Cabaret, Long Wharf Theatre, and Shubert Performing Arts Center.

The religious and spiritual resources of Yale University serve all students, faculty, and staff of all faiths. These resources are coordinated and/or supported through the University Chaplaincy (located on the lower level of Bingham Hall on Old Campus); the University Church in Yale in Battell Chapel, an open and affirming ecumenical Christian congregation; and Yale Religious Ministries, the on-campus association of professionals representing numerous faith traditions. This association includes the Saint Thomas More Catholic Chapel and Center at Yale and the Joseph Slifka Center for Jewish Life at Yale, and it supports Buddhist, Hindu, and Muslim life professionals; several Protestant denominational and nondenominational ministries; and student religious groups such as the Baha'i Association, the Yale Hindu Student Council, the Muslim Student Association, and many others. Hours for the Chaplain's Office during the academic term are Monday through Thursday from 8:30 a.m. to 11 p.m., Friday from 8:30 a.m. to 5 p.m., and Sunday evenings from 5 to 11. Additional information is available at http://chaplain.yale.edu.

ATHLETIC FACILITIES

The Payne Whitney Gymnasium is one of the most elaborate and extensive indoor athletic facilities in the world. This complex includes the 3,100-seat John J. Lee Amphitheater, the site for many indoor varsity sports contests; the Robert J. H. Kiphuth Exhibition Pool; the Brady Squash Center, a world-class facility with fifteen international-style courts; the Adrian C. Israel Fitness Center, a state-of-the-art exercise and weight-training complex; the Brooks-Dwyer Varsity Strength and Conditioning Center; the Colonel William K. Lanman, Jr. Center, a 30,000-square-foot space for recreational/intramural play and varsity team practice; the Greenberg Brothers Track, an eighth-mile indoor jogging track; the David Paterson Golf Technology Center; and other rooms devoted to fencing, gymnastics, rowing, wrestling, martial arts, general exercise, and dance. Numerous physical education classes in dance (ballet, modern, and ballroom, among others), martial arts, zumba, yoga, pilates, aerobic exercise, and sport skills are offered throughout the year.

Yale undergraduates and graduate and professional school students may use the gym at no charge throughout the year. Academic term and summer memberships at reasonable fees are available for faculty, employees, postdoctoral and visiting fellows, alumni, and student spouses. Additional information is available online at http://sportsandrecreation.yale.edu.

During the year various recreational opportunities are available at the David S. Ingalls Rink, the McNay Family Sailing Center in Branford, the Yale Outdoor Education Center in East Lyme, the Yale Tennis Complex, and the Golf Course at Yale. Students, faculty, employees, students' spouses, and guests of the University may participate at each of these venues for a modest fee. Up-to-date information on programs, hours, and specific costs is available online at http://sportsandrecreation.yale.edu.

Approximately fifty club sports come under the jurisdiction of the Office of Outdoor Education and Club Sports. Most of the teams are for undergraduates, but a few are available to graduate and professional school students. Yale undergraduates, graduate and professional school students, faculty, staff, and alumni/ae may use the Yale Outdoor Education Center (OEC), which consists of 1,500 acres surrounding a mile-long lake in East Lyme, Connecticut. The facility includes overnight cabins and campsites, a pavilion and dining hall available for group rental, and a waterfront area with supervised swimming, rowboats, canoes, stand-up paddleboards, and kayaks. Adjacent to the lake, a shaded picnic grove and gazebo are available to visitors. In another area of the property, hiking trails surround a wildlife marsh. The OEC runs seven days a week from the third week of June through Labor Day. For more information, call 203.432.2492 or visit http://sportsandrecreation.yale.edu.

Throughout the year, Yale graduate and professional school students have the opportunity to participate in numerous intramural sports activities. These seasonal, team-oriented activities include volleyball, soccer, and softball in the fall; basketball and volleyball in the winter; softball, soccer, ultimate, and volleyball in the spring; and softball in the summer. With few exceptions, all academic-year graduate-professional student sports activities are scheduled on weekends, and most sports activities are open to competitive, recreational, and coeducational teams. More information is available from the Intramurals Office in Payne Whitney Gymnasium, 203.432.2487, or online at http://sportsandrecreation.yale.edu.

HEALTH SERVICES

The Yale Health Center is located on campus at 55 Lock Street. The center is home to Yale Health, a not-for-profit, physician-led health coverage option that offers a wide variety of health care services for students and other members of the Yale community. Services include student medicine, gynecology, mental health, pediatrics, pharmacy, laboratory, radiology, a seventeen-bed inpatient care unit, a round-the-clock acute care clinic, and specialty services such as allergy, dermatology, orthopedics, and a travel clinic. Yale Health coordinates and provides payment for the services provided at the Yale Health Center, as well as for emergency treatment, off-site specialty services, inpatient hospital care, and other ancillary services. Yale Health's services are detailed in the *Yale Health Student Handbook,* available through the Yale Health Member Services Department, 203.432.0246, or online at http://yalehealth.yale.edu/understand-your-coverage.

Eligibility for Services

All full-time Yale degree-candidate students who are paying at least half tuition are enrolled automatically for Yale Health Basic Coverage. Yale Health Basic Coverage is offered at no charge and includes preventive health and medical services in the departments of Student Health, Gynecology, Health Education, and Mental Health & Counseling. In addition, treatment for urgent medical problems can be obtained twenty-four hours a day through Acute Care.

Students on leave of absence or on extended study and paying less than half tuition are not eligible for Yale Health Basic Coverage but may enroll in Yale Health Student Affiliate Coverage. Students enrolled in the Division of Special Registration as nondegree special students or visiting scholars are not eligible for Yale Health Basic Coverage but may enroll in the Yale Health Billed Associates Plan and pay a monthly fee. Associates must register for a minimum of one term within the first thirty days of affiliation with the University.

Students not eligible for Yale Health Basic Coverage may also use the services on a fee-for-service basis. Students who wish to be seen fee-for-service must register with the Member Services Department. Enrollment applications for the Yale Health Student Affiliate Coverage, Billed Associates Plan, or Fee-for-Service Program are available from the Member Services Department.

All students who purchase Yale Health Hospitalization/Specialty Coverage (see below) are welcome to use specialty and ancillary services at Yale Health Center. Upon referral, Yale Health will cover the cost of specialty and ancillary services for these students. Students with an alternate insurance plan should seek specialty services from a provider who accepts their alternate insurance.

Health Coverage Enrollment

The University also requires all students eligible for Yale Health Basic Coverage to have adequate hospital insurance coverage. Students may choose Yale Health Hospitalization/Specialty Coverage or elect to waive the plan if they have other hospitalization coverage, such as coverage through a spouse or parent. The waiver must be renewed annually, and it is the student's responsibility to confirm receipt of the waiver by the University's deadlines noted below.

YALE HEALTH HOSPITALIZATION/SPECIALTY COVERAGE

For a detailed explanation of this plan, which includes coverage for prescriptions, see the *Yale Health Student Handbook,* available online at http://yalehealth.yale.edu/understand-your-coverage.

Students are automatically enrolled and charged a fee each term on their Student Financial Services bill for Yale Health Hospitalization/Specialty Coverage. Students with no break in coverage who are enrolled during both the fall and spring terms are billed each term and are covered from August 1 through July 31. For students entering Yale for the first time, readmitted students, and students returning from a leave of absence who have not been covered during their leave, Yale Health Hospitalization/Specialty Coverage begins on the day the dormitories officially open. A student who is enrolled for the fall term only is covered for services through January 31; a student enrolled for the spring term only is covered for services through July 31.

Waiving Yale Health Hospitalization/Specialty Coverage Students are permitted to waive Yale Health Hospitalization/Specialty Coverage by completing an online waiver form at https://www.yhpstudentwaiver.yale.edu that demonstrates proof of alternate coverage. It is the student's responsibility to report any changes in alternate insurance coverage to the Member Services Department. Students are encouraged to review their present coverage and compare its benefits to those available under Yale Health. The waiver form must be filed annually and must be received by September 15 for the full year or fall term or by January 31 for the spring term only.

Revoking the waiver Students who waive Yale Health Hospitalization/Specialty Coverage but later wish to be covered must complete and send a form voiding their waiver to the Member Services Department by September 15 for the full year or fall term, or by January 31 for the spring term only. Students who wish to revoke their waiver during the term may do so, provided they show proof of loss of the alternate insurance plan and enroll within thirty days of the loss of this coverage. Yale Health fees will not be prorated.

YALE HEALTH STUDENT TWO-PERSON AND FAMILY PLANS

A student may enroll his or her lawfully married spouse or civil union partner and/or legally dependent child(ren) under the age of twenty-six in one of two student dependent plans: the Two-Person Plan or the Student Family Plan. These plans include services described in both Yale Health Basic Coverage and Yale Health Hospitalization/Specialty Coverage. Coverage is not automatic, and enrollment is by application. Applications are available from the Member Services Department or can be downloaded from the Web site (http://yalehealth.yale.edu) and must be renewed annually. Applications must be received by September 15 for full-year or fall-term coverage, or by January 31 for spring-term coverage only.

YALE HEALTH STUDENT AFFILIATE COVERAGE

Students on leave of absence or extended study, students paying less than half tuition, or students enrolled in the Eli Whitney Program prior to September 2007 may enroll in Yale Health Student Affiliate Coverage, which includes services described in both Yale Health Basic and Yale Health Hospitalization/Specialty Coverage. Applications are available from the Member Services Department or can be downloaded from the Web site (http://yalehealth.yale.edu) and must be received by September 15 for full-year or fall-term coverage, or by January 31 for spring-term coverage only.

Eligibility Changes

Withdrawal A student who withdraws from the University during the first ten days of the term will be refunded the fee paid for Yale Health Hospitalization/Specialty Coverage. The student will not be eligible for any Yale Health benefits, and the student's Yale Health membership will be terminated retroactive to the beginning of the term. The medical record will be reviewed, and any services rendered and/or claims paid will be billed to the student on a fee-for-service basis. Assistance with identifying and locating alternative sources of medical care may be available from the Care Management Department at Yale Health. At all other times, a student who withdraws from the University will be covered by Yale Health for thirty days following the date of withdrawal. Fees will not be

prorated or refunded. Students who withdraw are not eligible to enroll in Yale Health Student Affiliate Coverage. Regardless of enrollment in Yale Health Hospitalization/Specialty Coverage, students who withdraw will have access to services available under Yale Health Basic Coverage (including Student Health, Athletic Medicine, Mental Health & Counseling, and Care Management) during these thirty days to the extent necessary for a coordinated transition of care.

Leaves of absence Students who are granted a leave of absence are eligible to purchase Yale Health Student Affiliate Coverage during the term(s) of the leave. If the leave occurs during the term, Yale Health Hospitalization/Specialty Coverage will end on the date the leave is granted, and students may enroll in Yale Health Student Affiliate Coverage. Students must enroll in Affiliate Coverage prior to the beginning of the term during which the leave is taken or within thirty days of the start of the leave. Fees paid for Yale Health Hospitalization/Specialty Coverage will be applied toward the cost of Affiliate Coverage. Coverage is not automatic, and enrollment forms are available at the Member Services Department or can be downloaded from the Web site (http://yalehealth.yale.edu). Fees will not be prorated or refunded.

Extended study or reduced tuition Students who are granted extended study status or pay less than half tuition are not eligible for Yale Health Hospitalization/Specialty Coverage. They may purchase Yale Health Student Affiliate Coverage during the term(s) of extended study. This plan includes services described in both Yale Health Basic and Yale Health Hospitalization/Specialty Coverage. Coverage is not automatic, and enrollment forms are available at the Member Services Department or can be downloaded from the Web site (http://yalehealth.yale.edu). Students must complete an enrollment application for the plan prior to September 15 for the full year or fall term, or by January 31 for the spring term only.

For a full description of the services and benefits provided by Yale Health, please refer to the *Yale Health Student Handbook,* available from the Member Services Department, 203.432.0246, 55 Lock Street, PO Box 208237, New Haven CT 06520-8237.

Required Immunizations

Measles (rubeola), German measles (rubella), and mumps All students who were born after January 1, 1957, are required to provide proof of immunization against measles (rubeola), German measles (rubella), and mumps. Connecticut state law requires two doses of measles vaccine. The first dose must have been given on or after January 1, 1980, *and* after the student's first birthday; the second dose must have been given at least thirty (30) days after the first dose. Connecticut state law requires proof of two doses of rubella vaccine administered on or after January 1, 1980, *and* after the student's first birthday. Connecticut state law requires proof of two mumps vaccine immunizations administered on or after January 1, 1980, *and* after the student's first birthday; the second dose must have been given at least thirty (30) days after the first dose. The law applies to all students unless they present (a) a certificate from a physician stating that such immunization is contraindicated, (b) a statement that such immunization would be contrary to the student's religious beliefs, or (c) documentation of a positive blood titer for measles, rubella,

and mumps. In addition to vaccination, all health care students should provide blood titers for measles, rubella, and mumps.

Meningitis All students living in on-campus housing must be vaccinated against meningitis. The vaccine must have been received after January 1, 2011. Students who are not compliant with this state law will not be permitted to register for classes or move into the dormitories for the fall term, 2015. Please note that the State of Connecticut does not require this vaccine for students who intend to reside off campus.

Varicella (chicken pox) All students are required to provide proof of immunization against varicella. Connecticut state law requires two doses of varicella vaccine. The first dose must have been given on or after the student's first birthday; the second dose must have been given at least twenty-eight (28) days after the first dose. Documentation of a positive blood titer for varicella is also acceptable. History of varicella disease is not acceptable.

TB screening The University requires tuberculosis screening for all incoming students. For students in the School of Medicine, this entails providing proof of a PPD done within six months of the start of the fall term, or a chest X-ray for individuals known to be PPD positive.

In addition to University requirements, all School of Medicine students must also meet immunization requirements of the various hospitals in which they will work. Yale-New Haven Hospital requires that, before beginning any clinical work, all students with negative serology be successfully vaccinated against hepatitis B and must ascertain that students are immune to mumps, rubeola, rubella, and varicella. Those refusing the hepatitis B vaccine must do so in writing at the time of matriculation. Students must show evidence that they have received a tetanus-diphtheria-pertussis booster within the past ten years.

Any students who will be traveling abroad should make an appointment in the Travel Clinic at Yale Health at least six to eight weeks prior to departure. It is especially important that students notify the Travel Clinic of travel activities that include working in areas where they might encounter blood or fluid exposure. Such students will be given a supply of antiretroviral medication at no charge. They will also receive instructions about how to handle possible exposure.

OFFICE OF INTERNATIONAL STUDENTS AND SCHOLARS

The Office of International Students and Scholars (OISS) coordinates services and support for Yale's 5,000 international students, faculty, staff, and their dependents. OISS staff offers assistance with issues related to employment, immigration, and personal and cultural adjustment, as well as serves as a source of general information about living at Yale and in New Haven. As Yale University's representative for immigration concerns, OISS provides assistance to students, faculty, and staff on how to obtain and maintain legal nonimmigrant status in the United States. All international students and

scholars must register with OISS as soon as they arrive at Yale; see http://oiss.yale.edu/information-new-yalies.

OISS programs, like the Community Friends hosting program, daily English conversation groups, U.S. culture workshops and discussions, bus trips, and social events, provide an opportunity to meet members of Yale's international community and become acquainted with the many resources of Yale University and New Haven. Spouses and partners of Yale students and scholars will want to get involved with the International Spouses and Partners at Yale (ISPY), which organizes a variety of programs.

The OISS Web site (http://oiss.yale.edu) provides useful information to students and scholars prior to and upon arrival in New Haven, as well as throughout their stay at Yale. International students, scholars, and their families and partners can connect with OISS and the Yale international community virtually through several listservs and Facebook.

OISS is housed in the International Center for Yale Students and Scholars, which serves as a welcoming venue for students and scholars who want to peruse resource materials, check their e-mail, and meet up with a friend or colleague. Open until 9 p.m. on weekdays during the academic year, the center—located at 421 Temple Street, across the street from Helen Hadley Hall—also provides meeting space for student groups and a venue for events organized by both student groups and University departments. For more information about reserving space at the center, send a message to oiss@yale.edu or call 203.432.2305. For information about the center, visit http://oiss.yale.edu/about/international-center.

RESOURCE OFFICE ON DISABILITIES

The Resource Office on Disabilities facilitates accommodations for undergraduate and graduate and professional school students with disabilities who register with and have appropriate documentation on file in the Resource Office. Early planning is critical. Documentation may be submitted to the Resource Office even though a specific accommodation request is not anticipated at the time of registration. It is recommended that matriculating students in need of disability-related course accommodations at Yale University contact the Resource Office by June 15. Special requests for University housing need to be made in the housing application. Returning students must contact the Resource Office at the beginning of each term to arrange for course and exam accommodations.

The Resource Office also provides assistance to students with temporary disabilities. General informational inquiries are welcome from students and members of the Yale community and from the public. The mailing address is Resource Office on Disabilities, Yale University, PO Box 208305, New Haven CT 06520-8305. The Resource Office is located at 35 Broadway (rear entrance), Room 222. Office hours are Monday through Friday, 8:30 a.m. to 4:30 p.m. Voice callers may reach staff at 203.432.2324; fax at 203.432.8250. The Resource Office may also be reached by e-mail (anthony.kulikowski@yale.edu) or through its Web site (www.yale.edu/rod).

RESOURCES ON SEXUAL MISCONDUCT

Yale University is committed to maintaining and strengthening an educational, employment, and living environment founded on civility and mutual respect. Sexual misconduct is antithetical to the standards and ideals of our community, and it is a violation of Yale policy and the disciplinary regulations of Yale College and the graduate and professional schools.

Sexual misconduct incorporates a range of behaviors including sexual assault, sexual harassment, intimate partner violence, stalking, voyeurism, and any other conduct of a sexual nature that is nonconsensual, or has the purpose or effect of threatening, intimidating, or coercing a person. Sexual activity requires consent, which is defined as voluntary, positive agreement between the participants to engage in specific sexual activity. Violations of Yale's Policy on Teacher-Student Consensual Relations also constitute sexual misconduct.

Yale aims to eradicate sexual misconduct through education, training, clear policies, and serious consequences for violations of these policies. In addition to being subject to University disciplinary action, many forms of sexual misconduct are prohibited by Connecticut and federal law and may lead to civil liability or criminal prosecution. Yale provides a range of services, resources, and mechanisms for victims of sexual misconduct. The options for undergraduate, graduate, and professional school students are described at http://smr.yale.edu.

SHARE: Information, Advocacy, and Support

55 Lock Street, Lower Level
Office hours: 9 a.m.–5 p.m., M–F
24/7 hotline: 203.432.2000
http://sharecenter.yale.edu

SHARE, the Sexual Harassment and Assault Response and Education Center, has trained counselors available at any time of day or night via its direct hotline, as well as drop-in counseling on weekdays during regular business hours. SHARE is available to members of the Yale community who wish to discuss any experience of sexual misconduct involving themselves or someone they care about. SHARE services are confidential and can be anonymous when desired. SHARE can provide professional help with medical and health issues (including accompanying students to the hospital), as well as advice and assistance with contacting police and/or initiating a formal or informal complaint, and it offers ongoing counseling and support. SHARE works closely with the University-Wide Committee on Sexual Misconduct, the Title IX coordinators, the Yale Police Department, and other campus resources.

If you wish to make use of SHARE's services, you can call the crisis number (203.432.2000) at any time for a phone consultation or to set up an in-person appointment. You may also drop in on weekdays during regular business hours. Some legal and medical options are time-sensitive, so if you have been assaulted, we encourage you to call SHARE and/or the Yale Police as soon as possible. Counselors can talk with you over the telephone or meet you in person at Acute Care in the Yale Health Center or at the Yale-New Haven Emergency Room. If it is not an acute situation and you would like to

contact the SHARE staff during regular business hours, you can contact Carole Goldberg, the director of SHARE (203.432.0310, carole.goldberg@yale.edu), Jennifer Czincz, assistant director (203.432.2610, jennifer.czincz@yale.edu), Amy Myers (203.436.8197, amy.myers@yale.edu), or John Criscuolo (203.494.6247, john.criscuolo@yale.edu).

Title IX Coordinators

http://provost.yale.edu/title-ix

Title IX of the Education Amendments of 1972 protects people from sex discrimination in educational programs and activities at institutions that receive federal funding. Sex discrimination includes sexual harassment, sexual assault, and other forms of misconduct. The University is committed to providing an environment free from discrimination on the basis of sex.

Each school, including Yale College, has assigned a senior administrator to act as a deputy Title IX coordinator, reporting to Stephanie Spangler, Deputy Provost for Health Affairs and Academic Integrity and the University Title IX Coordinator. Coordinators provide information, track and resolve complaints, and address issues relating to gender-based discrimination and sexual misconduct within their respective schools. Coordinators are knowledgeable about, and will provide information on, all options for complaint resolution, and can initiate institutional action when necessary. Discussions with a Title IX coordinator will be treated confidentially; at times, the coordinator may need to consult with other administrators or take action in the interest of safety. The coordinators also work closely with the SHARE Center, the University-Wide Committee on Sexual Misconduct, and the Yale Police Department.

University-Wide Committee on Sexual Misconduct

203.432.4449 (business hours)
http://provost.yale.edu/uwc

The University-Wide Committee on Sexual Misconduct (UWC) is an internal disciplinary board for complaints of sexual misconduct available to students, faculty, and staff across the University, as described in the committee's procedures. The UWC provides an accessible, representative, and trained body to fairly and expeditiously address formal and informal complaints of sexual misconduct. UWC members can answer informal inquiries about procedures and the University definition of sexual misconduct. Operated from the Provost's Office, the UWC is comprised of faculty, administrative, and student representatives from across the University. In cases where formal resolution is sought, investigations are conducted by professional, independent fact finders.

Yale Police Department

101 Ashmun Street
24/7 hotline: 203.432.4400
http://publicsafety.yale.edu/police/sensitive-crimes-support

The Yale Police Department (YPD) operates 24/7 and is comprised of highly trained, professional officers. The YPD can provide information on available victims' assistance

services and also has the capacity to perform full criminal investigations. If you wish to speak with Sergeant Marnie Robbins Hoffman, the Sensitive Crimes & Support coordinator, she can be reached at 203.432.9547 during business hours or via e-mail at marnie.robbins@yale.edu. Informational sessions are available with the Sensitive Crimes & Support coordinator to discuss safety planning, available options, etc. The YPD works closely with the New Haven State's Attorney, the SHARE Center, the University's Title IX coordinators, and various other departments within the University. Talking to the YPD does not commit you to submitting evidence or pressing charges; with few exceptions, all decisions about how to proceed are up to you.

Departments and Sections

This section provides information for all departments and some sections in the School of Medicine.

Courses designated *a* meet in the fall term only. Courses designated *b* meet in the spring term only. Courses enclosed in brackets are not offered in the current academic year.

Faculty listings reflect approved appointments effective April 5, 2014.

ANESTHESIOLOGY

TMP 3, 203.785.2802
http://medicine.yale.edu/anesthesiology

Professors P.G. Barash, C.A. Brandt (*Emergency Medicine*), F.R. Braveman, J.G. Collins (*Emeritus*), J. Ehrenwerth (*Emeritus*), R.L. Hines (*Chair*), L.M. Kitahata (*Emeritus*), C.J. Kopriva (*Emeritus*), R. Lagasse, R.H. LaMotte, J. Lichtor, P.L. Miller (*Medical Informatics*), L.E. Niklason, T.H. Oh (*Emeritus*), A.C. Perrino, T.D. Rafferty (*Emeritus*), S.H. Rosenbaum, W. Rosenblatt, K.J. Ruskin, K.H. Shelley, R.N. Shiffman (*Pediatrics*), D.G. Silverman, R.S. Sinatra (*Emeritus*)

Associate Professors S. Akhtar, A.A. Alian, K. Cheung (*Emergency Medicine*), S. Garwood, T.M. Halaszynski, V. Kurup, L.L. Maerz (*Surgery*), G.F. McCloskey, G.C. Michaud (*Medicine*), W.M. Popescu, R. Ramani, J.J. Schwartz, N. Vadivelu

Assistant Professors C. Al Haddadin, R.T. Aouad, S.I. Assaad, T. Banack, E.R. Beaudoin, M.E. Blessing, S. Chatterjee, N. Chawla, M. Cortes, S. Dabu-Bondoc, R. Deshpande, J. Farmer, J. Feinleib, L. Freudzon, D.J. Gaal, M. Ganatra, T.J. Golembeski, J. Golia, L. Grecu, A.S. Haddadin, L.E. Helgeson, K. Hernandez, A. Herrera, N.F. Holt, M.G. Hrycelak, L.H. Kwan, K. Labib, M. Leonova, J. Li, M. Liu, S. Liu, A.M. Lobo, D. Lombardo, S.M. Luczycki, D. Lujic, A. Malik, R. Marando, K.E. Marschall, V. Matei, J. McCarthy, P.M. Meeks, H. Mikhael, R.K. Modak, T. Myslajek, C. Noto, J. Oliver, L. Oliver, A.D. Oprea, J.T. Pan, M. Punjala, I. Rock, R.M. Romero, M.J. Rose, A. Ruskis, J. Santoro, J. Schneider, R.B. Schonberger, C. Schulten, R. Schulten, R. Sekhar, J. Sherman, D. Snegovskikh, J. Sramcik, R.G. Stout, P. Tanka, H.E. Tantawy, J. Tao, D.M. Thomas, I. Vaitkeviciute, D.W. Vaughn, C.A. Voets, R. Wardhan, X. Xu, A. Yamani, J. Zafar, M. Zhang (*Adjunct*), G.X. Zhou, Q. Zhu

Instructors C. Bartels, J. Bourassa, R.S. Brunetti, L. Calo, T. Cooke, M.S. Cosgrove, D. Diaz, M.L. Flaherty, C. Garceau, O. Geismar, C. Gibbs, N. Guay, J. Heath, L. Hovagim, N. Hymel, C. Ippolito, E.A. Jakab, R. Kyle, A.A. Lamacchia, H. Manzolillo, K. McClintock, A. Mercurio, M. Michaud, M. Montefusco, C. Natividad Le, D. O'Mara, D.D. Pannella, M. Paulin, A. Phillips, D. Reilly, J. Roman, J. Sacco, N. Saidi, H.N. Syombathy

Senior Research Scientists J.G. Collins, T.D. Rafferty

Research Scientists N. Rajeevan, F.G. Sayward

Associate Research Scientists P.H. Addy, S.J. Frawley, M. Ghaedi, L. Gui, S.J. Jarad, T. Kawecki, P.G. Mutalik, H. Qian, H. Rajeevan, M.A. Shifman (*Medical Informatics*), S. Sundaram, R. Wang

Clinical Professor J.D. Katz

Associate Clinical Professors J. Charchaflieh, K.S. Chung, L.P. Kirschenbaum, A.L. Mandel, E.K. Prokop, S.B. Stone, A.D. Weinstock

Assistant Clinical Professors C. Ayoub, J. Kim, M. Lomanto, L. Wang, J.C. Weinberg, T. Wong

Clinical Instructors M.M. Abreu, L.A. Carlson, A.M. Deshpande (*Medical Informatics*), M. Dudley, W.J. Hancock, K.M. Hurd, T. Jacobson, N. Kashyap, M.A. Kondor, M.M. Madonick, B. McLean, L. Orozco, L. Pettway, S. Stebbins, P.G. Thomas

Lecturers C. Bruce, A.M. Deshpande (*Medical Informatics*), V.N. Garla, Z. Gong, B. Kaplan, S. LaCoursiere, P. Nadkarni, H. Robins, E. Zador

ANES 104, Anesthesiology Advanced Clinical Elective Individualized program of instruction in anesthesia subspecialties, including cardiovascular, neurosurgical, obstetrical, and pediatric anesthesia. One or two students every four weeks. Director: S. Akhtar

ANES 141, Anesthesiology Laboratory Research Elective Participation in ongoing research by department faculty involving clinical responses to drugs affecting cardiopulmonary, central nervous and autonomic nervous system, noninvasive cardiovascular monitoring, perioperative coagulation, and other topics. The development of individual research projects is also encouraged. Students interested in complementary approaches to pain management, such as acupuncture, should contact S.-M. Wang. One student every four weeks; additional time recommended. Director: D.G. Silverman

ANES 142, Anesthesiology Clinical Research Elective Laboratory research projects focused on the neurophysiology and neuropharmacology of the sensations of pain and itch, and on vascular biology. One or two students every four weeks. Director: L.E. Niklason; R.H. LaMotte, C. Ma, K.H. Shelley, D.G. Silverman, S.-M. Wang

CELL BIOLOGY

SHM C207, 203.737.5603
www.cellbiology.yale.edu

Professors C.G. Burd, M.J. Caplan (*Cellular & Molecular Physiology*), L. Cooley (*Genetics*), P. Cresswell (*Immunobiology*), P. De Camilli, J.E. Galán (*Microbial Pathogenesis*), F. Gorelick (*Medicine*), C. Hashimoto, J.D. Jamieson, D.S. Krause (*Laboratory Medicine*), T.L. Lentz (*Emeritus*), H. Lin, V.T. Marchesi (*Pathology*), M.S. Mooseker (*Molecular, Cellular & Developmental Biology*), M.H. Nathanson (*Medicine*), K. Neugebauer (*Molecular Biophysics & Biochemistry*), T.D. Pollard (*Molecular, Cellular & Developmental Biology*), J.E. Rothman (*Chair*), M.A. Schwartz (*Medicine*), M. Simons (*Medicine*), S.L. Wolin

Associate Professors J. Bewersdorf, J.S. Bogan (*Medicine*), D.A. Calderwood (*Pharmacology*), D. Colón-Ramos, E.R. Dufresne (*Engineering & Applied Science*), V. Greco (*Genetics*), T. Melia, K.M. Reinisch, D.K. Toomre, Y. Zhang

Assistant Professors D. Baddeley, T. Carroll, S.M. Ferguson, S. Guo, M. King, C. Lin, C.P. Lusk, M. Mariappan, P.A. Takizawa, J. Yao

Senior Research Scientists T.L. Lentz, A.M. Vignery (*Orthopaedics & Rehabilitation*)

Research Scientists X. Chen, S.S. Krishnakumar, G. Lavieu, X.N. Liu, C. Qiu

Associate Research Scientists S.J. An, S.M. Auclair, J. Baskin, Y. Cai, E. Cheng, R.J. Chi, P. Colombi, J. Dancourt, A.R. Ferguson, X. Ge, L. Geng, C. Juliano, F. Li, N. Liu, M.C. Llaguno, F. Pincet, H. Qi, S. Sim, N. Vishnoi, T. Watanabe, F. Wu, Y. Wu, Z. Xi, W. Xu, M. Zhong, J. Zhu

CBIO 502, Molecules to Systems This course is designed to provide medical students with a current and comprehensive review of biologic structure and function at the cellular, tissue, and organ system levels. Areas covered include structure and organization of cells; regulation of the cell cycle and mitosis; protein biosynthesis and membrane targeting; cell motility and the cytoskeleton; signal transduction; cell adhesion; cell and tissue organization of organ systems. Clinical correlation sessions, which illustrate the contributions of cell biology to specific medical problems, are interspersed in the lecture schedule. Histophysiology laboratories provide practical experience with an understanding of exploring cell and tissue structure. The course is offered only to M.D. and M.D./Ph.D. students. It runs for three terms from September to December of the next academic year to coincide with the School of Medicine curriculum. Registration and the release of grades will take place in the third term. The course is equivalent to two graduate credits. P.A. Takizawa, F. Gorelick, J.D. Jamieson, T.L. Lentz, and faculty

CBIO 601a/b, Molecular and Cellular Basis of Human Disease The course emphasizes the connections between diseases and basic science using a lecture and seminar format. It is designed for students who are committed to a career in medical research, those who are considering such a career, or students who wish to explore scientific topics in depth. The first half of the course is organized in four- to five-week blocks that topically parallel

CBIO 502a/b. Examples of blocks from past years include "Diseases of protein folding" and "Diseases of ion channels." Each topic is introduced with a lecture given by the faculty. The lecture is followed by sessions in which students review relevant manuscripts under the supervision of a faculty mentor. The second half of the course focuses on the relationship of basic science to disease processes while emphasizing translational and clinical research. In addition, sessions are devoted to academic careers and cover subjects such as obtaining an academic position, promotions, and grant writing. The course is open to M.D. and M.D./Ph.D. students who are taking or have taken CBIO 502a/b. Student evaluations are based on attendance, participation in group discussions, formal presentations, and a written review of an NIH proposal. The course runs from September to mid-May and is equivalent to two graduate credits. F. Gorelick, J.D. Jamieson, and faculty

CBIO 602a/MB&B 602a/MCDB 602a, Molecular Cell Biology A comprehensive introduction to the molecular and mechanistic aspects of cell biology for graduate students in all programs. Emphasizes fundamental issues of cellular organization, regulation, biogenesis, and function at the molecular level. S.L. Wolin, M.J. Caplan, T. Carroll, C. Crews, P. De Camilli, M. King, T. Melia, I.-H. Park, J.E. Rothman, M.A. Schwartz

CBIO 603a/MCDB 603a, Seminar in Molecular Cell Biology A graduate-level seminar course in modern cell biology. The class is devoted to the reading and critical evaluation of classical and current papers. The topics are coordinated with the CBIO 602a lecture schedule. Thus, concurrent enrollment in CBIO 602a is required. M. King, M.J. Caplan, T. Carroll, C. Crews, P. De Camilli, T. Melia, J.E. Rothman, M.A. Schwartz, S.L. Wolin

CBIO 604b, Systems Cell Biology Introduction to the organization and function of cells within complex multicellular systems as encountered in the human body. Covers major tissues and organs as well as the cardiovascular, immune, and nervous systems, with special emphasis on the molecular and cellular bases of developmental processes and human diseases. Lectures supplemented by electronic-based tutorials on the histology of tissues and organs. C. Hashimoto, D. Colón-Ramos, and faculty

CBIO 606b, Advanced Topics in Cell Biology This seminar course, which meets once weekly, covers advanced topics in cell biology. Each topic is spread over two or three sessions, which start with an introductory overview and are followed by a discussion of key papers led by an expert in the field. C.P. Lusk, C.G. Burd, S.M. Ferguson

CBIO 611b, Vascular Cell Biology This course introduces the structure and organ-level physiology of the vascular system, then covers in greater depth the development, regulation, mechanics, and pathology of blood vessels. The major focus is on cellular and molecular mechanisms. The course includes both lectures and reading and discussion of recent literature. M.A. Schwartz and faculty

CBIO 655a/GENE 655a, Stem Cells: Biology and Application This course is designed for first-year or second-year students to learn the fundamentals of stem cell biology and to gain familiarity with current research in the field. The course is presented in a lecture and discussion format based on primary literature. Topics include stem cell concepts, methodologies for stem cell research, embryonic stem cells, adult stem cells, cloning and stem cell reprogramming, and clinical applications of stem cell research. Prerequisites:

undergraduate-level cell biology, molecular biology, and genetics. I.-H. Park, H. Lin, and faculty

CBIO 701b, Illuminating Cellular Function Introduction to the principles and practical methods of live cell imaging. Covers principles of fluorescent microscopy (including genetically encoded probes and physiological indicators), image formation, image detection, and image analysis. Includes hands-on demonstrations of state-of-the-art instrumentation, such as video-rate confocal and super-resolution "nanoscopes." D.K. Toomre, J. Bewersdorf, and faculty

CBIO 900a/GENE 900a/MCDB 900a, First-Year Introduction to Research—Grant Writing and Scientific Communication Grant writing, scientific communication, and laboratory rotation talks for Molecular Cell Biology, Genetics, and Development track students. S. Holley and faculty

CBIO 901b/GENE 901b/MCDB 901b, First-Year Introduction to Research—Ethics: Scientific Integrity in Biomedical Research Ethics and laboratory rotation talks for Molecular Cell Biology, Genetics, and Development track students. J. Bewersdorf

CBIO 903a or b, Reading Course in Cell Biology Independent study of specific topics in cell biology through directed reading of the literature under faculty supervision. Student may choose any topic and any Yale faculty subject to approval by the Cell Biology DGS. Open to Cell Biology students, and to students in other departments with approval from their respective DGS. Term paper required. K.M. Reinisch

CBIO 911a/GENE 911a/MCDB 911a, First Laboratory Rotation First laboratory rotation for Molecular Cell Biology, Genetics, and Development track students. C. Crews

CBIO 912b/GENE 912b/MCDB 912b, Second Laboratory Rotation Second laboratory rotation for Molecular Cell Biology, Genetics, and Development track students. C. Crews

CBIO 913b/GENE 913b/MCDB 913b, Third Laboratory Rotation Third laboratory rotation for Molecular Cell Biology, Genetics, and Development track students. C. Crews

CELLULAR AND MOLECULAR PHYSIOLOGY

SHM B147, 203.785.4041
http://medicine.yale.edu/physiology

Professors P.S. Aronson (*Medicine*), A. Bordey (*Neurosurgery*), E.L. Boulpaep, T.H. Brown (*Psychology*), C. Canessa, L.G. Cantley (*Medicine*), M.J. Caplan (*Chair*), N. Carrasco, W.K. Chandler (*Emeritus*), L.B. Cohen, M.E. Egan (*Pediatrics*), B.E. Ehrlich (*Pharmacology*), A. Eichmann (*Medicine*), B. Forbush, J.P. Geibel (*Surgery*), G.H. Giebisch (*Emeritus*), J.F. Hoffman (*Emeritus*), L.K. Kaczmarek (*Pharmacology*), G. Lister (*Pediatrics*), M. Nitabach, V.A. Pieribone, P.A. Preisig (*Medicine*), W.M. Saltzman (*Engineering & Applied Science*), J. Santos-Sacchi (*Surgery*), G.I. Shulman (*Medicine*), F.J. Sigworth, C.L. Slayman, C.W. Slayman (*Genetics*), S. Tomita, T. Wang, F.S. Wright (*Medicine*), L.H. Young (*Medicine*), D. Zenisek, Z. Zhou (*Ophthalmology & Visual Science*)

Associate Professors N.A. Ameen (*Pediatrics*), I.E. De Araujo (*Psychiatry*), J.B. Demb (*Ophthalmology & Visual Science*), S. Ishibe (*Medicine*), R.G. Kibbey (*Medicine*), X. Yang (*Comparative Medicine*)

Assistant Professors N.A. Addy (*Psychiatry*), S. Bragiantsev, S.G. Campbell (*Biomedical Engineering*), G. de Lartigue, E. Gracheva, E. Karatekin, J.J. Rinehart, S.K. Singh, C. Thoreen

Senior Research Scientists G.H. Giebisch, J.F. Hoffman, D.P. Zecevic

Associate Research Scientists C.X. Bleau, B.A. Davis, X. Jin, M. Kunst, C. Lv, M.A. Reyna, A. Rivetta, M.M. Tomita, Y. Yang

C&MP 500, From Molecules to Systems: Medical Physiology This course is open only to first-year medical students. The purpose of the course is to understand complex physiological processes at the level of component molecules, cells, specific tissues, organs, organ systems, and the whole body. Lectures cover human medical physiology in eleven modules: Cell Physiology/Membrane Transport, Nerve, Muscle, Metabolism, Blood, Cardiovascular, Respiratory, Kidney, Gastrointestinal, Endocrine, and Reproduction. Two major themes emerge during the course: (1) the human body employs a multitude of approaches for regulating the environment around its individual cells, and (2) these individual cells perform tasks necessary for sustaining life in the whole organism. E.L. Boulpaep and staff

C&MP 550a^{U}/ENAS 550a^{U}/MCDB 550a^{U}/PHAR 550a, Physiological Systems The course develops a foundation in human physiology by examining the homeostasis of vital parameters within the body, and the biophysical properties of cells, tissues, and organs. Basic concepts in cell and membrane physiology are synthesized through exploring the function of skeletal, smooth, and cardiac muscle. The physical basis of blood flow, mechanisms of vascular exchange, cardiac performance, and regulation of overall circulatory function are discussed. Respiratory physiology explores the mechanics of ventilation, gas diffusion, and acid-base balance. Renal physiology examines the formation

and composition of urine and the regulation of electrolyte, fluid, and acid-base balance. Organs of the digestive system are discussed from the perspective of substrate metabolism and energy balance. Hormonal regulation is applied to metabolic control and to calcium, water, and electrolyte balance. The biology of nerve cells is addressed with emphasis on synaptic transmission and simple neuronal circuits within the central nervous system. The special senses are considered in the framework of sensory transduction. Weekly discussion sections provide a forum for in-depth exploration of topics. Graduate students evaluate research findings through literature review and weekly meetings with the instructor. E.L. Boulpaep, W.M. Saltzman

C&MP 560b^{U}/ENAS 570b^{U}/MCDB 560b^{U}/PHAR 560b, Cellular and Molecular Physiology: Molecular Machines in Human Disease The course focuses on understanding the processes that transfer molecules across membranes at the cellular, molecular, biophysical, and physiological levels. Students learn about the different classes of molecular machines that mediate membrane transport, generate electrical currents, or perform mechanical displacement. Emphasis is placed on the relationship between the molecular structures of membrane proteins and their individual functions. The interactions among transport proteins in determining the physiological behaviors of cells and tissues are also stressed. Molecular motors are introduced and their mechanical relationship to cell function is explored. Students read papers from the scientific literature that establish the connections between mutations in genes encoding membrane proteins and a wide variety of human genetic diseases. E.L. Boulpaep, F.J. Sigworth

C&MP 570b/NBIO 570b, Sensory Physiology The course provides an overview of the mammalian special sensory systems, including molecular and cellular bases of vision, audition, taste, olfaction, and somatosensation. Faculty with focus in those areas lead presentations and discussions on peripheral and central mechanisms. Psychophysical aspects of sensation are introduced. D. Zenisek, J. Santos-Sacchi, Z. Zhou

C&MP 600, Medical Physiology Case Conferences Two-term course taught in groups of ten to twelve students by the same group leader(s) throughout the year. Workshop format permits students to apply basic concepts of physiology to clinical syndromes and disease processes. Students are expected to participate actively in a weekly discussion of a clinical case that illustrates principles of human physiology and pathophysiology at the whole-body, system, organ, cellular, or molecular level. Prerequisites: C&MP 550a and permission of the instructor. Credit for full year only. E.L. Boulpaep and staff

C&MP 610, Medical Research Scholars Program: Mentored Clinical Experience The goals of the course are to introduce MRSP students to aspects of clinically important human diseases. Students explore each disease over three one-and-one-half-hour sessions led by a clinician-scientist who is an expert in the relevant organ system. Students explore two disease processes per term. The first of the three sessions is devoted to a discussion of the clinical presentation, natural history, pathology, epidemiology, treatment, and prognosis of the disease process. During this session students have the opportunity to view gross or microscopic specimens of diseased tissue in association with members of the Pathology faculty. Students are assigned readings in pathology, pathophysiology, and clinical texts to prepare for the first class session. The second session focuses on

translational aspects of the disease process. Students read and present papers relevant to the molecular basis of the disease and cutting-edge approaches to its therapy. In the third session students meet with patients who have experienced the disease and/or visit and explore facilities associated with diagnosis and treatment of the disease process. Prior to the third session students receive guidance as to what they will observe and how to approach the experience; and at the end of the session, the group discusses its thoughts and impressions. Students are expected to prepare for sessions, to participate actively, and to be scrupulously respectful of patients and patient facilities. R.R. Russell, M.J. Caplan

C&MP 620b/NBIO 610b, Fundamentals in Neurophysiology The course is designed for students who wish to gain a theoretical and practical knowledge of modern neurophysiology. Graduate students specializing in neurophysiology and non-neurophysiology are encouraged to attend, as the course begins at a very basic level and progresses to more complicated topics. Topics include properties of ion channels, firing properties of neurons, synaptic transmission, and neurophysiology methodology. V.A. Pieribone, F.J. Sigworth

C&MP 630a/PATH 680a/PHAR 502a, Seminar in Molecular Medicine, Pharmacology, and Physiology Readings and discussion on a diverse range of current topics in molecular medicine, pharmacology, and physiology. The class emphasizes analysis of primary research literature and development of presentation and writing skills. Contemporary articles are assigned on a related topic every week, and a student leads discussions with input from faculty who are experts in the topic area. The overall goal is to cover a specific topic of medical relevance (e.g., cancer, neurodegeneration) from the perspective of three primary disciplines (i.e., physiology: normal function; pathology: abnormal function; and pharmacology: intervention). D. Nguyen, T. Boggon

C&MP 650/PATH 660/PHAR 580, The Responsible Conduct of Research Organized to foster discussion, the course is taught by faculty in the Pharmacology, Pathology, and Physiology departments and two or three senior graduate students. Each session is based on case studies from primary literature, reviews, and two texts: Francis Macrina's *Scientific Integrity* and Kathy Barker's *At the Bench*. Each week, students are required to submit a reaction paper discussing the reading assignment. Students take turns leading the class discussion; a final short paper on a hot topic in bioethics is required. B.E. Ehrlich, D. Braddock

C&MP 710b/MB&B 710b4, Electron Cryo-Microscopy for Protein Structure Determination Understanding cellular function requires structural and biochemical studies at an ever-increasing level of complexity. The course is an introduction to the concepts and applications of high-resolution electron cryo-microscopy. This rapidly emerging new technique is the only method that allows biological macromolecules to be studied at all levels of resolution from cellular organization to near atomic detail. Counts as 0.5 credit. F.J. Sigworth, C.V. Sindelar

CHILD STUDY CENTER

NIHB 208, 203.785.2540
http://medicine.yale.edu/childstudy

Professors H. Blumberg (*Psychiatry*), J.P. Comer, V. Gallo (*Adjunct*), E.L. Grigorenko, S.L. Kagan (*Adjunct*), Z. Kain (*Adjunct*), A.E. Kazdin (*Psychology*), R.A. King, J.F. Leckman, J.M. Leventhal (*Pediatrics*), P.J. Lombroso, S.S. Luthar (*Adjunct*), R.W. Makuch (*Public Health*), S. Marans, A.S. Martin, L.C. Mayes, R. Paul (*Adjunct*), K. Pelphrey, M. Picciotto (*Psychiatry*), M.N. Potenza (*Psychiatry*), L. Sadler (*Nursing*), J.E. Schowalter (*Emeritus*), S.E. Shaywitz (*Pediatrics*), W.K. Silverman, R. Sinha (*Psychiatry*), D.L. Snow (*Psychiatry*), P. Snyder (*Adjunct*), S.M. Southwick (*Psychiatry*), M.W. State (*Adjunct*), J.K. Tebes (*Psychiatry*), F. Vaca (*Emergency Medicine*), F.M. Vaccarino, F.R. Volkmar, J. Woolston, H. Zhang (*Public Health*)

Associate Professors S.J. Berkowitz (*Adjunct*), K. Chawarska, B.W. Forsyth (*Pediatrics*), W.S. Gilliam, S.M. Horwitz (*Public Health*), J. Kaufman (*Psychiatry*), Y. Kim (*Adjunct*), T.J. McMahon (*Psychiatry*), J.C. McPartland, E.C. Miguel (*Adjunct*), C. Pittenger (*Psychiatry*), D. Stubbe, N.E. Suchman (*Psychiatry*), E. Viding (*Adjunct*)

Assistant Professors B. Barbot (*Adjunct*), M.H. Bloch, D. Bridgett (*Adjunct*), P.R. Britto, A.L. Close, M.J. Crowley, D.W. Evans (*Adjunct*), R. Feldman (*Adjunct*), T.V. Fernandez, P.G. Fischman (*Adjunct*), I. Gordon (*Adjunct*), N. Landi (*Adjunct*), E.R. Lebowitz, P. Luyten (*Adjunct*), I. Park (*Genetics*), Y.B. Poncin, Z. Qayyum (*Psychiatry*), A. Raefski (*Adjunct*), J.A. Reich (*Adjunct*), B. Reichow (*Adjunct*), M.C. Rosario-Campos (*Adjunct*), V.V. Ruchkin (*Adjunct*), F. Shic, M.V. Smith (*Psychiatry*), H.E. Stevens (*Adjunct*), C.S. Stover (*Adjunct*), D. Sukhodolsky, B. Vander Wyk, P. Ventola, V. Weersing (*Adjunct*), A. Westphal (*Psychiatry*), M. Yazgan (*Adjunct*)

Instructors C. Moreno, L.E. Taylor

Senior Research Scientist G.M. Anderson

Research Scientist V.R. Seitz

Associate Research Scientists M. Akbar, A. Amiri, K.M. Balestracci, L.L. Booth, F.E. Brown, L. Cardona-Wolenski, G. Coppola, C.J. Cutter (*Medicine*), C. Dauser, P.S. El-Fishawy, H.M. Fichtenholtz, M. Finn-Stevenson, M. Goslin, M.A. Goyette-Ewing, A.R. Gupta (*Pediatrics*), H. Hahn, L. Hart, E.J. Hoffman, S. Kim, K. Koenig, P. Kotapurathu kurup, T. Liu, S.L. Macari, C. Marin, O.Y. Naumova, S.S. Nicholls, A. Ponguta, K.K. Powell, C.R. Reyes, H.J. Rutherford, S.S. Stahl, K.D. Tsatsanis, T. Vanderwal, E.M. Warnick, J. Wu, J. Xu

Clinical Professors J. Adnopoz, R. Angoff (*Pediatrics*), T.W. Downey, P. Fonagy, A.S. Kaufman, N. Laor, K.D. Pruett, D. Reiss, E.R. Shapiro, A. Slade

Associate Clinical Professors A.J. Avni-Singer (*Pediatrics*), M.W. Azeem, S. Boltax-Stern, C. Canny (*Pediatrics*), L. Combrinck-Graham, K. Dahl, J.B. Ferholt, N.M. Haynes, D. Koenigsberg, J.G. Narad, E.A. Perlswig, M. Target, A.P. Thies, P. Van Wattum

Assistant Clinical Professors H.A. Allen, E.R. Arzubi, D.M. Aversa, M. Best, D. Bober, L.A. Bogen, S. Brooke, J.T. Brown, C.F. Califano, J.F. Chapman, P.B. Chappell, J. Chilton, J.T. Collins, B. Cook, K.S. D'Eramo, L.N. Dennehy, P.S. El-Fishawy, C. Emmons, C. Epstein, G.E. Epstein-Wilf, S.E. Fitzpatrick, D. Flanagan, J. Fowler, Y. Fradkin, R.P. Franks, M.G. Fromm, G.D. Gammon, S. Gossart-Walker, R.M. Greenbaum, F.X. Gregory, K.E. Hanson, B.T. Harel, A.G. Hess, A.S. Holmes, I.R. Jennings, R.J. Jou, H.P. Kahn, M.D. Kaplan, B.A. Keyes, B. Kleine, A. Landeros-Weisenberger, J.M. Lang, L. Lavalley, P.K. Leebens, J.W. Loomis, G.L. Lopez-Cohen, D.I. Lowell, A.S. Lustbader, M. Lustick, J.A. Madigan, N.T. Malberg, J.P. Marachi, R.S. McWilliam, J.C. Meyers, E.S. Millman, C. Mills, Z. Mohiuddin, N. Moss, S.F. Nagler, F.J. Ninivaggi, B.F. Nordhaus, M.J. Palmieri, J.F. Poll, M.D. Powers, I. Qureshi, D.R. Rau (*Psychiatry*), J. Reiss, R.A. Ritvo, E. Rodriguez-Keyes, R. Salah, D.A. Sasso, A.G. Smaller, K.W. Sondergaard, R. Sotsky, P.K. Thomas, J.G. Tillman, J. Webb, S. Werblood, J.M. Wolf, M. Wudarsky, V.J. Zecchini, L.D. Zimmerman

Clinical Instructors P. Aguayo, J.M. Ambrosino (*Pediatrics*), J.E. Arias, A. Aujla, M. Berkman, A. Bolander, C. Conway, J.D. Cunningham, T.S. Davila, M.B. de-Naclerio, D.M. Dodge, L.M. Donovan, H.S. Dowling, K. Finch, M. Fouhy, J.A. Gallalee, J. Gereda, K. Gereda Marganski, P. Hetherington, K.H. Kowats, E. Kressley, J.S. Landau, M. Lyons, K. Malensek, W. Marans, B.L. Mason, Z.H. Meredith, M. Moca, W.F. Njoroge, S. Peck, S.L. Peshori, H.C. Pizzanello, R. Plant, K.H. Pracitto, R.G. Pugliese, J. Radawich, B. Reddy, B.N. Rickler, C.T. Rowland, C. Schaefer, D.A. Schneider, C. Schwartz, V.M. Shiller, A.R. Square, M. St. Pierre, V. Stob, B. Taggart, E.O. Tongul, K. Voccola, M. Weinshel, G. Weiss

Lecturers K.F. Bailey, L.G. Barbieri, D.L. Bella, M.A. Ben-Avie, N.A. Brown, K. Carlson, E. Christakis, C.J. Cooper, J. Gillette, M. Gunsalus, D.P. Hauser, S. Heidmann, C.M. Horwitz, N.L. Kaufman, C.H. Olson, J.P. Platner, C. Reberkenny-Frisketti, P. Rhodeen, C. Savo, B.B. Sherman, C.B. Sicher, A. Zonderman

The Child Study Center is a multidisciplinary academic department of the School of Medicine for the study and care of children from birth through adolescence and their families. Child psychiatrists, psychologists, pediatricians, social workers, psychoanalysts, biomedical scientists, nurses, and other professionals collaboratively engage in research and treatment programs on various aspects of children's growth and development, both normal and deviant. Research programs include child development, psychiatric disorders, social systems and schools, mental retardation, psychosomatic conditions, crisis and trauma, and treatment. Clinical services are provided in general and specialized outpatient clinics, in the Child Psychiatry Inpatient Service in the Children's Hospital of Yale-New Haven, and in the Child and Adolescent Psychiatry Consultation-Liaison Service. The center provides courses and other academic opportunities for undergraduates and graduate students in various disciplines concerned with children and families, as well as specialized training in child psychiatry, psychology, social work, and clinical research.

CHLD 222, Childhood Psychopathology Students are offered lectures, workshops, and videotapes of children with major or common psychiatric disorders usually first evident during infancy, childhood, and adolescence, including autism, mental retardation,

attention deficit hyperactivity disorder, school phobia, learning disabilities, Tourette's Syndrome, obsessive-compulsive disorder, and adolescent disorders. Second year. R.A. King and faculty

CHLD 302, Child Study Center Clinical Research Elective This elective entails etiology, clinical manifestations, and treatment of adolescent psychopathology, including eating disorders, depression, suicide, psychosis, delinquency, and the impact of physical and mental disabilities on adolescent development. Reading is supplemented with live and taped clinical material. One student every four weeks. Director: A.S. Martin; R.A. King

CHLD 325/Psychiatry 325, Child Study Center Psychiatry Elective The aim of this elective is to provide the student with an intensive experience in infant, child, and adolescent psychiatry. The curriculum includes assessments of normal development and psychopathology in childhood, treatment methods, and research in major disorders of childhood. Students are active team members of the Children's Psychiatric Inpatient Service (CPIS) and the consultation service to the pediatric wards of Yale-New Haven Hospital and can take advantage of the wide range of ongoing seminars, conferences, and clinical services in place at the Child Study Center. Teaching methods include seminars, conferences, field observations, ward rounds, and practicals selected by the student following consultation with the director of medical studies and the Child Study Center. One student every four weeks. Directors: A.S. Martin, R.M. Rohrbaugh

COMPARATIVE MEDICINE

BML 330, 203.785.2525
http://medicine.yale.edu/compmed

Professors A.M. Bennett (*Pharmacology*), J. Bruning (*Adjunct*), M.A. Cowley (*Adjunct*), S. Diano (*Obstetrics, Gynecology & Reproductive Sciences*), V.D. Dixit, L.M. Garcia-Segura (*Adjunct*), M. Hajos (*Adjunct*), J. Hirsch (*Psychiatry*), T.L. Horvath (*Chair*), R.O. Jacoby (*Emeritus*), J.D. Macy, M.W. Sleeman (*Adjunct*), I. Torres Aleman (*Adjunct*), M. Tschoep (*Adjunct*), C.J. Zeiss

Associate Professors J.L. Brandsma (*Adjunct*), C. Fernandez-Hernando, X. Gao, A.K. Sfakianaki (*Obstetrics, Gynecology & Reproductive Sciences*), P.C. Smith, X. Yang

Assistant Professors C.J. Booth, M.O. Dietrich, J.A. Goodrich, M.S. Lawrence (*Adjunct*), I. Levy, M.S. Rodeheffer, J.A. Scholz, Y. Suarez, S.R. Wilson

Research Scientists S.R. Compton, J.M. McGrath, T.P. Nottoli, G. Yao

Associate Research Scientists J.L. Asher, R. Jakab, Z. Liu, H. Pushkarskaya, C.M. Ramirez-Hidalgo, H. Ruan, N.R. Vila, Y. Youm

DERMATOLOGY

LCI 501, 203.785.4092
http://medicine.yale.edu/dermatology

Professors R.J. Antaya, S. Ariyan (*Surgery*), J.L. Bolognia, I.M. Braverman (*Emeritus*), L. Chen (*Immunobiology*), P. Cresswell (*Immunobiology*), R.L. Edelson (*Chair*), F.M. Foss (*Medicine*), M. Girardi, E.J. Glusac (*Pathology*), P.W. Heald (*Emeritus*), D.J. Leffell, J.M. McNiff, L.M. Milstone (*Emeritus*), J.S. Pober (*Immunobiology*), R.E. Tigelaar, L.D. Wilson (*Therapeutic Radiology*)

Associate Professors M.W. Bosenberg, K.A. Choate, S.E. Cowper, M.B. Faries (*Surgical Oncology*), V. Greco (*Genetics*), V. Horsley (*Molecular, Cellular & Developmental Biology*), C.J. Ko, R. Lazova, A. Subtil

Assistant Professors S.E. Book, C.G. Bunick, J. Choi, J.N. Choi, S.R. Christensen, O.R. Colegio, B.G. Craiglow, A. Galan, S. Imaeda, B.A. King, P. Myung, S. Ramachandran, M.M. Tomayko

Instructors Y.K. Khan, L. Kole, A. Zubek

Senior Research Scientists D.E. Brash (*Therapeutic Radiology*), I.M. Braverman, R. Halaban, L.M. Milstone, J.M. Pawelek

Associate Research Scientists K.R. Blenman, D.J. Hanlon

Clinical Professors I. Dvoretzky, M.T. Johnson, R.C. Savin, K.L. Watsky

Associate Clinical Professors M.R. Alexiades-Armenakas, S.H. Bender, A. Bronin, F.M. Castiglione, I.S. Cohen, D.M. Davidson, L.M. Donofrio, J.S. Dover, J.W. Edelglass, M.A. Gohara, R.S. Kahan, M. Kaminer, R.C. Langdon, E. Milstone, J. Moss, P.I. Schneiderman, P.E. Shapiro, L.A. Sibrack, A. Zalka

Assistant Clinical Professors J.N. Alter, A.V. Atton, S.H. Barrett, P.M. Bevilacqua, D.L. Bilinski, C.B. Carroll, T. Chartier, S. Chavel, C. Chess, D. Correale, L.A. Daman, K.M. Diette, D.L. Feinberg, B. Goldberg, M.J. Goldstein, D.R. Greene, W.S. Jacoby, J.D. Knispel, L.C. Kugelman, J.C. Lehrman, S.P. Lerner, A.B. Lewis, L.E. Luck, E.A. Markstein, E.R. Marsh, D.R. Miller, E. Mirrer, E. Naidorf, M.P. Noonan, W.A. Notaro, R.G. Oshman, B.J. Richter, J.G. Sansing, N.K. Sherline, N.R. Silverman, S.B. Sloan, J.R. Zirn, B. Zubkov

Clinical Instructors J. Cantatore-Francis, M.P. Coolidge, K.O. Duncan, T. Futoryan, J.M. Grant-Kels, P. Lowenstein, M.I. Oestreicher, D. Robinson, F. Santoro, E. Smith, B. Srivastava, D.S. Weissman

DERM 120, Dermatology Outpatient Elective The goal of this course is to ground students in the fundamentals of dermatologic physical examination, diagnosis, and treatment. Students are expected to acquire the skills needed by a primary care physician or surgeon to evaluate dermatological problems independently. Through outpatient experiences at the West Haven VA Medical Center, the Adult and Pediatric Yale Primary Care

Clinics, and possibly the Yale Health Center, students are exposed to a variety of primary and referral dermatology services that treat inflammatory and neoplastic skin diseases. Students are also exposed to dermatologic surgery and dermatopathology. Students participate in departmental Grand Rounds and educational conferences, and read and review assigned materials in preparation for a series of case discussions led by faculty. A formal presentation on a topic of the student's choice is required in the final week. One or two students every four weeks. Director: S. Imaeda

DERM 302, Dermatology Inpatient Consult Elective Working as integral members of the dermatology consult team, comprised of a dermatology resident and attending physician, students are exposed to dermatologic disease requiring inpatient admission, systemic disease with cutaneous manifestations, and skin complications among hospitalized patients. Students learn about initial evaluation, workup, and differential diagnosis building; the role of biopsy and histologic evaluation; and treatment plan design. Under resident supervision, students evaluate a new consult patient each day and follow this patient for the course of his or her stay. Students are expected to read intensively on relevant disease processes and formally present the patient to the attending on rounds. Additionally, students research disease and management-related questions that arise on the service and informally present a summary of findings to the attending and resident. Students participate in departmental Grand Rounds and educational conferences and in resident rounds of the inpatient service. Each student identifies a patient with a chronic dermatologic condition, conducts an in-depth interview to learn about how the disease and its treatment have affected the patient's life, and how life considerations have affected disease management, and writes a 3–5-page summary. At the end of the rotation, the student presents a formal case presentation and literature review at Grand Rounds. One student every four weeks. Prerequisite: DERM 120. Directors: M.M. Tomayko, S. Imaeda

DIAGNOSTIC RADIOLOGY

TE-2, 203.785.6938
http://medicine.yale.edu/diagnosticradiology

Professors J.J. Abrahams, H. Blumberg (*Psychiatry*), S. Bokhari, R.A. Bronen, M.I. Burrell, R.E. Carson, R.T. Constable, E.A. Cornelius (*Emeritus*), A.M. Curtis, J.S. Duncan, H.P. Forman, M.G. Glickman (*Emeritus*), T.R. Goodman, A.H. Haims, Y.H. Huang, D. Hyder, G.M. Israel, M.H. Johnson, L.D. Katz, E. Kier, J.P. Lawson (*Emeritus*), G.F. Mason, S.M. McCarthy, B.L. McClennan (*Emeritus*), D.B. Nunez, L.E. Philpotts, J. Pollak, A.T. Rosenfield (*Emeritus*), D.L. Rothman, L.M. Scoutt, C. Shaw (*Emeritus*), L.H. Staib, J.H. Sunshine (*Adjunct*), G. Sze, H.D. Tagare, I. Tocino, F.J. Wackers (*Emeritus*), J.C. Weinreb, R.I. White (*Emeritus*)

Associate Professors D. Cornfeld, K.P. Cosgrove (*Psychiatry*), R. de Graaf, R.K. Fulbright, R.J. Hooley, K.M. Johnson, C.R. Miller, H.R. Mojibian, E.D. Morris, X. Papademetris, E. Reiner, A.N. Rubinowitz, C.J. Silva, C.R. Taylor, S.W. Woods (*Psychiatry*)

Assistant Professors L. Andrejeva, M.H. Arici, R.R. Ayyagari, J. Brown, R. Butler, P.A. Cedeno, M. Chen, M.A. Choma, D. Dicks, I. Doddamane, M.A. Durand, L. Ehrlich, G. Galiana, J. Geisel, G. Gunabushanam, M. Hampson, L.J. Horvath, S. Huber, C. Juchem, R.H. Kent, J. Killam, J.D. Kirsch, I. Latich, P.H. Levesque, A.W. Lischuk, C. Liu, A. Mahajan, A. Malhotra, M. Mather, C.C. Matouk (*Neurosurgery*), R.D. Messina, F.J. Minja, J. Modi, J.A. Obando, J.K. Pahade, J.L. Perez Lozada, D.C. Peters, M. Raghu, M.V. Revzin, L.A. Saperstein, L.S. Sheiman, B.M. Shuch (*Urology*), D.D. Silin, M. Spektor, P. Varma, W.B. Zucconi

Instructors R. Chundru, P. Deb, K. Quencer, A. Velcani

Research Scientists D.E. Befroy, F. D'Errico, H. De Feyter

Associate Research Scientists F. Bois, C. Chan, D. Coman, J. Gallezot, B.S. Ganganna, P. Herman, L. Jiang, D.C. Labaree, K. Lim, S. Lin, D. Matuskey, N. Nabulsi, M. Naganawa, M. Negishi, V. Neklesa, E. Park, M. Qiu, J.R. Ropchan, X. Shen

Clinical Professors M.S. Shin, J.D. Slavin

Associate Clinical Professors G.R. Berg, L.W. Hammers, E.A. Hyson, T.R. McCauley, J.P. Seibyl

Assistant Clinical Professors W.E. Allen, R.D. Becker, S.B. Berger, M. Carino, J.K. Crowe, A.R. Daftary, P.A. Dinauer, M. Friedman, W.N. Friedman, J. Gagliardi, M. Ghita, R. Gonzalez, B.D. Griffith, A.I. Jonisch, A. Kalyanpur, J. Kim, R.A. Knobelman, C.T. Kubiak, H. Moukaddam, A.R. Niakosari, G.S. Novick, I. Onyiuke, J.R. Pannese, A. Pathak, C. Poon, Z. Protopapas, R. Sadar, B.D. Simonds, S.J. Sullivan, R.R. Tash, N.W. Tishkoff, M. Trivedi, J. Wruble

Clinical Instructors L.J. Hodges, D.G. Walled

DIAG 121, Diagnostic Radiology Clinical Elective Students are introduced to the basic principles of various types of radiologic interpretation and rotate daily through different sections in the department of diagnostic imaging, including gastrointestinal, genitourinary, chest, musculoskeletal, pediatrics, neuroradiology, computed tomography (CT), magnetic resonance imaging (MRI), nuclear medicine, ultrasound, interventional, and emergency radiology. In addition to participating in the daily film interpretation with residents and staff, students receive an introduction to the role of each section in the diagnosis and management of disease. Interactive teaching presentations are available on the departmental Web site. Self-teaching materials are available in the radiology library. Students attend the department resident teaching conferences twice daily as well as specific student seminars. No on-call responsibilities. Maximum of six students every four weeks. Director: A.H. Haims

DIAG 134, Vascular and Interventional Radiology Elective This elective is an introduction to vascular and interventional radiology: the use of radiological imaging to guide procedures in various organ systems of the body and the evaluation and management of patients who are candidates for these. In the vascular system, this includes arterial and venous angiography, angioplasty, stenting, embolization for bleeding, tumors (such as uterine fibroids), vascular malformations, venous reflux management, inferior vena cava filter placement, hemodialysis access management, and placement of a variety of venous access devices. Nonvascular experience includes percutaneous approaches to biliary and urinary track pathology, drainage of abscesses and other fluid collections, and tumor ablation. Students participate in the interventional radiology clinic and admitting service. One student every two weeks. Director: I. Latich; J. Pollak, J.E. Aruny

DIAG 135, Pediatric Imaging Elective This elective serves as an introduction to the clinical management of infants, children, and adolescents through the use of integrated diagnostic imaging. Students participate through a review of imaging studies with residents and attending physicians; observation of fluoroscopic, ultrasound, and computed tomography (CT) procedures; and attendance at daily clinical conferences. Students are encouraged to present interesting cases or to participate in research projects during the elective. One or two students every two or four weeks. Director: L. Ehrlich

DIAG 137, Neuroradiology Elective This rotation is designed as an introduction to neuroradiology. The student becomes an integral part of the neuroradiology team, which consists of the resident, fellow, and attending physician. A number of teaching conferences and lectures are offered. The student is exposed to the various subsections of neuroradiology, including neuro CT, neuro MR, and neuro special procedures. One or two students every two or four weeks. Director: J.J. Abrahams

SECTION OF EDUCATION

Office of Education: ESH 305, 203.737.4190
Office of Student Research: ESH 308, 203.785.6633
http://medicine.yale.edu/education/curriculum

Integrated Course Curriculum (for students matriculating in 2015)

MASTER COURSES

MD 1000, Introduction to the Profession The first master course in the new curriculum is Introduction to the Profession, or iPro. This is a two-week course in which students have the opportunity to participate in an immersive hospital experience and introduction to New Haven as well as an introduction to bioethics and professional responsibility. Themes emphasized are teamwork and communication, the experience of illness for the patient, and medical decision making and what goes into it. The premise of iPro is stories. Students reflect on the stories of the patients they meet and hear about, stories of the neighborhoods from which their patients come, the stories of the profession they are entering, and their own stories as they move forward in their professional journeys to become physicians. Open to M.D. and M.D./Ph.D. students only. N.R. Angoff, J.S. Hughes, M.R. Mercurio

MD 1025, Scientific Foundations This course integrates essential content from biochemistry, cell biology, epidemiology and public health, genetics, pathology, pharmacology, and physiology to provide first-year medical students with a foundation of knowledge in the basic sciences that underlies modern medicine. The course organizes content from the above disciplines into the following themes: Building a Body, Cell Communication, Cell Energy, Fluids and Gradients, Gene Expression, Life and Death of a Cell, and Population Health. Additional organ- and systems-related content for the above disciplines is distributed across the remaining pre-clerkship courses, as appropriate. Open to M.D. and M.D./Ph.D. students only. M.L. Schwartz, P.A. Takizawa

MD 1050, Genes and Development This course begins with content in the areas of basic human genetics, genetics technology, embryology, and developmental genetics. This is followed by principles of neoplasia and cancer biology, considering neoplasia as a genetically based aberration of normal development and cellular regulation. The course concludes with the topics of clinical oncology and hematology. This content is integrated and sequenced for optimal learning utilizing a variety of teaching methods including lectures, demonstrations, team-based learning, small-group workshops, clinical-pathologic correlations, patient interviews, and labs. Open to M.D. and M.D./Ph.D. students only. A.E. Bale, M.P. DiGiovanna

MD 1075, Attacks and Defenses This course includes content focused on the ability of the body to respond to injury, especially infectious and inflammatory injury. Themes include innate immunity, cellular immunology, infection and immunity, applied topics in immunopathology including autoimmune diseases such as are seen in rheumatology and immunomodulation, infectious disease and antimicrobial therapeutics, and dermatology and musculoskeletal disorders, integrating content areas by interweaving immunology

and infection to inform each section of the other's concepts. Human anatomy is introduced and aligned to the musculoskeletal content. There is also an introduction to radiology with specific topics relevant to the anatomy material. Multiple small workshops and laboratories focus on practical aspects of this material including microbiology laboratories; laboratories that focus on histologic aspects of injury and repair; and workshops on clinical approaches and management of common musculoskeletal, infectious, and dermatologic conditions. Open to M.D. and M.D./Ph.D. students only. Lectures may be audited with approval of the course directors. S.M. Campbell, R.J. Homer

MD 1100, Connection to the World An integrative overview of the structure and function of the human brain as it pertains to major neurological and psychiatric disorders. Neuroanatomy, neurophysiology, and clinical correlations are interrelated to provide essential background in the neurosciences. Lectures in neurocytology and neuroanatomy survey neuronal organization in the human brain, with emphasis on functional regionalization in the brain and on the long fiber tracts related to clinical neuroscience. Laboratory sessions examine preparations of human brain to explore anatomical relationships. Lectures in neurophysiology cover neuronal function at the cellular level, with a strong emphasis on the mammalian nervous system. Clinical correlations focus on specific diseases and are presented by one or two faculty members representing both basic and clinical sciences. Throughout the course, lectures in neurology and sensory system clinical correlates are paired with presentations of structure-function relationships. Lectures on the biological basis of behavior are integrated with neurology and psychiatry. Topics in the biological basis of behavior and psychiatry include principles and neural mechanisms of learning and memory, neural systems involved in fear and anxiety, reward and drug addiction, stress, and neural systems attention. Patients diagnosed with specific diseases aree interviewed by course faculty during clinical correlations and workshops. Teaching formats include lectures, labs, team-based learning, workshops and clinical correlations. Open to M.D., M.D./Ph.D., and Neuroscience Ph.D. students only. The course cannot be audited. C.A. Greer, D.S. Navaratnam

MD 1125, Homeostasis Homeostasis is one of the fundamental properties of any living organism. The heart, lungs, and kidneys work in concert to provide oxygen to and remove toxins from our cells, and do so continuously from our first breath to our last. This course integrates cardiology, pulmonary, and renal content. The course starts with the renal system prior to the summer break, supported by digital anatomy sessions. Cadaver dissections matched to the organ and systems content of the course begin in the fall. Physiology and pathophysiology of organ systems are integrated in workshops and are taught by both clinical and physiology faculty. The sessions are heavily case-based and aimed at preparing the students for their clinical rotations. Open to M.D. and M.D./Ph.D. students only. D.S. Geller, S. Hull, N. Thande

MD 1150, Energy and Metabolism This course integrates physiology, cell biology, pathology, and pathophysiology for the following content areas: metabolism, gastrointestinal, hepatic and pancreatic, endocrinology, and the liver. It includes topics in nutrition, epidemiology and public health, and history of medicine. Open to M.D. and M.D./Ph.D. students only. E.H. Holt, C.R. Kapadia

MD 1175, Across the Lifespan The goal of this course is for medical students to acquire knowledge of normal and abnormal human development through all stages of life: conception, pregnancy and birth, child and adolescent growth and development, the reproductive years, and middle age and senescence. Material is taught in a variety of formats, including lectures, small-group workshops that discuss patient cases, and laboratories, and in a way that fosters the acquisition of clinical reasoning skills and prepares students to enter clerkships. Open to M.D. and M.D./Ph.D. students only. F. Galerneau, C. Kumar

LONGITUDINAL COURSES

MD 1200, Human Anatomy This longitudinal course runs concurrently with the master courses of the School of Medicine curriculum. It begins in the second term of first year and is completed at the end of the first term of the second year. Human Anatomy is integrated with the radiology, embryology, and pathophysiology activities of the master courses. Students engage in lectures, conferences, and cadaver dissections. Extensive use is made of computer software and Web-based radiologic, anatomic, and clinical reasoning activities. Four students are assigned to each cadaver; students work collaboratively; interpersonal and group process skills are stressed. Open to M.D. and M.D./Ph.D. students only. L.J. Rizzolo and staff

MD 1225, Professional and Ethical Responsibility This longitudinal course runs the duration of the eighteen-month pre-clerkship period and features lectures, readings, and small-group case discussions. The course examines the various contexts (social, legal, financial, and organizational) in which the practice of medicine takes place, with a particular focus on principles and approaches to medical ethics. Specific ethical problems in the practice of medicine are addressed, both historical and current, and these issues are considered in the setting of individual patient encounters as well as on the societal level. In addition, practical and ethical aspects of the various components of the U.S. health care system are reviewed. Open to M.D. and M.D./Ph.D. students only. J.S. Hughes, M.R. Mercurio

MD 1250, Scientific Inquiry: Biostatistics and Research Methods and Responsible Conduct of Research (includes MD 501b) This course has two overarching goals. The first is to instill in students an understanding of the value of the Yale student research program and thesis and to provide a primer for success in the thesis. Emphasis is placed on how to choose an excellent thesis project and mentor in laboratory or clinical research, as well as in the areas of epidemiology and public health, international medicine, or medicine and the humanities. Students are instructed on the importance of the research environment, the selection of the best possible up-to-date methods, the importance of issues related to human investigation, and the requirements for HIC approval of protocols for medical student research. The second area of emphasis is to provide students with the basics in designing laboratory and clinical studies, including the use of power calculations, proper control groups, practical biostatistical measurements and their applications for research, and methods for efficient searching of the literature and online databases. Open to M.D. and M.D./Ph.D. students only. J.N. Forrest, faculty, and staff

MD 501b, Responsible Conduct of Research (taught as part of MD 1250) The Office of Student Research and the M.D./Ph.D. Program have developed a compact ethics course

that satisfies the NIH requirements for students supported on training grants, i.e., first- and fifth-year medical students, and M.D./Ph.D. students. Attendance is mandatory by those students. Topics covered include peer review; responsible authorship and publications; policies regarding human subjects; live vertebrate animal subjects in research and safe laboratory practice; collaborative research including collaborations with industry; data acquisition and laboratory tools, management, sharing, and ownership; conflict of interest; mentor-mentee responsibilities and relationships; research misconduct and policies for handling misconduct; the scientist as a responsible member of society, contemporary ethical issues in biomedical research, and the environmental and social impacts of scientific research. Material is taught through lectures with group discussion and case studies. (Six 1.5-hour sessions.) J.N. Forrest S. Alfano, M.J. Caplan, L. Cohen, F. Gorelick, B. Kazmierczak, R.J. Levine, D. Lewin, J.D. Macy, M. Picciotto, D.G. Schatz, S.S. Spangler, M. Waxman

MD 1300, Clinical Skills This course spans the first eighteen months of school for all medical students. Students begin to develop and refine their clinical skills, the essential elements of "doctoring" that physicians use during patient encounters. In Clinical Skills (CS), students learn to communicate with patients, families, and other members of the care team; examine patients; develop clinical reasoning skills; and understand the important role of a student-doctor in a patient's care. Multiple teaching modalities are utilized in CS, but the bulk of the experiences are designed to be hands-on, offering students the opportunity to develop clinical skills with direct faculty observation and feedback, frequently with the use of standardized patients. Throughout CS, emphasis is placed on taking a patient-centered approach to care. Students pass the course by attending all class sessions (attendance is mandatory) and performing a competent history and physical exam in a standardized assessment session at UConn. Course content is practiced and supplemented in the Clinical Skills Tutor Program or Longitudinal Clinical Experience (LCE) pilot. Director: J. Talwalkar

MD 1325, Clinical Skills Tutor Program The C.S. Tutor Program provides opportunities for students to practice and reinforce the skills learned in Clinical Skills class sessions. Students work with their tutor groups longitudinally during weekly sessions throughout the first eighteen months of school. Tutor groups consist of four students led by experienced physicians who help students learn the basics of history taking, physical examination, and clinical reasoning, while modeling professionalism. Students practice these skills on each other and with patients in various clinical settings. The tutor group sessions are designed specifically to provide supervised, individualized instruction and reinforcement of the concepts learned in class. Open to M.D. and M.D./Ph.D. students only. Attendance at the weekly tutor sessions is mandatory. Director: B. Wu

MD 1350, Clinical Skills Longitudinal Clinical Experience (Pilot) The C.S. Longitudinal Clinical Experience (LCE) is a pilot program at Yale School of Medicine in which groups of three to four students from YSM, Yale School of Nursing, and the Yale Physician Associate Program see patients at a specific site alongside faculty mentors. Groups meet approximately once a week throughout the first eighteen months of school. LCE sessions provide students with opportunities to practice clinical skills, with specific emphasis on interprofessional teamwork, quality, safety, and other issues related to the

health care system. The Class of 2019 will be invited to participate in the pilot program. Students will be chosen by lottery from those interested. These students will participate in the traditional C.S. course but will practice and reinforce their in-class learning with patients in a clinical setting in lieu of the traditional C.S. Tutor Program. Open to M.D., M.D./Ph.D., PA, and YSN students. Attendance at LCE sessions is mandatory. Director: E.R. Colson

Second-Year Courses (for students who matriculated in 2014)

MD 105, Pre-Clinical Clerkship This course, extending throughout the first two years, is intended to teach medical students skills in communication, medical history taking, and physical examination, as well as clinical reasoning. The format of the course involves large-group sessions for the purpose of demonstrating or modeling interview techniques and many small-group sessions in which students get a chance to observe and practice specific skills. Standardized patients are used throughout the course for teaching interviewing skills as well as specialized physical examination maneuvers. At the beginning of their second year, students are evaluated on their ability to perform a complete history and physical examination at the Clinical Skills Assessment Program at UConn. The Clinical Tutor Program and Longitudinal Clinical Experience are integral to the Pre-Clinical Clerkship. In these programs, groups of students work longitudinally with faculty mentors weekly over a two-year period to practice their newly learned skills on patients in various clinical settings. Students pass the Pre-Clinical Clerkship by attending all the skill-building sessions; demonstrating the ability to perform a complete history and physical exam from memory (at UConn); and having acquired the skills needed on the wards according to their tutor(s) or LCE mentors. Open only to second-year medical students in 2015–2016. Director: J. Talwalkar

MD 106, Mechanisms of Disease Course: Organs/Systems The purpose of this course is to bridge the preclinical and clinical years and to teach students to use scientific data in a clinical context. It introduces the pathologic variation of the normal physiologic mechanisms that the students have already learned. This required course is offered in a continuum from September through March for second-year medical students. It consists of thirteen integrated discrete organ-system-based modules that present disease processes from various disciplinary perspectives. The components include pathology, laboratory medicine, diagnostic radiology, preventive medicine, geriatrics, pharmacology, clinical medicine, pediatrics, surgery, and potentially others as indicated by the subject matter.

For each module, representatives from each discipline meet and create a course that presents a comprehensive overview of the organ/system, progressing and building information in a way that allows students to form a basis on which to add knowledge throughout their careers.

Material is taught in a variety of formats including lectures, small group workshops that discuss patient cases, and laboratories. The modules are Hematology; Cardiovascular System; Clinical Neuroscience; Clinical Psychiatry; Endocrine Systems; Reproductive Medicine; Digestive Diseases; Musculo-Skeletal System; Renal/Urology Systems; Respiratory; Ophthalmology; Oncology; and Dermatology. Each module has a module director who is the faculty coordinator. These modules provide excellent preparation

for clinical work on the wards as well as preparation for the second-year USMLE Board Exam, the questions of which use a clinical paradigm. Open only to second-year medical students in 2015–2016. Director: M.P. DiGiovanna

Integrated Clerkships

MD 2000 (IM)/MD 2025 (NEUR), Medical Approach to the Patient This twelve-week integrated clerkship includes internal medicine (eight weeks) and neurology (four weeks) clinical components. Throughout the clerkship, students participate in integrated experiences that address the themes related to hospital-based care such as management of acute disease, diagnostic skills, transitions of care, quality improvement, and organ systems. Directors: D.B. DiCapua, D.W. Dunne

MD 2050 (IM)/MD 2075 (Psych), Primary Care and Psychiatry Clerkship This twelve-week integrated clerkship includes ambulatory internal medicine and psychiatry clinical components, as well as outpatient pediatrics and OB/Gyn. Students participate in one four-week full-time placement at a primary care practice in Connecticut and one four-week part-time placement, which co-occurs with a part-time psychiatry consult placement. The psychiatry component of the clerkship includes four weeks of full-time inpatient psychiatry, four weeks part-time consultation psychiatry, and eight half-days in an ambulatory psychiatry setting. This integrated clerkship emphasizes themes such as health promotion and disease prevention, social determinants of health, behavioral change, systems-based care, and management of chronic disease. Directors: W.N. Kernan, K.M. Wilkins

MD 2100 (SURG)/MD 2125 (EMER), Surgical Approach to the Patient This twelve-week integrated clerkship includes surgery (six weeks, general; three weeks, specialties) and emergency medicine (three weeks) clinical components. Throughout the clerkship students participate in integrated experiences that address themes of the OR experience such as perioperative care, emergency/trauma management, procedures, medical error and patient safety, and anesthesiology. Students also participate in a twelve-week mentoring program during the clerkship. Directors: L. Hile, A.W. Kim

MD 2150 (OBGY)/MD 2175 (PEDS), Women and Children's Health This twelve-week integrated clerkship includes clinical components in obstetrics and gynecology and pediatrics. Students participate in four weeks of OB/Gyn inpatient, four weeks of pediatric inpatient, and four weeks of combined OB/Gyn and pediatric outpatient clinical experiences. Throughout the clerkship students participate in integrated experiences that cover themes such as health and development, preventive care, sexual health, families and communities, health promotion and disease prevention, and perinatal care. All students attend an evening session with the gynecologic teaching associates. Directors: E.R. Colson, D.C. Hersh, S.R. Pathy

Fourth-Year Courses

MD 158, Primary Care Clerkship The Fourth-Year Primary Care Clerkship provides students with an opportunity to acquire knowledge and develop clinical and interpersonal skills applicable to outpatient primary care practice. Students are assigned to a

community-based office or clinic where they care for patients under supervision by a family practitioner, internist, or pediatrician on Mondays, Wednesdays, and Fridays for one month. On Tuesdays and Thursdays students attend a case-based Workshop Program based on common disorders and core skills relevant to primary care practice. Open only to students who matriculated in 2012 or earlier. Director: P. Ellis; with a faculty made up of physician educators who share a commitment to practice-based teaching

MD 158-1, Primary Care Wednesday Evening Clinic This one-year weekly outpatient clerkship in the Primary Care Center provides experience in the longitudinal care of adults. Students are directly responsible for care of medical problems and preventive care as well as coordination of specialty care for their own patient panel. There are weekly preclinic conferences, which include Journal Club and primary care case-centered topics presented by students or specialty attendings. The clinic is held every Wednesday evening, 5–9 p.m., except the day before Thanksgiving and between Christmas and New Year's. It is open to a limited number of fourth-year students and fulfills the fourth-year primary care clerkship requirement provided that students also complete the Primary Care Clerkship Workshop Program. (*Note:* Primary Care Clerkship credit given for students who matriculated in 2012 or earlier.) Students must have completed Hospital Medicine I and II of the Core Medicine Clerkship and Ambulatory Medicine as well as two other third-year clerkships, preferably Psychiatry and Obstetrics, Gynecology, and Reproductive Sciences. Director: P. Oray-Schrom; staffed by rotating attending physicians

MD 9999, Integrated Clinical Medicine This capstone course is required of fourth-year students in the spring term immediately prior to the internship match. Conceived more than ten years ago as a capstone to four years of medical school training, the ICM course provides a review of some of the knowledge and skills needed for internship and beyond, a forum for a comprehensive and critical evaluation of clinical cases, a chance to review some of the historical and economic factors that inform the practice of medicine, and an opportunity to reflect on the social, ethical, psychological, and even spiritual challenges of a life in medicine. Director: D.I. Rosenthal

Elective Courses

MD 101, Intensive Pedagogical Experience in Laboratory Research Techniques Intensive one-week summer course in biomedical research protocols and techniques is open to first-year medical students at Mount Desert Island Biological Laboratory in Bar Harbor, Maine. Four biomedical research topics are the focus of each course: (1) physiological studies of chloride transport in an intact epithelial organ from Squalus acanthias; (2) ion channel gene expression in a heterologous expression system (Xenopus oocytes); (3) studies in isolated tubule preparations, including immunocytochemistry of phosphorylated vs. non-phosphorylated co-transporters, tissue processing, confocal microscopy, Western blots, and antibody design; (4) molecular biology of membrane proteins and transporters in shark salt gland, including methods in RNA, cDNA, PCR, cloning, and sequencing. J.N. Forrest, B. Forbush, P. Aaronson, R. Frizzell, and staff

MD 102, Organization and Leadership This course is an introduction to topics in the field of organizational behavior. It is designed to offer participants an opportunity to

explore a variety of concepts that relate to the effective and humane management of organizations. Though medicine was once a profession made up primarily of individual practitioners, it is increasingly true that medical professionals, both researchers and clinicians, are now involved in collective endeavors that require coordinated efforts to produce meaningful results. This is the domain of organizational behavior and the subject matter of this course. D.N. Berg

MD 103, Applied Principles of Clinical Research (First-Year Seminars) — Office of Student Research The purpose of this intensive two-week course is to provide an overview of the objectives, research strategies, and methods of conducting patient-oriented research. Topics include research designs, how to ask a research question, data collection, how to write a protocol, bias in studies, qualitative methods, etc. Emphasis is placed on applying concepts to students' actual research projects. Sessions are workshops that combine didactics and use students' projects to illuminate concepts. Students must have declared interest in conducting patient-oriented research by May of the first year. Consent of instructor required. Two weeks in summer to be announced. Staff

MD 104, Applied Principles of Clinical Research (Fifth-Year Seminars) — Office of Student Research The purpose of this intensive two-week course is to provide an overview of the objectives, research strategies, and methods of conducting patient-oriented designs, how to ask a research question, data collection, how to write a protocol, bias in studies, qualitative methods, etc. Emphasis is placed on applying concepts to students' actual research projects. Sessions are workshops that combine didactics and use students' projects to illuminate concepts. Students must be funded for one year of research. Consent of instructor required. Two weeks in summer to be announced. Staff

MD 110, *The Yale Journal of Biology and Medicine* (*YJBM*) The course provides an educational opportunity for students in medicine, public health, nursing, and the biological sciences to gain experience in all aspects of academic publishing. The *YJBM* publishes online four times a year through PubMed Central and receives manuscripts on a wide variety of topics in basic and clinical sciences from authors around the world. Alongside participating faculty members, students review and select articles for publication and have the opportunity to review books and write articles showcasing their research or sharing clinical experiences from Yale and abroad. Student editors are chosen each year from the School of Medicine and the Combined Program in the Biological and Biomedical Sciences. The editorial staff meets monthly. Faculty adviser: J.R. Bender

MD 503, Seminars in Pediatrics: Bedside to Bench The purpose of these seminars is to begin to understand how interesting questions derived from patients can help us learn more about biologic and pathologic processes. We specifically engage the group in discussions related to diseases or medical problems that affect infants and children. Students select a topic and faculty preceptor, see a patient with that preceptor, lead a seminar, present the patient briefly to the group, and, most importantly, develop some questions that arise in the course of learning about the patients. C.W. Bogue, M. Brueckner, M.K. Khokha, J.D. Jamieson

MD 505, Family Medicine Elective, Oneonta, New York This is a unique opportunity to experience the full spectrum of family practice in a small-town environment. In this elective students (1) learn how to approach the practice of family medicine in a small town with limited access to specialists and how to use available resources to provide high-quality care, (2) learn about care coordination with larger health care systems in this practice setting, (3) learn about the practice of medicine in a small community and how physicians are integrated into that community, and (4) develop a family systems-based approach to providing care. The preceptor is a Yale graduate who provides primary care for a diverse population in both the hospital and clinic setting. One student every two or four weeks. Director: P. Ellis

MD 510, Teaching and Learning Center Medical Education Elective The word "doctor" is derived from the Latin *docere,* which means "to teach." Indeed, the role of physicians as care providers is deeply intertwined with their role as teachers — of patients, of students, and of peers. The goal of this rotation is to introduce medical students to their role as teachers and better prepare them for this role before they begin residency. It makes use of didactic lectures, observations, group exercises, and teaching activities to facilitate the development of knowledge, skills, and attitudes necessary to help students develop their experience and identity as teachers as they transition from medical school into residency. The objectives are (1) to develop specific skills that will allow students to teach more effectively in the various clinical and classroom scenarios (work rounds, grand rounds, physical diagnosis rounds, operating room, morning report, noon conference) that they will experience during residency; (2) to observe and learn from role models in the field of medical education and describe the characteristics of effective teachers; (3) to describe the current state of medical education, with a focus on educational theory and evidence derived from the medical education literation; (4) to explore how students can integrate their roles as clinician and educator regardless of career goals; and (5) to develop the attitudes that place a strong emphasis on the value of medical education. Assessment is built into the elective through self-reflection and verbal and written feedback from peers and faculty. These include homework assignments or feedback in group exercises and teaching activities. Students are also asked to self-assess their previous knowledge of and exposure to each of the topics described in the course. All students complete a set of objective structured teaching encounters (OSTEs) at the end of the course, directly observed by faculty facilitators. Maximum of twelve students for two weeks. Directors: J. Hafler, G. Connors

MD 600, Family Medicine Elective, Middlesex Hospital This elective exposes students to the wide variety of clinical situations encountered in a national model, community-based family medicine residency program. In offices in Middletown, Portland, and East Hampton, students see and examine patients, present their findings and differential diagnosis, develop a plan of investigation and management with their supervisor, and explain the plan to their patients. Students manage and document care using electronic health records. In Middlesex Hospital, students are members of the team on the family medicine inpatient service, which provides medical, pediatric, newborn, maternity, and consultative care. Formal teaching activities include both didactic and interactive sessions, daily bedside teaching rounds, several weekly conference series, and weekly

three-hour hands-on seminars. All three offices are equipped with facilities for minor surgery, casting, colposcopy, spirometry, audiometry, complete vision screening, electrocardiograms, various cultures, and rapid, enzyme-based diagnostic tests. Patients are from all walks of life and all ages and seek medical care for a wide variety of acute and chronic conditions. The emphasis is on continuity in ambulatory, nursing home, and hospital care. One student every four weeks. Director: M. Cardona

MD 601, Family Medicine Subinternship, Middlesex Hospital This advanced inpatient experience provides an opportunity for motivated students to challenge themselves with an in-depth experience in inpatient family medicine. The goal is to help prepare future family physicians to provide high-quality inpatient management of common problems, including procedures and medical emergencies. Students function at the intern level as a member of the teaching service team, which consists of two upper-year residents and two other interns. Responsibilities include performing admission histories and physicals, making daily work rounds and progress notes, entering orders electronically, dictating discharge summaries, and responding to hospital emergencies. Students are on call two weekend days during the rotation. Students also participate in multiple daily teaching opportunities—including morning report, hospitalist teaching rounds, and subspecialty conferences—and attend the weekly half-day Family Medicine Seminar. Open to fourth-year students only. Prerequisites: completion of Inpatient Medicine and Inpatient Pediatrics. One student every four weeks. Director: M. Cardona.

MD 610, Palliative/Hospice Medicine Elective, Branford, Connecticut This fifty-two-bed inpatient program at the nation's first hospice provides intensive palliative care for patients with terminal illness. The medical, psychological, and spiritual needs of these patients and their families are met through the coordinated efforts of an interdisciplinary team (IDT) of physicians, nurses, social workers, pharmacists, clergy, art therapists, and volunteers. Students work one-one-one with an attending physician caring for patients approaching the end of life and their families. They participate fully in admissions, morning rounds, family conferences, and IDT conferences. This elective offers students an opportunity to acquire advanced knowledge and skills in the management of symptoms (pain, anxiety, insomnia, etc.), which will benefit them in their future care of all patients, both those approaching the end of life as well as those who are acutely or chronically ill. It is the only elective in which symptom management receives a major focus. The goal of this elective is to learn to provide optimal symptom management and, as members of the IDT, to learn to care for patients approaching the end of life and to give support to their families. A four-week rotation, which allows for optional time spent with allied services and/or home care, is recommended, although a two-week rotation is available. One or two students every two or four weeks. Codirectors: J. Andrews, W.S. Long

EMERGENCY MEDICINE

464 Congress Avenue, Suite 260, 203.785.4404
http://medicine.yale.edu/emergencymed

Professors S.L. Bernstein, C.A. Brandt, D.C. Cone, G. D'Onofrio (*Chair*), S.M. Powsner (*Psychiatry*), F. Vaca

Associate Professors M.S. Bogucki, K. Cheung, D. Della-Giustina, J.D. Dziura, A.L. Hsiao (*Pediatrics*), C. Moore, L.A. Post, M. Shapiro

Assistant Professors B.J. Biroscak, J.W. Bonz, S.A. Chekijian, K.L. Dodge, L.V. Evans, A.R. French, K. Goldflam, D. Hile, K.J. Jubanyik, R. Liu, E.G. Marcolini, E. Melnick, E.P. Monico, H.C. Moscovitz, H.O. Mowafi, V. Parwani, B. Safdar, J.E. Sather, A.F. Tarabar, R.A. Taylor, A. Tomassoni, C.R. Wira

Instructors P. Agrawal, A. Aydin, D.R. Camenga, R. Carter, M.K. Hall, R. Harrison, K. Hawk, A. Hayward, L. Hile, K.A. Lord, I. Medoro, A.K. Merritt, T. Moadel, C.M. Ngaruiya, J. Pare, J. Shih, S. Thomas, A. Tsyrulnik, M. VanderMey, A.K. Venkatesh

Research Scientist M.V. Pantalon

Associate Research Scientists F. Abujarad, C.H. Lee

Associate Clinical Professors J. Maisel, M.J. Werdmann

Assistant Clinical Professors C.L. Barsky, C. Rambus, I. Schwartz, T.D. Shah

Lecturers I.M. Abrahamson, J. Aldrich, R.D. Austin, K. Baker, T. Balga, G.P. Bernardi, C. Bogan, K.J. Burns, R.E. Chen, J. Ciarleglio, T.E. Cohen, S. Colella, V. Colon, G.C. Demers, C. Dill, J. DiLungo, M. Ebling, G.M. Faherty, M. Gargano, A.L. Glick, K. Haskins, R.P. Hausfeld, G. Hepburn, A. Hirschman, E.W. Kelleher, T. Kimberly, R. Kissane, N. Klein, J. Kneen, D. Leonard, J. Lockel, D.S. MacMillan, K.A. Martens, A. Meiman, T.A. Morris, Z. Mundus, D. O'Reilly, H. Puciata, L. Russ, R. Sheehan, V. Sinha, S. Sutherland, K.S. Sylvester, V. Takacs, A. Turczak, A. Umstead, S. Verity, J. Walz, H.B. White, M.L. Young

MD 2125 (EMER)/MD 2100 (SURG), Surgical Approach to the Patient This twelve-week integrated clerkship includes surgery (six weeks, general; three weeks, specialties) and emergency medicine (three weeks) clinical components. Throughout the clerkship students participate in integrated experiences that address themes of the OR experience such as perioperative care, emergency/trauma management, procedures, medical error and patient safety, and anesthesiology. Students also participate in a twelve-week mentoring program during the clerkship. Directors: L. Hile, A.W. Kim

EMER 105, Emergency Medicine Subinternship Students participating in this four-week subinternship are immersed in the acute care setting, working under direct faculty supervision in the Yale-New Haven Hospital emergency department. Students work approximately thirty-six clinical hours per week and participate in both the weekly didactic sessions as well as specialized student case conferences and procedure workshops.

Interested students can also do some ultrasound scanning shifts and/or attend ultrasound tape review sessions. Students also have the option to do the subinternship in a longitudinal fashion, completing at least sixteen shifts over a six-month period. This is an ideal opportunity for students in the lab or completing a combined degree program at Yale to maintain clinical skills while away from the wards. Students who are not planning on a career in emergency medicine may also consider applying to do a two-week advanced elective in emergency medicine to learn advanced acute patient management, clinical skills, and procedures. Prerequisites: Internal Medicine and General Surgery Clerkships. Maximum of eight students every four weeks. Director: L. Hile

EMER 107, Integrative Clinical Medicine ICM is a month-long course offered for graduating students. The emphasis is on preparing the student for internship, and the course offers a practical approach to common complaints. Chief complaints such as chest pain and shortness of breath as well as dysrhythmias are discussed. Presentations, differentials, and efficient, evidence-based work-ups and emergent/urgent treatment are outlined. K.J. Jubanyik

EMER 109, Physician Associate Emergency Medicine Rotation A four-week introduction to emergency medicine, with emphasis on teaching the importance of creating an appropriate differential diagnosis in patients who present to the ED with routine as well as potentially life-threatening chief complaints. The students work shifts in the main ED as well as in Urgent Care, where they learn the skills necessary to assess and treat patients with undifferentiated complaints and are given the opportunity to perform a number of procedures. Emphasis is on teaching the students to take a history, perform a physical examination, formulate differentials, and implement treatment in the acute, fast-paced setting of the emergency department. Students attend morning report as well as the Emergency Medicine resident didactics for five hours each week. J.E. Sather

EMER 112, Emergency Medicine Point-of-Care Ultrasound Elective A two- or four-week experience that introduces the student to the use of diagnostic and procedural ultrasound at the bedside. Educational ultrasounds are performed by the student on emergency department patients using ultrasound equipment in the ED. Attention is paid to image acquisition, machine optimization, and image interpretation. Diagnostic pelvic, vascular, cardiac, pulmonary, biliary, trauma, and soft-tissue sonography are introduced. In addition, there are opportunities for the student to participate in supervised ultrasound-guided procedures (central and peripheral vascular access, abscess drainage, paracentesis). The bulk of time is spent performing ultrasounds in the emergency department, with one half-day a week spent reviewing recorded examinations. Educational materials are provided. While the focus of this rotation is the sonographic evaluation of the emergency patient, students considering almost any specialty may benefit as clinician-performed ultrasound continues to expand. This elective is dedicated solely to the experience and practice of point-of-care ultrasound in the ED. Students are assigned daily scanning shifts that do not carry any clinical responsibility but offer exposure to the clinical environment. It is not the same as the combined Emergency Medicine/Ultrasound Subinternship, in which the student is primarily assigned clinical shifts to demonstrate knowledge, proficiency, and workflow, and also receives exposure to ultrasound through

a few scan shifts and image review sessions. May be taken as a four-week half-time elective. Maximum of four students every two or four weeks. R. Liu

EMER 115, Medical Simulation Course A twelve-week course. Each week, students have the opportunity to manage acute emergency medicine and surgical scenarios using a high-fidelity mannequin simulator, the Laerdal SimMan 3-G. Sample scenarios include acute myocardial infarction, septic shock, and ruptured abdominal aortic aneurysm. A group of four students cares for the patient from the arrival in the emergency department to final patient disposition. Students take a history and physical, administer medications, perform procedural interventions to stabilize the patient, consult specialists, discuss plans with the patient, and inform family members of the patient's status. Procedures include endotracheal intubation, chest tube thoracostomies, and nasogastric tube and urinary catheter insertion. Medical students manage twenty-four scenarios over the twelve-week course, with debriefing sessions led by faculty experts and debriefers from the Departments of Emergency Medicine and Surgery. Team communication, professionalism, and leadership skills are emphasized. The simulation course exposes students to acute emergencies and management strategies not available to them at their level of training on the clinical wards. L.V. Evans

EMER 155/PEDS 155, Pediatric Emergency Medicine Elective Fourth-year students have the opportunity to evaluate and manage a broad range of acute medical and surgical complaints under direct attending supervision, including thirty-six clinical hours per week in the pediatric emergency department. Participation in teaching conferences and mock codes is required. One student every four weeks. Prerequisites: pediatric rotation, EPIC inpatient training, and EPIC ED e-learning. Director: P.L. Aronson

EMER 305, Combined Emergency Medicine/Ultrasound Subinternship Students are immersed in the acute care setting, working under direct faculty supervision in the Yale-New Haven Hospital emergency department. Students work a combination of clinical shifts (eight hours long) and scan shifts (four hours long) and participate in the weekly resident conference, ultrasound tape review, and specialized student case conferences and procedure workshops. Ultrasounds are performed by students on emergency department patients using ultrasound equipment in the ED. Attention is paid to image acquisition, machine optimization, and image interpretation. Diagnostic pelvic, vascular, cardiac, pulmonary, biliary, trauma, and soft-tissue sonography are introduced. In addition, there are opportunities for the student to participate in supervised ultrasound-guided procedures (central and peripheral vascular access, abscess drainage, paracentesis). One or two students every four weeks. Director: L. Hile

GENETICS

SHM I308, 203.785.2649
http://medicine.yale.edu/genetics

Professors A.E. Bale, S.J. Baserga (*Molecular Biophysics & Biochemistry*), W.R. Breg (*Emeritus*), L. Cooley, D.C. DiMaio, B.G. Forget (*Medicine*), P.G. Gallagher (*Pediatrics*), J.E. Gelernter (*Psychiatry*), A.J. Giraldez, P.M. Glazer (*Therapeutic Radiology*), J.R. Gruen (*Pediatrics*), M. Gunel (*Neurosurgery*), K.K. Hirschi (*Medicine*), A.L. Horwich, K.K. Kidd, R.P. Lifton (*Chair*), H. Lin (*Cell Biology*), M.J. Mahoney, C.M. Radding (*Emeritus*), M.R. Seashore, N. Sestan (*Neurobiology*), G.S. Shadel (*Pathology*), C.W. Slayman, S. Somlo (*Medicine*), J.B. Sweasy (*Therapeutic Radiology*), P.J. Tattersall (*Laboratory Medicine*), P. Tsipouras (*Adjunct*), S.M. Weissman, T. Xu, H. Zhao (*Public Health*)

Associate Professors M. Brueckner (*Pediatrics*), K.A. Choate (*Dermatology*), V. Greco, N.B. Ivanova, M.K. Khokha (*Pediatrics*), P. Li, J. Lu, A. Mani (*Medicine*), M.N. Nitabach (*Cellular and Molecular Physiology*), J. Noonan, V. Reinke, Z. Sun, S.D. Weatherbee

Assistant Professors K. Bilguvar, C. Cotsapas (*Neurology*), M. Hammarlund, J. Lim, I. Park, C. Scharfe, M. Spencer-Manzon, A. Xiao, H.Z. Zhang

Senior Research Scientist S.M. Mane

Research Scientists W.A. Fenton, A.M. Hudson, J. Knight, J.M. McGrath (*Comparative Medicine*), A.J. Pakstis, X. Pan

Associate Research Scientists A. Bazzini, L.M. Boyden, A. Canaan, C.Y. Chabu, J. Cheng, D. Cifuentes Buira, J.L. Cotney, S. Ding, W. Ji, T. Kazakov, K. Kim, H. Kokubu, D. Li, J. Lian, Y. Liu, J.F. Lopez-Giraldez, A. Leung, J. Lu, Y. Lu, D. Ma, S. Mehta, M.A. Moreno-Mateos, M. Nagy, D.N. Nguyen, W. Niu, L.M. Petti, F. Qian, A.M. Szekely, C. Takacs, T. Wang, Z. Wang, T. Wu, F. Xu, J. Yang, J. Zhang

GENE 625a/MB&B 625a^{U}/MCDB 625a^{U}, Basic Concepts of Genetic Analysis The universal principles of genetic analysis in eukaryotes are discussed in lectures. Students also read a small selection of primary papers illustrating the very best of genetic analysis and dissect them in detail in the discussion sections. While other Yale graduate molecular genetics courses emphasize molecular biology, this course focuses on the concepts and logic underlying modern genetic analysis. T. Xu and staff

GENE 645b/BIS 645b/CB&B 647b, Statistical Methods in Human Genetics Probability modeling and statistical methodology for the analysis of human genetics data are presented. Topics include population genetics, single locus and polygenic inheritance, linkage analysis, quantitative trait analysis, association analysis, haplotype analysis, population structure, whole genome genotyping platforms, copy number variation, pathway analysis, and genetic risk prediction models. Prerequisites: genetics; BIS 505a and b; STAT 541 or equivalent; or permission of the instructor. H. Zhao, K.K. Kidd

GENE 655a/CBIO 655a, Stem Cells: Biology and Application This course is designed for first-year or second-year students to learn the fundamentals of stem cell biology and to gain familiarity with current research in the field. The course is presented in a lecture and discussion format based on primary literature. Topics include stem cell concepts, methodologies for stem cell research, embryonic stem cells, adult stem cells, cloning and stem cell reprogramming, and clinical applications of stem cell research. Prerequisites: undergraduate-level cell biology, molecular biology, and genetics. I.-H. Park, H. Lin, and faculty

GENE 675a and b, Graduate Student Seminar: Critical Analysis and Presentation of Scientific Literature Students gain experience in preparing and delivering seminars and in discussing presentations by other students. A variety of topics in molecular, cellular, developmental, and population genetics are covered. Required of all second-year students in Genetics. Graded Satisfactory/Unsatisfactory. V. Greco and staff

[**GENE 703b, The Mouse in Biomedical Research** This course describes aspects of comparative genomics, construction of genetically altered mice, mouse phenotyping, and study design relevant to the use of mice in the study of human disease. Prerequisites: undergraduate-level knowledge of genetics and mammalian anatomy and physiology. Not offered in 2015–2016]

GENE 734a/MB&B 734a/MBIO 734a, Molecular Biology of Animal Viruses Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. B.D. Lindenbach

GENE 743b/MB&B 743b^{U}/MCDB 743b, Advanced Eukaryotic Molecular Biology Selected topics in transcriptional control, regulation of chromatin structure, mRNA processing, mRNA stability, RNA interference, translation, protein degradation, DNA replication, DNA repair, site-specific DNA recombination, somatic hypermutation. Prerequisite: biochemistry or permission of the instructor. M.W. Hochstrasser, K. Neugebauer, M. Simon, P. Sung

GENE 749a/MB&B 749a^{U}, Medical Impact of Basic Science Consideration of examples of recent discoveries in basic science that have elucidated the molecular origins of disease or that have suggested new therapies for disease. Emphasis is placed on the fundamental principles on which these advances rely. Reading is from the primary scientific and medical literature, with emphasis on developing the ability to read this literature critically. Aimed primarily at undergraduates. Prerequisite: biochemistry or permission of the instructor. J.A. Steitz, I.G. Miller, A.D. Miranker, K. Neugebauer, D.G. Schatz, T.A. Steitz, and staff

GENE 760b, Genomic Methods for Genetic Analysis Introduction to the analysis and interpretation of genomic datasets. The focus is on next-generation sequencing (NGS) applications including RNA-seq, ChIP-seq, and exome and whole genome sequencing. By the end of the course, each student will be able to process and analyze large-scale NGS datasets and interpret the results. This course is intended only for graduate students who are interested in applying genomic approaches in their thesis research. At a minimum, students must have basic familiarity with working in a UNIX/Linux computing

environment. Prior experience with shell scripting or a scripting language such as Perl, Python, or Ruby is strongly recommended. Interested students must contact the instructor early in the fall term to discuss their prior experience and expectations for the course. Enrollment limited to twenty. Prerequisite: permission of the instructor. J. Noonan

GENE 777b/MCDB 677b, Mechanisms of Development An advanced course on mechanisms of animal development focusing on the genetic specification of cell organization and identity during embryogenesis and somatic differentiation. The use of evolutionarily conserved signaling pathways to carry out developmental decisions in a range of animals is highlighted. Course work includes student participation in critical analysis of primary literature and a research proposal term paper. V. Reinke and staff

GENE 840a and b, Medical Genetics Elective Students participate in the diagnosis and management of fetuses, children, and adults with genetic disorders or who are at risk for genetic disorders. Patients are assigned to students for counseling and diagnostic evaluation, and for presentation at conferences. A laboratory experience in one of our genetics laboratories (Cytogenetics, Biochemical, and Molecular) is arranged according to the interest of the student. Twenty hours per week. One or two students every two or four weeks. Director: H.Z. Zhang

GENE 900a/CBIO 900a/MCDB 900a, First-Year Introduction to Research—Grant Writing and Scientific Communication Grant writing, scientific communication, and laboratory rotation talks for Molecular Cell Biology, Genetics, and Development track students. S. Holley and faculty

GENE 901b/CBIO 901b/MCDB 901b, First-Year Introduction to Research—Ethics: Scientific Integrity in Biomedical Research Ethics and laboratory rotation talks for Molecular Cell Biology, Genetics, and Development track students. J. Bewersdorf

GENE 911a/CBIO 911a/MCDB 911a, First Laboratory Rotation First laboratory rotation for Molecular Cell Biology, Genetics, and Development track students. C. Crews

GENE 912b/CBIO 912b/MCDB 912b, Second Laboratory Rotation Second laboratory rotation for Molecular Cell Biology, Genetics, and Development track students. C. Crews

GENE 913b/CBIO 913b/MCDB 913b, Third Laboratory Rotation Third laboratory rotation for Molecular Cell Biology, Genetics, and Development track students. C. Crews

GENE 921a and b, Reading Course in Genetics and Molecular Biology Directed reading with faculty. Term paper required. Prerequisite: permission of Genetics DGS.

GLOBAL HEALTH

Office of International Medical Student Education: ESH 214, 203.785.5937
http://medicine.yale.edu/globalhealth

GH 700/EPH 591, Global Health Seminar The Global Health Seminar is a yearlong, weekly elective intended for students in the health professions to develop an understanding of key aspects of global health research and practice. The objective is for students to attain a good understanding of key issues upon which they may base future research, service, and clinical pursuits in the field of global health. As the course involves students and faculty from all of the health professions, its participatory and collaborative nature provides a rich environment for interdisciplinary dialogue. Over the course of the fall term, lectures focus on global health history and architecture and advocacy, and the modules in 2014–2015 focus on neglected tropical diseases (NTDs). Readings and class discussion. Each module concludes with student projects. Required of students in the Global Health Concentration at YSPH and of students in the Certificate in Global Medicine program at YSM. Faculty advisers: G. Friedland, T. Rabin, S. Shenoi (YSM); P. Ryan-Krause (YSN); M. Skonieczny (YSPH); R. Gonzalez-Colaso (PA)

GH 701, Topics in Global Medicine Topics in Global Medicine (formerly the Tropical Medicine course) is a student-led, case-based seminar that provides participants with a broad knowledge base in current globally important health issues. Each session focuses on a specific health concern and aims to integrate issues concerning epidemiology and prevention along with diagnosis and treatment in a case-based format and clinically relevant fashion. The specifics of medical management are not the priority for this course. Importantly, the course provides a forum for interactive discussions of the health issues that pose unique challenges in resource-limited settings. Most sessions are collaborative—a faculty instructor is paired with one or two students, and the team works together to research and present the topic. Typically, each session includes a one-hour lecture by the presenting team followed by a half-hour interactive discussion facilitated by the student presenters. The discussion format is flexible and will be guided by the particular session topic. The content might focus on ethical concerns, interesting research questions, preventive strategies, etc. The course is designed for students in all of the health profession programs, specifically physician associate (PA), nursing (YSN), medicine (YSM), and public health (YSPH) students who have an interest in the clinical aspects of global health; it is open to all members of the Yale community. Active participation is expected, whether by way of presenting a topic, leading a discussion session, or participating in the discussion. Upon completion of this course, students are able to (1) appreciate the spectrum of clinical diseases, both communicable and noncommunicable, affecting persons in low- and middle-income countries (LMIC); (2) identify the major principles and challenges of providing medical care in LMIC; (3) broadly outline methods of diagnosis, prevention, and treatment for diseases encountered in resource-limited settings; (4) appreciate the importance of public health interventions in dealing with these diseases; and (5) have the opportunity to collaborate with a faculty member on the presentation of a topic of interest. Participation in this class is highly encouraged for students and residents interested in applying for an international rotation. Director: J. Schwartz

HISTORY OF MEDICINE

SHM L132, 203.785.4338
http://medicine.yale.edu/histmed

Professors D. Kevles (*History*), S.E. Lederer (*Adjunct*), N. Rogers, F. Snowden (*History*), B.J. Strasser (*Adjunct*), W.C. Summers (*Therapeutic Radiology*), J.H. Warner (*Chair*)

Associate Professor M. Espinosa (*Adjunct*)

Assistant Professors P. Bertucci (*History*), H.M. Cowles, J. Radin

Yale College and Graduate School courses open to medical students:

HSHM 202a/AMST 247a/FILM 244a/HIST 147a/HLTH 170a, Media and Medicine in Modern America Relationships between medicine, health, and the media in the United States from 1870 to the present. The changing role of the media in shaping conceptions of the body, creating new diseases, influencing health and health policy, crafting the image of the medical profession, informing expectations of medicine and constructions of citizenship, and the medicalization of American life. J.H. Warner, G.K. Berland

HSHM 204a/AMST 163a/EVST 120a/HIST 120a, Introduction to Environmental History Ways in which people have shaped and been shaped by the changing environments of North America from precolonial times to the present. Migration of species and trade in commodities; contrasting uses of land; the impact of industry and markets; the rise of modern conservation and environmental movements; the development of public policy; the global search for resources by the United States. P. Sabin

HSHM 214b/HIST 402b, Extraterrestrials in History The notion of extraterrestrials and "radical others" in history and culture from antiquity to the present. Topics include other worlds and their inhabitants in ancient Greece; medieval debates on the plurality of worlds; angels, freaks, native Americans, and other "aliens" of the Renaissance; comet dwellers in puritan New England; Mars as a socialist utopia in the early twentieth century; and visitors from space in American popular culture. I. Dal Prete

HSHM 226b/HIST 236b/HUMS 342b, The Scientific Revolution The changing relationship between the natural world and the arts from Leonardo to Newton. Topics include Renaissance anatomy and astronomy, alchemy, and natural history. P. Bertucci

HSHM 235b/HIST 234b, Epidemics and Society in the West since 1600 A study of the impact of epidemic diseases such as bubonic plague, cholera, malaria, and AIDS on society, public health, and the medical profession in comparative and international perspective. Topics include popular culture and mass hysteria, the mortality revolution, urban renewal and rebuilding, sanitation, the germ theory of disease, the emergence of scientific medicine, and debates over the biomedical model of disease. F. Snowden

HSHM 408b/HUMS 306b, Science and Human Sciences The modern dichotomy of natural science and human science, i.e., the totality of disciplines devoted to human experience, as it has developed from the mid-seventeenth century to the present. Focus on key works by Galileo Galilei, Giambattista Vico, Charles Darwin, and Terrence Deacon.

The shifting relations of Western understandings of the natural and human realms. G. Tomlinson

HSHM 409b/HIST 416Jb/PSYC 401b, Minds and Brains from Phrenology to fMRI A survey of the science and medicine of mind and brain since 1800. Topics include madness and the asylum; phrenology and psychoanalysis; psychology in politics, law, and advertising; the rise of the "neuro-" disciplines; and mental health in public life. Sources from fields such as neurology, physiology, psychology, psychiatry, and philosophy. Readings from works by Darwin, James, Freud, Foucault, Chomsky, and Pinker.

HSHM 410a/HIST 149Ja, History of Pollution The science and politics of pollution issues from the late nineteenth century through the end of the twentieth. The rise of antipollution regulations; the emergence of environmental social movements; the role of scientific expertise in national and international policy making; changes in scientific, political, and public assessments of environmental risks.

HSHM 411a/HIST 141Ja, Science from Newton to Neutrons Major themes and ideas in science from the seventeenth century through the twentieth. Focus on evolving descriptions and theories of matter and energy, physics, and chemistry. The evolution of Newtonian ideas to the world of modern physics and the transition from alchemical thinking to the chemical revolution. W.C. Summers

HSHM 412b/HIST 429Jb, The History of the Laboratory The social and cultural history of the experimental laboratory as a site for scientific activity, from early modern origins to the present day. The early modern origins of the laboratory; private, institutional, and state laboratories; relations between labs and field stations; the lab in the colonial and developing world; industrial and corporate labs; laboratory architecture; secrecy and openness; gender in the experimental workplace; and popular representations of the laboratory. Undergraduate enrollment limited to juniors and seniors. C. Ramalingam

HSHM 422b/HIST 467Jb, Cartography, Territory, and Identity Exploration of how maps shape assumptions about territory, land, sovereignty, and identity. The relationship between scientific cartography and conquest, the geography of statecraft, religious cartographies, encounters between Western and non-Western cultures, and reactions to cartographic objectivity. Students make their own maps. No previous experience in cartography or graphic design required.

HSHM 437b/HIST 435Jb, The Global Crisis of Malaria The global crisis of malaria examined in comparative and historical context. The mosquito theory of transmission and other developments in scientific understanding of the disease; World Health Organization strategies to eradicate malaria since 1955; the development of tools such as insecticides, medication, and bed nets; the attempt to create an effective vaccine. F. Snowden

HSHM 459a/HIST 159Ja/HUMS 359a, Spies, Secrets, and Science The relationship between secrecy, intellectual property, and science from the Middle Ages to the Cold War. Topics include alchemy and esoteric knowledge; the Manhattan Project and other secret scientific projects run by the state; the history of patents and copyright laws; and scientists as spies. P. Bertucci

HSHM 468b/HIST 254Jb, Sex, Life, and Generation Theories and practices of life, sex, and generation in Western civilization. Politics and policies of conception and birth; social control of abortion and infanticide in premodern societies; theories of life and gender; the changing status of the embryo; the lure of artificial life. I. Dal Prete

HSHM 656a[U]/HIST 949a[U], Photography and the Sciences Does photography belong in the history of art, or does its status as an "automatic" or "scientific" recording technique and its many uses in the sciences distinguish its history from that of earlier visual media? How does photography look when we approach it from the cultural history of science? How might its role in the sciences have shaped photographic aesthetics in the arts? This course examines the making of photography's discursive identity as an experimental and evidentiary medium in the sciences, from its announcement to the public in 1839 to the digital innovations of the present day. We take a historical and archival perspective on uses for (and debates over) photography in different fields of the natural and human sciences, grounded in visits to photographic collections at Yale. C. Ramalingam

HSHM 680a[U]/HIST 911a[U], History of Chinese Science Major themes in Chinese scientific thinking from antiquity to the twentieth century. Non-Western concepts of nature and the development of science in China; East-West scientific exchanges; and China's role in modern science. W.C. Summers

HSHM 701a/HIST 930a, Problems in the History of Medicine and Public Health An examination of the variety of approaches to the social and cultural history of medicine and public health. Readings are drawn from recent literature in the field, sampling writings on health care, illness experiences, ideas, and medical cultures in Europe, the Americas, Asia, and Africa from antiquity to the twentieth century. Topics include the role of gender, class, ethnicity, race, religion, and region in the experience of health care and sickness; the intersection of lay and professional understandings of the body; and the role of the marketplace in shaping professional identities and patient expectations. J.H. Warner

HSHM 702b/HIST 931b, Problems in the History of Science Survey of classic and recent work in the history of science, broadly conceived. Topics include physical, life, and human sciences; role of technology and instruments; relationship between theory and practice; and interactions with society, politics, and capitalism. Focus on mastering debates in history of science, with connections to philosophy, anthropology, and literary studies. H.M. Cowles

HSHM 710a/HIST 921a, Problems in Science Studies Exploration of the methods and debates in the social studies of science, technology, and medicine. This course covers the history of the field and its current intellectual, social, and political positioning. It provides critical tools—including feminist, postcolonial, and new materialist perspectives—to address the relationships among science, technology, medicine, and society. J. Radin

HSHM 713b/HIST 913b, Geography and History A research seminar focused on methodological questions of geography and geographic analysis in historical scholarship. We consider approaches ranging from the Annales School of the early twentieth century to contemporary research in environmental history, history of science, urban history, and more. We also explore interdisciplinary work in social theory, historical geography, and

anthropology and grapple with the promise (and drawbacks) of GIS. Students may write their research papers on any time period or geographic region, and no previous experience with geography or GIS is necessary. Open to undergraduates with permission of the instructor. W. Rankin

HSHM 736b/HIST 943b/WGSS 730b, Health Politics, Body Politics A reading seminar on struggles to control, pathologize, and normalize human bodies, with a particular focus on science, medicine, and the state, both in North America and in a broader global health context. Topics include disease, race, and politics; repression and regulation of birth control; the politics of adoption; domestic and global population control; feminist health movements; and the pathologizing and identity politics of disabled people. N. Rogers

HSHM 744b/AMST 839b/F&ES 843b/HIST 743b, Readings in Environmental History Readings and discussion of key works in environmental history. The course explores major forces shaping human-environment relationships, such as markets, politics, and ecological dynamics, and compares different approaches to writing about social and environmental change. P. Sabin

HSHM 914a or b, Research Tutorial I By arrangement with faculty.

HSHM 915a or b, Research Tutorial II By arrangement with faculty.

HSHM 920a or b, Independent Reading By arrangement with faculty.

HSHM 930a or b, Independent Research By arrangement with faculty.

In addition to formal course offerings and tutorials offered in the School of Medicine, Yale College, and the Graduate School, activities in the Section of History of Medicine are supplemented by a number of related historical medical programs. Colloquia in the History of Science and Medicine are held fortnightly and are open to the School of Medicine community. The section sponsors an annual Frederic L. Holmes Lecture, and the Department of Surgery sponsors the annual Samuel Clark Harvey Memorial Lecture. The Nathan Smith Club is composed of medical students interested in medical history. The Beaumont Medical Club, founded at Yale in 1920, sponsors six lectures in the History of Medicine during the academic year and annually selects a Beaumont Lecturer and a George Rosen Lecturer in the History of Medicine.

Section faculty are available for M.D. thesis supervision. Information about the History of Medicine M.D. thesis, and a list of recent titles, can be found at http://medicine.yale.edu/humanities/research/theses.aspx.

The section faculty work with the Department of History to offer a Ph.D. program in the History of Science and Medicine. In addition, there is an M.A. program designed particularly for those who plan to combine teaching or scholarship in these fields with a professional career in medicine or the life sciences. For further information concerning admissions and the program itself, consult the Graduate School bulletin.

IMMUNOBIOLOGY

TAC S625, 203.785.3857
http://medicine.yale.edu/immuno

Professors J.R. Bender (*Medicine*), A.L. Bothwell, L. Chen, J.E. Craft (*Medicine*), P. Cresswell, M.V. Dhodapkar (*Medicine*), V.D. Dixit (*Comparative Medicine*), R.A. Flavell (*Chair*), D.R. Goldstein (*Medicine*), D. Hafler (*Neurology*), K. Herold, A. Iwasaki, P.B. Kavathas (*Laboratory Medicine*), R.M. Medzhitov, J.S. Pober, C.R. Roy (*Microbial Pathogenesis*), N. Ruddle (*Emerita*), D.G. Schatz, M.J. Shlomchik (*Laboratory Medicine; Adjunct*), W.D. Shlomchik (*Medicine*), B. Su (*Adjunct*)

Associate Professors Tarek Fahmy (*Biomedical Engineering*), S. Kaech, S.H. Kleinstein, E.R. Meffre

Assistant Professors S.C. Eisenbarth (*Laboratory Medicine*), A.M. Haberman (*Laboratory Medicine*), M.A. Kriegel, J.P. Pereira, C.V. Rothlin

Research Scientists T.H. Chi, E.E. Eynon, M.S. Kluger

Associate Research Scientists P. Bielecki, W. Chae, P.R. Clark, T. Ghazi, J. Grotzke, D. Herndler-Brandstetter, N. Iijima, W. Ip, L. Kim, N.C. Kirkiles-Smith, E.B. Kopp, Y. Kumamoto, R.M. Leonhardt, Y. Li, T.D. Manes, Y. Okabe, S.D. Pope, A. Rongvaux, E. Roulis, R.B. Seth, M. Taura, N. Vudattu, T. Willinger, G. Zhu

For a complete listing of immunology-related courses, see http://bbs.yale.edu.

IBIO 530a/MCDB 530a[U], Biology of the Immune System The development of the immune system. Cellular and molecular mechanisms of immune recognition. Effector responses against pathogens. Immunologic memory and vaccines. Human diseases including allergy, autoimmunity, cancer, immunodeficiency, HIV/AIDS. C.V. Rothlin, P. Cresswell, K. Herold, A. Iwasaki, S. Kaech, R.M. Medzhitov, E.R. Meffre, J.P. Pereira, D.G. Schatz, M.J. Shlomchik

IBIO 531b, Advanced Immunology The historical development and central paradigms of key areas in immunology. The course attempts to develop a clear understanding of how these paradigms were established experimentally. Landmark studies are discussed to determine how the conclusions were obtained and why they were important at the time they were done. Lecture and discussion format; readings of primary research papers and review articles. Prerequisite: IBIO 530a or equivalent. Enrollment limited to fifteen. A.L. Bothwell and faculty

IBIO 539b, Advanced Immunology Seminar: Cancer Immunology M.V. Dhodapkar, L. Chen, K. Politi

IBIO 600a, Introduction to Research: Faculty Research Presentations Introduction to the research interests of the faculty. Required of all first-year Immunology/BBS students. Pass/Fail. S. Kaech and faculty

IBIO 601b/CB&B 601b, Fundamentals of Research: Responsible Conduct of

Research A weekly seminar presented by faculty trainers on topics relating to proper conduct of research. Required of first-year Immunobiology students, first-year CB&B students, and training grant-funded postdocs. Pass/Fail. S. Kaech and faculty

IBIO 603b, Responsible Conduct of Research, Refresher Course The NIH requires that students receive training in the responsible conduct of research every four years. This course meets that requirement for fourth-year students. The course has two components: (1) one large-group session is held for all fourth-year students through the BBS; the main topics are scientific misconduct and authorship; (2) two Immunobiology faculty facilitate discussions based on RCR topics, gathered in advance from the students; anonymous or hypothetical stories are selected by the faculty and discussed in a workshop environment in which students are then asked to analyze each case and suggest courses of actions.

IBIO 611a, Research Rotation 1 Intensive experience in the design and execution of experiments in immunology or other areas of biology. Students design a focused research project in consultation with a faculty mentor and execute the designed experiments in the mentor's laboratory. Students are expected to read relevant background papers from the literature, design and perform experiments, interpret the resulting data, and propose follow-up experiments. Students are also expected to attend the mentor's weekly lab meeting(s) as well as weekly Immunobiology departmental seminars and Research in Progress seminars. The course concludes with the student giving a brief presentation of the work performed at Rotation Talks, attended by other first-year immunology-track graduate students. Evaluation is by the mentor; students also evaluate the rotation experience. Students must turn in a prioritized list of four possible mentors to Barbara Cotton in the office of the director of graduate studies at least one week prior to the beginning of the course. Mentors are assigned by the DGS. Graded Pass/Fail. Course dates are Sept. 15–Dec. 5. (1 course credit; minimum of 20 hours/week). Required of all first-year Immunology/BBS students. S. Kaech and faculty

IBIO 612b, Research Rotation 2 See description under IBIO 611a. Course dates are Jan. 9–March 13. A.L. Bothwell and faculty

IBIO 613b, Research Rotation 3 See description under IBIO 611a. Course dates are March 16–May 22. A.L. Bothwell and faculty

INTERNAL MEDICINE

Boardman 110, 203.785.4119
http://medicine.yale.edu/intmed

Professors J.I. Allen, R.J. Alpern, F. Altice, V.A. Andriole (*Emeritus*), P.S. Aronson, P.W. Askenase, W.P. Batsford (*Emeritus*), J.R. Bender, F.J. Bia (*Emeritus*), M.J. Bia, H.J. Binder (*Emeritus*), L.K. Bockenstedt, C.H. Boshoff (*Adjunct*), J.L. Boyer, A.E. Broadus (*Emeritus*), R. Bucala, L.M. Buckley, H.S. Cabin, C. Canessa (*Cellular & Molecular Physiology*), L.G. Cantley, L. Chen (*Immunobiology*), J.H. Cho (*Adjunct*), N.A. Christakis (*Sociology*), M.W. Cleman, L.S. Cohen (*Emeritus*), D.L. Coleman (*Emeritus*), J.P. Concato, L.M. Cooney, J. Costa (*Pathology*), P.V. Coveney (*Adjunct*), J.E. Craft, S.T. Crowley, J.E. Deanfield (*Adjunct*), L. Dembry, G.V. Desir, V.T. DeVita, M.V. Dhodapkar, M.A. Drickamer (*Emeritus*), T.P. Duffy (*Emeritus*), J.P. Eder, A. Eichmann, J.A. Elias (*Emeritus*), D.G. Federman, D.A. Fiellin, E. Fikrig, R.L. Fisher, B.G. Forget (*Emeritus*), J.N. Forrest, F.M. Foss, L. Frankel, T.R. Fried, G. Friedland, G. Garcia-Tsao, J.B. Gee (*Emeritus*), R.H. Gifford (*Emeritus*), T.M. Gill, J.A. Goffinet (*Emeritus*), D.R. Goldstein, F. Gorelick, M.L. Green, C.P. Gross, R.J. Groszmann (*Emeritus*), R. Herbst, K. Herold (*Immunobiology*), W.J. Hierholzer (*Emeritus*), K.K. Hirschi, H.S. Hochster, E.S. Holmboe (*Adjunct*), R.J. Homer (*Pathology*), R.I. Horwitz (*Emeritus*), J.S. Hughes, S.J. Huot, S. Inouye (*Adjunct*), K.L. Insogna, S.E. Inzucchi, C. Jaffe (*Emeritus*), D. Jain (*Pathology*), P.A. Jamidar, A.C. Justice, N. Kaminski, F.S. Kantor, C.R. Kapadia, W.N. Kernan, H. Kluger, A.I. Ko (*Epidemiology*), M.J. Kozal, H.M. Krumholz, M. Kryger, J. Lacy, L. Laine, M. Landry (*Laboratory Medicine*), F.A. Lee, R.J. Levine, R.P. Lifton (*Genetics*), R.C. Lilenbaum, T.J. Lynch (*Chair*), M.J. Mamula, R.A. Marottoli, J.C. Marsh (*Emeritus*), J.F. Martin (*Adjunct*), R.A. Matthay (*Emeritus*), W.J. McKenna (*Adjunct*), G. McMahon (*Adjunct*), P.K. Mistry, V. Mohsenin, M.H. Nathanson, P.G. O'Connor, A.J. Peixoto, M.A. Perazella, K.F. Petersen, D. Petrylak, P.A. Preisig, D.D. Proctor, L. Pusztai, V.J. Quagliarello, B.S. Ramakrishna (*Adjunct*), A. Rastegar, N.S. Redeker (*Nursing*), C. Redlich, D.L. Rimm (*Pathology*), H.M. Rinder (*Laboratory Medicine*), M.E. Robert (*Pathology*), J.D. Roberts, S.H. Rosenbaum (*Anesthesiology*), M.B. Russi, R. Safirstein, M.A. Schwartz, W.C. Sessa (*Pharmacology*), R.S. Sherwin, W.D. Shlomchik (*Adjunct*), G.I. Shulman, M.D. Siegel, M. Simons, A.J. Sinusas, B.R. Smith (*Laboratory Medicine*), S. Somlo, R. Soufer, C. Stefanadis (*Adjunct*), R.L. Steinbrook (*Adjunct*), M. Strazzabosco (*Adjunct*), M. Sznol, L. Tanoue, M.E. Tinetti, R.J. Vender, F.S. Wright, J.J. Wysolmerski, L.H. Young, B.L. Zaret (*Emeritus*)

Associate Professors C. Abraham, M.M. Abu-Khalaf, J.G. Akar, H.G. Allore, N.R. Angoff, D.E. Antin-Ozerkis, H.R. Aslanian, C. Ben Mamoun, G.K. Berland, J.S. Bogan, J. Boyer (*Adjunct*), J. Brennan, U.C. Brewster, H. Cain, H.H. Chao, S.I. Chaudhry, C. Chung, G.L. Chupp, G.W. Cline, H. Cohen (*Adjunct*), L.E. Cohn, J.M. Coviello (*Nursing*), J.P. Curtis, N.K. Dahl, H.A. Deshpande, M.P. DiGiovanna, B.R. Doolittle, D.W. Dunne, J.D. Dziura (*Emergency Medicine*), M.S. Ellman, J. Evans, J.J. Farell, L.E. Fiellin, R.N. Formica, A.H. Fortin, C.A. Fragoso, I. Genao, S.N.

Gettinger, F.J. Giordano, B.I. Gulanski, S.G. Haskell, J.B. Henrich, E.L. Herzog, E.H. Holt, L.I. Horwitz (*Adjunct*), J. Hwa, S. Ishibe, Y. Iwakiri, G.Y. Jenq, S. Jin (*Adjunct*), E.A. Jonas, M. Juthani-Mehta, A. Kamarulzaman (*Adjunct*), I. Kang, J.M. Kapo, B.I. Kazmierczak, J.E. Kerstetter (*Adjunct*), R.G. Kibbey, J. Koo, J.D. Kravetz, S. Kulkarni (*Surgery*), R.J. Lampert, A.J. Lansky, P. Lee, J.K. Lim, A. Mani, M.A. Marieb, S. Mark (*Adjunct*), P.W. Marks, K.A. Martin, R.A. Martinello, R.L. McNamara, E.R. Meffre (*Immunobiology*), W.Z. Mehal, G.C. Michaud, R.R. Montgomery, J.P. Moriarty, L.J. Morrison, A.B. Nagar, C.R. Parikh, S.E. Pfau, M.A. Pisani, P. Protiva, P.M. Rabinowitz (*Adjunct*), A.B. Reisman, M.S. Remetz, C. Rochester, M.G. Rose, J.R. Rosenbaum, L.E. Rosenfeld, J.S. Ross, C.B. Ruser, R.R. Russell, M.M. Sadeghi, V.T. Samuel, L. Sanders, M. Schilsky, S.E. Seropian, J.F. Setaro, A.C. Shaw, M.N. Smith, A.N. Sofair, S.A. Springer, L. Sugeng, R. Sutton, T.H. Taddei, O.A. Taiwo (*Adjunct*), T.K. Trow, J. Van Rhee, M.S. Villanueva, L.M. Walke, D.M. Windish, H.K. Yaggi, T. Zheng, Z. Zhu (*Pediatrics*)

Assistant Professors A.K. Abu-Alfa (*Adjunct*), K.B. Adelson, A.M. Ahasic, K.M. Akgun, K.N. Alavian (*Adjunct*), A. Annamalai (*Psychiatry*), L. Aoun-Barakat, W.S. Asch, D. Assis, R.A. Attaran, D.B. Banach, M.R. Basso (*Adjunct*), W.C. Becker, R. Belfort De Aguiar, L. Bellumkonda, C.W. Bergwitz, P.S. Bhatt, R.S. Brienza, D. Brissette, C.M. Brunet, O. Chan, H. Chao, L.A. Chaptini, A. Chiang, H.J. Chun, G.G. Chung, J.F. Clancy, S. Coca (*Adjunct*), S. Cole, G.R. Connors, C. Cromwell, D.J. Curran, C.S. Dela Cruz, S.G. Deftereos (*Adjunct*), N. Desai, K. Dharmarajan, L.S. Dugdale, E.J. Edelman, S.C. Eisenbarth (*Laboratory Medicine*), R.W. Elder (*Pediatrics*), P.J. Ellis, B. Emu, L. Fabris (*Adjunct*), W.H. Fares, M.K. Fikrig, A.F. Fisher, C.A. Flannery (*Obstetrics, Gynecology & Reproductive Sciences*), R. Fogerty, J.K. Forrest, B.E. Fortune, J.V. Freeman, R.L. Garcia, A. Garino, D.S. Geller, G. Giannopoulos (*Adjunct*), S.B. Goldberg, R. Gonzalez-Colaso, B.E. Gould Rothberg, M. Grant, D. Greif, M. Gulati, C.G. Gunderson, S. Halene, I.E. Hall, C. Hatzis, S.F. Hay, J. Herrin (*Adjunct*), R.I. Herzog, E.W. Hofstatter, S.R. Holt, S. Honiden, R. Hoque, C.J. Howes, M.E. Hurwitz, A. Hyson, A.B. Imaeda, I. Isufi, D.L. Jacoby, F. Jadbabaie, S.S. Jakab, A.M. Jastreboff, S. Jeffery (*Adjunct*), L.B. Jilaveanu, M. Kang, A.K. Karihaloo (*Adjunct*), S.S. Kashaf, J.W. Kim, N. Kim, F. Knauf (*Adjunct*), J. Koff, R. Koski (*Adjunct*), C.I. Kossyvakis (*Adjunct*), M.A. Kriegel (*Immunobiology*), N. Krishnan, C. Kumar, P. Kumar, R.E. Laff, A.I. Lee, G.S. Lee, J. Li, A.H. Liapakis, B.A. Lin, K.J. Lipska, R. Luciano, B.C. Lupsa, U. Makris (*Adjunct*), M. Malinis, B.J. Malm, P. Mannam, E.P. Marin, P.S. Marshall, R.J. McCrimmon (*Adjunct*), K.C. McKenzie, E.C. McNay (*Adjunct*), J.L. Meadows, M.C. Mecca, P. Meier (*Adjunct*), C.I. Mena, J.P. Meyer, T.A. Molisse, A. Moll (*Adjunct*), E. Moreyra (*Adjunct*), V.A. Morris, A.R. Morrison, S. Mougalian, M. Murakami (*Adjunct*), T.E. Murphy, K Nandigam, R.J. Nardino, N. Neparidze, S. Nicoli, O. O'Hara, O.E. Ogbuagu, P. Oray-Schrom, S. Parikh (*Epidemiology*), T.L. Parker, M. Pillai, N.A. Podoltsev, J.D. Possick, C.C. Price, J.T. Puchalski, L. Puglisi, A.T. Putnam, Y. Qyang, T. Rabin, A.M. Reed, R.A. Rienzo, C. Ritsema, E.M. Roessler, D.I. Rosenthal, C. Ruhrberg (*Adjunct*), C.J. Sakr (*Adjunct*), M.J. Sanchez, T. Sanft, C.B. Sankey, J.R. Satchell-Jones, S.M. Schnittman (*Adjunct*), A.R. Schwartz, J. Schwartz, S. Shenoi, A.C. Shirali, L.A. Simprini, J.M. Siner, S. Soares, E.S. Spatz, J.F. Spelman, C. Spirli, S.M. Stein, J. Stepczynski, M.P.

Strout, L.G. Suter, S. Takyar, J. Talwalkar, J.M. Testani, J.M. Tetrault, N. Thande, D.G. Tobin, J. Turner, L.S. Vasquez, E. Wang, Y. Wang (*Adjunct*), L.M. Whitman, F.P. Wilson, C. Won, E.Y. Wong, R. Worthington (*Adjunct*), X. Yan, X. Yao, A.M. Zeidan

Instructors A.M. Ahmed, S.S. Akhtar, C.J. Britto-Leon, W. Chang, E. Cristea, J.L. Gomez Villalobos, J. Herazo-Maya, E. Hsieh, J.J. Hwang, S. Jayasuriya, M.J. Jurczak, M.P. Knauert, R.Y. Lefkowitz, J. McLaughlin, S. Pandey, B. Richards, S. Rinne, M. Sauler, M.R. Stacy, A. Tarabar, E. Torrazza Perez, A. Valika, R. Wadia, C.J. Winterbottom

Senior Research Scientists M. Ananthanarayanan, H.J. Binder, A.E. Broadus, S. Cai, L.S. Cohen, L. Han, L. Leng, Y. Liu, R.A. Matthay, W.M. Philbrick, C.J. Soroka, E.C. Thrower, P.H. Van Ness, L. Wen, A.V. Wisnewski, J. Yu, B.L. Zaret, Z. Zhuang

Research Scientists S. Alfano, D.I. Baker, D.E. Befroy (*Diagnostic Radiology*), A.A. Belperron, J. Choi, J.M. Juergensmeier, S. Narasimhan, D.C. Tirziu, H. Velazquez, C.M. Viscoli, J. Zhang

Associate Research Scientists M. Abdelmessih, F. Ahangari, M. Aslan, O. Bartulos-Encinas, J.M. Belcher, K. Blount, A. Bregasi, S.N. Brown, M. Budatha, Y. Cai, P. Chen, R. Chen, S.J. Cheng, A.K. Coskun, C.J. Cutter, K. Dong, H.A. Doyle, X. Du, X. Fan, R. Fiorotto, A. Gallagher, A.K. Gattu, M.T. Guerra, X. Guo, J. Han, M. Haslip, M. Hedl, K. Hieftje, Y. Hu, Y. Hu, Y. Huang, Z. Jiang, L. Jozsef, J. Jung, E.J. Kaftan, H. Kim, J. Kim, K. Kim, M. Kish, J. Lee, S.H. Lee, M. Li, P.P. Licznerski, J. Liu, L. Liu, M. Ma, A. Marlier, G.J. McAvay, N. Mnatsakanyan, S. Mohanty, A. Nassar, C.R. Oladele, X. Ouyang, I. Papangeli, D. Qi, L. Qin, V.S. Ramgolam, V.S. Rao, M. Razavian, Y. Ren, J.M. Rhodes, J. Ruan, M. Schniederberend, J. Schwartz, H. Shen, W. Shi, M. Shin, R. Singh, A. Srivastava, R. Srivastava, M.H. Stowe, B. Sun, H. Sun, S. Sutton, K.L. Swan, N. Tai, W. Tang, J.P. Tate, T.M. Thompson, R.B. Thomson, X. Tian, X. Tian, M. Trentalange, P. Vagenas, V. Wali, K. Wang, P. Wang, Y. Wang, Y. Wei, J. Wickersham, Y. Wu, Y. Xie, M. Yang, T. Yarovinsky, Y. Ye, F. You, G. Yu, J. Yureneva, A. Zelenev, X. Zhang, Y. Zhang, Y. Zhao

Clinical Professors J. Belsky, J.B. Borak (*Epidemiology*), J.M. Boyce, M.H. Brand, K.L. Cohen, N. Dainiak, F.O. Finkelstein, D.S. Fischer, L. Friedman, A.S. Kliger, N.J. Marieb, C.A. McPherson, D.N. Podell, R.T. Schoen, M.H. Schoenfeld, C.B. Seelig, C.B. Sherter, S.M. Winter, B.J. Wu

Associate Clinical Professors G.G. Abdelsayed, S. Aronin, S.A. Atlas, M.C. Bennick, S.T. Bogardus, S.D. Brenner, R.D. Bruce, G.K. Buller, M.M. Burg, C.A. Caldwell, J.P. Cleary, W.B. Crede, C.A. Disabatino, K.J. Dobuler, A.B. Douglass, S.M. Epstein, E.L. Etkind, J.J. Garsten, D.I. Geisser, R.A. Gelfand, A.V. Granata, L.E. Grauer, F.D. Haeseler, L.W. Hammers (*Diagnostic Radiology*), H.L. Haronian, K.A. Hutchinson, S.G. Jones, G.J. Kerins, G.I. Lancaster, A. Lebowitz, W.S. Long, R.W. Lyons, E.P. Mardh, A.M. Marino, B.A. Martell, A.B. Mayerson, E.M. Mazur, R.M. McLean, D.J. Miller, E.D. Moritz, S.J. Moses, P.B. Nussbaum, J.M. Perlotto, J.H. Revkin, J.R. Sabetta, M.L. Schwartz, M.F. Simms, J.F. Sullivan, H.L. Taubin, R. Torres, E. Vosburgh, S.B. Weissman, K.H. Yang, S.W. Zarich

Assistant Clinical Professors R.M. Aaronson, A.J. Accomando, E.D. Agin, O.T. Akande, L. Alaparthi, J. Alexander, R. Alfano-Kostenka, Y. Amoateng-Adjepong, S.K. Apgar, V.S. Argento, C.A. Arnold, S. Asefaw, P. Asiedu, P. Bahuguna, T.J. Balcezak, J.M. Banatoski, G.V. Bedarida, A. Bedford, A.M. Bekui, L. Berman, S.M. Bernheim, D.J. Berube, M.L. Blitzer, J.M. Blumberg, F. Boateng, N.A. Bonheim, B. Boyd, T. Braverman, J. Breen, R. Breier, J.A. Brier, D. Brock, C. Brown, L. Burgo-Black, A.R. Cadariu, K.E. Calia, L.L. Calo, E.M. Carlson, B.J. Chan, J.J. Chang, C. Chen, D.M. Chess, D. Chia, L.M. Chou, H.S. Chowdhary, J.J. Chuong, M.I. Chustecki, M.A. Ciampi, P.R. Cimino, R.B. Cooper, J.A. Cosgriff, A.J. Cusano, W.L. Cushing, S.B. D'Cunha, M.A. Demetrius, O.M. Deshpande, D. Desir, A.J. Dhond, P. Dogbey, T.A. Doherty, J.T. Dreznick, M.H. Driesman, D.J. Edwards, D.J. Eilbott, T.D. Eisen, J.M. Elser, J.J. Ernstoff, N. Fahmi, E. Fan, I. Feintzeig, T. Feld, D. Fine, F.A. Flatow, M.H. Floch, M.J. Franco, J.H. Fullerton, J.E. Gage, L.S. Galante, P.N. Geimer, S. Geller, R.S. Generoso, B.J. Gerstenhaber, P. Gibbs, R.D. Gibbs, P.A. Goldberg, G. Goldenberg, S.M. Gordon-Dole, D.I. Grayer, M.S. Grogan, S. Gupta, T.K. Gupta, J.H. Hansson, D.J. Hass, J.K. Henchel, D.G. Hill, C.F. Hollander, D. Hollister, X. Hong, L.J. Huang, R.G. Huntley, C.D. Illick, O.T. Imevbore, P.E. Jaffe, P.M. Jenei, L. Jung, S.V. Kanade, A. Karne, D. Kaufman, M.A. Kazakoff, G. Kelley, J. Kleinstein, H. Knight, C.R. Kramer, H.M. Kramer, M.L. Kraus, S.H. Kunkes, J.M. Lai, S. Lam, M. Lataillade, U. Latif, R.E. Lebson, M. Lee, R.J. Lewis, E. Liben, H.M. Likier, L.S. Lim, C.S. Loeser, R.I. Lovins, S.K. Majumdar, M.A. Mankus, M.E. Mann, V. Martin, U. Masiukiewicz, S.W. McCalley, R.J. McDonald, C.C. McNair, C.F. McNamara, S.G. Menon, N. Merchant, J.A. Merritt, K. Michels-Ashwood, S.P. Mickley, D.T. Miller, E.A. Mirabile-Levens, A. Mohammad, J. Morris, M.M. Munteanu, J.I. Nadelmann, N. Nanda, H. Nawaz, A.M. Nelson, K.K. Nelson, E.A. Nolfo, R. Nudel, C. Nwangwu, J.W. O'Brien, S.P. O'Mahony, G. Oliver, B.R. Olson, K. Olson, J.M. Oshlick, O.I. Ololorin, J.R. Ouellette, W.T. Panullo, W.N. Pearson, B. Peck, A.E. Perrin, M. Perrotti, F. Petruzziello, L. Pham, D. Phanumas, M. Pouresmail, B.M. Priest, E. Prior, P.H. Pronovost, T.E. Quan, H.L. Quentzel, D.C. Ranani, H.H. Reinhart, C.R. Rethy, M. Rho, N.I. Riegler, B. Ringstad, D. Roer, P.R. Rogol, S.E. Rosener, M.C. Rubinstein, L. Saberski, D.M. Sack, R.T. Sadock, J.A. Salvana, L.S. Samson, S.L. Saunders, J.A. Schmierer, H.M. Schwartz, N. Shah, J.M. Shi, W.Y. Shih, R.S. Silverman, K.S. Sinusas, M.L. Skluth, D.N. Smith, M.J. Smith, M.L. Smith, M.A. Stehney, L. Sussman, K.P. Swan, E.S. Swenson, G.F. Tansino, B.S. Thomas, P. Tietjen, J. Tomanelli, J.E. Topal, P.C. Tortora, K.J. Twohig, J.G. Uberti, R. Umashanker, S. Urciuoli, I. Vashist, H. Ward, W.S. Warren, K.E. Webb, R.B. Wein, R. Weissberger, K.P. White, D.M. Wolfsohn, A. Wormser, M. Zain, C.S. Zalis, F. Zarcu-Power, J.S. Zaretzky, J.S. Zesk, J.J. Zumpano, F.R. Zwas

Clinical Instructors O. Abreu-Lanfranco, S.A. Alston, L. Ameti, L.A. Anderson, D. Antonetti, A. Apoltan, G. Ashrafzadeh, H.H. Atkins, L. Bakkali, K.M. Baran, J.M. Belcher, R. Beri, M. Berkmen, C. Borz-Baba, A. Brahaj, R.M. Brammer, J.A. Brunetti, A.W. Camp, H. Carey, D. Casablanca (*Nursing*), J.P. Chandler, P. Chandler, V. Christiana, J.M. Chua-Reyes, T.M. Clarke, D.L. Copen, M.B. Courtney, S.A. D'Souza, A.R. Datunashvili, A.M. Davies, A. DeLisle, J.D. Demayo, M. Derosa, R. Desouza, S. Dey, P. Dhawan, M.P. Dorfman, P. Drost, D.H. Dumont, A.M. Dunn,

C.M. Edelmann, D.E. Evans, S.J. Farber, R.B. Feldman, P. Feuerstadt, R. Flores, M. Franco Vega, E.H. Francois, G. Gangu, M.W. Garber, H.B. Garfinkel, C.E. Glass, O.J. Green, K.N. Grieco, C. Gruss, M. Gupta, W.B. Hale, V. Harisis, J. Hauser, D.G. Heacock, J.C. Hlawitschka, S.M. Hoq, J. Huang, K. Jay, S.R. Joshi, E. Kang, K.A. Kaplove, D.L. Katz, J.D. Kenkare, A. Khan, R. Khodzinsky, L. Knoll, A. Kohli-Pamnani, E.D. Kulaga, M.E. Kulaga, A.S. Kunte, C. Kurlander, C. Ligon, S.R. Lin, F.A. Loria, N.T. Manickam, R. McLeod-Labissiere, C.J. Michos, J.D. Miller, R.L. Miller, D. Moll, E. Montesino, R.F. Morrison, A.S. Murray, G.J. Napolitano, E.R. Nash, S. Nawaz, E. Nemergut, S.N. Novack, E. Ofori-Mante, R. Ohene-Adjei, D. Olson, M. Orias, J.R. Orlinick, J.K. Pacini, W.W. Paramanathan, B. Patel, G.S. Pazhayattil, N. Pechter, T.E. Pellechi, J.F. Pezzimenti, K.C. Pham, L.J. Phillips, M. Plavec, V.B. Popov, P.T. Porello, H.R. Pun, N.G. Ragovis, S. Raissi, R.F. Ramos, Y. Riat, N. Rizk, T. Robey, A.J. Rodriguez, R.R. Rohatsch, M. Rosenthal, S.T. Rottinghaus, J. Samuel, S.M. Santana, R.R. Savino, R. Scatena, K.V. Schwartz, M.B. Schwartz, A.E. Selkin, D.L. Sewell, I. Shalom, S. Sharma, R.K. Shaw, J.F. Shea, N. Sheikh, B.V. Sheynberg, B.A. Skudlarska, D.C. Stair, A.J. Stannard, R.H. Stember, R.P. Streeter, A. Taneja, A. Teng, J.N. Thompson, S. Tiyyagura, A. Tota-Maharaj, G.E. Tratt, J.S. Urbanetti, F. Urbano, A. Usmani, D.J. Van Rhijn, I.D. Weir, O.G. Weis, S.C. Widman, F.E. Williams, B. Yeboah, R.A. Zlotoff

Lecturers D. Acampora, B. Adelsberg, E. Balica, A. Bhutta, M. Cabrera Martinez, Z. Chauhan, S. Cord, P.C. Cremer, J. Donroe, M. Evans, J.D. Ferholt, J. Goetz (*Nursing*), R. Henry, Z. Ker, R. Linden, R.R. Mahali, P. Maher, J. Marino, R. Nadkarni, E. Rippel, J. Salay, M.D. Slade, R.W. Smith, L. Street, M. Syed, R.N. Tuktamyshov, M. Vahey, Y. Wang, S. Williams

MD 2000 (IM)/MD 2025 (NEUR), Medical Approach to the Patient This twelve-week integrated clerkship includes internal medicine (eight weeks) and neurology (four weeks) clinical components. Throughout the clerkship, students participate in integrated experiences that address the themes related to hospital-based care such as management of acute disease, diagnostic skills, transitions of care, quality improvement, and organ systems. Directors: D.B. DiCapua, D.W. Dunne

MD 2050 (IM)/MD 2075 (Psych), Primary Care and Psychiatry Clerkship This twelve-week integrated clerkship includes ambulatory internal medicine and psychiatry clinical components, as well as outpatient pediatrics and OB/Gyn. Students participate in one four-week full-time placement at a primary care practice in Connecticut and one four-week part-time placement, which co-occurs with a part-time psychiatry consult placement. The psychiatry component of the clerkship includes four weeks of full-time inpatient psychiatry, four weeks part-time consultation psychiatry, and eight half-days in an ambulatory psychiatry setting. This integrated clerkship emphasizes themes such as health promotion and disease prevention, social determinants of health, behavioral change, systems-based care, and management of chronic disease. Directors: W.N. Kernan, K.M. Wilkins

IM 122, Endocrinology Elective The student participates as an active member of the endocrine training program, making daily rounds with the endocrine fellows, residents,

and attending physicians. The student works primarily on the inpatient consult service at Yale-New Haven Hospital and has the opportunity to attend selected endocrine clinics at YNHH and the West Haven VA Medical Center. The student also participates in the regularly scheduled metabolism-endocrine conferences. Full-time. One student every four weeks. Director: S.E. Inzucchi

IM 123, Nephrology Elective This elective in clinical nephrology offers the student an opportunity for in-depth learning regarding problems in fluid and electrolyte disturbances, acute renal failure, chronic renal failure, and hypertension. Emphasis is placed on problem recognition, pathophysiologic diagnosis, evidence-based clinical judgment, and management based on pathophysiologic principles. The primary activity involves the inpatient consultation service in which the student works up and follows several patients per week, and participates in daily rounds with the attending physicians, postdoctoral fellows, and residents on service. An introduction to hemodialysis, peritoneal dialysis, renal transplantation, and renal biopsy histology is also provided. Full-time. One student every two or four weeks. Director: J. Turner

IM 136, Digestive Disease Conference Each Friday afternoon from 2 to 3:30 p.m., current patients with gastrointestinal and liver problems of medical, surgical, pediatric, pathologic, or radiologic interest are presented and discussed. This is a practical series of discussions intended to interest anyone from a second-year student to a practitioner. Active participation by all who come is encouraged. Meets in Fitkin. Digestive Disease faculty

IM 137, Gastroenterology Elective The student is an integral part of the inpatient GI consult service, working primarily in an inpatient setting. This is an opportunity to see a wide variety of gastrointestinal problems and patients, with discussion and review. Students should plan to attend this rotation on a full-time basis. Open to fourth-year students only. One or two students every two or four weeks. Director: S.S. Jakab

IM 141, Cardiology Elective The student participates in the daily activities of the inpatient cardiology consult service, including rounds, consultations, and conferences, and gains exposure to procedures such as cardiac catheterization, stress testing, echocardiography, nuclear imaging, and electrocardiography. The training experience emphasizes the physiologic basis for clinical manifestations of cardiovascular diseases, and their therapy. A collection of pertinent review articles is provided. Limited to one student at Yale-New Haven Hospital every four weeks and one student at the VA Connecticut Healthcare System, West Haven, every two or four weeks. Directors: J. Brennan (Yale-New Haven Hospital); B.J. Malm (VA Connecticut Healthcare System, West Haven)

IM 142, Infectious Disease Elective This elective offers a robust learning experience in general infectious diseases, including the diagnostic evaluation and management of common community-acquired and nosocomial infections in a diverse patient population, as well as infections in the immunocompromised patient. There are opportunities for learning in subspecialty areas such as medical microbiology, transplant ID, HIV/AIDS, hospital infection control, antimicrobial stewardship, and sexually transmitted diseases. Students participate as active members of the consultation and training program

in infectious diseases at Yale-New Haven Hospital and are expected to attend and participate in daily attending rounds, microbiology rounds four times a week, weekly clinical conferences, and monthly journal clubs. Evaluations are based on performance in clinical case presentations on the consult service. One student every four weeks. Director: O. Ogbuagu

IM 146, Hematology Elective This elective provides intensive exposure to clinical hematology by direct participation in the activities of a regular clinical hematology service. Students work up new patients and consults in rotation with the fellows and residents, and attend outpatient clinics. Students participate in daily hematology ward rounds and bone marrow readings, and in weekly inpatient and outpatient clinical reviews and clinical research conferences. One student every two weeks. Four-week rotations are available for visiting students. Director: A.I. Lee

IM 151/EHS 575a, Introduction to Occupational and Environmental Medicine This course presents a broad overview of the principles of occupational and environmental medicine. The major diseases of environmental origin and the major hazards—chemical, physical, and biologic—and settings in which they occur are examined. M.H. Stowe

IM 152, Occupational and Environmental Medicine Elective This rotation is designed to provide senior medical students (and PA and nursing students) with an introduction to the principles and practice of occupational and environmental medicine, including exposure, assessment, and evaluation of disease causality. Students learn how to evaluate workplace and environmental exposures and assess the contribution of such exposures to patients' diseases. In addition, students participate in ongoing didactic and research conferences and workplace surveillance programs, and they visit workplaces and other environmental sites that are being evaluated for their role in disease causation. Students are exposed to the varied opportunities for careers in this discipline. One student every two or four weeks. Director: R.Y. Lefkowitz; M. Gulati, H. Harari, A. Mohammad, C. Redlich, M.B. Russi, C.J. Sakr

IM 155, Internal Medicine Subinternship The subinternship offers students the opportunity to function in the role of an intern on an Internal Medicine inpatient team at Yale-New Haven Hospital, West Haven VA Medical Center, or Waterbury Hospital. Subinterns join a team consisting of an upper-year medical resident and an attending physician and are responsible for admitting patients, writing admission and daily progress notes, presenting cases on rounds, communicating with consultants, ordering medications and tests, and serving as the front-line physician for patients admitted to the hospital. Students are responsible for managing approximately half the number of patients typically managed by an Internal Medicine intern. The subinternship offers an outstanding opportunity to prepare for internship, whether the student intends to pursue a career in Internal Medicine or another specialty. Prerequisites: Internal Medicine Clerkships I and II. Four weeks. Codirectors: M.D. Siegel, D.W. Dunne

IM 156, Hepatology Elective The student is an integral part of the inpatient liver service, working primarily in an inpatient setting. This is an opportunity to see a wide variety of liver problems and patients, with discussion and review. Students should plan to attend

this rotation on a full-time basis. Open to fourth-year students only. One or two students every two or four weeks. Director: S.S. Jakab

IM 159, Pulmonary Elective This elective is designed to provide medical students with an in-depth knowledge of respiratory diseases through consults on the patient care floors and through didactic sessions and directed reading. Students become an integral part of the pulmonary and critical care (PCCM) section consult service, working with the attending physician and PCCM fellow(s). From two to six new consults on average are seen daily. Students work closely with faculty and staff of the pulmonary group and participate in daily consulting and rounds. Students assist in the examination and treatment of patients with various cardiopulmonary diseases, including tuberculosis, chronic obstructive airway disease, asthma, lung cancer, bacterial and fungal lung infection, and other diagnostic problems. They receive practical instruction in chest images and pulmonary function tests and their interpretation, and in clinical and laboratory methods used for diagnosis and management, including intensive respiratory care and respiratory therapy, and they have an opportunity to observe fiberoptic bronchoscopy. Weekly didactic lectures are given in a number of areas relating to airway pharmacology, lung cell biology, and lung immunology (respiratory cells, immunologic reactions, etc.). Students are expected to learn (1) the differential diagnosis and treatment of respiratory disorders, (2) how to interpret pulmonary function tests, and (3) how to read a chest radiograph and understand the essentials of a chest CT scan. Maximum of three students every two or four weeks. Director: G. Connors

IM 180, Rheumatology Elective Students work closely with the faculty member and fellow assigned to the inpatient consultative service at both Yale-New Haven Hospital and the West Haven VA Medical Center. They attend rounds and evaluate patients with rheumatic conditions and other diseases with rheumatic manifestations. In addition, they participate in outpatient clinics, including two arthritis clinics and two general rheumatology clinics, and attend two weekly conferences sponsored by the Section of Rheumatology. One student every two or four weeks. Director: J. Evans

IM 181, Oncology Elective This is an advanced elective offered to students who have completed the third-year Internal Medicine Clerkship. It is designed to expose students to all aspects of clinical medical oncology by direct participation in the daily disease-specific outpatient oncology clinics at Yale Cancer Center. Working closely with the medical oncology fellows and attending physicians, students have the opportunity to work up patients with new cancer diagnoses and participate in the ongoing care of patients with diverse cancer diagnoses. Students participate as active members of the medical oncology training program, attending the regularly scheduled daily clinical conferences as well as weekly disease-specific multidisciplinary tumor boards and medical oncology fellow education conferences. Although the emphasis of the elective is on outpatient oncology in disease-specific units, students can also opt to work with the inpatient oncology team at Yale-New Haven Hospital. Rotations at the VA Cancer Center can be arranged as well. Maximum of three students every two or four weeks. Director: H.A. Deshpande

IM 184, Medical Informatics We explore topics in informatics, such as the definition and scope of the specialty, software engineering, networking and networks, database

management systems, information retrieval, the electronic medical record, clinical decision support, and medical decision science. By arrangement with the instructor. R.N. Shiffman

IM 195, Medical Intensive Care Elective This elective provides an opportunity to participate in the acute management of common medical emergencies. Students are on call in the medical intensive care unit (MICU) at Yale-New Haven Hospital every fourth day with an intern and resident pair, assisting them in the admission of patients. Students follow patients in the MICU, assist in their care with the intern and resident, and are expected to present during rounds. Although students are exposed to a variety of ICU-based procedures, there are limited "hands-on" opportunities. Prerequisite: Internal Medicine Clerkship. No overnight responsibilities. One or two students every two or four weeks. Director: S. Honiden

IM 304, Analytical Clinical Cardiology Elective This rotation emphasizes a rigorous history and physical exam to develop a differential diagnosis to guide the care of patients in the hospital and clinic. Supplementary reading on topics arising from the management of the patients is an important component of the experience. Interested students should discuss their goals prior to the rotation. One student every two or four weeks. Director: J.E. Gage

IM 306, Allergy and Immunology Elective Students attend the Allergy & Immunology Clinic for adults at the Yale Allergy & Immunology Center in North Haven and the Allergy & Immunology Pediatric Clinic at Long Wharf. It is recommended that they attend Journal Club and the Allergy Seminar, and they may also join in the consultations with the Allergy & Immunology service at Yale-New Haven Hospital. Prerequisite: Immunobiology course. One or two students every two or four weeks. Director: F.S. Kantor

IM 312, Geriatric Medicine Elective The goals of this elective are (1) to understand care delivery in subacute care, long-term care, assisted living, and home care settings, including both the services available and the role of the physician in all of these settings; (2) to appreciate how goals of care can be met differently in these settings and appreciate the unique opportunity to avoid hospitalization that these settings afford; (3) to understand the role of geriatric syndromes in the quality of life of individuals in these settings and gain skill in approaching the multifactorial nature of the patient's illness states; (4) to further skills through interface with the hospice and palliative care team and the geropsychiatry team; and (5) to appreciate the need for appropriate information transfer in transitions in care. The two-week rotation is an introduction to sites of care; the student spends two full days on home care, four full days in the nursing home setting doing both subacute admissions and monthly reviews of longer-term residents, two half-days in the consultation clinic, and two days in a setting tailored to the student's interests. In the four-week rotation, the student is given a more graduated experience of responsibility. In the extended care setting, the student is assigned patients to follow once a week throughout the rotation, including new, complex subacute admissions and hospice patients. The student sees patients in their homes and in assisted living with a physician who is an attending in these settings. The student also spends one full day with

the Agency on Aging and a half-day at an adult day care center. Prerequisites: Internal Medicine Clerkships I and II. One student every two or four weeks. Director: G.J. Kerins

IM 349, Spiritual Care in the Hospital Setting Elective The goals of this elective are to convey to the student an awareness of the options for spiritual care and support within an acute care hospital setting and to give the student an opportunity to learn and practice spiritual caregiving skills appropriate to the physician's role. The Department of Religious Ministries has professionally certified chaplains of many faiths who serve as faculty and spiritual caregiving mentors. Students spend time with at least four different chaplains (of Jewish, Roman Catholic, Protestant, and Pentecostal backgrounds) to observe their chaplaincy practices and discuss with them the implications of both faith-specific and interfaith spiritual care. Students are also instructed in various spiritual assessment models and are invited to conduct a least four assessments (a self-assessment, a colleague assessment, and two patient assessments). In addition to shadowing individual chaplains, students attend departmental morning reports, staff meetings, and at least one Sunday worship service. Students prepare a brief essay at the end of the rotation, reflecting upon their experiences. One or two students every four weeks. Director: A.H. Fortin

IM 360, General Medicine Consult Elective The General Medicine Consult Team provides consultative services to all non-internal medicine services throughout Yale-New Haven Hospital and Yale-New Haven Psychiatric Hospital. The team, consisting of one attending physician and one PA or APRN, performs preoperative evaluations, offers general medicine consultation and co-management, and evaluates patients for possible transfer to the internal medicine service. Students are responsible for their own patients and, with supervision, perform independent evaluations of all types of consults. Daily didactic sessions are held. Prerequisite: Internal Medicine Clerkship. One student every two or four weeks. Director: V.A. Morris

IM 500, Methods of Clinical Research This composite course begins with an intensive set of summer classes during July and the first two weeks of August. The course resumes in September and continues throughout the remainder of the academic year, ending in early June. The overall curriculum integrates several distinct components. The summer term contains sessions on statistics, epidemiology, clinical and health services research methods, health economics, and community-based participatory research. The fall term contains more advance statistics and research methods, as well as several sessions on health policy, social and behavioral influences on health, and community-based research. The spring term contains remaining topics in research methods and several sessions on health management. Summer sessions are held four times a week (ten hours); fall sessions are held three times a week (six and one-half hours); spring sessions are held two times a week (five hours). Open only to postdoctoral students with clinical training; permission of course director required. Director: C.P. Gross

Yale-New Haven Hospital Saint Raphael Campus Electives

IM 326, Geriatric Medicine Elective This elective provides an opportunity to diagnose and manage geriatric syndromes in a variety of settings, including inpatient consultation service, outpatient geriatric assessment clinic, and nursing homes. Students work up and

follow patients and participate in weekly team conferences. One student every two or four weeks. Codirectors: B.J. Wu, G.J. Kerins

IM 327, Critical Care Elective Senior students participate in critical care medicine activities in the medical intensive care unit (MICU). The emphasis is on evaluation and acute management of respiratory failure, shock, and sepsis, and on the use of invasive monitoring. The physiological basis of disease and the rationale for therapeutic interventions are also emphasized. One student every two or four weeks. Director: B.J. Wu; H. Knight, R. Elias, A. Uzunpinar, F. Lopez, T. Palvinskaya

IM 361, Internal Medicine Elective for M.D./Ph.D. Students The goal of this elective is to reinforce students' clinical skills following their time away from clinical medicine. The emphasis is on history taking, physical examination skills, interpretation of data, morning presentations, medical terminology, patient communication, and coordination of care. Students are assigned to a team that consists of one intern, one resident, and one attending physician. Students admit their own patients and are responsible, with supervision, for the care of their patients during hospitalization. Students present daily on rounds; and history, physical diagnosis, and laboratory interpretation skills are emphasized. One student every two or four weeks. Director: B.J. Wu

Humanities in Medicine

The courses listed below are representative of those offered through the Program for Humanities in Medicine. Further information is available from Dr. Anna Reisman (anna.reisman@yale.edu).

Poetry and Medicine Hope, courage, devotion, anguish, pain, illness, and death—the substance of all great literature is also fundamental to medicine. Poetry and Medicine, a bimonthly seminar elective, introduces students to works of poetry, illuminating the ethical, moral, and psychological issues continually confronting their profession. The course helps students develop an understanding of the ways in which interpreting literature enhances their interactions with patients and clarifies some dimensions of their work. Course schedule: Bimonthly meetings at a mutually determined time.

Creative Writing This seminar is held biweekly throughout the academic year. Participants share and critique prose, poetry, and theater pieces.

INVESTIGATIVE MEDICINE

2 Church Street South, Suite 406, 203.785.6842
http://medicine.yale.edu/investigativemedicine

Professors T.M. Gill (*Medicine*), J.R. Gruen (*Pediatrics*), H.M. Krumholz (*Medicine*), G. Tellides (*Surgery*), M.E. Tinetti (*Medicine*)

IMED 625a, Principles of Clinical Research The purpose of this intensive two-week course is to provide an overview of the objectives, research strategies, and methods of conducting patient-oriented clinical research. Topics include competing objectives of clinical research, principles of observational studies, principles of clinical trials, principles of meta-analysis, interpretation of diagnostic tests, prognostic studies, causal inference, qualitative research methods, and decision analysis. Sessions generally combine a lecture on the topic with discussion of articles that are distributed in advance of the sessions. Consent of instructor required. Two weeks, July 27–August 7, 2015. E.D. Shapiro

IMED 630a, Ethical Issues in Biomedical Research This termlong course addresses topics that are central to the conduct of biomedical research, including the ethics of clinical investigation, conflicts of interest, misconduct in research, data acquisition, and protection of research subjects. Practical sessions cover topics such as collaborations with industry, publication and peer review, responsible authorship, and mentoring relationships. Satisfactory completion of this course fulfills the NIH requirement for training in Responsible Conduct of Research. Format consists of lecture presentation followed by discussion. Consent of instructor required. J.E. Craft

IMED 635a or b, Directed Reading in Investigative Medicine An independent study course for first-year students in the Investigative Medicine program. Topics are chosen by the student, and reading lists are provided by faculty for weekly meetings to discuss articles. Four sessions are required; dates/times by arrangement. Consent of instructor required. J.E. Craft

IMED 645a, Introduction to Biostatistics in Clinical Investigation The course provides an introduction to statistical concepts and techniques commonly encountered in medical research. Previous course work in statistics or experience with statistical packages is not a requirement. Topics to be discussed include study design, probability, comparing sample means and proportions, survival analysis, and sample size/power calculations. The computer lab incorporates lecture content into practical application by introducing the statistical software package SPSS to describe and analyze data. Consent of instructor required. Two weeks, July 13–24, 2015. E.D. Shapiro

IMED 655b, Writing Your First Big Grant Proposal In this termlong course, students gain intensive, practical experience in evaluating and preparing grant proposals, including introduction to NIH study section format. The course gives new clinical investigators the essential tools to design and to initiate their own proposals for obtaining grants to do research and to develop their own careers. The course is limited to students who plan to submit grant proposals (usually for a K-type mentored career development award, but

also for R-type awards). Attendance and active participation are required. Consent of instructor required. E.D. Shapiro

IMED 680b, Topics in Human Investigation The course teaches students about the process through which novel therapeutics are designed, clinically tested, and approved for human use. It is divided into two main components, with the first devoted to moving a chemical agent from the bench to the clinic, and the second to outlining the objectives and methods of conducting clinical trials according to the FDA approval process. The first component describes aspects of structure-based drug design and offers insight into how the drug discovery process is conducted in the pharmaceutical industry. The format includes background lectures with discussions, labs, and computer tutorials. The background lectures include a historical perspective on drug discovery, the current paradigm, and important considerations for future success. The second component of the course provides students with knowledge of the basic tools of clinical investigation and how new drugs are tested in humans. A series of lectures and discussions provides an overview of the objectives, research strategies, and methods of conducting patient-oriented research, with a focus on design of trials to test therapeutics. Each student is required to participate (as an observer) in an HIC review, in addition to active participation in class. Consent of instructor required. J.E. Craft, K.S. Anderson

LABORATORY MEDICINE

PS 210, 203.688.2286
http://medicine.yale.edu/labmed

Professors A. Baumgarten (*Emeritus*), J.R. Bove (*Emeritus*), Y. Choi (*Pathology*), R.K. Donabedian (*Emeritus*), S.C. Edberg (*Emeritus*), S.D. Hudnall (*Pathology*), P.I. Jatlow (*Emeritus*), P.B. Kavathas, D.S. Krause, M. Landry, P. McPhedran (*Emeritus*), H.M. Rinder, M.R. Seashore (*Genetics*), M.J. Shlomchik (*Adjunct*), J.L. Sklar (*Pathology*), B.R. Smith (*Chair*), E.L. Snyder, G.E. Stack, P.J. Tattersall

Associate Professors S.M. Campbell, S. Chang, J. Hendrickson, J.G. Howe, P.W. Marks (*Medicine*), Y. Wu (*Adjunct*)

Assistant Professors T. Eid, S.C. Eisenbarth, J.M. El-Khoury, A.M. Haberman, M.J. Levene (*Adjunct*), T.S. Murray (*Adjunct*), D.R. Peaper, C.A. Tormey, R. Torres, M.L. Xu (*Pathology*)

Instructors S. Fink, E.F. Foxman, R. Harb, R.G. Hauser, A. Siddon (*Pathology*)

Senior Research Scientists S.F. Cotmore, P.I. Jatlow

Associate Research Scientists A. Bersenev, L. Devine, R. Dhaher, P. Gu, L. Li, I.S. Mihaylov, E.M. Olson, R. Rai, Y. Wang, P. Zhang

Clinical Professors B.P. Griffith (*Retired*), R.A. Levine, S.C. Wardlaw

Associate Clinical Professors P.N. Fiedler (*Pathology*), M.E. Hodsdon, D.R. Mayo

Assistant Clinical Professors J. Breen (*Medicine*), W.G. Frederick, I.V. Kaplan, H. Sanchez, N. Shafi, K.D. Smith, M. Velleca

Clinical Instructor B.R. Spencer

Lecturers D.J. Barchi, S.A. Cohen, D. Ferguson, P.E. Marone, R.L. Ross

LMED 123a, Medical Microbiology This course focuses on both basic microbial pathophysiology and medical microbiology. The course is divided into four sections, consisting of microbial physiology and genetics, bacteriology and mycology, virology, and parasitology. Microbial pathogenesis is taught as it relates to human infectious disease on the cellular and molecular levels. The unique structures, lifestyles, and roles in producing disease of medically important microbes are taught in lecture, laboratory, and small group settings. Laboratory sessions employ a case-based approach to teach the effective use of laboratory testing in the diagnosis and management of infectious diseases. Microscopy, culture and biochemical, immunological, and molecular techniques are demonstrated and discussed, and simple tests such as Gram stain and rapid antigen tests are performed. Problem-based learning sessions in clinical infectious disease are offered in the last half of the course to provide a bridge from the science of the microbe to the management of infected patients. Second-year course. S.M. Campbell, M. Landry, D.R. Peaper

LMED 131, Laboratory Medicine Clinical Elective This elective offers rotations through the clinical laboratories, including Blood Bank, Therapeutic Apheresis, Clinical Chemistry, Toxicology, Hematology and Coagulation, Flow Cytometry, Immunology, Molecular Diagnostics, Microbiology, and Virology. Students work closely with residents, fellows, attending physicians, and laboratory staff; work up clinical cases under supervision; and attend morning report, case conference, journal club, clinical rounds, and didactic sessions. Students also have the opportunity to work with the resident on call for at least one weekend day during the elective. Students can rotate through all laboratories or focus on specific laboratories of interest. The goals of the elective are to learn appropriate usage and interpretation of laboratory tests, and to gain a better understanding of the theoretical and clinical underpinnings of laboratory medicine. This elective is appropriate for students considering a career in laboratory medicine or combined laboratory medicine and pathology, but also for all students who will use clinical laboratory testing in their careers. One or two students every two or four weeks. Director: M. Landry

LMED 619/PATH 619, Anatomic Pathology and Laboratory Medicine Combined Elective The goals for anatomic pathology are to understand the basic principles of diagnostic anatomic pathology and its role in clinical medicine. The goals for laboratory medicine are to learn appropriate usage and interpretation of laboratory tests and to gain a better understanding of the theoretical, technological, and clinical underpinnings of laboratory medicine. This elective is appropriate for students considering a career in laboratory medicine and/or pathology, and for all students who will use laboratory and pathology tests in their careers. One or two students every four weeks. Directors: A. Adeniran, M. Landry

Laboratory Medicine Teaching Sessions The purpose of the Laboratory Medicine Teaching Sessions is to introduce second- and third-year students on their clinical rotations to basic concepts of laboratory diagnosis. On the first afternoon of their Medicine-Neurology rotations at Yale-New Haven Hospital, students visit four laboratories: Blood Bank, Hematology, Chemistry, and Microbiology/Virology. In each laboratory the faculty use clinical cases together with relevant slides, culture plates, or other test data to illustrate the use and interpretation, as well as pitfalls, of laboratory tests. These teaching sessions should also serve to encourage and facilitate communication with the laboratories after the students return to the wards. M. Landry and associates

MICROBIAL PATHOGENESIS

BCMM 336E, 203.737.2404
http://medicine.yale.edu/micropath

Professors M. Cappello (*Pediatrics*), E. Fikrig (*Medicine*), J.E. Galán (*Chair*), E. Groisman, C. Jacobs-Wagner (*Molecular, Cellular & Developmental Biology*), C.R. Roy

Associate Professors C. Ben Mamoun (*Medicine*), A. Goodman, B.I. Kazmierczak (*Medicine*), B.D. Lindenbach, J.D. MacMicking, W.H. Mothes, R. Sutton (*Medicine*)

Assistant Professors J.M. Crawford (*Chemistry*), P. Kumar (*Medicine*)

Associate Research Scientists C.C. Butan, D.C. Desrosiers, S. Hannemann, J. Kato, B. Kim, M.D. Lara-Tejero, M.D. Lefebre, J.A. McDonough, J. Ndjomou, H.N. Ramanathan, F.X. Sewald, P.D. Uchil

The following courses in the Graduate School of Arts and Sciences are open to medical students with permission of the DGS.

MBIO 547b/EMD 547b, Vaccines: Concepts in Biology Vaccines are one of the major public health preventive approaches for disease control. However, the underlying biological mechanisms are still being explored, with the purpose of designing better and more efficacious vaccines. Vaccine-preventable diseases now include many infectious diseases as well as cancer. This course briefly reviews the immunological basis of immunity to infection and disease. Topics then include the basic science underlying vaccine development, current vaccine-preventable diseases, as well as vaccines under development. D. McMahon-Pratt

MBIO 670, 671, 672, Laboratory Rotations Rotation in three laboratories. Required of all first-year graduate students. W.H. Mothes

MBIO 680a/EMD 680a, Advanced Topics in Tropical Parasitic Diseases An introductory topic-based course in modern parasitology. For each topic there is an introductory lecture followed by a journal club-like discussion session of relevant papers selected from the literature. The course provides an introduction to basic biological concepts of parasitic eukaryotes causing diseases in humans. Topics include strategies used by parasitic eukaryotes to establish infections in the host and approaches to disease control, through either chemotherapy, vaccines, or genomics. In addition, emphasis is placed on evaluating the quality and limitation of scientific publications and developing skills in scientific communication. Prerequisite: permission of the instructor. D. McMahon-Pratt

MBIO 685b, Molecular Mechanisms of Microbial Pathogenesis This interdisciplinary course focuses on current topics related to host-pathogen interactions. Each week a lecture is given on the topic, followed by student presentations of seminal papers in the field. All participants are required to present a paper. J.D. MacMicking

MBIO 686a, Bacterial Determinants of Pathogenesis The course provides an introduction to basic principles in bacterial pathogenesis. Topics focus on the bacterial

determinants mediating infection and pathogenesis, as well as strategies to prevent and treat diseases. Each week a lecture is given on the topic, followed by student presentations of seminal papers in the field. All participants are required to present a paper. E. Groisman

MBIO 701a,b, Research in Progress All students, beginning in their third year, are required to present their research once a year at the Graduate Student Research in Progress. These presentations are intended to give each student practice in presenting his or her own work before a sympathetic but critical audience and to familiarize the faculty with the research. W.H. Mothes

MBIO 702a,b, Microbiology Seminar Series All students are required to attend all Microbiology seminars scheduled throughout the academic year. Microbiologists from around the world are invited to describe their research. W.H. Mothes

MBIO 734a/GENE 734a/MB&B 734a, Molecular Biology of Animal Viruses Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. B.D. Lindenbach

MOLECULAR BIOPHYSICS AND BIOCHEMISTRY

JWG 301, 203.432.5662; SHM C106, 203.785.4595
http://medicine.yale.edu/mbb

Professors K.S. Anderson (*Pharmacology*), S.J. Baserga, R.R. Breaker (*Molecular, Cellular & Developmental Biology*), G.W. Brudvig (*Chemistry*), E.M. De La Cruz, D.C. DiMaio (*Genetics*), D.M. Engelman, A. Garen, M.B. Gerstein, N.D. Grindley (*Emeritus*), M.W. Hochstrasser, J. Howard, A.J. Koleske, W.H. Konigsberg, P. Lengyel (*Emeritus*), J. Loria (*Chemistry*), I.G. Miller (*Pediatrics*), A.D. Miranker, K. Neugebauer, T.D. Pollard (*Molecular, Cellular & Developmental Biology*), L.J. Regan, D.G. Schatz (*Immunobiology*), R.G. Shulman (*Emeritus*), D.G. Söll, M.J. Solomon, J.A. Steitz, T.A. Steitz, S.A. Strobel, W.C. Summers (*Therapeutic Radiology*), P. Sung (*Chair*), S.L. Wolin (*Cell Biology*)

Professor Adjunct of Research K.R. Williams

Associate Professors M.R. Koelle, A.E. Rhoades, H. Wang (*Adjunct*), C.J. Wilson (*Engineering & Applied Science*), Y. Xiong

Assistant Professors R. Baxter (*Chemistry*), J. Berro, D.S. Greenbaum (*Adjunct*), C. Schlieker, M. Simon, C.V. Sindelar, S. Takyar (*Medicine*)

Senior Research Scientists N.D. Grindley, C.M. Joyce

Research Scientists J.L. Burton, E.J. Folta-Stogniew, Y. Kong, J.S. Rozowsky, K. Tycowski, J. Wang

Associate Research Scientists A. Alexandrov, W. Cao, T. Christian, J. Daley, M. Englert, C. Fan, J. Graham, L. Guo, D.A. Hiller, X. Jia, Y. Kwon, T.T. Lam, F. Liang, J. Lin, B. Liu, I. Lomakin, S. Longerich, D. Ostapenko, R. Park, Y. Polikanov, A. Sethi, K.J. Smith, G. Wang, X. Xue, K. Yan, W. Zhao, Y. Zuo

Lecturers A.A. Belperron (*Medicine*), A.B. Pawashe, M.P. Strout (*Medicine*), E.C. Thrower (*Medicine*), C.A. Tormey (*Laboratory Medicine*), J.M. Ueland, J.S. Weinstein

MB&B 500b^{U}/MCDB 500b^{U}, Biochemistry An introduction to the biochemistry of animals, plants, and microorganisms, emphasizing the relations of chemical principles and structure to the evolution and regulation of living systems. R.R. Breaker, N. Clay

MB&B 517b3/ENAS 517b/MCDB 517b3/PHYS 517b3, Methods and Logic in Interdisciplinary Research This half-term PEB class is intended to introduce students to integrated approaches to research. Each week, the first of two sessions is student-led, while the second session is led by faculty with complementary expertise and discusses papers that use different approaches to the same topic (for example, physical and biological or experiment and theory). Counts as 0.5 credit toward MB&B graduate course requirements. Required of students in PEB. L.J. Regan, J. Berro, E.M. De La Cruz, E. Dufresne, T. Emonet, P. Forscher, J. Howard, M. King, S. Mochrie, C. O'Hern, T.D. Pollard, Y. Zhang, and staff

MB&B 520a1, Boot Camp Biology An intensive introduction to biological nomenclature, systems, processes, and techniques for graduate students with previous backgrounds in non-biological fields including physics, engineering, and computer science who wish to perform graduate research in the biological sciences. Counts as 0.5 credit toward MB&B graduate course requirements. Required of students in PEB. L.J. Regan and staff

MB&B 523b/ENAS 541b/PHYS 523b, Biological Physics An introduction to the physics of several important biological phenomena including transport in the cell cytoplasm, protein folding, DNA packaging, and thermodynamics of protein binding and aggregation. The material and approach are positioned at the interface of the physical and biological sciences, and involve significant computation. This course teaches the basics of computer programming necessary for quantitative studies of biological systems. We start with the foundations of programming in MATLAB. During the course, students perform sophisticated data analyses, view and analyze protein structures, and perform Monte Carlo and molecular dynamics simulations. No prior programming experience is needed. Required of students in PEB. C. O'Hern

MB&B 550a, Molecular Foundations of Medicine This course is part of the Molecules to Systems course, which is open only to first-year medical students. An introduction to the major concepts of biochemistry and molecular biology, with emphasis on the human body. Special attention is devoted to how recent advances in basic science contribute to our understanding and treatment of human disease. S.J. Baserga, M.J. Solomon, and staff

MB&B 562a^{U}/CB&B 562a/ENAS 561a/MCDB 562a^{U}/PHYS 562a, Dynamical Systems in Biology This course covers advanced topics in computational biology. How do cells compute, how do they count and tell time, how do they oscillate and generate spatial patterns? Topics include time-dependent dynamics in regulatory, signal-transduction, and neuronal networks; fluctuations, growth, and form; mechanics of cell shape and motion; spatially heterogeneous processes; diffusion. Prerequisite: MCDB 561b or equivalent, or a 200-level biology course, or permission of the instructor. D. Clark, J. Howard

MB&B 591b/ENAS 991b/MCDB 591b/PHYS 991b, Integrated Workshop This required course for students in PEB involves hands-on laboratory modules with students working in pairs. A biology student is paired with a physics or engineering student; a computation/theory student is paired with an experimental student. The modules are devised so that a range of skills is acquired, and students learn from each other. Modules are hosted in faculty laboratories. Receives no course credit toward MB&B graduate course requirements. With permission of the DGS, can be used by PEB students to replace the third rotation of MB&B 650b but will receive no separate course credit toward MB&B course requirements. L.J. Regan, J. Bewersdorf, S.G. Campbell, K. Miller-Jensen, S. Mochrie, C. O'Hern

MB&B 600a^{U}, Principles of Biochemistry I Discussion of the physical, structural, and functional properties of proteins, lipids, and carbohydrates, three major classes of molecules in living organisms. Energy metabolism, hormone signaling, and muscle contraction as examples of complex biological processes whose underlying mechanisms can be understood by identifying and analyzing the molecules responsible for these phenomena. M.R. Koelle, M. Simon

MB&B 601b[U], Principles of Biochemistry II A continuation of MB&B 600a that considers the chemistry and metabolism of nucleic acids, the mechanism and regulation of protein and nucleic acid synthesis, and selected topics in macromolecular biochemistry. C. Schlieker, K. Neugebauer

MB&B 602a/CBIO 602a/MCDB 602a, Molecular Cell Biology A comprehensive introduction to the molecular and mechanistic aspects of cell biology for graduate students in all programs. Emphasizes fundamental issues of cellular organization, regulation, biogenesis, and function at the molecular level. S.L. Wolin, M.J. Caplan, T. Carroll, C. Crews, P. De Camilli, M. King, T. Melia, I.-H. Park, J.E. Rothman, M.A. Schwartz

MB&B 625a[U]/GENE 625a/MCDB 625a[U], Basic Concepts of Genetic Analysis The universal principles of genetic analysis in eukaryotes are discussed in lectures. Students also read a small selection of primary papers illustrating the very best of genetic analysis and dissect them in detail in the discussion sections. While other Yale graduate molecular genetics courses emphasize molecular biology, this course focuses on the concepts and logic underlying modern genetic analysis. T. Xu and staff

MB&B 630b/MCDB 630b, Biochemical and Biophysical Approaches in Molecular and Cellular Biology This graduate course introduces the theory and application of biochemical and biophysical methods to study the structure and function of biological macromolecules. The course considers the basic physical chemistry required in cellular and molecular biology but does not require a previous course in physical chemistry. One class per week is a lecture introducing a topic. The second class is a discussion of one or two research papers utilizing those methods. Does not count for graduate course credit for BBSB graduate students. T.D. Pollard and staff

MB&B 635a[U]/ENAS 518a, Mathematical Methods in Biophysics Applied mathematical methods relevant to analysis and interpretation of biophysical and biochemical data are covered. Students apply these methods (statistics and error analysis, differential equations, linear algebra, and Fourier transforms) to analyze data from research groups in MB&B. Prerequisites: MATH 120 (or equivalent) and MB&B 600a (or equivalent), or permission of the instructors. Y. Xiong, J. Berro

MB&B 650, Lab Rotation for First-Year Students Required of all first-year BBSB graduate students. Credit for full year only.

MB&B 675a, Seminar for First-Year Students Required of all first-year BBSB graduate students. K. Neugebauer, Y. Xiong

MB&B 676b, Responsible Conduct of Research Designed for students who are beginning to do scientific research. The course seeks to describe some of the basic features of life in contemporary research and some of the personal and professional issues that researchers encounter in their work. Approximately six sessions, run in a seminar/discussion format. Required of all first-year BBSB graduate students. S.J. Baserga and staff

MB&B 710b4/C&MP 710b, Electron Cryo-Microscopy for Protein Structure Determination Understanding cellular function requires structural and biochemical studies at an ever-increasing level of complexity. The course is an introduction to the concepts and

applications of high-resolution electron cryo-microscopy. This rapidly emerging new technique is the only method that allows biological macromolecules to be studied at all levels of resolution from cellular organization to near atomic detail. Counts as 0.5 credit toward MB&B graduate course requirements. F.J. Sigworth, C.V. Sindelar

[**MB&B 715b/ENAS 705b/PHYS 705b, Numerical Simulations of Liquids** Not offered in 2015–2016]

MB&B 720a[U], Macromolecular Structure and Biophysical Analysis An in-depth analysis of macromolecular structure and its elucidation using modern methods of structural biology and biochemistry. Topics include architectural arrangements of proteins, RNA, and DNA; practical methods in structural analysis; and an introduction to diffraction and NMR. Prerequisites: physical chemistry (may be taken concurrently) and biochemistry. A.D. Miranker, J. Howard, Y. Xiong

[**MB&B 722b3, Optical Spectroscopy of Biomolecules** Not offered in 2015–2016]

MB&B 723a2, Macromolecular Interactions: Atoms to Networks The course examines the nature of the intricate networks of macromolecular interactions that underlie the functioning of every cell and the modern biophysical methods available for their study across multiple length, time, and energy scales. Counts as 0.5 credit toward MB&B graduate course requirements. L.J. Regan

MB&B 730a, Methods and Logic in Molecular Biology The course examines fundamental concepts in molecular biology through intense critical analysis of the primary literature. The objective is to develop primary literature reading and critical thinking skills. Required of and open only to first-year graduate students in BBSB. M. Simon, A.J. Koleske, C. Schlieker

MB&B 734a/GENE 734a/MBIO 734a, Molecular Biology of Animal Viruses Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. B.D. Lindenbach

MB&B 743b[U]/GENE 743b/MCDB 743b, Advanced Eukaryotic Molecular Biology Selected topics in transcriptional control, regulation of chromatin structure, mRNA processing, mRNA stability, RNA interference, translation, protein degradation, DNA replication, DNA repair, site-specific DNA recombination, somatic hypermutation. Prerequisite: biochemistry or permission of the instructor. M.W. Hochstrasser, K. Neugebauer, M. Simon, P. Sung

MB&B 749a[U]/GENE 749a, Medical Impact of Basic Science Consideration of examples of recent discoveries in basic science that have elucidated the molecular origins of disease or that have suggested new therapies for disease. Emphasis is placed on the fundamental principles on which these advances rely. Reading is from the primary scientific and medical literature, with emphasis on developing the ability to read this literature critically. Aimed primarily at undergraduates. Prerequisite: biochemistry or permission of the instructor. May not be taken by MB&B B.S./MS. students for graduate course credit. J.A. Steitz, I.G. Miller, A.D. Miranker, K. Neugebauer, D.G. Schatz, T.A. Steitz, and staff

MB&B 750a2, Biological Membranes Biological membranes and their resident proteins are essential for cellular function; yet comparatively little is known about their structure and dynamics. This class provides an introduction to the biochemistry and biophysics of lipids, lipid bilayers, and lipid-derived second messengers. In addition, structural as well as functional aspects of the different classes of membrane proteins are discussed along with an outline of experimental approaches used to achieve an understanding of membrane protein structure and function at a molecular level. Counts as 0.5 credit toward MB&B graduate course requirements. Prerequisite: biochemistry. D.M. Engelman

MB&B 752b^{U}/CB&B 752b/CPSC 752b^{U}/MCDB 752b^{U}, Bioinformatics: Practical Application of Simulation and Data Mining Bioinformatics encompasses the analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. It represents a major practical application for modern techniques in data mining and simulation. Specific topics to be covered include sequence alignment, large-scale processing, next-generation sequencing data, comparative genomics, phylogenetics, biological database design, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, normalization of microarray data, mining of functional genomics data sets, and machine-learning approaches to data integration. Prerequisites: biochemistry and calculus, or permission of the instructor. M.B. Gerstein

MB&B 753b3, Bioinformatics: Practical Application of Data Mining Bioinformatics encompasses the analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. It represents a major practical application for modern techniques in data mining and simulation. This module focuses on the first of these techniques, data mining. Specific topics to be covered include sequence alignments, comparative genomics and phylogenetics, biological databases, microarray normalization, and machine-learning approaches to data integration. Counts as 0.5 credit toward MB&B graduate course requirements. Prerequisites: biochemistry and calculus, or permission of the instructor. M.B. Gerstein

MB&B 754b4, Bioinformatics: Practical Application of Simulation Bioinformatics encompasses the analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. It represents a major practical application for modern techniques in data mining and simulation. This module focuses on the second of these techniques, simulation. Specific topics to be covered include geometric analysis of protein structure, molecular-dynamics simulation, and biological networks. Counts as 0.5 credit toward MB&B graduate course requirements. Prerequisites: biochemistry and calculus, or permission of the instructor. M.B. Gerstein

MB&B 760a2, Principles of Macromolecular Crystallography Rigorous introduction to the principles of macromolecular crystallography, aimed at students who are planning to carry out structural studies involving X-ray crystallography or who want to obtain in-depth knowledge for critical analysis of published crystal structures. Counts as 0.5 credit toward MB&B graduate course requirements. Prerequisites: physical chemistry and biochemistry. T.A. Steitz, Y. Xiong

[**MB&B 761b4, X-ray Crystallography Workshop** Not offered in 2015–2016]

MB&B 800a, Advanced Topics in Molecular Medicine The seminar, which covers topics in the molecular mechanisms of disease, illustrates timely issues in areas such as protein chemistry and enzymology, intermediary metabolism, nucleic acid biochemistry, gene expression, and virology. M.D. and M.D./Ph.D. students only. Prerequisite: biochemistry (may be taken concurrently). S.J. Baserga, W.H. Konigsberg, and staff

MB&B 900a or 901b, Reading Course in Biophysics Directed reading course in biophysics. Term paper required. By arrangement with faculty. Open only to graduate students in MB&B. Please see syllabus for additional requirements.

MB&B 902a or 903b, Reading Course in Molecular Genetics Directed reading course in molecular genetics. Term paper required. By arrangement with faculty. Open only to graduate students in MB&B. Please see syllabus for additional requirements.

MB&B 904a or 905b, Reading Course in Biochemistry Directed reading course in biochemistry. Term paper required. By arrangement with faculty. Open only to graduate students in MB&B. Please see syllabus for additional requirements.

NEUROBIOLOGY

SHM C303, 203.785.4323
http://medicine.yale.edu/neurobiology

Professors A.F. Arnsten, H. Blumenfeld (*Neurology*), M.M. Chun (*Psychology*), M.C. Crair, N. Daw (*Ophthalmology & Visual Science*), P. De Camilli (*Cell Biology*), N.C. DeLanerolle (*Neurosurgery*), S. Diano (*Obstetrics, Gynecology & Reproductive Sciences*), R.S. Duman (*Psychiatry*), J.E. Gelernter (*Psychiatry*), C.A. Greer (*Neurosurgery*), M. Gunel (*Neurosurgery*), J. Hirsch (*Psychiatry*), T.L. Horvath (*Comparative Medicine*), J.D. Kocsis (*Neurology*), A.J. Koleske (*Molecular Biophysics & Biochemistry*), J.H. Krystal (*Psychiatry*), R.H. LaMotte (*Anesthesiology*), D. Lee, C. Leranth (*Obstetrics, Gynecology & Reproductive Sciences*), P.J. Lombroso (*Child Study Center*), D.A. McCormick, G.D. Pearlson (*Psychiatry*), M. Picciotto (*Psychiatry*), V.A. Pieribone (*Cellular & Molecular Physiology*), M.N. Potenza (*Psychiatry*), P. Rakic (*Chair*), J. Santos-Sacchi (*Surgery*), I.R. Schwartz (*Surgery*), N. Sestan, G.M. Shepherd, R. Sinha (*Psychiatry*), S.M. Strittmatter (*Neurology*), F.M. Vaccarino (*Child Study Center*), C.H. Van Dyck (*Psychiatry*), S.G. Waxman (*Neurology*), Z. Zhou (*Ophthalmology & Visual Science*)

Associate Professors M. Alreja (*Psychiatry*), C.J. Bruce, K.P. Cosgrove (*Psychiatry*), R.J. DiLeone (*Psychiatry*), J. Grutzendler (*Neurology*), E.A. Jonas (*Medicine*), C. Li (*Psychiatry*), A. Louvi (*Neurosurgery*), J.A. Mazer, D.S. Navaratnam (*Neurology*), M.L. Schwartz, J.V. Verhagen

Assistant Professors J.A. Cardin, S.C. Chang (*Psychology*), B. Chen (*Ophthalmology & Visual Science*), M.O. Dietrich (*Comparative Medicine*), G. Dragoi (*Psychiatry*), J.L. Gerrard (*Neurosurgery*), M.J. Higley, I. Kim (*Ophthalmology & Visual Science*), C.A. Kwan (*Psychiatry*), I. Levy (*Comparative Medicine*)

Senior Research Scientists N. Carnevale, M. Hines

Research Scientists A.E. Ayoub, A. Duque, C.D. Paspalas, L.D. Selemon, M. Wang

Associate Research Scientists J.I. Arellano, Y. Bao, C. Chiu, S. Hayashi, H. Komuro, M. Li, L.N. Marenco, Y. Morozov, T.M. Morse, M. Onorati, S. Pochareddy, B.G. Rash, H. Seo, M. Shibata, M. Skarica, H. Xu, X. Xu

NBIO 500b/NSCI 510b, Structural and Functional Organization of the Human Nervous System An integrative overview of the structure and function of the human brain as it pertains to major neurological and psychiatric disorders. Neuroanatomy, neurophysiology, and clinical correlations are interrelated to provide essential background in the neurosciences. Lectures in neurocytology and neuroanatomy survey neuronal organization in the human brain, with emphasis on long fiber tracts related to clinical neurology. Weekly three-hour laboratory sessions in close collaboration with faculty members. Lectures in neurophysiology cover various aspects of neural function at the cellular level, with a strong emphasis on the mammalian nervous system. Clinical correlations consist of five sessions given by one or two faculty members representing both basic and clinical sciences. These sessions relate neurological symptoms to cellular processes in various

diseases of the brain. Variable class schedule; contact course instructors. This course is offered to graduate and M.D./Ph.D. students only and cannot be audited. M.L. Schwartz, P. Rakic, and staff

NBIO 501a/NSCI 501a, Principles of Neuroscience General neuroscience seminar: lectures, readings, and discussion of selected topics in neuroscience. Emphasis is on how approaches at the molecular, cellular, physiological, and organismal levels can lead to understanding of neuronal and brain function. R.J. DiLeone, A. Louvi

[**NBIO 504b/MCDB 735b[U]/NSCI 504b, Seminar in Brain Development and Plasticity** Not offered in 2015–2016]

NBIO 507b/NSCI 507b, Cellular and Molecular Mechanisms of Neurological Disease The course focuses on those diseases (Alzheimer's, Parkinson's, ALS, and other neurodegenerative diseases, triplet repeat induced diseases, multiple sclerosis, epilepsy, etc.) in which modern neuroscience has advanced mechanistic explanations for clinical conditions. It highlights recent molecular, electrophysiological, and imaging experiments in parsing disease mechanisms. The application of pathophysiologic understanding to therapeutics is considered. S.S. Chandra, W.B. Cafferty

NBIO 510a, Introduction to Methods in Cellular and Molecular Neurobiology Independent study providing firsthand insight into various techniques and approaches used in neuroscience. Light microscopic techniques include various metallic impregnation methods, autoradiography, anterograde and retrograde axonal transport methods, hybridoma and recombined DNA technology, deoxyglucose metabolic method, fluorescent and immunocytochemical methods. Electron microscopy encompasses transmission, electronmicroscopic autoradiography, and immuno-peroxidase methodology. Choice of techniques and hours to be arranged with individual faculty or staff members of the Department of Neurobiology.

NBIO 511, Introduction to Techniques Used in Electrophysiological Analysis at the Cellular Level Independent study providing practical training in in vivo and in vitro nervous system preparations, extracellular and intracellular recordings, sensory stimulation, dye injections, and selected neuropharmacological procedures. Choice of techniques and hours to be arranged with individual faculty of the Department of Neurobiology.

NBIO 512a/b/NSCI 512a/b, Lab Rotation for First-Year Students Required of all first-year Neurobiology and Neuroscience graduate students. Rotation period is one term. Both terms required. Grading is Satisfactory/Unsatisfactory. C.A. Greer

NBIO 513a/b, Second-Year Thesis Research Required of all second-year Neurobiology graduate students. Both terms required. Grading is Satisfactory/Unsatisfactory. M.C. Crair

[**NBIO 532a/NSCI 532a, Neurobiology of Cortical Systems** Not offered in 2015–2016]

[**NBIO 535b/NSCI 535b, History of Modern Neuroscience** Not offered in 2015–2016]

NBIO 540b/NSCI 540b, How to Give a Talk This course is a practical introduction to the art and science of giving a data-based seminar. The ability to give a clear, convincing,

and engaging talk about your work is one of the key career skills of successful scientists. Content, visual presentation, body language, and delivery all combine to determine your impact on your audience. The focus in class is on student presentation skills and detailed feedback, interspersed with short example talks by invited guests from Yale and other institutions. Students give at least two talks over the course of the term and participate in weekly Q&A and feedback. Grading is based on class participation. Enrollment limited to ten. J.A. Cardin

NBIO 570b/C&MP 570b, Sensory Physiology The course provides an overview of the mammalian special sensory systems, including molecular and cellular bases of vision, audition, taste, olfaction, and somatosensation. Faculty with focus in those areas lead presentations and discussions on peripheral and central mechanisms. Psychophysical aspects of sensation are introduced. D. Zenisek, J. Santos-Sacchi, Z. Zhou

NBIO 580b/NSCI 580b, Bioethics in Neuroscience This course is an introduction to ethics and ethical decision making in the neurosciences. Format for the course is an informal discussion. Each week we are joined by members of the Yale faculty and community who can share their experiences and expertise as it relates to the topic of the week. This course is mandatory for first-year graduate students in the Interdepartmental Neuroscience Program (INP). Grading is Satisfactory/Unsatisfactory and is based on attendance/participation, weekly reaction papers, and a final term paper. The successful (Satisfactory) completion of this course is worth one full graduate course credit. C.A. Greer

NBIO 590a, Sensory Neuroethology: Bats and Owls, Electric Fish, and Beyond In this course we review the neurophysiology of sensory processing with particular attention to animal behavior (ethology) and computation. We begin with the classic neuroethology literature and end with current work on neocortical circuits underlying sensory processing in higher vertebrates. This seminar course meets once per week to read and discuss (mostly) primary research papers selected and presented by the students. J.A. Mazer

[**NBIO 595a/NSCI 595a, Seminar in Visuomotor Neurophysiology** Not offered in 2015–2016]

[**NBIO 596a/NSCI 596a, Seminar in Neurophysiology of Decision Making** Not offered in 2015–2016]

[**NBIO 597b/NSCI 597b, Neuroeconomics** Offered every other year. Not offered in 2015–2016]

NBIO 602a/b, Topics in Cortical Development and Evolution This advanced tutorial course involves extensive reading, discussion, and pilot experiments on the topic. P. Rakic

NBIO 610b/C&MP 620b, Fundamentals in Neurophysiology The course is designed for students who wish to gain a theoretical and practical knowledge of modern neurophysiology. Graduate students specializing in neurophysiology and non-neurophysiology are encouraged to attend, as the course begins at a very basic level and progresses to more complicated topics. Topics include properties of ion channels, firing properties of neurons, synaptic transmission, and neurophysiology methodology. V.A. Pieribone, F.J. Sigworth

NBIO 720a/MCDB 720a[U]/NSCI 720a, Neurobiology Examination of the excitability of the nerve cell membrane as a starting point for the study of molecular, cellular, and intracellular mechanisms underlying the generation and control of behavior. H. Keshishian, P. Forscher

NEUROLOGY

LCI 910, 203.737.1860
http://medicine.yale.edu/neurology

Professors T. Allison (*Emeritus*), H. Blumenfeld, J. Booss (*Emeritus*), M.B. Bracken (*Epidemiology*), H. Feldman (*Adjunct*), W.D. Graf (*Pediatrics*), D.M. Greer, D. Hafler (*Chair*), L.J. Hirsch, B. Jabbari, R.D. Kerns (*Psychiatry*), J.D. Kocsis, E.D. Louis, R.H. Mattson (*Emeritus*), L.R. Ment (*Pediatrics*), G. Miller (*Pediatrics*), D. Pelletier (*Adjunct*), J.W. Prichard (*Emeritus*), P. Rakic (*Neurobiology*), B.A. Shaywitz (*Pediatrics*), S.M. Strittmatter, C.H. Van Dyck (*Psychiatry*), S.G. Waxman

Associate Professors J.M. Baehring (*Medicine*), S.S. Chandra, R.B. Duckrow, J. Grutzendler, D.S. Navaratnam, H.S. Patwa, O.A. Petroff, K.N. Sheth, S. Spudich, J. Thomas

Assistant Professors M. Alkawadri, H. Amin, C.J. Azevedo, M.A. Bailey, K.P. Becker, C.F. Benjamin, L.A. Beslow (*Pediatrics*), F.C. Brown, G. Buchanan (*Adjunct*), W.B. Cafferty, C. Cotsapas, J.L. Dearborn, K. Detyniecki, D.B. DiCapua, M. Dominguez-Villar, P. Farooque, N. Gaspard (*Adjunct*), S. Ghosh, E.J. Gilmore, H. Hamid, O. Honmou (*Adjunct*), D.Y. Hwang, C. Juchem (*Diagnostic Radiology*), B. Keung, B. Khokhar, B.B. Koo, C. Loomis, D.G. Machado, N. Makhani (*Pediatrics*), E.G. Marcolini (*Emergency Medicine*), A.L. Meyer, J.J. Moeller, S. Novella, R. Nowak, K.C. O'Connor, N.H. Petersen, D. Pitt, N. Rampal, D. Richardson, K.R. Robeson-Gewuerz, L. Sansing, J. Schindler, E.S. Sharp, J.J. Sico, H. Tokuno, D.C. Volpe, J. Yoo (*Adjunct*)

Instructors D. Kuruvilla, I.H. Quraishi, A. Salardini

Senior Research Scientists S.D. Dib-Hajj, R.H. Mattson

Research Scientists J. Bai, J.A. Black

Associate Research Scientists Y. Ai, E.J. Arroyo, Y. Cao, B. Dash, N.R. Driesen (*Psychiatry*), M. Estacion, E.C. Gunther, C. Han, H. Harshvardhan, N.C. Hernandez, J. Hyun, T. Kang, I. Kim, K. Lankford, J. Park, G.D. Ponath, K. Raddassi, Y. Sekine, D. Sizova, A.M. Szekely (*Genetics*), H. Takahashi, A. Tan, K.J. Vargas, X. Wang, S.A. Wilson, Y. Yang, H.P. Zaveri, Y. Zhang, P. Zhao

Clinical Professors R.L. Lesser (*Ophthalmology & Visual Science*), S.R. Levy (*Pediatrics*), F.M. Testa, T.J. Walsh (*Ophthalmology & Visual Science*)

Associate Clinical Professors R.C. Delaney, J.C. McVeety, N.S. Werdiger, R.S. Young (*Pediatrics*)

Assistant Clinical Professors S.L. Bridgers, L.J. Cretella, T.Z. Fischer, J.B. Guarnaccia, M. Hasbani, M.J. Hasbani, D.S. Russell (*Psychiatry*), K.N. Sena, M.J. Stransky

Clinical Instructors S.S. Ali, O. Avitzur, P. Fattahi

Lecturer L. Bangalore

MD 2025 (NEUR)/MD 2000 (IM), Medical Approach to the Patient This twelve-week integrated clerkship includes internal medicine (eight weeks) and neurology (four weeks) clinical components. Throughout the clerkship, students participate in integrated experiences that address the themes related to hospital-based care such as management of acute disease, diagnostic skills, transitions of care, quality improvement, and organ systems. Directors: D.B. DiCapua, D.W. Dunne

NEUR 108b/NBIO 507b/NSCI 507b, Cellular and Molecular Mechanisms of Neurological Disease The course focuses on those diseases (Alzheimer's, Parkinson's, ALS, and other neurodegenerative diseases, triplet repeat induced diseases, multiple sclerosis, epilepsy, etc.) in which modern neuroscience has advanced mechanistic explanations for clinical conditions. It highlights recent molecular, electrophysiological, and imaging experiments in parsing disease mechanisms. The application of pathophysiologic understanding to therapeutics is considered. S.S. Chandra, W.B. Cafferty

NEUR 200, Neurology Ward Service Elective Under appropriate supervision, students directly examine, diagnose, and manage patients on the neurology ward service at Yale-New Haven Hospital; attend daily teaching rounds; and attend a series of special didactic conferences on the most important topics in neurology. One student every four weeks. Director: D.B. DiCapua

NEUR 201, Neurology Consult Service Elective Under the supervision of the neurology consult resident and attending physician, students evaluate patients referred for neurologic consultation from other inpatient services at Yale-New Haven Hospital. Students also participate in academic activities of the department. One student every four weeks. Director: D.B. DiCapua

NEUR 202, Neurology Clinical Elective (Tailored) This is a customized elective for students who wish to do a two-week elective in neurology. Students in this tailored elective can choose the neurology wards, consults, or a specialties service such as epilepsy, stroke, movement disorders, neuromuscular medicine, neuroimmunology, pediatric neurology, and neurocritical care service. Students work with attending faculty and senior and junior residents. Students directly examine, diagnose, and manage patients; and they attend daily teaching rounds as well as a series of special didactic conferences and seminars on the most important topics in neurology. Students hone their ability to (1) obtain an accurate neurological history, (2) perform and interpret a neurological examination, (3) recognize the appropriate indications for ordering laboratory studies, and (4) interpret these studies through EEG, EMG, nerve conduction studies, evoked potentials, lumbar puncture, and CT and MR imaging of the brain and spinal cord. The goal is to recognize and understand less common neurological problems, including multiple sclerosis, Parkinson's disease and other movement disorders, neuromuscular diseases, dementia, central nervous system infections, and tumors of the nervous system. Prerequisite: NEUR 102, Clinical Neuroscience Core Clerkship. One student every two weeks. Director: D.B. DiCapua

NEUR 400, Neurology Subinternship The subinternship in clinical neurology is an advanced elective that offers students the opportunity to work at a higher level of independence and responsibility equivalent to that of an intern on the neurology ward service

at Yale-New Haven Hospital. Students work directly with attending faculty, senior and junior residents, and support staff. Students directly examine, diagnose, and manage patients; and they attend daily teaching rounds as well as a series of special didactic conferences and seminars on the most important topics in neurology. Students hone their ability to (1) obtain an accurate neurological history, (2) perform and interpret a neurological examination, (3) recognize the appropriate indications for ordering laboratory studies, (4) interpret these studies through EEG, EMG, nerve conduction studies, evoked potentials, lumbar puncture, and CT and MR imaging of the brain and spinal cord. The goal is to recognize and understand less common neurological problems, including multiple sclerosis, Parkinson's disease and other movement disorders, neuromuscular diseases, dementia, central nervous system infections, and tumors of the nervous system. At times, other customized electives may be designed with the program director in areas such as epilepsy, stroke, movement disorders, neuromuscular diseases, neuroimmunology, and neurocritical care. Prerequisite: NEUR 102, Clinical Neuroscience Core Clerkship. One student every four weeks. Director: D.B. DiCapua

NEUROSURGERY

TMP 4, 203.785.2805
http://medicine.yale.edu/neurosurgery

Professors H. Blumenfeld (*Neurology*), A. Bordey, R.A. Bronen (*Diagnostic Radiology*), R.T. Constable (*Diagnostic Radiology*), N.C. DeLanerolle, C.C. Duncan, C.A. Greer, D.M. Greer (*Neurology*), M. Gunel (*Chair*), H.P. Hetherington (*Adjunct*), M.H. Johnson (*Diagnostic Radiology*), C.C. LaMotte (*Emeritus*), J.A. Persing (*Surgery*), J.M. Piepmeier, D.E. Redmond, Jr. (*Psychiatry*), K.J. Ruskin (*Anesthesiology*), D.D. Spencer, A.N. Van den Pol

Associate Professors K.M. Abbed, J.M. Baehring (*Neurology*), K.R. Bulsara, V.L. Chiang, R.B. Duckrow (*Neurology*), J.T. King, A. Louvi, A. Williamson (*Adjunct*)

Assistant Professors I. Cavus (*Psychiatry*), M.L. DiLuna, T. Eid (*Laboratory Medicine*), D.J. Gaal (*Anesthesiology*), J.L. Gerrard, M.S. Laurans, C.C. Matouk, J. Moliterno Gunel, D.A. Petrucci, J. Schindler (*Neurology*), K.N. Sheth (*Neurology*), P. Tomak, K. Wu, J. Zhou

Research Scientist K. Yasuno

Associate Research Scientists A.G. Ercan-Sencicek, E. Erson Omay, O.I. Henegariu, J.T. Kennard, E. Martin-Lopez, K. Mishra, S. Nishimura, S.B. Omay, J.C. Paglino, D.J. Rodriguez-Gil, A. Serin Harmanci, D. Spergel, S. Yilmaz, X. Zhang

Clinical Professor J.F. Kveton (*Surgery*)

Associate Clinical Professor D.E. Nijensohn

Assistant Clinical Professors P.S. Dickey, P.B. Senatus

Clinical Instructor K.E. Holmes

NEUS 101, Neurosurgery Subinternship The goals of this full-time, four-week subinternship experience are to work as a team; develop clinical skills, patient management strategies, in-depth understanding of patients assigned, and fundamental operative skills; and be able to articulate differential diagnosis and treatment options for faculty and residents. The subinternship is designed to give the student maximum opportunity to see inpatients and outpatients with neurosurgical problems and to have a correlation with neuroanatomy, neurophysiology, and neuropathology. A major portion of the time is patient-care-oriented, with specific subject-oriented assignments in the basic neurological sciences. Students are expected to round with their team, follow their patients, participate in operative cases, and present at teaching conferences. This subinternship is required for Yale School of Medicine students planning to enter the match for neurosurgery and is strongly recommended prior to outside subinternship experiences.

Students who wish to have a more limited exposure to the field as an elective may choose a two-week rotation; and outside (non-Yale) students may wish to opt for a two-week experience if their scheduling is limited. Additional information is available

at http://medicine.yale.edu/neurosurgery. Maximum of four students every four weeks. Codirectors: C.C. Duncan, C.C. Matouk

NEUS 102, Investigational Neuroscience Typically taken during completion of the thesis requirement. Specific projects are by agreement with faculty members. Ongoing laboratory research includes the molecular neuroanatomical assessment of the epileptic focus (N.C. DeLanerolle); ultrastructural assessment of organization and plasticity in local synaptic networks (C.A. Greer); use of viruses and viral vectors to treat brain cancer and neurological dysfunction (A.N. Van den Pol); understanding tuberous sclerosis complex and mTOR contribution to neurodevelopmental disorders associated with cognitive deficits (A. Bordey); human and animal slice electrophysiology and metabolism (A. Bordey); human and animal intracerebral microdialysis (D.D. Spencer, T. Eid); image-guided neurosurgical robotics and biophysical studies of brain imaging (D.D. Spencer, J. Duncan); stimulation of the brain for chronic neurological diseases (R.B. Duckrow, D.D. Spencer); molecular genetics of neurological disease (M. Gunel, M.L. DiLuna); molecular mechanisms of brain morphogenesis and pathogenesis (A. Louvi); metabolome analysis in cerebral vasospasm, angiogenesis and neurogenesis, skull base anatomy, bypass techniques, and endovascular technology development (K.R. Bulsara); characterization of ensheathing cells in promoting axonal elongation (C.A. Greer); biodegradable nanoparticles for convection enhanced delivery of therapy for malignant gliomas (J.M. Piepmeier, J. Zhou). Clinical research includes spine disease and clinical trials (K.M. Abbed), epilepsy surgery (D.D. Spencer), pediatric neurosurgery outcomes (C.C. Duncan, M.L. DiLuna), neurooncology (J.M. Piepmeier, J.M. Baehring), basic mechanisms in CNS lymphoma, and stereotactic radiosurgery (V.L. Chiang). Available throughout the year. Arrangements made with C.A. Greer

OBSTETRICS, GYNECOLOGY, AND REPRODUCTIVE SCIENCES

FMB 307, 203.785.4212, Janice Crabtree, Manager of Medical Education
http://medicine.yale.edu/obgyn

Professors A.M. Arici, M.B. Bracken (*Epidemiology*), F.R. Braveman (*Anesthesiology*), R. Bukowski, T.C. Chai (*Urology*), J.A. Copel, T. D'Hooghe (*Adjunct*), S. Diano, A.J. Duleba (*Adjunct*), R.A. Ehrenkranz (*Pediatrics*), S.A. Higgins (*Therapeutic Radiology*), R.B. Hochberg, T.L. Horvath (*Comparative Medicine*), H. Kennedy (*Nursing*), E.I. Kohorn (*Emeritus*), C. Leranth, P.E. Levi Setti (*Adjunct*), H. Lin (*Cell Biology*), C.J. Lockwood (*Adjunct*), W.E. Longo (*Surgery*), M.J. Mahoney (*Genetics*), S.M. McCarthy (*Diagnostic Radiology*), G.G. Mor, M.J. Paidas, P. Patrizio, S. Pecorelli (*Adjunct*), A.D. Santin, P.M. Sarrel (*Emeritus*), P.E. Schwartz, F.A. Tavassoli (*Pathology*), H.S. Taylor (*Chair*), K.A. Yonkers (*Psychiatry*)

Associate Professors V.M. Abrahams, M.M. Abu-Khalaf (*Medicine*), M. Azodi, M.O. Bahtiyar, V. Bhandari (*Pediatrics*), C. Bulletti (*Adjunct*), F. Galerneau, X. Gao (*Comparative Medicine*), J.B. Henrich (*Medicine*), Y. Huang, P. Hui (*Pathology*), J.L. Illuzzi, M. Lee (*Adjunct*), H.S. Lipkind, U. Magriples, L. Pal, C.M. Pettker, L.M. Rickey (*Urology*), D. Sakkas (*Adjunct*), A.K. Sfakianaki, D. Silasi, N.L. Stanwood

Assistant Professors S. Abdel-Razeq, N. Adsuar, R.S. Bercik, K.H. Campbell, S.N. Cross, V.B. Desai, E.C. Dun, L.L. Fan, M.C. Fishman, C.A. Flannery, A. Gariepy, M.K. Guess, C.S. Han (*Adjunct*), A.N. Kallen, R. Kaza, P.H. Kodaman, K. Kohari, N.E. Kummer, M.D. Lalioti (*Adjunct*), B. Litkouhi, W. Mak, J. Martin, E. Ratner, E. Robinson, J.A. Shaw, S.S. Sheth, M. Silasi, A.V. Vash-Margita, R.J. Welsh, X. Xu

Instructors M. Alvarez, B.R. Ball, J.D. Black, L.R. Bruck, S. Collins, J. Deng, A. Desai, C. Duke, K.R. Heim, P.W. Hendrix, R. Irani, G. Menderes, M. Platner, N. Qasba, A. Russo, C.L. Schwab, R. Tal, L. Tuzovic, L.C. Zuckerwise

Senior Research Scientists S.M. Guller, G.B. Huszar, N.S. Stachenfeld

Research Scientists A. Alvero, J. Johnson, H.J. Kliman, G. Krikun

Associate Research Scientists M. Basar, S. Bellone, D. Kelk, J. Kim, K. Lowther, L. Lundsberg, R. Mamillapalli, Y. Yang

Clinical Professors D. Greenfeld, V.A. Lynch, M. Minkin, H.J. Sauer, S.S. Spangler, R.J. Stiller

Associate Clinical Professors R.D. Auerbach, Y. Barnhard, S.E. Casper, R.A. Cwik, S.J. Fleischman, T.M. Hanson, R.B. Kaump, G.E. Kleinman, N.A. Ravski, S.M. Richman, S. Shahabi, H. Simon

Assistant Clinical Professors N. Achong Dorvilus, P.C. Brines, A.R. Chelouche, R. Chosak, P.J. Coppola, J. Cron, J.A. Cuteri, R.C. Deal, M. Dube, E.A. Fine, S.M. Flaherty, W.P. Fleming, K.C. Fletcher, D.P. Fox, M.E. Gillette, D. Gottschall, B.D. Karsif, J.M. Knudson, S.A. Laifer, P.M. Lamastra, M.R. Laser, D.M. Lima, S. Mark

(*Medicine*), R.D. Moscarelli, L. Plisic, R. Pringle, M.S. Reel, B.F. Rigney, A.M. Ross, D.M. Roth, D.J. Russell, T. Spurrell, L.A. Starace-Colabella, A. Strong, O.J. Vincent, M.J. Wise, T. Zreik

Clinical Instructors A. Acharya, M. Albright (*Nursing*), M.C. Asis, K.R. Aversa, M.A. Baumbusch, U. Bhuvanesh, E.E. Blair, S.M. Cassell, K. Chacho, R.D. Choudhary, C. Cookson, N. DeGennaro (*Nursing*), K. Despot, G. Dunston-Boone, A.Y. Edusa, J.T. Grosso, C.R. Huttler, C.M. Jevitt (*Nursing*), N. Kaushal, N.R. Kellett (*Office of Medical Education*), D.R. Kopel, H. Lope De Haro, G. Lynch, B.L. Maloy, E. McMahon, E.M. Morelli (*Nursing*), M. Murray, C. Negron, M. Nwosu, E. Palluotto, C.E. Presnick, K.M. Rath, S. Reilly (*Nursing*), J.A. Reinshagen (*Office of Medical Education*), M.C. Rhee, A.G. Shorten (*Nursing*), M.L. Speranza, J.P. Stanek (*Nursing*), S. Tandon, M. Telfer, K.A. Thomas, A.L. Tirado, D. Tonzola, M. Torbey, M.M. Tse, J.D. Vulte (*Office of Medical Education*), S.D. Wheeler (*Nursing*), R. Wineland

Lecturers F.P. Haseltine, C. Kress, A.E. Moss (*Office of Medical Education*)

Clinicians M.L. Polan, E.U. Seli

MD 2150 (OBGY)/MD 2175 (PEDS), Women and Children's Health This twelve-week integrated clerkship includes clinical components in obstetrics and gynecology and pediatrics. Students participate in four weeks of OB/Gyn inpatient, four weeks of pediatric inpatient, and four weeks of combined OB/Gyn and pediatric outpatient clinical experiences. Throughout the clerkship students participate in integrated experiences that cover themes such as health and development, preventive care, sexual health, families and communities, health promotion and disease prevention, and perinatal care. All students attend an evening session with the gynecologic teaching associates. Directors: E.R. Colson, D.C. Hersh, S.R. Pathy

OBGY 107, Maternal Fetal Medicine Subinternship The Maternal Fetal Medicine division offers a four-week high-risk obstetrics elective for fourth-year medical students. The student functions as a subintern and team member in the care of high-risk obstetrical patients at Yale-New Haven Hospital. In addition to inpatient duties, the student attends the outpatient clinic once a week. Students also participate in prenatal ultrasound sessions as well as labor and delivery activities. Numerous didactic conferences are held during the rotation. It is recommended that students use the text *Williams Obstetrics* (Cunningham) to prepare for this experience and for research during the rotation. Evaluation of the student is based on clinical performance, participation at rounds, and the student's presentation of one evidence-based case review to members of the MFM division. Prerequisite: OBGY 103 or equivalent. Students are expected to work two weekend days of their choice. One student every four weeks. Director: F. Galerneau

OBGY 108, Reproductive Endocrinology and Infertility Subinternship The Reproductive Endocrine and Infertility (REI) division offers a four-week elective for fourth- and fifth-year students. In addition to gaining knowledge about human reproductive endocrine function, students are introduced to disruptions in physiology and function, which can lead to endocrinological and infertility disorders. Common problems seen in REI

practice include female and male infertility, recurrent pregnancy loss, polycystic ovarian syndrome, anovulation, amenorrhea, endometriosis, chronic pelvic pain, abnormal uterine bleeding, and uterine leiomyomas. Exposure to Advanced Reproductive Technologies (ART) is integrated into this elective. In addition to clinical activities in the office and the hospital, students have the opportunity to attend division conferences. Evaluation is based on clinical performance in the office and the operating room, and on an evidence-based presentation on an REI topic of interest. Recommended text: *Clinical Gynecological Endocrinology & Infertility* (Speroff). Prerequisite: OBGY 103 or equivalent. During this rotation, it is necessary to travel back and forth between Yale-New Haven Hospital and the Long Wharf Medical Center, 150 Sargent Drive, New Haven. One student every four weeks. Director: P.H. Kodaman

OBGY 109, Gynecologic Oncology Subinternship The purpose of the oncology elective is to enhance the student's knowledge of the diagnosis and management of women with gynecologic malignancies. The student is exposed to all modalities of treatment for gynecologic malignancies including radical gynecological surgery, chemotherapy, and radiation therapy. The student is expected to be an integral part of the team in the management of the patients admitted to the service. The student admits patients and takes part in their care throughout the elective period. In addition to operating room exposure, extensive experience is gained in the postoperative management of these patients. In the ambulatory setting, the student is exposed to the outpatient management of cancer, chemotherapy, and colposcopy. On a weekly basis, the student also attends divisional teaching sessions and the multidisciplinary tumor conference. There is no night call on this elective. The recommended text is *Clinical Gynecologic Oncology* (DiSaia). Prerequisite: OBGY 103 or equivalent. One student every four weeks. Director: E. Ratner

OBGY 110, Obstetrics & Gynecology Elective, Gallup Indian Medical Center (New Mexico) The general Ob/Gyn department of the Gallup Indian Medical Center (GIMC) in New Mexico offers a subinternship in obstetrics and gynecology to fourth- and fifth-year Yale medical students. This center provides Ob/Gyn health care to a growing underserved population. There are no residents at GIMC, and the student therefore gains first-assistant experience during this rotation. The center has 20,000 outpatient visits, 750 deliveries, and 400 surgical cases per year. Bedside rounds, hands-on teaching, formal and informal lectures, and weekly conferences (high-risk Ob/Gyn M&M, C-section review) are integrated into this extramural elective. Students also experience an immersion in the Navajo culture. Evaluation of students is based on clinical performance, participation at rounds, and a final case-based presentation. Night call is approximately every 4–5 nights. The recommended text for this elective is *Danforth's Obstetrics and Gynecology*. Prerequisite: OBGY 103 or equivalent. Students are responsible for the cost of travel, lodging, and miscellaneous expenses. One or two students every four weeks. Director: G. Lynch (on site at GIMC, New Mexico)

OBGY 112, Family Planning Elective This two- or four-week elective provides hands-on experience in family planning in diverse clinical settings. Family planning clinics provide resources to enable couples to determine whether, when, and how often to have children, with special consideration to birth spacing and maternal and child health. The

student is exposed to contraceptive counseling and options counseling (abortion, adoption, parenthood). Contraceptive counseling and care include insertion of long-acting reversible contraceptive methods (LARC, IUDs, and implants). In addition, the student participates in first-trimester ultrasound, medical and surgical abortions, medical and surgical management of early pregnancy failures, and intrauterine fetal demise. The student is expected to be an active participant in all aspects of patient care. Clinical settings include outpatient visits and operating room experience at Yale-New Haven Hospital and Planned Parenthood in New Haven. During this rotation, it is necessary to travel back and forth between YNHH and Planned Parenthood in New Haven (345 Whitney Avenue). Prerequisite: OBGY 103 or equivalent. One student every two or four weeks. Co-directors: N.L. Stanwood, A. Gariepy

OBGY 203, Urogynecology and Reconstructive Pelvic Surgery Service Internship Offered by the Section of Urogynecology and Reconstructive Pelvic Surgery. Students are taught about the normal and abnormal physiology and function of the female pelvic floor and are introduced to the diagnosis and management of female pelvic floor disorders, namely lower urinary tract disorders, pelvic organ prolapse, and defecatory disorders. Common problems encountered by urogynecologists, include urinary incontinence, recurrent urinary tract infections, cystocele, rectocele, uterine prolapse, vaginal vault prolapse after hysterectomy, microscopic hematuria, dyspareunia, interstitial cystitis, anal incontinence, and constipation. Exposure to advanced pelvic floor reconstructive surgery is also integrated into this elective. In addition to clinical activities in the office and the hospital, students have the opportunity to attend section didactics. Evaluation is based on clinical performance in the office and the operating room, participation in didactics, and an evidence-based presentation on a urogynecology topic of interest. Required text: Walters and Karram, *Urogynecology*. Prerequisite: OBGY 103. One student every four weeks. Director: M.K. Guess

OBGY 208, Obstetrics & Gynecology Outpatient Elective This elective provides a broad exposure to outpatient gynecologic issues commonly encountered in the ambulatory setting, such as contraception, menstrual abnormalities, pelvic pain, vaginitis and sexually transmitted disease, infertility, disorders of urinary continence, screening for gynecologic malignancies, and management of menopausal symptoms. The student also has the opportunity to participate in the prenatal care of pregnant women in order to gain a deeper understanding of the changes in maternal physiology throughout gestation, prenatal diagnosis, genetic counseling, and the outpatient management of the pregnant woman and her fetus. The student's time can be distributed, based on student's interests and schedule, among Yale-New Haven Hospital Women's Center, the Yale Urogynecology practice, the Yale Gynecologic Oncology Colposcopy Clinic, the Yale Maternal-Fetal Medicine practice, the Yale Reproductive Endocrinology and Infertility practice, and the private community office setting. Prerequisite: OBGY 103 or equivalent. One student every two or four weeks. Director: J.L. Illuzzi

OBGY 270, Obstetrics & Gynecology Subinternship, Bridgeport Hospital Students actively participate in an Ob/Gyn team-centered learning environment at a community hospital. Prerequisite: OBGY 103 or equivalent. One or two students every four weeks. Director: H.J. Sauer

OPHTHALMOLOGY AND VISUAL SCIENCE

40 Temple Street, 3rd floor, 203.785.2020
http://medicine.yale.edu/eyes

Professors R.A. Adelman, M. Coca-Prados (*Adjunct; Emeritus*), M.C. Crair (*Neurobiology*), N. Daw (*Emeritus*), C. Gonzalez (*Emeritus*), W.H. Miller (*Emeritus*), M.L. Sears (*Emeritus*), M. Shields (*Emeritus*), J.H. Sinard (*Pathology*), V. Vasiliou (*Epidemiology*), Z. Zhou

Associate Professors J.B. Demb, J.J. Hoh (*Epidemiology*), M.A. Materin (*Medicine*), L.J. Rizzolo (*Surgery*), K.M. Stoessel, C.J. Zeiss (*Comparative Medicine*), D. Zenisek (*Cellular & Molecular Physiology*)

Assistant Professors B. Chen, J.H. Chow, M.S. Ehrlich, J.A. Galvin, T.M. Grippo (*Adjunct*), J.E. Kempton, I. Kim, N.E. Kombo, J. Liu, P.C. Palmisano

Instructors N. Chadha, P.A. Coady, S. Garcia Santana

Associate Research Scientists S. Lee, J. Park

Clinical Professors I. Abrahams, R.L. Lesser, D.E. Silverstone, T.J. Walsh

Associate Clinical Professors B.M. DeBroff, S.H. Forster, P. Gaudio, P.H. Haffner, A.J. Levada, M.S. Milner, J.J. Olson, A.D. Rose, G. Shafranov, C.A. Sklar, R.A. Wiznia

Assistant Clinical Professors D.A. Bacal, P.J. Branden, N. Chaudhry, A.J. Daccache, V.P. de Luise, L. Doctor, P.A. Ecker, J.S. Elman, G.T. Emerick, P.M. Falcone, H.E. Fazzone, A.J. Fezza, K.C. Gagnon, J. Geffin, P.C. Guida, S.B. Hersh, M.A. Howard, A.M. Hwang, W.I. Larrison, F. Levin, E.S. Lim, J.F. Martone, A.W. Mead, R.J. Noecker, A. Romania, A. Shayegani, C.A. Sierra, J. Sokol, S.M. Soloway, D. Tom, J.M. Weisz, M.L. Weitzman, B.D. Zuckerman

Clinical Instructors S.B. Castracane, T.H. Cronin, M. Dombrow, O. Faridi, A.H. Guerrero, Y. Kostina-O'Neil, D.H. Levinson, P.A. Marks, P.E. Masi, S.W. Meskin, J.J. Pasternack, L.K. Robbins, M.R. Shapiro, J.E. Silbert, A.P. Swan, S.C. Thornquist, E.L. Volker

OPHT 120, Ophthalmology and Visual Science Clinical Elective This intensive two- or four-week elective consists of ten half-day sessions per week. Students observe in specialty clinics and ophthalmic surgery. More advanced students evaluate patients in a general ophthalmology clinic. Students are expected to participate in departmental conferences and review independent study material provided by the department. Subspecialty experience includes cornea and external eye disease, glaucoma, neuro-ophthalmology, oculoplastics, retinal disease, and strabismus. By the end of the elective, students should be able to recognize the four most common causes of profound blindness and be able to identify vision-threatening and non-vision-threatening causes of a red eye; perform an external eye exam; use an ophthalmoscope to identify the optic nerve and be able to describe it; and have some familiarity with the slit lamp. Students who do the four-week elective are expected to do a presentation at the end of the rotation.

Evaluation is based on clinic performance, the case discussions, and the presentation. Teaching settings include the Yale Eye Center; the Yale Health Center; the Eye Clinic at the West Haven VA Medical Center; and the Cornell Scott-Hill Health Center. Prerequisite: second-year ophthalmology module or equivalent. Maximum of three students every two or four weeks. Director: S.H. Forster

ORTHOPAEDICS AND REHABILITATION

YPB 133, 203.785.2579
http://medicine.yale.edu/ortho

Professors M.R. Baumgaertner, C.G. Carpenter (*Emeritus*), T.O. Carpenter (*Pediatrics*), D.R. Cooperman, J. Costa (*Pathology*), G.E. Friedlaender (*Chair*), A.H. Haims (*Diagnostic Radiology*), M.C. Horowitz, P. Jokl, L.D. Katz (*Diagnostic Radiology*), K.J. Keggi, M.M. Panjabi (*Emeritus*), R.R. Pelker, T.S. Renshaw (*Emeritus*), B.G. Smith, W.O. Southwick (*Emeritus*)

Associate Professors T.A. Blaine, S.D. Dodds, J.V. Eswarakumar, J.N. Grauer, D.M. Lindskog, M.J. Medvecky, J.S. Reach, C.R. Swigart, P.G. Whang, J.J. Yue

Assistant Professors C.W. Carter, N.E. Casemyr, F. Fishman, J.A. Fretz, E.C. Gardner, M.P. Leslie, M. Sharkey, K.M. Sutton, S. Tommasini, R.J. Walls

Instructors S. Gallacher, A. Halim, O. Lamikanra, C.P. Miller, J. Piposar, A. Yacob

Senior Research Scientists C.G. Carpenter, A.M. Vignery

Associate Research Scientists P.C. Ivancic, L. Li

Clinical Professors J.K. Lynch, U.H. Weil

Associate Clinical Professors H.B. Bradburn, D.S. Rosenblum, E.J. Sella

Assistant Clinical Professors M.P. Altman, J.M. Aversa, N. Babu, R.A. Bernstein, D.S. Caminear, M.P. Connair, J.P. Daigneault, P.A. DeLuca, D.H. Gibson, G.A. Gorecki, J.F. Irving, M.J. Kaplan, J.V. Lieponis, M.A. Luchini, P.P. Luchini, R.B. Mayor, J.D. McCallum, P. Minotti, T. Moran, M.J. Murphy, D.C. Novicki, M.M. Pressman, J.F. Raycroft, A.M. Reznik, A. Rice, C.J. Rosenberg, A.B. Sicklick, M.D. Silver, J.M. Sumner, S.L. Tomak, S. Vyce, L.D. Weis, V.J. Williams, J. Wu, R.A. Zell

Clinical Instructors J.M. Beiner, M.A. Carey, E.J. Carlson, M.R. Clain, R. Diana, R.P. Hendrikson, N.R. Kaplan, J.D. Kelley, K.M. Kramer, D.P. Sakalkale, P.M. Sethi, R.A. Stanton, P.B. Stovell

Lecturers L.R. Brenner, M.J. Parisi, R.E. Stevenson, B.T. Zazulak

ORTH 104, Orthopaedics and Rehabilitation Subinternship Limited to third, fourth, and fifth clinical years. Students are active members of one of seven orthopaedic teaching teams: Adult Reconstruction and Orthopaedic Oncology, Orthopaedic Trauma and Fracture Care, Pediatric Orthopaedics, Spine Surgery, Hand and Upper Extremity Surgery, Sports Medicine and Arthroscopic Surgery, and Foot and Ankle Surgery. Students assist in the management of orthopaedic inpatients and receive operating room experience in both the inpatient and outpatient settings. Participation in the orthopaedic outpatient clinics provides experience in the evaluation and treatment of common musculoskeletal conditions. It is recommended that students take call with the orthopaedic resident in the emergency room to gain insight into the principles of acute fracture management.

Clinic and operating room experiences are supplemented by weekly subspecialty conferences and the residents' education program. Maximum of five students every four weeks.
Director: S.D. Dodds

PATHOLOGY

BML 140, 203.785.3624
http://medicine.yale.edu/pathology

Professors R. Bucala (*Medicine*), D. Chhieng, Y. Choi, J. Costa, G.E. Friedlaender (*Orthopaedics & Rehabilitation*), P.G. Gallagher (*Pediatrics*), E.J. Glusac, R.J. Homer, S.D. Hudnall, P. Hui, P. Humphrey, D. Jain (*Internal Medicine*), M. Kashgarian (*Emeritus*), J.H. Kim (*Emeritus*), D.S. Krause (*Laboratory Medicine*), G. Kupfer (*Pediatrics*), T. Kyriakides, J.A. Madri, V.T. Marchesi, J.M. McNiff (*Dermatology*), W. Min, M. Mooseker (*Molecular, Cellular, & Developmental Biology*), J.S. Morrow (*Chair*), J.S. Pober (*Immunobiology*), M. Prasad, D.L. Rimm, M.E. Robert, J.K. Rose, G.S. Shadel, J.H. Sinard, J.L. Sklar, D.F. Stern, F.A. Tavassoli, A. West, W. Yarbrough

Associate Professors A. Adeniran, M.W. Bosenberg (*Dermatology*), D. Braddock, J.L. Brandsma (*Adjunct*), G. Cai, S. Chang (*Laboratory Medicine*), S.E. Cowper (*Dermatology*), L. Hao, M. Harigopal, S.H. Kleinstein, Y. Kluger, C.J. Ko (*Dermatology*), D. Kowalski, M.O. Krauthammer, R. Lazova (*Dermatology*), K.A. Mitchell-Richards, G. Moeckel, R. Morotti, V. Parkash, A. Subtil-Deoliveira (*Dermatology*), A.O. Vortmeyer, Z. Walther, Q. Yan

Assistant Professors R. Bindra (*Therapeutic Radiology*), V. Bossuyt, N. Buza, K. Choate (*Dermatology*), P. Cohen, S. Fernandez, K. Finberg, A. Galan (*Dermatology*), J.A. Gibson, B. Gould Rothberg (*Yale Cancer Center*), S. Hattangadi (*Pediatrics*), M. Hurwitz (*Yale Cancer Center*), A.J. Huttner, R. Jensen (*Therapeutic Radiology*), Anita Kamath, S.G. Katz, A. Levi, D. Nguyen, M.M. Pinto, K. Politi (*Medicine*), Y. Qyang (*Medicine*), Y. Suarez (*Comparative Medicine*), N. Wajapeyee, M.L. Xu, X. Zhang

Instructors A.L. Barbieri, S. Chaudhary, U. Ozerdem, E. Patonay, A. Siddon, S. Wong

Senior Research Scientists M. Centrella, M. Kashgarian, J.H. Kim

Research Scientists P. Gershkovich, T.L. McCarthy, R. Means, M.M. Wan

Associate Research Scientists R.A. Albright, Y. Bai, L.P. Blair, R.L. Camp, J. Cao, A. Chattopadhyay, D. Chen, K. Cheung, R. Cong, S.M. Lang, Z. Liu, X. Ma, V. Neumeister, V. Pelekanou, K. Schalper, L. Shao, M.C. Stankewich, J. Wang, L. Yu, H. Zhang

Associate Clinical Professors P.N. Fiedler, I. Nash

Assistant Clinical Professors R.N. Eisen, J. Gill, I. Hahn, B.C. Kenney, A. Neto

Clinical Instructor C. Haberland

PATH 200, Molecular and Genomic Mechanisms of Disease This is predominantly a seminar course that covers aspects of the fundamental molecular and cellular mechanisms underlying various human diseases in the context of various clinical scenarios. The objective is to highlight advances in genomic and molecular medicine as they relate to

understanding the pathogenesis of disease and the formulation of therapies. There are a few lectures on autopsy pathology and one lecture on bioinformatics. The course is only open to medical students. Various times. R.J. Homer and staff

PATH 505, Neuropathology Elective The core of the elective is shadowing a neuropathologist at work. As experience is gained, core functions of tissue evaluation, processing, and examination can be performed by the student. One or two students every two or four weeks. A.O. Vortmeyer

PATH 600, Pathological Basis of Human Disease Fundamental principles underlying the pathological alterations in function and structure that constitute the reaction of the organism to injury. Pathology of diseases involving neoplasia and special organs and systems. Correlation of the clinical and anatomical manifestations is emphasized. For Public Health graduate students and MSTP students who are required to take PATH 100 for graduate credit. R.J. Homer and staff

PATH 616, Autopsy Pathology This course provides participation in the autopsy service with house staff in pathology. It covers proper performance of the autopsy including dissection, documentation and reporting, presentation of autopsy findings, and communication of medical opinions formed from the autopsy. The work includes involvement in dissection of cases, review of gross pathology, submission of sections for histology, review of microscopic slides, preparation of reports of findings, and involvement in investigative procedures related to necropsy material. Opportunities exist for correlation studies with previous biopsies and for clinical investigative and cell biologic techniques in relation to necropsy material and attendance. Six weeks minimum, enrollment limited to two students.

PATH 617, Anatomic Pathology Elective The department offers an elective to medical students in the third or fourth year that provides a broad experience in general diagnostic techniques. Students have opportunities to participate in autopsy pathology, cytopathology, and surgical pathology. A daily diagnostic conference is scheduled for both residents and students. In addition to direct responsibilities in autopsy and surgical pathology areas, the student has opportunities to participate in electron microscopy, immunohistochemistry, molecular diagnostics, and flow cytometry techniques. One or two students every two or four weeks. Director: A. Adeniran

PATH 618b, Clinical and Pathologic Correlates in Renal Disease A series of clinical pathologic conferences designed to illustrate clinicopathologic correlates in renal disease. At each session, one student acts as clinician and another as pathologist in the evaluation and discussion of case material from autopsies or renal biopsies. Discussions are informal but require preparation in advance, and all participants are expected to contribute in each session. One two-hour session per week for six weeks. Given once in spring term. Limited to twelve students. G. Moeckel

PATH 619/LMED 619, Anatomic Pathology and Laboratory Medicine Combined Elective The goals for anatomic pathology are to understand the basic principles of diagnostic anatomic pathology and its role in clinical medicine. The goals for laboratory medicine are to learn appropriate usage and interpretation of laboratory tests and to

gain a better understanding of the theoretical, technological, and clinical underpinnings of laboratory medicine. This elective is appropriate for students considering a career in laboratory medicine and/or pathology, and for all students who will use laboratory and pathology tests in their careers. One or two students every four weeks. Directors: A. Adeniran, M. Landry

PATH 620a and b, Laboratory Rotations in Experimental Pathology Laboratory rotations for first-year graduate students. T. Kyriakides

PATH 630b/ENAS 535b[U], Biomaterial-Tissue Interactions The course addresses the interactions between tissues and biomaterials, with an emphasis on the importance of molecular- and cellular-level events in dictating the performance and longevity of clinically relevant devices. In addition, specific areas such as biomaterials for tissue engineering and the importance of stem/progenitor cells, and biomaterial-mediated gene and drug delivery are addressed. T. Kyriakides

PATH 650b, Cellular and Molecular Biology of Cancer A comprehensive survey of cancer research from the cellular to the clinical level. The relation of cancer to intracellular and intercellular regulation of cell proliferation is emphasized, as are animal models for cancer research. Background in molecular genetics and cell biology is assumed. Open to advanced undergraduates with permission of the organizers. D.F. Stern, Q. Yan

PATH 660/C&MP 650/PHAR 580, The Responsible Conduct of Research Organized to foster discussion, the course is taught by faculty in the Pharmacology, Pathology, and Physiology departments and two or three senior graduate students. Each session is based on case studies from primary literature, reviews, and two texts: Francis Macrina's *Scientific Integrity* and Kathy Barker's *At the Bench*. Each week, students are required to submit a reaction paper discussing the reading assignment. Students take turns leading the class discussion; a final short paper on a hot topic in bioethics is required. B.E. Ehrlich, D. Braddock

PATH 670b, Biological Mechanisms of Reaction to Injury An introduction to human biology and disease as a manifestation of reaction to injury. Topics include organ structure and function, cell injury, circulatory and inflammatory responses, disordered physiology, and neoplasia. S.D. Hudnall, J.A. Gibson, J.A. Madri, J.S. Morrow, J.L. Sklar

PATH 680a/C&MP 630a/PHAR 502a, Seminar in Molecular Medicine, Pharmacology, and Physiology Readings and discussion on a diverse range of current topics in molecular medicine, pharmacology, and physiology. The class emphasizes analysis of primary research literature and development of presentation and writing skills. Contemporary articles are assigned on a related topic every week, and a student leads discussions with input from faculty who are experts in the topic area. The overall goal is to cover a specific topic of medical relevance (e.g., cancer, neurodegeneration) from the perspective of three primary disciplines (i.e., physiology: normal function; pathology: abnormal function; and pharmacology: intervention). D. Nguyen, T. Boggon

PATH 690a, Molecular Mechanisms of Disease This course covers aspects of the fundamental molecular and cellular mechanisms underlying various human diseases. Many

of the disorders discussed represent major forms of infectious, degenerative, vascular, neoplastic, and inflammatory disease. Additionally, certain rarer diseases that illustrate good models for investigation and/or application of basic biologic principles are covered in the course. The objective is to highlight advances in experimental and molecular medicine as they relate to understanding the pathogenesis of disease and the formulation of therapies. N. Wajapeyee

PEDIATRICS

LMP 4085, 203.785.4638
http://medicine.yale.edu/pediatrics

Professors W.A. Andiman, R.J. Antaya (*Dermatology*), R.S. Baltimore, G.P. Beardsley, C.W. Bogue, L.M. Buckley (*Medicine*), M. Cappello, S. Caprio, T.O. Carpenter, M.G. Caty (*Surgery*), E.R. Colson, J.A. Copel (*Obstetrics, Gynecology & Reproductive Sciences*), D.F. Donnelly, C.C. Duncan (*Neurosurgery*), M.E. Egan, R.A. Ehrenkranz, S.H. Emre (*Surgery*), J.T. Fahey, R.L. Fisher (*Medicine*), B.W. Forsyth, A.H. Friedman, P.G. Gallagher, W.D. Graf, I. Gross, J.R. Gruen, J.P. Hafler, W.E. Hellenbrand, A.L. Horwich (*Genetics*), G. Kupfer, J.F. Leckman (*Child Study Center*), J.M. Leventhal, J. Lichtor (*Anesthesiology*), G. Lister, M.J. Mahoney (*Genetics*), L.C. Mayes (*Child Study Center*), P.L. McCarthy, L.R. Ment, M.R. Mercurio, G. Miller, I. Miller, P.K. Mistry (*Medicine*), S.A. Ryan, K. Santucci, M.R. Seashore (*Genetics*), E.D. Shapiro, B.A. Shaywitz, S.E. Shaywitz, R.N. Shiffman, B.G. Smith (*Orthopaedics & Rehabilitation*), B.R. Smith (*Laboratory Medicine*), W.V. Tamborlane, F.R. Volkmar (*Child Study Center*), C.C. Weitzman, J. Woolston (*Child Study Center*)

Associate Professors N.A. Ameen, L.D. Arnold, A.G. Asnes, J. Asnes, C.R. Baum, A. Bazzy-Asaad, K.A. Bechtel, M.J. Bizzarro, M. Brueckner, K. Chawarska (*Child Study Center*), L. Chen, K. Dhodapkar, B.R. Doolittle (*Medicine*), U.D. Ekong, E.V. Faustino, A.M. Fenick, J.S. Giuliano, Jr., J.N. Grauer (*Orthopaedics & Rehabilitation*), J. Hendrickson (*Laboratory Medicine*), A.L. Hsiao, N. Kadan-Lottick, M.K. Khokha, M. Langhan, R.A. Martinello (*Medicine*), J.M. McNamara, R. Morotti (*Pathology*), E. Paintsil, J.M. Panisello, D.S. Pashankar, F.D. Pashankar, M.I. Rodriguez-Davalos (*Surgery*), L.E. Rosenfeld (*Medicine*), A. Tufro, M. Vázquez, S.A. Weinzimer, P.G. Weiss, T. Zhang (*Medicine*), Z. Zhu

Assistant Professors P.L. Aronson, M. Auerbach, A.K. Berkwitt, L.A. Beslow, E.M. Bruscia, C.A. Canapari, E. Cengiz, S.D. Chirnomas, M.A. Choma (*Diagnostic Radiology*), E.R. Christison-Lagay (*Surgery*), M.X. Cicero, O.M. Couloures, A.I. Del Valle-Segarra (*Adjunct*), M.L. DiLuna (*Neurosurgery*), A.S. El-Guindy, R.W. Elder, B.L. Emerson, A.E. Esquibies, J.A. Galvin (*Ophthalmology & Visual Science*), R.K. Gill, J.E. Goodwin, M.R. Grossman, A.R. Gupta, E.K. Hall, S. Hattangadi, D.C. Hersh, A.B. Hittelman (*Urology*), A.M. Jastreboff (*Medicine*), L.C. Johnston, S. Kandil, M.W. Kent, O. Levit, K.F. Liem, J. Loyal, N. Makhani, A.M. Marks, E. Michaelides (*Surgery*), R.L. Moles, D.E. Ozgediz (*Surgery*), A.D. Patel, S.G. Pels, U.P. Phatak, E. Pinter, A.F. Porto, C.C. Price (*Medicine*), A. Riera, N.D. Romberg, J.L. Sherr, M. Spencer-Manzon (*Genetics*), D.M. Steinbacher (*Surgery*), G.Y. Tiyyagura, B.P. Weeks, C.G. Weismann, H.Z. Zhang (*Genetics*)

Instructors S. Banker, E. Deniz, B.R. Herrin, S.Kwon, N. Nadeau, E.A. Nozetz, R. Osborn, L. Pavlovic

Research Scientists E. Drye, J.M. McGrath (*Comparative Medicine*)

Associate Research Scientists M. Ahsan, A. Ali, J.M. Ambrosino, L. Balsamo, X. Chen, F. Del Viso, K.B. Dorsey, D.V. Kravtsov, E. Legue, M. Li, Q. Li, K.E. Marchione, A. Robson, M.S. Rosenthal, N. Santoro, V. Schulz, S.S. Stahl (*Child Study Center*), M.A. Van Name, K. Yu

Clinical Professors R. Angoff, M.A. Berman, H. Jacobs, S.R. Levy (*Neurology*), B.M. McDonald, C. Randolph, S.Z. Spiesel, F.M. Testa (*Neurology*), J.H. Zelson

Associate Clinical Professors A.J. Avni-Singer, K.M. Berkwits, H.D. Bornstein, C. Canny, R.D. Chessin, D.H. Dreyfus, S.I. Escalera, M.B. Flaherty-Hewitt, R.M. Freedman, M.W. Galal, G.S. Germain, C.W. Goff, F.L. Gruskay, J. Hen, R.A. Herzlinger, M.P. Hommel, C.F. Mann, S.K. Nallainathan, S.M. Peterec, E.L. Stone, S.N. Sudikoff, S.C. Updegrove, S.A. Walsh, P.P. Wang, C.C. Wood, R.S. Young

Assistant Clinical Professors R.J. Anderson, L. Ardeshirpour, S. Baker (*Surgery*), S. Bogursky, S. Boulware, C.G. Butler, A. Cameron, M.S. Cohen, N. Condulis, N. Czarkowski, M.E. Dilorenzo, C.L. Dorfman, A. Driggers, D.P. Durante, M. Ellison, K.A. Fearn, C.A. Fischbein, M. Gaeta, B. Gardner, A. Golioto, A. Gork, L.E. Gray, D.L. Griffin, J.A. Gruskay, R.B. Halperin, M.S. Hogan, M.K. Ikeda, L.R. Jayanthi, D.E. Karas (*Surgery*), S.J. Lavietes, M.A. Lee, J.C. Long, A. Matczuk, C. Menzies, J.L. Morgan, B.C. Natt, C.L. Patterson, H.J. Pierce, M.F. Robert, M.A. Sanyal, M. Seli, L. Semeraro, L.B. Shader, M. Sharkey (*Orthopaedics & Rehabilitation*), R.J. Shea, E.C. Springhorn, J.M. Stein, L.E. Sude, C.P. Summers, S. Tsalbins, A. Vaezy, G.R. Wanerka, E. Wiesner, R.D. Windom, J. Wynne

Clinical Instructors P.M. Alvino, A. Antman, F. Beig, R.S. Boyarsky, C.A. Brown, K.R. Burke, R.S. Caplan, M.C. Caserta, A.M. Coughlin, E.S. Cuoco, M.R. Dillaway, R.G. Dorr, B.G. Freeman, K.Y. Goldberg, J.E. Harwin, S. Hassan, K.M. Hesse, B.A. Hillman, D.L. Idelson, J.C. Jennings, L. Kappus, H. Kipperman, J. Koziel, K. Koziol-Dube, E.M. Lawrence, F.M. Lobo, R. Lockhart, A.J. Maley, K. Mozny, C. Nicolosi, L. Pavlovic, M. Pouliot, R.F. Ramos (*Medicine*), R.C. Rastetter, A.L. Rodriguez, E.A. Romano, L.K. Rudich, J.C. Samuel, L.T. Siew, D.J. Springer, J.H. Stein, S.M. Storeygard, D.C. Torres, V.P. Tsuei, L. Visscher, L.M. Walby, L.A. Waldman, N.G. Wijesekera, M. Williams, J.L. Young, R.A. Zlotoff (*Medicine*)

Lecturers L. Alonso, K.M. Baker, S. Baum, A. Beitel, N.B. Brown, A.J. Carlson, J. Chinchilla-Karolicki, A.V. Cohen, M.C. DeLucia, B.E. Esmaili, D.B. Flanagan, S. Frank, M.H. Gad, L. Glassman-Wisnewski, L.L. Gould, E. Herz, A.M. Hoefer, C.M. Keanna, C.M. Kennedy, K. Kinsella, S.E. Kuhn, S. Kurian, B.M. Liebler, L.M. Marks, S.P. Martinello, P. Murtagh, R. Nolfo, J.E. O'Connor, K. Pae, E.N. Rice (*Nursing*), C.A. Rowan, Z.A. Scates, R. Seligson, M.J. Sheehan, S.J. Slattery, C.M. Smillie, K. Vassell, K. Wallis

MD 2175 (PEDS)/MD 2150 (OBGY), Primary Care and Psychiatry Clerkship This twelve-week integrated clerkship includes ambulatory internal medicine and psychiatry clinical components, as well as outpatient pediatrics and OB/Gyn. Students participate in one four-week full-time placement at a primary care practice in Connecticut and one

four-week part-time placement, which co-occurs with a part-time psychiatry consult placement. The psychiatry component of the clerkship includes four weeks of full-time inpatient psychiatry, four weeks part-time consultation psychiatry, and eight half-days in an ambulatory psychiatry setting. This integrated clerkship emphasizes themes such as health promotion and disease prevention, social determinants of health, behavioral change, systems-based care, and management of chronic disease. Directors: W.N. Kernan, K.M. Wilkins

PEDS 128, Pediatric Hematology/Oncology Elective This two- or four-week elective provides a wide variety of experience in the diagnosis and management of malignant diseases and hematologic problems of infancy and childhood. The student functions as part of the inpatient service team and participates in the outpatient clinic three to four mornings each week. Weekly conferences include the multidisciplinary pediatric tumor conference, hemostasis rounds (jointly with medical hematology), a fellows conference, and weekly pediatric hematology/oncology patient management rounds. One student per block—either for a clerkship or an elective, not both—every two or four weeks. Prerequisite: Pediatric Clerkship. Director: F.D. Pashankar

PEDS 143/SURG 176, Pediatric Surgery Subinternship This subinternship provides an in-depth exposure to the broad spectrum of pediatric surgical problems. Specific attention is given to identifying the pediatric patient in crisis, a relevant skill whether or not the student pursues a career in surgery. Objectives include understanding the correction of major congenital anomalies, management of trauma, care of the critically ill child, and management of solid tumors. Experience includes in-depth exposure to the pediatric operating room, training in neonatal and pediatric critical care, and experience in the pediatric surgical outpatient clinic. The student is an integral part of the pediatric surgical team. Prerequisite: completion of third-year clerkships. One student every four weeks. Director: E.R. Christison-Lagay

PEDS 144, Pediatric Cardiology Elective This four-week elective encompasses all aspects of pediatric cardiology. The student is expected to make daily inpatient rounds in the PICU, NICU, and inpatient floors with the pediatric cardiology attending physician, fellow, and nurse practitioner. Observation in the pediatric cardiology catheterization laboratory and pediatric cardiothoracic operating room is encouraged. The student is also expected to attend the afternoon outpatient pediatric cardiology clinics and all scheduled pediatric cardiology conferences. One student every four weeks. Director: B.P. Weeks

PEDS 146, Pediatric Infectious Disease Elective Students participate in pediatric infectious disease rounds by presenting the case study of an inpatient whom they have examined to a group of faculty and fellows. Emphasis is placed on the correlation of the clinical problem and its practical management with principles of infectious epidemiology and clinical microbiology (bacteriology and virology). Consulting rounds are held daily. Teaching rounds in diagnostic microbiology are held four times a week. Weekly divisional rounds last approximately two hours. Students also attend the pediatric AIDS clinic. Prerequisite: Pediatric Clerkship or permission of the instructor. One student every four weeks. Director: R.S. Baltimore

PEDS 148, Pediatric Endocrinology and Diabetes Elective This four-week elective provides extensive exposure to various aspects of pediatric endocrinology, with an emphasis on disorders of growth and sexual development, thyroid function, diabetes (type 1 and type 2), obesity, and bone and mineral metabolism. The student participates primarily in the outpatient pediatric endocrinology and diabetes clinics, as well as the inpatient service. The rotation includes participation in weekly pediatric endocrinology conferences as well as conferences held jointly with the adult endocrinology service. One or two students every four weeks. Codirectors: A.D. Patel, S.A. Weinzimer

PEDS 152, Pediatrics Subinternship A four-week rotation during which senior medical students are considered the equivalent of interns and are directly responsible for the care of assigned patients under the supervision of resident and attending physicians. Students are assigned to one of the two general pediatric inpatient units at Yale-New Haven Hospital (Medicine/Cardiology and Short Stay). The rotation offers an opportunity to develop organizational skills and experience the pace of internship in a supportive environment. Emphasis is placed on being a good team member, taking ownership of one's patients, and demonstrating improvement in intern skills (clinical reasoning, communication with patients/families, organization, prioritization, presentation, and efficiency) through incorporation of constructive feedback. Prerequisite: satisfactory completion of third-year Pediatric and Internal Medicine clerkships. One or two students every four weeks. Director: D.C. Hersh

PEDS 154, Pediatric Respiratory Pulmonary Elective Students are exposed to a wide variety of activities in the Section of Pediatric Respiratory Medicine. These include the evaluation and treatment of infants and children with acute and chronic respiratory diseases such as asthma, cystic fibrosis, bronchopulmonary dysplasia, bronchiolitis, pneumonia, aspiration syndromes, and obstructive sleep disorders. The emphasis is on learning how to assess respiratory dysfunction by physical exam and laboratory testing. The basics of mechanical ventilation are reviewed. Students rotate through both the inpatient and various outpatient services and specialty clinics, Pulmonary Function Laboratory, Exercise Stress Testing Lab, and Pediatric Sleep Center. Students are expected to participate in seminars, journal club, and patient rounds. In addition, students have the opportunity to experience one of only two CF Centers in the state of Connecticut offering a multidisciplinary team approach that provides state-of-the-art care of CF patients. One student every two or four weeks. Director: R.K. Gill

PEDS 155/EMER 155, Pediatric Emergency Medicine Elective Fourth-year students have the opportunity to evaluate and manage a broad range of acute medical and surgical complaints under direct attending supervision, including thirty-six clinical hours per week in the pediatric emergency department. Participation in teaching conferences and mock codes is required. One student every four weeks. Prerequisites: pediatric rotation, EPIC inpatient training, and EPIC ED e-learning. Director: P.L. Aronson

PEDS 307, Pediatric Neonatal-Perinatal Medicine Elective (NBSCU) Students spend two weeks on the step-down service, followed by two weeks on the intensive care service. On each service students attend medical rounds and follow neonatal patients and write progress notes under close supervision. Students attend delivery room resuscitations

and stabilizations, and prenatal consultations. On both services, students attend general and student-oriented educational conferences as well as radiology rounds. Students also pursue independent study on topics in neonatology and make brief presentations to the clinical team. Additional opportunities, such as attendance at outpatient developmental follow-up exams, are available to students based on interest. One student every four weeks. Directors: L.C. Johnston, S.M. Peterec

PEDS 314, Pediatric Critical Care Medicine Elective This four-week elective provides an opportunity for senior medical students to participate as members of the pediatric intensive care unit team. The student is directly responsible for the care of assigned patients under the supervision of pediatric residents, critical care fellows, and attending intensivists. A core curriculum composed of interactive talks on the major pediatric critical care topics is presented two to three times a week, as well as daily radiology rounds and a monthly morbidity and mortality conference. One student every four weeks. Director: K.G. Couloures

PHARMACOLOGY

SHM B204, 203.785.4393
http://medicine.yale.edu/pharm

Professors K.S. Anderson, A.M. Bennett, Y. Cheng, J.R. Cooper (*Emeritus*), C.M. Crews (*Molecular, Cellular & Developmental Biology*), P.S. Dannies, B.E. Ehrlich, R.E. Handschumacher (*Emeritus*), R. Heimer (*Epidemiology*), R. Herbst (*Medicine*), J.R. Howe, L.K. Kaczmarek, E. Lolis, G. McMahon (*Adjunct*), A.C. Nairn (*Psychiatry*), M. Picciotto (*Psychiatry*), S. Rockwell (*Therapeutic Radiology*), R.H. Roth (*Psychiatry*), G. Rudnick, A.C. Sartorelli, J. Schlessinger (*Chair*), W.C. Sessa, S.G. Waxman (*Neurology*)

Associate Professors T. Boggon, D.A. Calderwood, M.P. DiGiovanna (*Medicine*), J.V. Eswarakumar (*Orthopaedics & Rehabilitation*), Y. Ha, M.E. Hodsdon (*Laboratory Medicine*), I. Lax, K.A. Martin (*Medicine*), E. Paintsil (*Pediatrics*), B.E. Turk

Assistant Professor J.N. Contessa (*Therapeutic Radiology*)

Senior Research Scientist J.R. Cooper

Associate Research Scientists R.P. Baumann, M. Brown, C.H. Calderwood, F. Chen, L. El Hassar, K.A. Grabinska, F. Guan, B. Ha, S. Hamill, R. Hu, P. Iyidogan, Z. Jiang, K.T. Kucera, L. Kuruvilla, W. Lam, H. Lee, S. Lee, X. Li, Z. Lin, J.W. Murphy, E. Park, P.G. Penketh, S. Raghavan, C. Rajagopal, D. Rajasekaran, A.V. Reshetnyak, A. Sachpatzidis, X. Shi, K. Shyam, L.P. Sousa, J. Srivastava, W. Tang, G. Wu, A.L. Wyler, P. Zhang, Y. Zhang, Y. Zhang, R. Zhu, Y. Zhu

Lecturers P. Klein, R.J. Levine (*Medicine*)

PHAR 502a/C&MP 630a/PATH 680a, Seminar in Molecular Medicine, Pharmacology, and Physiology Readings and discussion on a diverse range of current topics in molecular medicine, pharmacology, and physiology. The class emphasizes analysis of primary research literature and development of presentation and writing skills. Contemporary articles are assigned on a related topic every week, and a student leads discussions with input from faculty who are experts in the topic area. The overall goal is to cover a specific topic of medical relevance (e.g., cancer, neurodegeneration) from the perspective of three primary disciplines (i.e., physiology: normal function; pathology: abnormal function; and pharmacology: intervention). D. Nguyen, T. Boggon

PHAR 504a, Principles of Pharmacology This course covers the molecular mechanisms of therapeutics, which are presented in a conceptual framework to increase understanding but decrease memorization. Topics include (but are not limited to) receptor affinity, efficacy, multiple equilibria, pharmacokinetics, and toxicity; enzyme kinetics and inhibition, drug discovery and design; molecular basis of antimicrobial therapy, cardiology drugs, anticancer and antiviral therapies; and therapeutics for inflammatory disorders, asthma, and allergy. E. Lolis

PHAR 506a and b, Methods in Pharmacological Research (Rotations) Students work in laboratories of faculty of their choice. The period spent in each laboratory is one term. E. Lolis

[**PHAR 521a/NSCI 521a, Neuroimaging in Neuropsychiatry I: Imaging Methods** Not offered in 2015–2016]

PHAR 521b/NSCI 521b, Neuroimaging in Neuropsychiatry II: Clinical Applications Neuroimaging methodologies including Positron Emission Tomography (PET), Single Photon Emission Computed Tomography (SPECT), Magnetic Resonance Imaging (MRI), functional Magnetic Resonance Imaging (fMRI), and Magnetic Resonance Spectroscopy (MRS) are rapidly evolving tools used to study the living human brain. Neuroimaging has unprecedented implications for clinical diagnosis, for assessment of drug efficacy, for determination of psychotropic drug occupancy, and for the study of pathophysiological mechanisms underlying neurologic and psychiatric disorders. The course is designed to provide an overview of the application of state-of-the-art neuroimaging methods to research in neurologic and psychiatric disorders. I. Esterlis, H. Blumberg, K.P. Cosgrove

PHAR 528a, Principles of Signal Transduction The regulation of intracellular signaling is of fundamental importance to the understanding of cell function and regulation. This course introduces the broad principles of intracellular signal transduction. More detailed lectures on specific intracellular signaling pathways are given in which students learn both the basic and most recent and cutting-edge concepts of intracellular signaling. Topics include regulation of signaling by protein phosphorylation, small G proteins, G-protein-coupled receptors, hormones, phospholipids, adhesion, and gasses. A.M. Bennett

PHAR 529b, Structural Pharmacology The goal of the course is to show students how concepts of structural biology are applied to areas of great importance in pharmacology such as protein kinases, proteases, cell surface receptors, integrins and other membrane-bound enzymes, and transporters and channels, and how these concepts facilitate drug development. Y. Ha, T. Boggon

PHAR 530b, Practical Applications in Structural Pharmacology This 0.5-credit course begins on February 24, joining PHAR 529b. The goal of the course is to show students how concepts of structural biology are applied to areas of great importance in pharmacology such as protein kinases, proteases, cell surface receptors, integrins and other membrane-bound enzymes, and transporters and channels, and how these concepts facilitate drug development. Y. Ha, T. Boggon

PHAR 550a/C&MP 550a^{U}/ENAS 550a^{U}/MCDB 550a^{U}, Physiological Systems The course develops a foundation in human physiology by examining the homeostasis of vital parameters within the body, and the biophysical properties of cells, tissues, and organs. Basic concepts in cell and membrane physiology are synthesized through exploring the function of skeletal, smooth, and cardiac muscle. The physical basis of blood flow, mechanisms of vascular exchange, cardiac performance, and regulation of overall circulatory function are discussed. Respiratory physiology explores the mechanics of

ventilation, gas diffusion, and acid-base balance. Renal physiology examines the formation and composition of urine and the regulation of electrolyte, fluid, and acid-base balance. Organs of the digestive system are discussed from the perspective of substrate metabolism and energy balance. Hormonal regulation is applied to metabolic control and to calcium, water, and electrolyte balance. The biology of nerve cells is addressed with emphasis on synaptic transmission and simple neuronal circuits within the central nervous system. The special senses are considered in the framework of sensory transduction. Weekly discussion sections provide a forum for in-depth exploration of topics. Graduate students evaluate research findings through literature review and weekly meetings with the instructor. E.L. Boulpaep, W.M. Saltzman

PHAR 560b/C&MP 560b^{U}/ENAS 570b^{U}/MCDB 560b^{U}, Cellular and Molecular Physiology: Molecular Machines in Human Disease The course focuses on understanding the processes that transfer molecules across membranes at the cellular, molecular, biophysical, and physiological levels. Students learn about the different classes of molecular machines that mediate membrane transport, generate electrical currents, or perform mechanical displacement. Emphasis is placed on the relationship between the molecular structures of membrane proteins and their individual functions. The interactions among transport proteins in determining the physiological behaviors of cells and tissues are also stressed. Molecular motors are introduced and their mechanical relationship to cell function is explored. Students read papers from the scientific literature that establish the connections between mutations in genes encoding membrane proteins and a wide variety of human genetic diseases. E.L. Boulpaep, F.J. Sigworth

PHAR 580/C&MP 650/PATH 660, The Responsible Conduct of Research Organized to foster discussion, the course is taught by faculty in the Pharmacology, Pathology, and Physiology departments and two or three senior graduate students. Each session is based on case studies from primary literature, reviews, and two texts: Francis Macrina's *Scientific Integrity* and Kathy Barker's *At the Bench*. Each week, students are required to submit a reaction paper discussing the reading assignment. Students take turns leading the class discussion; a final short paper on a hot topic in bioethics is required. B.E. Ehrlich, D. Braddock

PSYCHIATRY

300 George Street, Suite 901, 203.785.2117
http://medicine.yale.edu/psychiatry

Professors G.K. Aghajanian (*Emeritus*), S.A. Ball, M.D. Bell, R.M. Berman (*Adjunct*), H. Blumberg, B.S. Bunney (*Emeritus*), T.D. Cannon (*Psychology*), K.M. Carroll, J.P. Comer (*Child Study Center*), D.C. D'Souza, L. Davidson, R.J. DiLeone, R.S. Duman, M.H. Ebert, J.E. Gelernter, D.C. Glahn, E.H. Griffith (*Emeritus*), C.M. Grilo, K.A. Hawkins, G. Heninger (*Emeritus*), J. Hirsch, R.A. Hoff, R.E. Hoffman, M.A. Hoge, S.C. Jacobs (*Emeritus*), H.G. Jarecki (*Adjunct*), R.D. Kerns, K.K. Kidd (Genetics), R.A. King (*Child Study Center*), T.A. Kirk (*Adjunct*), J.H. Krystal (*Chair*), M. Laruelle (*Adjunct*), J.F. Leckman (*Child Study Center*), P.J. Lombroso (*Child Study Center*), R.T. Malison, S. Martino, G.F. Mason (*Diagnostic Radiology*), C. Mazure, T.H. McGlashan (*Emeritus*), S. McKee, A.C. Nairn, S.S. O'Malley, G.D. Pearlson, I.L. Petrakis, M. Picciotto, M.N. Potenza, S.M. Powsner, D.M. Quinlan, D.E. Redmond, Jr., R.M. Rohrbaugh, R. Rosenheck, R.H. Roth, G. Sanacora, R.S. Schottenfeld, H.I. Schwartz (*Adjunct*), M.J. Sernyak, N. Sestan (*Neurobiology*), R. Sinha, W.H. Sledge, D. Small, D.L. Snow (*Emeritus*), M. Sofuoglu, S.M. Southwick, J.S. Strauss (*Emeritus*), J.R. Taylor, J.K. Tebes, D.F. Tolin (*Adjunct*), C.H. Van Dyck, F.R. Volkmar (*Child Study Center*), B.E. Wexler (*Emeritus*), S.W. Woods, K.A. Yonkers, H.V. Zonana

Associate Professors M. Alreja, L.M. Anez, S.R. Axelrod, M. Baranoski, K.L. Behar, R. Belitsky, Z. Bhagwagar (*Adjunct*), M.O. Bonarrigo, A. Buchanan (*Adjunct*), V.D. Calhoun (*Adjunct*), M.C. Chawarski, C. Chiles, C. Connell, J.M. Cook, N.L. Cooney, K.P. Cosgrove, C.A. Crusto, I.E. De Araujo, E. Diaz, N.C. Epperson (*Adjunct*), J.M. Fiszdon, I. Harpaz-Rotem, J.D. Iennaco (*Nursing*), S. Jordt (*Adjunct*), J. Kaufman, J.S. Kaufman, P.D. Kirwin, S. Krishnan-Sarin, M.M. Kurtz (*Adjunct*), H.B. Lee, C. Li, T.J. McMahon, P.T. Morgan, E.D. Morris (*Diagnostic Radiology*), M.A. Norko, D.A. Oren (*Adjunct*), M. Paris, C. Pittenger, A.N. Ponce, S.G. Resnick, M.I. Rosen, M. Rowe, V.H. Srihari, J.L. Steiner, M.C. Stevens (*Adjunct*), T.H. Styron, N.E. Suchman, T.P. Sullivan, G.D. Tamagnan (*Adjunct*), C. Tek, L.A. Trevisan, N. Ward, M.A. White, K.M. Wilkins

Assistant Professors C. Abdallah, N.A. Addy, K. Ahn, B.M. Anderson (*Adjunct*), A. Annamalai, E. Ansell, A. Anticevic, A. Arias, M. Assaf (*Adjunct*), A. Barkil-Oteo, D. Barry, A. Baskin-Sommers (*Psychology*), J.E. Beauvais, R.D. Beech, C.D. Bellamy, J.A. Brewer (*Adjunct*), E.R. Carr, I. Cavus (*Adjunct*), L.G. Chepenik, S. Corbera (*Adjunct*), P.R. Corlett, M. Day (*Adjunct*), M.E. Delphin, P.H. Desan, J.C. Deviva, N.A. Diaz, G.J. Diefenbach (*Adjunct*), C.C. Dike, L. Dorflinger, G. Dragoi, E.L. Edens, L.M. Edwards, J.A. Encandela, D. Epelbaum, I. Esterlis, D.C. Fehon, T.V. Fernandez (*Child Study Center*), E.H. Flanagan, A. Forray, D. Foster, H. Fox, L. Fucito, B. Fuehrlein, A. Garakani (*Adjunct*), K.A. Garrison, M.N. Goldenberg, D.M. Gordon, J.L. Goulet, S. Gupta, H. Hamid (*Neurology*), N. Hamlett, J.O. Hannestad (*Adjunct*), A.A. Heapy, K. Height (*Adjunct*), E. Hermes, D.M. Higgins (*Adjunct*), A.J. Holmes (*Psychology*), M.G. Hunt, T. Iheanacho, J.K. Johannesen, R. Kapoor, B. Kiluk, H. Kim,

A.S. Klee, H. Kober, S.D. Kruger, J.F. Kulas, C.A. Kwan, D.M. LaPaglia, M. Leddy, R.F. Leeman, S. Madonick (*Adjunct*), C. Marienfeld, R.S. McWilliam (*Child Study Center*), R.A. Miller, C. Montross (*Adjunct*), P.M. Morrissey (*Adjunct*), S. Muvvala, M. Nakic, B. Narayanan (*Adjunct*), S. Parke, R.H. Pietrzak, D. Pilkey, J.M. Pollard, M. Prabhu, Z. Qayyum, M.E. Rabbitt Morean (*Adjunct*), E. Ralevski, M. Ranganathan, D.A. Ross, C. Sanislow (*Adjunct*), C.E. Sartor, J.J. Sellinger, M.A. Silva, A.A. Simen (*Adjunct*), P.D. Skosnik, P. Skudlarski (*Adjunct*), M.V. Smith, H.R. Steinberg, M.J. Strambler, T.S. Surti, J.L. Tondora, J. Tsai, T.C. VanDeusen, D. Vojvoda, N. Ward, A.H. Weinberger (*Adjunct*), A. Westphal, J. Xu, K. Xu, B. Yang, G. Yoon, H. Zhang, P. Zimbrean, L.D. Zimmerman (*Child Study Center*), Z. Zimolo, L. Zuo

Instructors G.A. Angarita-Africano, P.Y. Geha, L. Henry, G. Hermes, C.L. Olezeski, M. Steinfeld, J.L. Traxler, W.A. Williams

Senior Research Scientists G.K. Aghajanian, J.D. Elsworth, E.H. Griffith, G. Heninger, P.I. Jatlow (*Laboratory Medicine*), T.H. McGlashan, A. Papsun, B.E. Wexler

Research Scientists S.A. Castner, N.R. Driesen, A. Kaffman, R. Masheb, G.V. Williams

Associate Research Scientists L. Averill, I.M. Balodis, M. Banasr, R.D. Barnes, A.C. Black, D.L. Boggs, D.A. Cavallo, G.M. Chowdhury, A.D. Dager, K.S. DeMartini, M.Desai, A. Desrosiers, E.E. DeVito, M. Driscoll, C.H. Duman, A. Harper, A. Herman, V. Ivezaj, J.S. Jane, K.P. Jensen, W.J. Kasprow, G. Kong, R. Liu, X. Luo, D. Matuskey (*Diagnostic Radiology*), M. Mitchell, J.A. Noah, E.E. O'Brien, L. Oberleitner, K.M. Olumide, S.L. Quick, D. Rodriguez-Moreno, B. Schweinsburg, M.D. Seay, D.J. Sells, D. Seo, P. Smith, E.A. Stefanovics, S.I. Tarbox, J.R. Trinko, M.G. Veldhuizen, L. Wei, E. Wohleb, K.M. Wrocklage, M. Wu, M. Xu, X. Zhang, S. Zhang

Clinical Professors D.N. Berg, D.A. Carlson, D.G. Greenfeld, L.L. Harkness, D. Laub, J. Phillips, L.W. Reiser, H.L. Ruben, L.D. Siggins, J.L. Young

Associate Clinical Professors J. Allison, V.A. Altshul, S. Boltax-Stern (*Child Study Center*), J.J. Ciarcia, V. Coric, J. De Figueiredo, J. Geller, R.L. Goettsche, O.F. Hills, R.J. Hoffnung, D. Johnson, D. Koenigsberg (*Child Study Center*), C.C. Kovel, K. Liebmann, K.M. Long, J.S. Lustman, M. Mandelkern, S. Mohamed, C.A. Morgan, M.S. Okasha, R.B. Ostroff, E.A. Perlswig (*Child Study Center*), R. Peters, S.H. Phillips, E.R. Ryan, S.J. Schreiber, A.P. Siegal, E.W. Snyder, R. Stern, R.R. Tampi, A.P. Thies (*Child Study Center*), P. Van Wattum (*Child Study Center*)

Assistant Clinical Professors L.J. Adams, A.C. Adis, A.T. Albrecht, A.M. Almai, J.A. Anderson, T. Armah, B. Arnaout, S.R. Atkins, R. Aziz, J. Ballew, A.L. Balter, J.A. Barber, L.C. Barr, M.V. Barrios, G.A. Bassett, B.R. Becker, E. Becker-Dunn, B.A. Beenken, F. Begum, M. Beitel, J.G. Bejarano, T. Belliveau, C.C. Bemis, S. Bender, D.E. Bendor, E.H. Berger, R.L. Bergeron, T. Bergherr, L.A. Blakley, Y.S. Blanco, D. Boltas, D. Bond, K.F. Bonese, Z. Boutaeva, D.M. Brandt, D. Brockett, T.E. Brown, J. Bullock, A. Buonopane, I. Burgos-Chapman, R. Casey, L.I. Chaikovsky, A. Chang, J. Charney, J.J. Chaudhary, J.R. Check, A.S. Cheng, D.E. Ciancimino, T.A. Cipriano, J.C.

Cleves-Bayon, J.C. Cline, J.T. Collins (*Child Study Center*), M.L. Conroy, E.C. Cook, P.R. Correa, C.D. Couch, K. Croce, L.W. Cross, A. Crutchfield, W.F. Dailey, S. De Asis, S.E. Decker, D. Deegan, C.M. Demaio, R.S. Denkin, D. Dicello, N.S. Downs, V.M. Dreisbach, S.M. Drew, B.A. Duncan, C.G. Edelen, J.J. Erdos, R.D. Fallot, L. Fenton, S. Feuerstein, J.F. Fickes, P.L. Filip, S. Finkelstein, D.A. Fisk, K.A. Foran-Tuller, F.G. Fortunati, P.A. Fountain, C.A. Franco, M.I. Frankel, L.M. Frantsve, A. Franz, E.R. Frazer, R. Freeman, T.A. Freeman, C.C. Frick, D. Fried, G.F. Fuller, M.S. Gandelman, J. Gaskins, T. Glinberg, L.I. Goldstein, S.E. Gomez-Luna, L.R. Greene, A. Grier, C.S. Grove, L.B. Grunebaum, H. Gunduz-Bruce, D.D. Hawkins, G.A. Henry, S.R. Hill, M. Hillbrand, K. Holtzman, J.M. Horowitz, D.D. Jacobson, N. Jain, M. Jean-Baptiste, M.M. Jernigan, P. Joksovic, R.R. Kaminsky, A. Kaner, M. Kang, P. Kelly, K.G. Kennedy, K.E. Kerfoot, B. Kerner, S. Khan, S. Kidd, B. Klink, B.E. Knox, F.E. Koerner, A. Krasner, R.E. Kravitz, J. Kremer, J. Kurt, A. Lamba, H.M. Lankenau, T. Latif, K.M. Lazzarini, B. Lee, N.E. Legow, R.C. Lewis, S.V. Lewis, H.J. Lin, A.L. Lipschutz, H.G. Lizcano, D.B. London, J. Lopez, C. Lozano, H. Lubin, C.L. Lukens, B.F. Marcus, C.A. Markle, R. Marotta, S.L. Matlin, R.W. McCleary, B.B. McConnell, N.C. Mellos, S. Meshberg-Cohen, R.M. Meyer, S.J. Migdole, R.M. Milstein, A.P. Morais, V.R. Morrow, F.C. Mueller, P.V. Mulinski, D.S. Mundy, J. Myer, E.D. Nasper, M.P. Nespoli, J. Nields, F.J. Ninivaggi (*Child Study Center*), P. Noulas, D.O. Nudel, C.J. Oleskey, N.D. Olson, A.G. Oren, S. Ottenheimer, R.M. Ownbey, M.V. Pantalon (*Emergency Medicine*), J.F. Pelletier, F. Perepletchikova, H.V. Phan, J. Poling, J.F. Poll (*Child Study Center*), M.L. Prevey, J. Rakfeldt, I.S. Rathbone, D.R. Rau, N. Reddy, M.D. Rego, A. Resnick, S.A. Riccardi, G. Richardson, J.E. Robinson, L. Robinson, S.H. Rodrigues, M. Rodriguez, B.S. Rothschild, M.P. Roy, N. Roy, R. Rubin, S. Rubin, D.S. Russell, J.A. Sabbatino, N. Sahay, S. Salant, K.M. Salisbury, C. Sanders, K.A. Sanders, L.C. Sanfilippo, A.P. Sawyer, J.O. Schechter, C.J. Schmidt, J.L. Scott, J.P. Seibyl (*Diagnostic Radiology*), K.A. Sevarino, M.A. Shamsi, B.C. Shelby, J.T. Shelton, R. Shenouda, J.K. Shepard, D.E. Sholomskas, S.H. Silverstein, M.N. Spann, M.F. Sperrazza, A.D. Spivack, D.A. Stayner, W.A. Stewart, M. Stitelman, T. Straun, K. Subramanyam, D.C. Tate, E.S. Tek, C. Tenny, A.N. Tessler, S.E. Thomas, K.M. Tie, B. Tobin, K. Trueblood, M. Tupper, J.J. Vanderploeg, P. Vanderploeg, D.C. Vogel, J. Walia, R.S. White, M.L. Whitson, E.M. Wilson, A.M. Winkler, C.V. Wiseman, J. Wolf, P. Wupperman, C.M. Young, W. Zito, L. Zonana

Clinical Instructors S. Agrawal, E.G. Ahlert-Smith, F. Appah, M. Bailey, N.M. Campo, V.V. Carvalho, R.L. Cohen, D.H. David, J.E. Farber, D.J. Flanigan, E. Garcia-Aracena, C. Grazia, M.C. Grenough, C.M. Hunnicutt, R.L. Kieran, W. Levy, F. Lopez, N.M. Lustman, M. Miglani, R. Plant (*Child Study Center*), P.G. Rao, J.N. Rascati, S.J. Rathi, M.M. Reyes, S.D. Romano, D. Sebastian, M.F. Shaw, S.J. Sokol, D.J. Suscovich, M.B. Vollmar, E. Weiss

Lecturers C. Atkins, C.M. Barber, J.L. Barron, L.E. Bedregal, R.H. Berger, S. Berman (*Emeritus*), D.A. Berv, D.S. Bialos (*Emeritus*), C. Conrad, H.F. Crabbe, M. Cruza-Guet, G.H. Davis, A.R. Demac, C.E. Desmond, P.J. Dileo, P.A. Dillon, M. Emmanuel, C. Feldman (*Emeritus*), V.C. Girard, P.B. Goldblatt (*Emeritus*), S.G. Goodson, J.B. Gordon, K. Grady (*Emeritus*), G. Greenberg, F. Grossman, E.G. Grottole (*Emeritus*),

C. Gulrajani, M.J. Honsberger, S.S. Horowitz (*Emeritus*), S.J. Houlding, D. Howe, C. Jean, M.A. Kalacznik, A. Kalafa, J.P. Kimmel, B.C. Klein, R.H. Klein, J. Klugman, A.S. Koleszar, K.K. Krusong, A.L. Labruzza, L. Lager, L.M. Lothstein, L.M. Madden, J.J. Magnavita, R.B. Makover, K. Marcus, A. Massa, A.W. Meisler, D.M. Mender, J.H. Meyer, J. Meyers, M.L. Mitchell, N.V. Mohatt, D.C. Moore, M. Moscarelli, K.F. Nuro, M.J. Orlosky, J.M. Palumbo, H.R. Pearsall (*Emeritus*), J. Pelletier, E. Peters, J.M. Pisciotta, S.J. Purcell, S. Ravven, P. Rehmer, W. Reich, E. Renaud, J. Richman, C.E. Riordan (*Emeritus*), E.B. Rubin, D.K. Sakheim, S.L. Satel, M.N. Savage, J.M. Schnitt, A.J. Sholomskas, R. Sirken, G.H. Sirkin, P.F. Thomas, B. Toll, P.J. Whang, C. Yang, H. Yarosh, J.R. Zigun

MD 2075 (Psychiatry)/MD 2050 (IM), Primary Care and Psychiatry Clerkship This twelve-week integrated clerkship includes ambulatory internal medicine and psychiatry clinical components, as well as outpatient pediatrics and OB/Gyn. Students participate in one four-week full-time placement at a primary care practice in Connecticut and one four-week part-time placement, which co-occurs with a part-time psychiatry consult placement. The psychiatry component of the clerkship includes four weeks of full-time inpatient psychiatry, four weeks part-time consultation psychiatry, and eight half-days in an ambulatory psychiatry setting. This integrated clerkship emphasizes themes such as health promotion and disease prevention, social determinants of health, behavioral change, systems-based care, and management of chronic disease. Directors: W.N. Kernan, K.M. Wilkins

Psychiatry 203, Psychiatry Inpatient Elective (CMHC) This elective includes intensive work with inpatients who suffer from major psychiatric disorders with or without substance abuse. Emphasis is on assessment, acute treatment, and arrangement of continuing care in the community. The subintern functions as an integral member of a multidisciplinary treatment team. Clinical research participation is encouraged. Opportunities are available to explore special areas of interest (e.g., forensics, psychopharmacology, administration) with CMHC faculty. Prerequisite: Psychiatry 106. Open to fourth-year students only. One student every four weeks. Director: R.M. Rohrbaugh; R.D. Beech, S. Elsamra

Psychiatry 206, Law and Psychiatry Elective This elective affords opportunities for third- and fourth-year students to observe and participate in "competency to stand trial" evaluations with a clinical team that makes these assessments at the New Haven Correctional Center. In addition, they may attend Law School classes with students who represent psychiatric patients, observe civil commitment procedures, and attend probate court hearings as well as the criminal proceedings in local New Haven Superior Courts. Students attend work seminars where case evaluations and write-ups are discussed and prepared, and read appropriate legal cases and psychiatric literature. Students may be able to participate in parts of evaluations of insanity defense, custody determination, and other forensic issues. They attend the Law and Psychiatry seminar during their rotation. Prerequisite: Psychiatry 106. One student every four weeks. Director: R.M. Rohrbaugh; H.V. Zonana

Psychiatry 209, Substance Abuse Elective An elective clinical training experience in substance abuse for third- and fourth-year students. The primary training site is the Outpatient Service at the VA Connecticut Healthcare System (VACHS) in West Haven. This experience is an intensive one in which students work closely with addicted patients with chronic mental illness. Students interested in learning about medical detoxification from alcohol and/or opiates may participate in an intensive two-week elective in the Ambulatory Detoxification Clinic at the VACHS. Students learn about the evaluation and treatment of alcohol withdrawal and detoxification. Patients with benzodiazepine and opiate dependence are also treated in this clinic. Prerequisite: Psychiatry 106. One student every four weeks. Director: R.M. Rohrbaugh; VACHS faculty: S.M. Drew, I.L. Petrakis

Psychiatry 210, Psychiatry Inpatient Elective (YNHH/YPH) This elective includes intensive work with patients who suffer from major psychiatric disorders and range in age from college students to middle age. Emphasis is on assessment, acute treatment, and arrangement of post-discharge follow-up care in the community. The student is an advanced clerk functioning as a member of the multidisciplinary treatment team, taking on primary clinician and psychiatric/medical responsibilities for patients under the supervision of senior clinicians. The elective is given on the inpatient service at the Yale-New Haven Psychiatric Hospital; clinical research and outpatient involvement may be options. Open to fourth-year students only. Prerequisite: Psychiatry 106. One student every four weeks. Director: R.M. Rohrbaugh; R.M. Milstein, R.B. Ostroff

Psychiatry 211, Clinical Neuroscience Research Unit Elective This elective offers senior medical students the opportunity to work closely with a variety of patients who are hospitalized during their participation and treatment in research protocols. The Clinical Neuroscience Research Unit (CNRU) is a thirteen-bed inpatient ward with associated outpatient clinics and basic science laboratories on the third floor of the Connecticut Mental Health Center (CMHC). Supervised implementation of novel psychopharmacology, exposure to multiple aspects of clinical and basic science research, and in-depth experience with individual and group psychotherapies are educational aspects of this elective. Patients' diagnostic categories include depression, obsessive-compulsive disorder, schizophrenia, cocaine abuse, substance abuse, and psychiatric genetics. Prerequisite: Psychiatry 106. One student every four weeks. Director: R.M. Rohrbaugh; M. Bloch, G.A. Angarita-Africano

Psychiatry 212, Mood Disorders and Neuromodulation Elective (ECT and TMS) This elective offers senior medical students the opportunity to learn about neuromodulation techniques in the treatment of mood disorders, more specifically, by using electroconvulsive therapy (ECT) and repetitive transcranial stimulation (TMS). Students learn the theoretical basis for the use of ECT and TMS, among other neuromodulation techniques, in the treatment of mood disorders. They learn indications and contraindications to treatment, the process of evaluation of patients prior to and during treatment (including use of standardized depression rating scales), how to monitor for complications and side effects to treatment, and the latest research in the field. Students work closely with psychiatry attending physicians and residents at the VA in the evaluation of patients referred for ECT and TMS, and have the opportunity for supervised participation in the

performance of these treatments. Patient population includes veterans of all ages with a variety of psychiatric conditions, including mood disorders with comorbid anxiety and substance use disorders. Prerequisite: Psychiatry 106. One student every four weeks. Director: R.M. Rohrbaugh; VACHS faculty: C.G Edelen, S. Khan, K.M. Wilkins, D.L. Boggs

Psychiatry 234, Adolescent Psychiatry Elective The purpose of this elective is to provide fourth-year medical students interested in child and adolescent psychiatry and/or adolescent medicine an experience in working with adolescents presenting with acute psychiatric illness. The elective is based on the adolescent inpatient unit at Yale-New Haven Psychiatric Hospital, a short-term fifteen-bed unit serving patients aged 12–18. Students gain exposure to a diverse patient population with severe mood, psychotic, behavioral, and/or substance use disorders, as well as begin to understand the intricacies of working with families and systems providing care for adolescents with significant emotional and/or behavioral disturbances. Teaching activities include daily rounds and weekly case conferences. Prerequisite: Psychiatry 106. One student every four weeks. Director: R.M. Rohrbaugh; Z. Qayyum, H.J. Kim

Psychiatry 238, Early Psychosis Elective (STEP Clinic) STEP (Specialized Treatment Early in Psychosis) is a multidisciplinary team-based treatment for individuals presenting early in the course of a psychotic illness. This clinic offers unique opportunities in the assessment and treatment of a population that is difficult to access in other clinical settings. Students have the opportunity to observe structured research assessments and interpretation of these scales in light of careful clinical follow-up. Given the diagnostic and prognostic heterogeneity of illnesses presenting with psychosis, this experience provides the opportunity to develop clinical expertise in diagnosis and management of a range of mental health issues. The enriched treatment includes cognitive-behavioral group therapy, family psycho-education groups, and cognitive remediation in addition to vocational support with a focus on rapidly reintegrating patients back to age-appropriate social, educational, and employment goals. Students have the opportunity to observe or participate in any of these treatments. The multidisciplinary and pluralistic nature of the intervention presents a rich opportunity to participate in collaborative care with other mental health disciplines. Students can also participate in regular seminars sponsored by the STEP and PRIME (Prevention through Risk Identification, Management, and Education) clinics. The latter is a research clinic focused on prodromal psychosis. Site: Connecticut Mental Health Center (CMHC). Scholarship: STEP is designed as a service delivery model with a built-in observational cohort and experimental pragmatic randomized controlled trial. Students are invited to take an active role in the various domains of scholarship including community and clinician education efforts, publication, and learning about clinical research design. This is a supplemental experience that *must* be paired with a main inpatient placement at CMHC or Yale-New Haven Psychiatric Hospital. Prerequisite: Psychiatry 106. Open to fourth-year students only. One student every four weeks. Director: R.M. Rohrbaugh; V.H. Srihari (clinic director), J.M. Pollard (project director and family interventions coordinator, STEP clinic), C. Tek (program director, Psychosis Team), L.C. Hyman (team leader, Psychosis Team), S.W. Woods (director,

PRIME clinic), J. Saksa (CBT coordinator, STEP clinic), B. Walsh (clinical coordinator, PRIME clinic)

Psychiatry 301, Psychiatry Inpatient Subinternship (CMHC) Intensive work with inpatients who suffer from major psychiatric disorders with or without substance abuse and who have significant social challenges often including lack of access to stable housing, work, and health insurance. Emphasis is on assessment, acute treatment, and arrangement of continuing care in the community. The student functions as an integral member of a multidisciplinary treatment team and serves as the primary clinician for four to five patients. The subinternship occurs on the inpatient service (4th floor) of the Connecticut Mental Health Center (CMHC). Prerequisite: Psychiatry 106. One student every four weeks, May through October only. Director: R.M. Rohrbaugh; R.D. Beech, S. Elsamra

Psychiatry 302, Psychiatry Inpatient Subinternship (YNHH, WS-2) Intensive work with patients who suffer from major psychiatric disorders and range in age from college students to middle age. Most patients have access to health insurance or have Medicare and/or Title XIX. Emphasis is on assessment, acute treatment, and arrangement of post-discharge follow-up care in the community. The student is an advanced clerk functioning as a member of the multidisciplinary treatment team, taking on primary clinician and psychiatric/medical responsibilities for patients under the supervision of senior clinicians. The subinternship occurs on the general adult inpatient service at the Yale-New Haven Psychiatric Hospital. Prerequisite: Psychiatry 106. One student every four weeks, May through October only. Director: R.M. Rohrbaugh; R.B. Ostroff, R.M. Milstein

Psychiatry 325/CHLD 325, Child Study Center Psychiatry Elective The aim of this elective is to provide the student with an intensive experience in infant, child, and adolescent psychiatry. The curriculum includes assessments of normal development and psychopathology in childhood, treatment methods, and research in major disorders of childhood. Students are active team members of the Children's Psychiatric Inpatient Service (CPIS) and the consultation service to the pediatric wards of Yale-New Haven Hospital and can take advantage of the wide range of ongoing seminars, conferences, and clinical services in place at the Child Study Center. Teaching methods include seminars, conferences, field observations, ward rounds, and practicals selected by the student following consultation with the director of medical studies and the Child Study Center. One student every four weeks. Directors: A.S. Martin, R.M. Rohrbaugh

PUBLIC HEALTH

LEPH 210, 203.785.2867
http://publichealth.yale.edu

Professors S. Aksoy, D. Albanes (*Adjunct*), F. Altice (*Medicine*), W.A. Andiman (*Pediatrics*), M.Y. Armstrong (*Emeritus*), R.S. Baltimore (*Pediatrics*), M.L. Bell, S. Bernstein (*Emergency Medicine*), M.B. Bracken, E.H. Bradley, R. Bucala (*Medicine*), S.H. Busch, M. Cappello (*Pediatrics*), E.B. Claus, P.D. Cleary (*Dean*), L. Dembry (*Medicine*), V.T. DeVita (*Medicine*), P. Diggle (*Adjunct*), J. Dovidio (*Psychology*), A.B. Du Bois (*Emeritus*), R. Dubrow, D.A. Fiellin (*Medicine*), E. Fikrig (*Medicine*), D. Fish (*Emeritus*), H.P. Forman (*Diagnostic Radiology*), G. Friedland (*Medicine*), A.P. Galvani, A. Gerber (*Political Science*), T.M. Gill (*Medicine*), E.L. Grigorenko (*Child Study Center*), C.P. Gross (*Medicine*), R. Heimer, W.J. Hierholzer (*Emeritus*), T.R. Holford, S.M. Horwitz (*Emeritus*), J.R. Ickovics, M.L. Irwin, J.F. Jekel (*Emeritus*), A.C. Justice (*Medicine*), E.H. Kaplan (*School of Management*), A.I. Ko, H.M. Krumholz (*Medicine*), Q. Lan (*Adjunct*), B.P. Leaderer, L.S. Levin (*Emeritus*), E.D. Louis (*Neurology*), H. Lu (*Adjunct*), R.W. Makuch, L.E. Marks, L.C. Mayes (*Child Study Center*), R. McCorkle (*Nursing*), D. McMahon-Pratt, I. Miller (*Pediatrics*), A.D. Paltiel, C.S. Panter-Brick (*Anthropology*), C.L. Patton (*Emeritus*), P.N. Peduzzi, R. Perez-Escamilla, E. Pinker (*School of Management*), J.R. Powell (*Ecology & Evolutionary Biology*), M.G. Reis (*Adjunct*), H.A. Risch, R. Rosenheck (*Psychiatry*), N. Rothman (*Adjunct*), N.H. Ruddle (*Emeritus*), M.B. Russi (*Medicine*), P. Salovey, N.G. Saravia (*Adjunct*), M.J. Schlesinger, E.D. Shapiro (*Pediatrics*), J.L. Sindelar, D.L. Snow (*Psychiatry*), J.T. Stitt (*Emeritus*), J.A. Stolwijk (*Emeritus*), J.K. Tebes (*Psychiatry*), G.H. Tignor (*Emeritus*), M.E. Tinetti (*Medicine*), C. Tschudi, V. Vasiliou, K.A. Yonkers (*Psychiatry*), H. Yu (*Adjunct*), D. Zelterman, H. Zhang, H. Zhao

Associate Professors H.G. Allore (*Medicine*), M.S. Bogucki (*Emergency Medicine*), T. Cohen, J.L. Davis, M.M. Desai, A.T. Dewan, M.A. Diuk-Wasser (*Adjunct*), J. Dziura (*Emergency Medicine*), D.A. Esserman, J.J. Hoh, T. Kershaw, K. Khoshnood, B. Levy, J.H. Lichtman, H. Lin, S. Ma, X. Ma, I.M. Nembhard, L.M. Niccolai, J.E. Pachankis, E. Paintsil (*Pediatrics*), A. Papachristos (*Sociology*), M.M. Pettigrew, J.S. Ross (*Medicine*), M.N. Smith (*Medicine*), A.N. Sofair (*Medicine*), N.S. Stachenfeld (*Obstetrics, Gynecology & Reproductive Sciences*), R. Stolzenberg-Solomon (*Adjunct*), J. Townsend, M.A. White (*Psychiatry*), Y. Zhu

Assistant Professors R. Almeling (*Sociology*), P. Aronow (*Political Science*), X. Chen, M.M. Ciarleglio, Z.N. Cooper, F.W. Crawford, N.C. Deziel, A.S. Friedman, N.L. Hawley, A. Jukic, D.E. Keene, J. Ma (*Adjunct*), J.E. Monin, C.D. Ndumele, S. Parikh, V.E. Pitzer, J. Schwartz, F.M. Shebl, M.V. Smith (*Psychiatry*), S. Wang, Z. Wang, J.L. Warren, D.M. Weinberger, R. Yaesoubi, B. Zhou

Senior Research Scientists A. Caccone (*Ecology & Evolutionary Biology*), B. Cartmel, J.E. Childs, L. Curry, A.J. Davidoff, D. Fish, R. Gueorguieva, P.J. Krause, L.E. Munstermann, N.H. Ruddle

Research Scientists N. Abdala, G.M. Attardo, Y. Chen, S.D. Cunningham, F. Dai, J.F. Gent, B.A. Jones, N.G. Kolev, L. Lu, M.L. Ndeffo Mbah, N. Sun, B.L. Weiss

Associate Research Scientists J.A. Alfaro-Murillo, R.C. Barbour, M. Brault, E. Buta, S.K. Calabrese, L. Calvocoressi, M.E. Canavan, K. Duffany, D.P. Durham, L.M. Ferrucci, S. Gaffney, L.E. Grau, L. Hou, A.J. Hromi-Fiedler, H. Huang, R. Josyula, M.J. Kane, T.C. Kyriakides, E.C. Leifheit-Limson, V.L. Patterson, M.J. Stolar, R. Wang, Z. Wang, E.A. Wunder, D. Yamin, C.W. Yeckel, X. Yu

Clinical Professors J.B. Borak, J.L. Hadler

Associate Clinical Professors M.L. Cartter, D. Shenson, H. Wang

Assistant Clinical Professors D. Brackney, S. Geballe, P.D. Guarino, A.M. Miller, L.E. Sosa, M. Wininger, H. Zhang

Clinical Instructors D.L. Humphries, J.E. Rawlings

Lecturers E. Anderson, J.F. Anderson, D.D. Aye, T.J. Balcezak (*Medicine*), M. Booss, M.P. Borgstrom, E.A. Bortnichak, M.M. Callaway, P.F. Canny, G.L. Capozzalo, B. Cartmel, G. Charnley, J.E. Childs, K.H. Clark, H. Cohen (*Medicine*), L. Curry, R. D'Aquila, D.A. D'Atri, M.G. Dale, A.S. Darefsky, H.G. Dove, J.D. Dunn, A.J. Durante, B.T. Fenton, C. Fields, B. Fontes, S.D. Geballe, W.A. Gillespie, G.L. Ginsberg, M.K. Gusmano, J.F. Jekel, B. Jennings, B.A. Jones, M. Klein, P.J. Krause, S. Kumar, M. Lee, L.S. Levin, D. Li, E.L. Linnander, L.G. Marc, J.A. Mattera, Z. McNatt, S.M. Merz, L.M. Mueller, J.M. Mullen, E. O'Keefe, J.E. Otero, C. Petit, B. Schachtel, J.C. Scheeren, R.L. Skolnik, M. Skonieczny, M.D. Slade (*Medicine*), J.P. Smith, S.S. Spangler, J.A. Sparer, R.S. Stahl (*Surgery*), D.E. Stevens, J.A. Stolwijk, M.H. Stowe (*Medicine*), K.M. Talbert-Slagle, P.H. Van Ness (*Medicine*), B.L. Weiss, C.W. Yeckel, K.M. Yousey-Hindes, J.A. Zaccagnino

The nationally accredited Yale School of Public Health (YSPH) offers a wide variety of courses across several departments. Many of these are also available for medical student enrollment. For information on courses and registration procedures, contact the YSPH Registrar's Office.

SURGERY

FMB 102, 203.785.2697
http://yalesurgery.org

Professors J.J. Abrahams (*Diagnostic Radiology*), S. Ariyan, L.M. Bartoshuk (*Emeritus*), S. Bokhari (*Diagnostic Radiology*), M.G. Caty, A. Dardik, K.A. Davis, F.C. Detterbeck, S.J. Dudrick (*Emeritus*), J.A. Elefteriades, S.H. Emre, J.P. Geibel, B.G. Green, R.J. Gusberg, G.L. Hammond (*Emeritus*), G.M. Israel (*Diagnostic Radiology*), B. Kinder (*Emeritus*), P. Kirshbom, G.S. Kopf, D.R. Lannin, S.B. Leder, D.J. Leffell (*Dermatology*), A. Lofqvist (*Adjunct*), W.E. Longo, L.M. Manuelidis, D.C. Mulligan, D. Narayan, W. Nealon, J.A. Persing, J. Pollak (*Diagnostic Radiology*), S.H. Rosenbaum (*Anesthesiology*), W. Rosenblatt (*Anesthesiology*), R.A. Rosenthal, P.E. Rubin (*Adjunct*), R.R. Salem, J. Santos-Sacchi, T.P. Sarac, C.T. Sasaki, I.R. Schwartz (*Emeritus*), L.M. Scoutt (*Diagnostic Radiology*), Y.H. Son (*Therapeutic Radiology*), B. Sumpio, G. Tellides, J.G. Thomson, R.J. Touloukian (*Emeritus*), R. Udelsman (*Chair*), W.G. Yarbrough, D.D. Yuh

Associate Professors J.E. Aruny, D.J. Boffa, P.N. Bonde, T. Carling, C.H. Cha, A.B. Chagpar, R.A. Cowles, A. Duffy, R.N. Formica (*Medicine*), S. Hashim, M.H. Johnson (*Diagnostic Radiology*), A.W. Kim, S. Kulkarni, L.L. Maerz, A.A. Mangi, A. Maung, M.F. Perkal, M. Prasad (*Pathology*), L. Rizzolo, K.E. Roberts, M.I. Rodriguez-Davalos, M. Schilsky (*Medicine*), K. Schuster, D.M. Steinbacher

Assistant Professors A.F. Au, M. Barnes, B. Bhattacharya, M.S. Bianchi, L.M. Bow, G.G. Callender, E.R. Christison-Lagay, U.M. Darr, R. Decker (*Therapeutic Radiology*), H.A. Deshpande (*Medicine*), M.L. Dewar, H. Einarsdottir, J. Federico, B.E. Fortune (*Medicine*), S. Ghiassi, D. Han, N.R. Horowitz, H. Hsia, J. Indes, N. Isaeva, D.C. Johnson, B. Judson, G.J. Kaml, M. Karimi, S.A. Khan, B. Killelea, D. Kowalski (*Pathology*), S.L. Kwei, A.H. Liapakis (*Medicine*), S.M. Luczycki (*Anesthesiology*), F.Y. Lui, R. Manes, S. Mehra, E. Michaelides, G. Nadzam, C. Ochoa Chaar, D.E. Ozgediz, K. Pei, C.E. Quinn, V. Reddy, D.H. Stitelman, H.E. Tantawy (*Anesthesiology*), P.S. Yoo, N. Young, J. Yun, P. Zimbrean (*Psychiatry*)

Instructors A.T. Arndt, S. Larson, S. Sainathan, J. Salluzzo, I. Sucandy, D. Suissa

Research Scientists S. Ivanov, A. Ivanova, L. Song

Associate Research Scientists H. Bai, R. Korah, J. Malinowski, L. Qin, D.P, Vangeli, S. Zhong, J. Zhou, B. Ziganshin

Clinical Professors J.E. Fenn, J.F. Kveton, R.S. Stahl, E. Yanagisawa

Associate Clinical Professors N.A. Atweh, Z.N. Chicarilli, R.C. Fazio, K. Lee, R.A. Lowlicht

Assistant Clinical Professors D.I. Astrachan, S. Baker, P.A. Barcewicz, H. Cedarbaum, B.Y. Cha, W. Cholewczynski, R.W. DeNatale, T.G. Duplinsky, S.I. Friedman, S. Fusi, R. Garvey, R.T. Golia, N.A. Gordon, S. Gregg, R.H. Hirokawa, G.E. Horblitt, D.E. Karas, D.B. Keck, A.S. Kenler, J.C. Kirchner, D.J. Muller, S. Natkin, M.K. O'Brien, G. Opin, P.M. Opin, L.R. Otake, M.T. Pronovost, J.C. Salomon, R.F. Schlessel, M.J.

Schpero, S. Shah, R.E. Steller, T.F. Sweeney, D.A. Tereb, S.C. Thornton, E.M. Vining, D. Wasson, M.H. Weinstein, J.M. Willett, K. Yanagisawa, K. Zuckerman

Clinical Instructors J.A. Arons, C.B. Beckman, R. Crombie, A. Czibulka, M. D'Agostino, K. Discepolo, P.L. Fortgang, A. Geirsson, E. Honigsberg, J. Kerner, T.H. Lesnik, C.J. Lovoulos, V. Nathan, H.F. Reilly, T. Takoudes

Lecturers L. Acton, B.C. Fichandler, H.H. Haversat, D.D. Hendrick, N.M. Hewitt, J. Hopper, R. Kohilakis, K. Le, V. Lee, J. Mendes, C. Powell, L. Romanelli, P.G. Sasaki, H.L. Warner

MD 2100 (SURG)/MD 2125 (EMER), Surgical Approach to the Patient This twelve-week integrated clerkship includes surgery (six weeks, general; three weeks, specialties) and emergency medicine (three weeks) clinical components. Throughout the clerkship students participate in integrated experiences that address themes of the OR experience such as perioperative care, emergency/trauma management, procedures, medical error and patient safety, and anesthesiology. Students also participate in a twelve-week mentoring program during the clerkship. Directors: L. Hile, A.W. Kim

SURG 123b, Biochemical and Metabolic Foundations of Plastic and Reconstructive Surgery A course designed to provide in-depth understanding of the molecular events underlying the diverse clinical phenomena encountered in plastic surgery. Topics include fluid electrolyte metabolism in the burn patient, biochemistry and metabolism of collagen and its relation to scarring and connective tissue disorders, normal wound healing, and disorders of the same. Offered for four weeks during the spring term, two hours per week by arrangement. Limited to two fourth-year students. J.A. Persing

SURG 129, Cardiac Transplantation/Cardiac Assist Device Elective Intensive exposure to laboratory and clinical aspects of cardiac transplantation. Special emphasis on the relationship between ongoing laboratory studies and clinical practice in this field. Students are involved in the preoperative assessment of prospective transplant candidates, donor procurement, intraoperative management, and postoperative immunosuppression. One or two students every four weeks. Codirectors: A. Mangi, P. Bonde

SURG 130, Cardiac Surgery Subinternship Intensive exposure to preoperative and postoperative management of adult and pediatric cardiac surgical patients and to intraoperative conduct of surgical procedures, with active participation in the operating room and in regular conferences. Students attend regular seminars covering major areas of cardiac surgery with members of the faculty and may be required to present a seminar on a subject in cardiac surgery to faculty and resident staff. Prerequisite: completion of third-year clerkships. Maximum of four students every four weeks. Director: J.A. Elefteriades; S. Hashim, D. Yuh

SURG 131, Thoracic Surgery Subinternship The student is expected to be a valuable contributing team member during daily rounds, in the operating room, in the outpatient clinics, and at conferences. The majority of patients under the care of the thoracic surgery service include those with lung, esophageal, and mediastinal malignancies and infections, and many present both diagnostic and therapeutic challenges. Students have the opportunity to understand the multidisciplinary approach toward the management

of these complex patients. Interested students can also pursue clinical research projects and papers. Prerequisite: completion of third-year clerkships. One or two students every four weeks. Director: A.W. Kim

SURG 143, Surgical Critical Care Elective (YNHH) The surgical intensive care unit exposes the senior medical student to the day-to-day and minute-to-minute management of the critically ill surgical patient. The breadth of surgical disease, spanning all aspects of surgery, allows the student to understand the management of respiratory, cardiovascular, gastrointestinal, and renal failure. Advanced techniques in ventilatory management and state-of-the-art sepsis management are used. Prerequisite: completion of third-year clerkships. One student every four weeks. Director: L.L. Maerz

SURG 144, Trauma and Emergency General Surgery Subintership A four-week exposure to the urgent surgical care of the critically ill and injured. Students are exposed to the evaluation and management of patients with traumatic and general surgical emergencies. Prerequisite: completion of third-year clerkships. One or two students every four weeks. Director: F.Y. Lui

SURG 150, Plastic and Reconstructive Surgery Subinternship Students participate in the evaluation and reconstructive surgery of deformities of congenital, traumatic, and neoplastic origin. Students are exposed to patients in inpatient and outpatient settings as well as operating room experiences, supplemented by regular conferences. Prerequisite: completion of third-year clerkships. One or two students every four weeks. Director: A.F. Au; J.A. Persing

SURG 151, Gastrointestinal Surgery Subinternship This subinternship offers in-depth exposure to the surgical care of the stomach and intestines in the clinic, hospital, and operating room. Diagnosis and treatment procedures are coordinated with gastroenterologists, endoscopists, and cancer experts, with emphasis on the most successful surgery with the least pain, trauma, scarring, and recovery time. Prerequisite: completion of third-year clerkships. One student every four weeks. Codirectors: W.E. Longo, K.E. Roberts

SURG 152, Advanced Senior Seminar, General Surgery This is a weekly evening seminar series covering advanced and controversial topics in general surgery. Three one-hour sessions include dinner at faculty homes and run from October through February. Reprints of pertinent articles provided prior to each seminar. Staff

SURG 153, Otolaryngology Subinternship This clinical experience is independent of the third-year Surgery/Otolaryngology rotation and takes place on an individual basis. It includes operating room experience, ward responsibilities, and involvement in outpatient ENT. Prerequisite: completion of third-year clerkships. One or two students every four weeks. Codirectors: M.S. Bianchi, S. Mehra

SURG 159, Urology Subinternship Flexible program designed to provide in-depth exposure to urology specialty areas, including uro-oncology, minimally invasive (laparoscopic) urology, endo-urology, neuro-urology, female urology, and pediatric urology. Students are part of the urologic team and participate actively in the clinic, the OR, and on rounds. Prerequisite: at least six months of prior clinical training. One or two students every four weeks. Director: D. Singh

SURG 171, Vascular Surgery Subinternship A practical experience in the diagnosis and management of vascular disease, including pre- and postoperative care. The scope of the experience includes orientation to the noninvasive vascular diagnostic laboratory, outpatient care in the Yale Vascular Center, and inpatient management (including patients in the OR, ICU, and the vascular surgery unit). Prerequisite: completion of third-year clerkships. One student every four weeks. Director: J. Indes

SURG 172, Transplantation Surgery Subinternship This intensive clinical experience emphasizes the preoperative assessment, intraoperative care, and postoperative management of patients suffering end-stage organ system failure who are cared for by transplantation. Emphasis also includes the management of immunosuppressive medication regimens and the care of post-transplant problems. Prerequisite: completion of third-year clerkships. One student every four weeks. Director: S.H. Emre

SURG 174, Surgical Oncology Subinternship Intensive exposure to surgical aspects of the treatment of cancer in the clinic, hospital, and operating room. The interaction among surgery, medical oncology, and radiation therapy is experienced by following patients receiving multiple forms of therapy. Prerequisite: completion of third-year clerkships. One student every four weeks. Director: A.B. Chagpar

SURG 176/PEDS 143, Pediatric Surgery Subinternship This subinternship provides an in-depth exposure to the broad spectrum of pediatric surgical problems. Specific attention is given to identifying the pediatric patient in crisis, a relevant skill whether or not the student pursues a career in surgery. Objectives include understanding the correction of major congenital anomalies, management of trauma, care of the critically ill child, and management of solid tumors. Experience includes in-depth exposure to the pediatric operating room, training in neonatal and pediatric critical care, and experience in the pediatric surgical outpatient clinic. The student is an integral part of the pediatric surgical team. Prerequisite: completion of third-year clerkships. One student every four weeks. Director: E.R. Christison-Lagay

SURG 203, Otolaryngology Elective This elective provides exposure to the broad spectrum of otolaryngology and head and neck problems. Students spend time in both the operating room and various clinics, including otology, laryngology, pediatric otolaryngology, head and neck cancer, facial plastics, and sinus. Students are asked to grasp in detail the head and neck exam and to learn diagnostic techniques and procedures useful to all medical specialties. The schedule is flexible and allows students to choose to participate in operations and clinics of special interest to them. Ample opportunity is provided to interact with the faculty and to develop a mentor relationship. One or two students every two weeks. Codirectors: M.S. Bianchi, S. Mehra

SURG 204, General Surgery Elective (YNHH/SRC) Students become an integral part of the resident team, supervised by the chief resident and attending physicians on the general surgery service. Students participate in the management of general surgical inpatients, preoperative evaluations, and outpatient clinics. Students are expected to participate in all teaching conferences, Grand Rounds, and clinics, and to attend core curriculum conferences each week. The goal is to provide an educational experience that will be of value to students' eventual practice, regardless of which specialty they enter. One student every four weeks. Director: G. Kaml

SURG 208, Burn Surgery Elective, Bridgeport Hospital This rotation provides intensive exposure to the care of the acutely burned patient: surgical and nonsurgical care, critical care, and outpatient wound care. Large burn injuries evoke the most severe critical illness known to medicine. Patients with such injuries are unstable for prolonged periods of time and require responsive and attentive critical care. The student participates in this care, including procedures performed in the burn intensive care unit. Assessment of burn depth and the prognosis for wound healing are often far from straightforward, and the student participates in this assessment process with the rest of the team, learning to gauge depth and prognosis via examination of multiple patients. Operative therapy for burns includes excisional debridement and often split-thickness skin grafting, but there are multiple choices to be made in providing optimal care to a particular patient. The student learns the rudiments of this decision-making process and is an active participant in all operations performed by the burn team. One student every four weeks. Director: A. Savetamal

SURG 209, Congenital Heart Surgery Elective Students actively participate in the diagnosis, treatment, and operative and postoperative management of patients with congenital heart disease. Daily rounds on adult and pediatric cardiothoracic patients. Students receive a large exposure to pediatric and adult surgical cardiac intensive care unit care. One or two students every four weeks. Director: P. Kirshbom; G.S. Kopf, M. Karimi

SURG 211, Surgical Critical Care Subinternship (VAMC/SICU) Students are assigned advanced clinical duties in the field of surgical critical care. Students spend time in the surgical intensive care unit (SICU), where they participate in the management of critically ill surgical patients, including general surgical, vascular, urologic, cardiothoracic, and neurosurgical patients. Topics covered include cardiopulmonary resuscitation, airway and ventilator management, fluid management, nutritional support, and the management of sepsis. Students can participate in all invasive procedures in the SICU, including bedside tracheostomy, percutaneous gastrostomy placement, bronchoscopy, and arterial and central venous catheter placement. Under the supervision of the intensive care attending physician, students are directly responsible for one to two critical care patients. Students present on rounds each day and assist in providing family and primary service communication. Limited to fourth-year students. Prerequisite: completion of third-year surgery and medicine clerkships. One student every two or four weeks. Director: M.F. Perkal

SURG 217, Endocrine Surgery Subinternship This elective exposes the student to in-depth clinical and surgical aspects of endocrine surgery. Special emphasis is placed on the multidisciplinary approach to the endocrine patient, understanding the laboratory and radiologic studies, cytopathology, biochemical analysis, preoperative stabilization of patients, intraoperative decision making, and postoperative follow-up and outpatient evaluation of patients. Technical skills are emphasized as well for students interested in improving their surgical hands. Prerequisite: completion of third-year clerkships. One or two students every four weeks. Director: G. Callender

THERAPEUTIC RADIOLOGY

HRT 140, 203.785.2956
http://radonc.yale.edu

Professors S.J. Baserga (*Molecular Biophysics & Biochemistry*), Z. Chen, D.C. DiMaio (*Genetics*), P.M. Glazer (*Chair*), B.G. Haffty (*Adjunct*), S.A. Higgins, R. Nath, R.E. Peschel (*Emeritus*), K.B. Roberts, S. Rockwell (*Emeritus*), W. Rupp, R.J. Schulz (*Emeritus*), Y.H. Son (*Emeritus*), W.C. Summers, P. Sung (*Molecular Biophysics & Biochemistry*), J.B. Sweasy, L.D. Wilson

Professor (Adjunct) of Research K. Low

Associate Professors D.J. Carlson, V.L. Chiang (*Neurosurgery*), R.H. Decker, J. Deng, M.S. Moran, F.A. Rogers, Z. Yun

Assistant Professors R.S. Bindra, J.N. Contessa, S. Damast, S.B. Evans, F. Guo, J.E. Hansen, Z.A. Husain, R.B. Jensen, K.L. Johung, S. Kamath, W. Liu, B. McGibbon, A.A. Patel, F. Su, J.B. Yu

Senior Research Scientist D.E. Brash

Associate Research Scientists R. Bahal, M. Kaushik, Q. Lin, Y. Lu, A. Narayan, S. Premi, A.G. Senejani, N. Tiwari

Clinical Professors D.E. Brash, N. Dainiak (*Medicine*)

Associate Clinical Professors F.S. Cardinale, J.G. Cardinale, P.M. Pathare

Assistant Clinical Professors J. Albanese, J.E. Bond, J.Y. Chung, C.A. Knowlton

Clinical Instructor A.K. Jain

Lecturers H.M. Lincoln, R. Vera

THER 101, Clinical Clerkship in Radiation Therapy A flexible program designed to introduce the medical student to radiation therapy. The biological and physical bases of radiation therapy, together with clinical practice and ongoing research. Clinical exposure to patients with malignant disease, with between ninety and one hundred ten treated daily in the department. The student takes part in departmental conferences, clinics, lectures, and individual teaching sessions. Limited to two students at any time. R.H. Decker and staff

THER 102, Clinical Radiobiology This course is designed to provide residents in radiation oncology with a comprehensive review of clinical radiobiology as it applies to the practice of radiation therapy. The course is open to residents and fellows in other disciplines interested in radiobiology as it applies to clinical oncology. The course participant attends approximately twenty lectures in clinical radiobiology, which are delivered throughout the academic year between September and June. Scheduling by arrangement with R.H. Decker

THER 201b, A Survey of Radiobiology A review of the interaction of radiation on living organisms, progressing from DNA damage to complex mammalian systems. Modern concepts in molecular biology and cell kinetics are emphasized in understanding the sequelae of this interaction and the mechanism by which the organism responds to the injury produced. Fourteen sessions. By arrangement with Radiobiology staff

THER 300, Radiation Oncology Elective A flexible program designed to introduce the student to radiation oncology. The biological and physical basis of radiation oncology, together with clinical practice and ongoing research. Clinical exposure to patients with malignant disease, with between seventy-five and one hundred patients treated daily in the department. The student takes part in departmental conferences, clinics, lectures, and individual training sessions. Maximum of three students every four weeks. Director: R.H. Decker

THER 305, Principles and Methods of Radiation Dosimetry A graduate-level course for physics students or medical students with a strong physics background who want to learn about radiation dosimetry as it applies to medical practice. Topics include X-ray spectra, ionization chambers, X-ray exposure and the roentgen, mass energy-absorption coefficients, the Bragg-Gray principle, stopping power and linear energy transfer, chemical dosimeters, instrumentation, and physical aspects of radiology. Approximately twenty hours of tutorial sessions. Scheduling by arrangement with instructor. R. Nath

THER 306, Laboratory Projects in Radiation Dosimetry Students are given problems that relate to and supplement long-term, ongoing radiation dosimetry projects within the department. Prerequisite: THER 305, or its equivalent. Scheduling by arrangement with instructor. R. Nath

UROLOGY

FMP 300, 203.737.6038
http://medicine.yale.edu/urology

Professors T.C. Chai, H.E. Foster, B. Lytton (*Emeritus*), D. Petrylak (*Medicine*), P. Schulam (*Chair*), R.M. Weiss

Associate Professors J.W. Colberg, L.M. Rickey

Assistant Professors R.S. Bercik (*Obstetrics, Gynecology & Reproductive Sciences*), M.K. Guess (*Obstetrics, Gynecology & Reproductive Sciences*), A.B. Hittelman, P.A. Kenney, C.R. Loose (*Adjunct*), P. Motamedinia, J.S. Rosoff, B.M. Shuch, D. Singh, P. Sprenkle, C.N. Walker

Instructor M.J. Whalen

Associate Research Scientists M. Lu, D.T. Martin, C.B. Nawaf, Y. Zheng (*Engineering & Applied Science*)

Assistant Clinical Professors P.A. Kraus, R.F. Stroup

Clinical Instructors J. Chang, J. Devanney, J.J. Williams

Urology electives are listed under the Department of Surgery.

Yale Cancer Center

WWW 205, 203.785.4095
Director: T.J. Lynch
www.yalecancercenter.org

MEMBERSHIP

Professors K.S. Anderson (*Pharmacology*), S. Ariyan (*Surgery*), P.W. Askenase (*Internal Medicine*), A.E. Bale (*Genetics*), L.M. Bartoshuk (*Surgery*), S. Baserga (*Molecular Biophysics & Biochemistry*), J.R. Bender (*Internal Medicine*), S.L. Bernstein (*Emergency Medicine*), J.L. Bolognia (*Dermatology*), A.L.M. Bothwell (*Immunobiology*), E.H. Bradley (*Public Health*), R.R. Breaker (*Molecular, Cellular & Developmental Biology*), R. Bucala (*Internal Medicine*), B. Burtness (*Internal Medicine*), L.G. Cantley (*Internal Medicine*), N. Carrasco (*Cellular & Molecular Physiology*), R.E. Carson (*Diagnostic Radiology; Biomedical Engineering*), T.C. Chai (*Urology*), L. Chen (*Immunobiology*), Z. Chen (*Therapeutic Radiology*), Y.-C. Cheng (*Pharmacology*), E.B. Claus (*Public Health*), L. Cooley (*Genetics; Cell Biology; Molecular, Cellular & Developmental Biology*), D.L. Cooper (*Internal Medicine*), J. Costa (*Pathology*), J. Craft (*Internal Medicine*), P. Cresswell (*Immunobiology*), C.M. Crews (*Molecular, Cellular & Developmental Biology*), P. De Camilli (*Cell Biology*), F. Detterbeck (*Surgery*), V.T. DeVita, Jr. (*Internal Medicine*), M.V. Dhodapkar (*Internal Medicine*), D.C. DiMaio (*Genetics*), R. Dubrow (*Public Health*), J.S. Duncan (*Diagnostic Radiology*), R.L. Edelson (*Dermatology*), J.P. Eder (*Internal Medicine*), B.E. Ehrlich (*Pharmacology*), J.A. Elias (*Internal Medicine*), J.A. Ellman (*Chemistry*), D. Engelman (*Molecular Biophysics & Biochemistry*), R.A. Flavell (*Immunobiology*), B.G. Forget (*Internal Medicine*), F. Foss (*Dermatology*), J.E. Galán (*Microbial Pathogenesis*), A. Garen (*Molecular Biophysics & Biochemistry*), J. Geibel (*Surgery*), M.B. Gerstein (*Molecular Biophysics and Biochemistry*), M. Girardi (*Dermatology*), P.M. Glazer (*Therapeutic Radiology*), E.J. Glusac (*Pathology*), S. Gore (*Cancer Center*), C.P. Gross (*Internal Medicine*), M. Gunel (*Neurosurgery; Neurobiology*), C. Hatzis (*Medical Oncology*), R. Herbst (*Internal Medicine*), S. Herzon (*Chemistry*), H. Hetherington (*Neurosurgery*), S.A. Higgins (*Therapeutic Radiology*), H. Hochster (*Medical Oncology*), M.W. Hochstrasser (*Molecular Biophysics & Biochemistry*), T.R. Holford (*Public Health*), S.D. Hudnall (*Pathology; Laboratory Medicine*), D.F. Hyder (*Diagnostic Radiology*), K.L. Insogna (*Internal Medicine*), A. Iwasaki (*Immunobiology; Molecular, Cellular & Developmental Biology*), W.L. Jorgensen (*Chemistry*), P.B. Kavathas (*Laboratory Medicine*), K.K. Kidd (*Genetics*), M.T. Knobf (*School of Nursing*), A.J. Koleske (*Molecular Biophysics & Biochemistry*), W.H. Konigsberg (*Molecular Biophysics & Biochemistry*), D.S. Krause (*Laboratory Medicine*), G. Kupfer (*Pediatrics*), D.R. Lannin (*Surgery*), S.B. Leder (*Surgery*), D.J. Leffell (*Dermatology*), P. Lengyel (*Emeritus; Molecular Biophysics & Biochemistry*), R. Lifton (*Genetics*), R.C. Lilenbaum (*Medical Oncology*), H. Lin (*Cell Biology*), E. Lolis (*Pharmacology*), P. LoRusso (*Cancer Center*), K.B. Low (*Therapeutic Radiology*), T.J. Lynch, Jr. (*Cancer Center*), J.A. Madri (*Pathology*), M.J. Mamula (*Internal Medicine*), R. McCorkle (*School of Nursing*), J.M. McNiff (*Dermatology*), R. Medzhitov (*Immunobiology*), I.G. Miller (*Pediatrics*), S.J.

Miller (*Chemistry*), W. Min (*Pathology*), G.G. Mor (*Obstetrics, Gynecology & Reproductive Sciences*), J.S. Morrow (*Pathology*), D. Narayan (*Surgery*), R. Nath (*Therapeutic Radiology*), M.H. Nathanson (*Internal Medicine*), K. Neugebauer (*Molecular Biophysics & Biochemistry*), S. O'Malley (*Psychiatry*), P. Patrizio (*Obstetrics, Gynecology & Reproductive Sciences*), P. Peduzzi (*Public Health*), R.E. Peschel (*Therapeutic Radiology*), D. Petrylak (*Internal Medicine*), A. Phillips (*Chemistry*), J.M. Piepmeier (*Neurosurgery*), J.S. Pober (*Pathology*), L. Pusztai (*Internal Medicine*), A.M. Pyle (*Molecular Biophysics & Biochemistry*), L. Regan (*Molecular Biophysics & Biochemistry; Chemistry*), D.L. Rimm (*Pathology*), H.A. Risch (*Public Health*), J.D. Roberts (*Cancer Center*), K.B. Roberts (*Therapeutic Radiology*), J.K. Rose (*Pathology*), N.H. Ruddle (*Public Health*), P. Salovey (*Psychology*), W.M. Saltzman (*Biomedical Engineering*), A. Santin (*Obstetrics, Gynecology & Reproductive Sciences*), A.C. Sartorelli (*Pharmacology*), C.T. Sasaki (*Surgery*), D.G. Schatz (*Immunobiology*), A. Schepartz (*Chemistry; Molecular, Cellular & Developmental Biology*), J. Schlessinger (*Pharmacology*), P. Schulam (*Pathology*), P.E. Schwartz (*Obstetrics, Gynecology & Reproductive Sciences*), W.C. Sessa (*Pharmacology*), G. Shadel (*Pathology; Genetics*), W.D. Shlomchik (*Internal Medicine*), J. Sklar (*Pathology*), B.R. Smith (*Laboratory Medicine*), E.L. Snyder (*Laboratory Medicine*), Y.H. Son (*Therapeutic Radiology*), J.A. Steitz (*Molecular Biophysics & Biochemistry*), D.F. Stern (*Pathology*), P. Sung (*Molecular Biophysics & Biochemistry*), J.B. Sweasy (*Therapeutic Radiology*), M. Sznol (*Internal Medicine*), P.J. Tattersall (*Laboratory Medicine*), H.S. Taylor (*Obstetrics, Gynecology & Reproductive Sciences*), R.E. Tigelaar (*Dermatology*), R. Udelsman (*Surgery*), A.N. Van den Pol (*Neurosurgery*), V. Vasiliou (*Public Health*), R. Weiss (*Urology*), S.M. Weissman (*Genetics*), K.R. Williams (*Adjunct; Molecular Biophysics & Biochemistry*), L.D. Wilson (*Therapeutic Radiology*), S.L. Wolin (*Cell Biology*), D. Wu (*Pharmacology*), J.J. Wysolmerski (*Internal Medicine*), T. Xu (*Genetics*), W. Yarbrough (*Surgery*), H. Yu (*Public Health*), H. Zhao (*Public Health*), T. Zheng (*Public Health*)

Associate Professors M. Abu Khalaf (*Cancer Center*), M. Azodi (*Obstetrics, Gynecology & Reproductive Sciences*), J.M. Baehring (*Neurology; Neurosurgery*), A.M. Bennett (*Pharmacology*), D.J. Boffa (*Surgery*), T. Boggon (*Pharmacology*), M.W. Bosenberg (*Dermatology*), D. Braddock (*Pathology*), J.L. Brandsma (*Comparative Medicine*), D.A. Calderwood (*Pharmacology*), T. Carling (*Surgery*), C. Cha (*Surgery*), A.B. Chagpar (*Surgery*), S. Chang (*Laboratory Medicine*), H.H. Chao (*Internal Medicine*), V.L. Chiang (*Neurosurgery*), K.A. Choate (*Dermatology*), J.W. Colberg (*Urology*), R.H. Decker (*Therapeutic Radiology; Surgery*), J. Deng (*Therapeutic Radiology*), K. Dhodapkar (*Pediatrics*), M.P. DiGiovanna (*Cancer Center*), T. Fahmy (*Biomedical Engineering*), J.J. Farrell (*Internal Medicine*), S.N. Gettinger (*Cancer Center*), A.J. Giraldez (*Genetics*), V. Greco (*Genetics*), J. Grutzendler (*Neurology; Neurobiology*), Y. Ha (*Pharmacology*), M. Hodsdon (*Laboratory Medicine*), J. Hoh (*Public Health; Ophthalmology & Visual Science*), M.L. Irwin (*Public Health*), S.E. Jordt (*Pharmacology*), N.S. Kadan-Lottick (*Pediatrics*), S.M. Kaech (*Immunobiology*), J. Kapo (*Internal Medicine*), P.A. Kenney (*Internal Medicine*), A.W. Kim (*Surgery*), J.W. Kim (*Cancer Center*), S.H. Kleinstein (*Pathology*), H.M. Kluger (*Cancer Center*), Y. Kluger (*Pathology*), J.P. Koo (*Internal Medicine*), M. Krauthammer (*Pathology*), S. Krishnan-Sarin (*Psychiatry*), J. Lacy (*Internal Medicine*), R. Lazova (*Dermatology*), P. Li (*Genetics*), H. Lin (*Public Health*),

B. Lindenbach (*Microbial Pathogenesis*), D.M. Lindskog (*Orthopaedics & Rehabilitation*), X. Llor (*Internal Medicine*), S. Ma (*Public Health*), X. Ma (*Public Health*), M.A. Materin (*Ophthalmology & Visual Science*), S. McKee (*Psychiatry*), R. Means (*Pathology*), E.R. Meffre (*Immunobiology*), M.S. Moran (*Therapeutic Radiology*), E.D. Morris (*Diagnostic Radiology; Biomedical Engineering; Psychiatry*), W. Mothes (*Microbial Pathogenesis*), L.M. Niccolai (*Epidemiology*), J.P. Noonan (*Genetics*), M. Nuñez-Smith (*Internal Medicine*), E. Paintsil (*Infectious Disease*), M. Prasad (*Pathology*), M. Robek (*Pathology*), M.G. Rose (*Cancer Center*), S. Seropian (*Internal Medicine*), M. Sofuoglu (*Psychiatry*), D.A. Spiegel (*Chemistry*), R. Sutton (*Internal Medicine*), D.K. Toomre (*Cell Biology*), J. Townsend (*Public Health*), B. Turk (*Pharmacology*), S.D. Weatherbee (*Genetics*), Y. Xiong (*Molecular Biophysics & Biochemistry*), X. Yang (*Comparative Medicine; Cellular & Molecular Physiology*), Z. Yun (*Therapeutic Radiology*), Y. Zhang (*Public Health*), Y. Zhu (*Public Health*)

Assistant Professors K.B. Adelson (*Internal Medicine*), K.P. Becker (*Neurology*), R.S. Bindra (*Therapeutic Radiology*), D.S. Brandt (*Cancer Center*), D.J. Carlson (*Therapeutic Radiology*), A. Chiang (*Cancer Center*), D. Chirnomas (*Hematology; Oncology*), J. Choi (*Dermatology*), J.N. Choi (*Dermatology*), G.G. Chung (*Cancer Center*), O.R. Colegio (*Dermatology*), J.N. Contessa (*Therapeutic Radiology*), J.M. Crawford (*Chemistry*), S. Damast (*Therapeutic Radiology*), H.A. Deshpande (*Cancer Center*), N.C. Deziel (*Public Health*), A.S. El-Guindy (*Pediatrics: Infectious Disease*), B. Emu (*Internal Medicine*), S.B. Evans (*Therapeutic Radiology*), R. Fan (*Biomedical Engineering*), S. Ghosh (*Neurology*), S.B. Goldberg (*Internal Medicine*), A. Goodman (*Microbial Pathogenesis*), B.E. Gould-Rothberg (*Medical Oncology*), F. Guo (*Therapeutic Radiology*), S. Guo (*Cell Biology*), A. Haberman (*Laboratory Medicine*), S. Halene (*Hematology*), D. Han (*Surgery*), J.E. Hansen (*Therapeutic Radiology*), S. Hattangadi (*Hematology*), E.W. Hofstatter (*Medical Oncology*), N.R. Horowitz (*Surgery*), V. Horsley (*Molecular Cellular & Developmental Biology*), M. Hurwitz (*Medical Oncology*), Z. Husain (*Therapeutic Radiology*), N. Issaeva (*Surgery*), N. Ivanova (*Genetics*), R.B. Jensen (*Therapeutic Radiology*), B. Judson (*Surgery/Otolaryngology*), S. Katz (*Pathology*), S. Khan (*Surgery*), R.G. Kibbey (*Endocrinology*), B. Killelea (*Surgery*), M.C. King (*Cell Biology*), M.A. Kriegel (*Immunobiology*), P. Kumar (*Internal Medicine*), S. Kwei (*Plastic Surgery*), J. Li (*Comprehensive Cancer Center*), W. Liu (*Therapeutic Radiology*), J. Lu (*Genetics*), A.M. Marks (*Pediatrics*), G.C. Michaud (*Internal Medicine*), K. Miller-Jensen (*Biomedical Engineering; Molecular, Cellular & Developmental Biology*), J. Moliterno-Gunel (*Neurosurgery*), S.S. Mougalian (*Internal Medicine*), N. Neparidze (*Internal Medicine*), D. Nguyen (*Pathology*), T.L. Parker (*Cancer Center*), A.A. Patel (*Therapeutic Radiology*), J.P. Pereira (*Immunobiology*), M. Pillai (*Hematology*), N.A. Podoltsev (*Hematology*), K. Politi (*Pathology*), J.T. Puchalski (*Internal Medicine*), E. Ratner (*Obstetrics, Gynecology & Reproductive Sciences*), F.A. Rogers (*Therapeutic Radiology*), C.V. Rothlin (*Immunobiology*), T. Sanft (*Medical Oncology*), C. Schlieker (*Molecular Biophysics & Biochemistry*), E.U. Seli (*Neurosurgery*), F.M. Shebl (*Epidemiology*), S.S. Sheth (*Obstetrics, Gynecology & Reproductive Sciences*), B. Shuch (*Internal Medicine*), P. Sprenkle (*Internal Medicine*), S. Stein (*Medical Oncology*), M. Strout (*Internal Medicine*), Y. Suarez (*Comparative Medicine*), S. Takyar

(*Internal Medicine*), N. Wajapeyee (*Pathology*), S. Wang (*Epidemiology*), A. Xiao (*Genetics*), M.L. Xu (*Pathology; Laboratory Medicine*), Q. Yan (*Pathology*), J.B. Yu (*Therapeutic Radiology*), J. Zhou (*Neurosurgery; Biomedical Engineering*)

Associate Director R.L. Mehta (*Cancer Center, Rapid Case Ascertainment Shared Resource*)

Senior Research Scientists D.E. Brash (*Therapeutic Radiology*), B. Cartmel (*Public Health*), A. Davidoff (*Public Health*), R. Halaban (*Dermatology*), S.M. Mane (*Molecular Biophysics & Biochemistry*)

Research Scientists F. D'Errico (*Diagnostic Radiology*), B.A. Jones (*Public Health*), J. Juergensmeier (*Internal Medicine*), J. Lu (*Public Health*), J.M. McGrath (*Comparative Medicine*), D.J. Schulman-Green (*School of Nursing*)

Associate Research Scientists L.P. Blair (*Pathology*), H. De Feyter (*Diagnostic Radiology*), E. Ercolano (*School of Nursing*), L.M. Ferrucci (*Epidemiology: Chronic Diseases*), D.J. Hanlon (*Dermatology*), T. Lam (*Molecular Biophysics & Biochemistry*), D.T. Martin (*Urology*), K. Schalper (*Pathology*), D. Sells (*Psychiatry*), J. Wang (*Immunobiology*)

Clinical Professor L. Farber (*Internal Medicine*)

Associate Clinical Professor A.L. Silber (*Internal Medicine*)

Instructors S. Halene (*Internal Medicine*), M.P. Strout (*Hematology*)

The center supports a $98 million research base to promote translational research through collaborations between and within seven basic, epidemiological, and clinical research programs. Basic research programs in Signal Transduction, Cancer Genetics and Genomics, Molecular Virology, and Developmental Therapeutics are integrated with clinical research programs in Cancer Immunology and Radiobiology and Radiotherapy, and one epidemiological program, Cancer Prevention and Control. The center also supports seven shared facilities that are available for oncological research: Flow Cytometry, Cesium 137 Irradiator, Rapid Case Ascertainment, Biostatistics, Yale Center for Genome Analysis, Yale Pathology Tissue Services, and the Yale Center for Molecular Discovery. Information regarding patient care, research, and cancer prevention and control may be obtained by telephoning 203.785.4095.

School of Nursing

The following courses in the School of Nursing are offered to interested medical students. For more information, contact faculty of record.

NURS 633a, Health Promotion in Infants and Children 2 credit hours. This course is designed to introduce the student to the primary care of children from infancy through adolescence. Key aspects of health promotion and disease prevention in culturally diverse pediatric populations are discussed within the context of the national health agenda. Health risks and behaviors of diverse populations are explored to determine culturally sensitive interventions. Clinical applications of concepts, theories, current health policies, and evidence-based best-practice guidelines related to well-child care are presented. Required of pediatric nurse practitioner and family nurse practitioner students in the first year of specialization; open to others with permission of the instructor. M. Meadows-Oliver

NURS 733b/REL 977b, Living with Dying 1.5–3.0 credit hours. This course develops students' cultural and gender awareness, understanding, and competencies in creating environments to relieve suffering for individuals and their families who have experienced a death or are caring for someone who is dying. Emphasis is on nonpharmacologic interventions to relieve suffering, including spiritual, interpersonal, and sociocultural. The course is structured with the premise that relief from suffering, meaning, and transcendence at the end of life are best achieved and understood through the interpersonal use of narrative techniques, like storytelling, to facilitate communication. One and one-half hours per week. R. McCorkle

NURS 769a, Advanced Concepts and Principles of Diabetes Care 2 credit hours. This seminar focuses on the concepts and principles of diabetes managed care based on the annually updated American Diabetes Association Standards of Care. It includes principles of primary care (screening, early detection, intervention, and patient education), secondary care principles related to diabetes management (various treatment modalities, patient education, and self-care), and tertiary care related to complications. These concepts and principles of care are presented relative to type of diabetes (type 1, type 2, gestational, diabetes in pregnancy, and secondary), age, developmental stage, duration of disease, and ethnicity. A multidisciplinary approach to care issues is emphasized, incorporating the contributions of other disciplines in the collaborative management of diabetes. Important aspects of living with a chronic illness such as psychological, social, occupational, and economic are also emphasized. Required of all students in the diabetes care concentration in the final year. V. Jefferson

Postgraduate Study

Graduate medical education in clinical departments is based upon the residency training programs of the Yale-New Haven Medical Center. Initial appointments are offered in Anesthesiology, Combined Child and Adult Psychiatry, Dermatology, Diagnostic Imaging, Emergency Medicine, Internal Medicine Primary Care, Internal Medicine, Neurology, Neurosurgery, Obstetrics and Gynecology, Ophthalmology, Orthopaedics and Rehabilitation, Otolaryngology, Pathology, Pediatrics, Plastic Surgery, Psychiatry, Surgery, Therapeutic Radiology, Thoracic Surgery, Urology, and Vascular Surgery; appointments are made through the National Resident Matching Program or the appropriate specialty matching program (Ophthalmology and Urology). Residencies are also offered in Dentistry, Pediatric Dentistry, Oral Maxillofacial Surgery, and Podiatry. Subspecialty residency programs are offered in the following specialties:

Anesthesiology
Cardiothoracic Surgery
Child Psychiatry
Dermatology
Diagnostic Radiology
Emergency Medicine
Internal Medicine
Medical Genetics
Neurology
Neurosurgery
Obstetrics and Gynecology
Pathology and Laboratory Medicine (AP/CP)
Pediatric Surgery
Pediatrics
Psychiatry

The School of Medicine and Yale-New Haven Hospital are joined in the establishment and management of an Office of Graduate Medical Education of Yale-New Haven Medical Center. Residents at the Yale-New Haven Hospital and the VA Connecticut Healthcare System, West Haven, are enrolled as postgraduate students in the School of Medicine in addition to their hospital appointments. In most of the clinical departments, a limited number of fellowships for research or clinical training are also available.

Detailed information concerning residency programs may be obtained from the chair of the appropriate department. Applicants must be graduates of an approved medical school in the United States or Canada or have successfully completed the requirements of the ECFMG and have a valid ECFMG certificate. General information may be obtained by visiting the Yale-New Haven Medical Center Graduate Medical Education Web site (www.ynhh.org/gme/welcome-to-ynhhgme.aspx) or the Yale School of Medicine site (http://medicine.yale.edu/ysm/departments) and visiting the appropriate department.

Continuing Medical Education

The mission of the Yale School of Medicine's Center for Continuing Medical Education is to advocate and support the continuing professional development of health care professionals. Through its Center for Continuing Medical Education, the School of Medicine offers a full range of evidence-based educational programs that enhance the practitioner's knowledge base, provide updates and review, and expand professional skills.

Yale School of Medicine is accredited by the Accreditation Council for Continuing Medical Education as a provider of continuing medical education (CME). Under the auspices of the Yale Medical Group, the educational programs sponsored by Yale CME include primary care, specialty, and subspecialty topics in the field of medicine. The scope of these activities involves the body of knowledge and skills generally recognized and accepted by the profession as within the basic medical sciences, the discipline of clinical medicine, and the provision of health care to the public.

Yale CME provides content and material tailored to complement the participant's needs and schedule through the following educational activities: conferences and workshops; enduring materials; and distance education by personal computer and other innovative formats. The offerings are intended to enhance physician and other health professionals' professional development and influence their behavior for the purpose of improving health outcomes and patient care.

Courses offered include (a) review courses and symposia designed to present advances in the diagnosis and management of selected disorders of general interest; (b) courses of interest to physicians in a particular specialty; and (c) courses dealing with matters of public health and its administration, developed by the faculty of the Department of Epidemiology and Public Health.

Most regularly scheduled educational conferences (Grand Rounds) of the Yale-New Haven Medical Center are also open to all physicians for CME credit. Also available for physicians and certain other health care workers are the Online Learning Program, which includes Medical Center Grand Rounds webcasts, live conference webcasts, and *The Diabetes Newsletter*. Based on the contents of well-known and widely circulated medical publications, the examination program is developed, edited, and supervised within the Center for Continuing Medical Education.

The Yale CME Web site and the Yale-New Haven Medical Center Weekly Schedule of Events contain the most timely and detailed listing of all these events. They may be accessed at http://cme.yale.edu or http://tools.medicine.yale.edu/calendar. Inquiries should be addressed to the Center for Continuing Medical Education, PO Box 208052, New Haven CT 06520-8052; telephone, 203.785.4578; e-mail, cme@yale.edu.

Doctors of Medicine

CLASS OF 2015

Pending completion of all requirements

*Ph.D. to be awarded in December 2015

Caroline Albert, B.A., Yale University. *Hydroxychloroquine Prevents Antiphospholipid Antibody-Induced Inhibition of Trophoblast Migration*. Pediatrics: University of Pittsburgh Medical Center, Pittsburgh, Pa.

Andre Alcon, B.A., Dartmouth College. *Adipose Tissue Engineering Using Pericytes and Hyperbaric Oxygen Therapy to Improve Fat Graft Vascularity for Autologous Breast Reconstruction*. Plastic Surgery (Integrated): University of California–San Francisco, San Francisco, Calif.

Ryan Michael Aronberg, B.A., M.S., Johns Hopkins University. *The Changing Landscape of Oral Cavity Cancer: Analysis of Epidemiological and Genomic Data*. Transitional: St. Joseph Mercy Hospital Program, Ann Arbor, Mich.; Diagnostic Radiology: University of Michigan Hospitals–Ann Arbor, Ann Arbor, Mich.

Deepak S. Atri, B.A., Johns Hopkins University; M.H.S., Yale University. *Syndecan2 Controls Vascular Smooth Muscle Development and Cytoskeletal Dynamics*. Internal Medicine: Johns Hopkins Hospital, Baltimore, Md.

Raghav Badrinath, B.S., Johns Hopkins University. *Exploring Femoroacetabular Impingement: An Examination of the Evolution of the Disease and Implications for the Development of Osteoarthritis*. Orthopaedic Surgery: University of California–San Diego, San Diego, Calif.

Paul S. Bagi, B.S., Cornell University. *Isolation of Bone Marrow Mononuclear Cells for Fabrication of Tissue-engineered Vascular Grafts: Evaluation of Two Methods*. Orthopaedic Surgery: Yale-New Haven Hospital, New Haven, Conn.

Aditi Balakrishna, A.B., Harvard University. *Hearts with Cardiac Arrest History Safe for Transplant in the Context of Donor and Recipient Factors*. Medicine–Preliminary. Yale-New Haven Hospital, New Haven, Conn.; Anesthesiology: Massachusetts General Hospital, Boston, Mass.

Zev Balsen, B.S., Yale University. *Counting Uncounted Gunshot Injuries: A Capture-Recapture Study of People Minding Their Own Business*. Emergency Medicine: Yale-New Haven Hospital, New Haven, Conn.

Jacob F. Baranoski, B.S., Georgetown University; M.H.S., Yale University. *SMARCB1-Mutant Intracranial Meningiomas: A Distinct Subtype of NF2-Mutant Tumors*. Neurosurgery: St. Joseph's Hospital (Barrow Neurological Institute), Phoenix, Ariz.

Christopher M. Bartley, B.S., Ph.D., Yale University. *A Fragile Connection: Disentangling Two Autism Spectrum Disorders*. Psychiatry: University of California–San Francisco, San Francisco, Calif.

Bryce Alexander Basques, B.S., University of Miami; M.H.S., Yale University. *Predicting Thirty-Day Readmission after Orthopaedic Surgery*. Orthopaedic Surgery: Rush University Medical Center, Chicago, Ill.

Jessica Elizabeth Mirabito Becker, A.B., Harvard University. *Reporting of Results in ClinicalTrials.gov and High-Impact Journals: A Cross-Sectional Study*. Pediatrics/Psychiatry–Adult & Child: Massachusetts General Hospital, Boston, Mass.

Rohan Bhandari, B.A., B.S., Emory University. *An Evaluation of the Genetic Markers Implicated in Thoracic Aortic Disease*. Internal Medicine: University of Michigan Hospitals–Ann Arbor, Ann Arbor, Mich.

Vicki Bing, B.S., University of Toronto. *Photoplethysmographic Delineation of Arterial and Venous Volume Responses to Release of Lower Body Negative Pressure*. Medicine–Preliminary: University of Maryland/Mercy Medical Center, Baltimore, Md; Anesthesiology: Johns Hopkins Hospital, Baltimore, Md.

Remy Bizimungu, A.B., Harvard University. *Objective Outcomes Following Semi-Constrained Total Distal Radioulnar Joint Arthroplasty*. Emergency Medicine: University of California–San Francisco, San Francisco, Calif.

Adriana Blakaj, B.S., Ph.D., Yale University. *The Role of Fibrocytes and Metallothioneins in Fibroproliferative Disorders*. Transitionala: Memorial Sloan-Kettering Cancer Center, New York, N.Y.; Radiation Oncology: University of Washington Affiliated Hospitals, Seattle, Wash.

Daniel David Bohl, B.A., Northwestern University; M.P.H., University of California–Berkeley. *Analysis of Adverse Event Rates Following Orthopaedic Surgery in the United States*. Orthopaedic Surgery: Rush University Medical Center, Chicago, Ill.

Eric David Kenny Brooks, B.S., Cornell University; M.H.S., Yale University. *Brain Normalization and Connectivity in Nonsyndromic Craniosynostosis*. Transitional: Memorial Sloan-Kettering Cancer Center, New York, NY; Radiation Oncology: The University of Texas MD Anderson Cancer Center, Houston, Tex.

Jason Robert Brown, B.S., Duke University; Ph.D., Yale University. *Quantitative Analysis of Protein Biomarkers of Proliferation and Immune Infiltration in the Setting of Neoadjuvant Chemotherapy for Breast Cancer*. Internal Medicine: University of Michigan Hospitals–Ann Arbor, Ann Arbor, Mich.

Emily Marie Bucholz, B.S., M.P.H., Ph.D., Yale University. *Long-Term Outcomes and Life Expectancy in Elderly Patients with Acute Myocardial Infarction*. Pediatrics: Children's Hospital of Boston, Boston, Mass.

Allison M. Campbell, B.A., Amherst College; Ph.D., Yale University. *The Role of NADPH Oxidase in the Pathogenesis of Systemic Lupus Erythematosus*. Medicine–Preliminary: Yale-New Haven Hospital, New Haven, Conn.; Radiation Oncology: Yale-New Haven Hospital, New Haven, Conn.

Barbara Hirschman Chaiyachati, B.A., Macalester College; Ph.D., Yale University. *BAF Complex in the Immune System: Biological Functions and Genetic Approaches*. Pediatrics: Children's Hospital of Philadelphia, Philadelphia, Pa.

Harry Chang, B.A., Brown University; M.P.H., University of California–Berkeley. *Medicare and Medicaid Enrollment and Utilization among HIV-infected and Uninfected Veterans in VA Care*. Internal Medicine: New York Presbyterian Hospital–Columbia, New York, N.Y.

Serene I. Chen, A.B., Harvard University. *Trends in National Shortages of Acute Care Drugs, 2001–2014*. Emergency Medicine: Alameda County Medical Center, Oakland, Calif.

Sakil Chundydyal, B.S., University of Pennsylvania; Graduate Diploma in Clinical Research, McGill University. *Is the Lack of Systematic Dermatologic Referral Process Delaying the Timely Diagnosis of Skin Cancer in Solid Organ Transplant Recipients?* Psychiatry: Cambridge Health Alliance Program, Cambridge, Mass.

Susan Elizabeth Combs, B.A., University of Oxford. *Evaluating Curative Intent Resections for Stage I-IIIA Small Cell Lung Cancers*. Internal Medicine: Cleveland Clinic Foundation, Cleveland, Ohio

Kate Davis, B.S., University of Miami. *Autophagy over the Lifespan: Using Fetal, Stem Cell, and Adult RPE Cultures to Model AMD Pathogenesis*. Transitional: St. Joseph Mercy Hospital Program, Ann Arbor, Mich.; Ophthalmology: University of Michigan Hospitals–Ann Arbor, Ann Arbor, Mich.

Uma Deshmukh, B.A., Swarthmore College; M.U.P., New York University. *Behavioral Outcomes in Children Exposed Prenatally to Lamotrigine, Valproate, or Carbamazepine*. Obstetrics and Gynecology: Yale-New Haven Hospital, New Haven, Conn.

Anna Ruth Duncan, B.A., Brown University; M.H.S., Yale University. *The Heterotaxy Candidate Gene, TMEM195, Regulates Nuclear Localization of Beta-catenin*. Pediatrics: Children's Hospital of Philadelphia, Philadelphia, Pa.

Nkemka Esiobu, B.S., M.P.H., University of Florida. *Gender and Depression among Veterans of Operation Enduring Freedom, Iraqi Freedom, and New Dawn*. Psychiatry: Yale-New Haven Hospital, New Haven, Conn.

Caroline Greenberg Falker, B.A., Brown University. *The Spectrum of Neurocognitive Abnormalities in Patients with Compensated Cirrhosis*. Internal Medicine: Yale-New Haven Hospital, New Haven, Conn.

Louis Edward Fazen, B.A., Brown University; *Ph.D., Yale University. *Evaluating Handheld Clinical Decision Support Tools to Improve Community-Based Delivery of Reproductive and Pediatric Health Services*. Internal Medicine/Primary Care: Yale-New Haven Hospital, New Haven, Conn.

Samir Gautam, B.A., Boston College; Ph.D., Yale University. *Re-engineering the Cell Wall of Staphylococcus Aureus with Small Molecules: Applications in Basic Bacteriology and Vaccine Design*. Internal Medicine/Physician Scientist: Yale-New Haven Hospital, New Haven, Conn.

Erik John Geiger, B.A., M.H.S., Yale University. *Surgical Reconstruction with Brachytherapy for Head and Neck Cancer: Complications and Recommendations*. Orthopaedic Surgery: University of California–San Francisco, San Francisco, Calif.

Juliet Fraser Gibson, B.A., Stanford University. *Improving Diagnosis of Cutaneous T-Cell Lymphoma through Fluorescence in Situ Hybridization and T-Cell Receptor VB Chain Analysis*. Medicine–Preliminary: Beth Israel Deaconess Medical Center, Boston, Mass.; Dermatology: University of Texas Southwestern Medical School Program, Dallas, Tex.

Thomas Candler Gilliland, Jr., B.S., Yale University. *Identification of a Long Non-Coding RNA Regulating Cholesterol Metabolism*. Internal Medicine. Brigham and Women's Hospital, Boston, Mass.

Nicholas Stephen Golinvaux, B.A., Yale University. *Limitations of Administrative Databases in Orthopaedic Surgery Research: A Study in Obesity and Anemia*. Orthopaedic Surgery: Vanderbilt University Medical Center, Nashville, Tenn.

Dan Ang Gong, A.B., Harvard University. *A Quantitative Analysis of the Relationship between Medicare Payment and Service Volume for Cataract, Glaucoma, and Retina Procedures from 2005 to 2009*. Medicine–Preliminary: Brigham and Women's Hospital, Boston, Mass.; Ophthalmology: New York Presbyterian Hospital–Columbia, New York, N.Y.

Jordan Alexander Gruskay, B.A., Amherst College. *Complications and Length of Stay Following Spine Surgery: Analyzing Local and National Cohorts*. Orthopaedic Surgery: Hospital for Special Surgery, New York, N.Y.

Abhijeet Gummadavelli, B.A., Johns Hopkins University. *Thalamic Neurostimulation to Improve Level of Consciousness after Seizures: An Electrophysiological and Behavioral Evaluation*. Neurosurgery: Yale-New Haven Hospital, New Haven, Conn.

Jennifer Nai-Zhen Guo, B.A., M.S., Johns Hopkins University; Ph.D., Yale University. *EEG and fMRI Correlates of Behavior during Childhood Absence Seizures*. Psychiatry: University of California–San Francisco, San Francisco, Calif.

Akash Gupta, B.A., Columbia University. *Case Finding for Pulmonary Tuberculosis among People Who Inject Drugs in Dar Es Salaam, Tanzania*. Medicine/Pediatrics: Massachusetts General Hospital, Boston, Mass.

Sasha Gupta, B.A., University of California–Berkeley. *B Cell Tolerance Checkpoint Defects in Seropositive Myasthenia Gravis Patients*. Neurology: University of California–San Francisco, San Francisco, Calif.

Stefan Gysler, B.M.Sc., University of Western Ontario; M.H.S., Yale University. *Novel Mechanisms of Trophoblast Responses to Antiphospholipid Antibodies and Therapeutics in Obstetric Antiphospholipid Syndrome*. Obstetrics and Gynecology: Yale-New Haven Hospital, New Haven, Conn.

Andy Han, B.A., University of Pennsylvania. *Targeted Therapy versus Placebo or Interferon-alpha for Metastatic Renal Cell Carcinoma*. Postdoctoral Associate: Wilmer Eye Institute–Johns Hopkins University, Baltimore, Md.

Jacquelyn Gayle Hancock, B.S., Rhodes College. *Non-Small Cell Lung Cancer in the National Cancer Database*. Internal Medicine: Duke University Medical Center, Durham, N.C.

Eileen Harder, B.S., University of British Columbia. *Stereotactic Body Radiation Therapy for Early Stage Lung Cancer: A Report on Efficacy and Toxicity*. Medicine-Preliminary: Yale-New Haven Hospital, New Haven, Conn.; Radiation Oncology: Yale-New Haven Hospital, New Haven, Conn.

Xin He, B.S., Massachusetts Institute of Technology; M.B.A., Yale University. *Cost Analysis of Percutaneous Pulmonary Valve Implantation Versus Surgical Pulmonary Valve Replacement*. Internal Medicine: University of Michigan Hospitals– Ann Arbor, Ann Arbor, Mich.

Joseph Heng, B.S., Johns Hopkins University. *Significantly Increased Anesthetic Dosing in the Elderly Is Associated with Greater Hypotension and a Higher Frequency of Vasopressor Use*. Internal Medicine: Johns Hopkins Hospital, Baltimore, Md.

Joan How, A.B., Harvard University. *Tartrate-Resistant Acid Phosphatase: Prognosis in Colorectal Cancer and the M1/M2 Distinction*. Internal Medicine: Barnes-Jewish Hospital, St. Louis, Mo.

Ken Yon Hui, B.S., M.S., Ph.D., Yale University. *Beyond GWAs: Translating the Genetics of Crohn's Disease in Ashkenazi Jews*. Internal Medicine: Johns Hopkins Hospital, Baltimore, Md.

Adam Craig Kaufman, B.A., Columbia University; M.H.S., *Ph.D., Yale University. *Modulation of the PrPc Pathway Ameliorates Aßo Induced Dysfunction*. Otolaryngology: Hospital of the University of Pennsylvania, Philadelphia, Pa.

Rabeea F. Khan, B.A., B.S., Emory University. *Symptom Burden among Patients Hospitalized for Heart Failure*. Medicine–Preliminary: Icahn School of Medicine at St. Luke's Roosevelt Hospital Center, New York, N.Y.; Anesthesiology: Massachusetts General Hospital, Boston, Mass.

Nour Kibbi, A.B., Harvard University. *T Cell Calcium Flux and Clonal Proliferation Report on Antigen-Specific Myeloid Cell Encounters*. Medicine–Preliminary: Yale-New Haven Hospital, New Haven, Conn.; Dermatology: Yale-New Haven Hospital, New Haven, Conn.

Changhyun Michael Kim, B.A., Yale University. *Extracorporeal Photopheresis as an Immunotherapy in Murine Melanoma*. Transitional: Santa Clara Valley Medical Center, San Jose, Calif.; Dermatology: University of Pittsburgh Medical Center, Pittsburgh, Pa.

Roger Kim, B.S., Yale University. *The Regulation of NHE3 by Multi-Site Patterns of Phosphorylation*. Internal Medicine: Yale-New Haven Hospital, New Haven, Conn.

Idil Kore, A.B., Princeton University. *Neuropsychological Testing Impairment in Acute HIV and the Effects of Immediate Antiretroviral Therapy*. Internal Medicine: Brigham and Women's Hospital, Boston, Mass.

Lauren Norell Krumeich, B.S., Brown University. *A Retrospective Study of the Timing and Consequences of Vasoplegia after Cardiopulmonary Bypass*. General Surgery: Hospital of the University of Pennsylvania, Philadelphia, Pa.

Alexander James Kula, B.S., University of Arizona; M.H.S., Yale University. *Blood-Pressure Reduction Is Associated with Worsening in Renal Function but Does Not Prevent Successful Decongestion in Patients Treated for Acute Decompensated Heart Failure*. Pediatrics: University of Washington Affiliated Hospitals, Seattle, Wash.

David R. Kull, B.A., Merrimack College; M.P.H., Dartmouth College. *Thoracentesis in Cardiac Surgery Patients with Non-Specific Pleural Effusion: A Case-Control Study*. Surgery–Preliminary: University of Connecticut School of Medicine, Farmington, Conn.

Natalie Caballero Lastra, B.S., University of California–Davis. *Predictors of Response in the Multimodal Treatment of Attention Deficit and Hyperactivity Disorder Trial*. Psychiatry: Yale-New Haven Hospital, New Haven, Conn.

Olga Laur, B.S., Emory University; M.H.S., Yale University. *The Impact of Donor and Recipient Renal Dysfunction on Cardiac Allograft Survival: Insights into Reno-Cardiac Interactions*. Medicine–Preliminary: Greenwich Hospital, Greenwich, Conn.; Diagnostic Radiology: Brigham and Women's Hospital, Boston, Mass.

Brian Letzen, B.S., University of Florida; M.S., Johns Hopkins University. *Development of a Wireless Percutaneous Left Ventricular Assist Device*. Medicine–Preliminary: Yale-New Haven Waterbury Hospital, Waterbury, Conn.; Diagnostic Radiology: Yale-New Haven Hospital, New Haven, Conn.

Geoffrey Zhi-Je Liu, B.A., Yale University. *Cholinergic Neurotransmission in Partial Limbic Seizures*. Psychiatry: Massachusetts General Hospital, Boston, Mass.

Jia Liu, B.S., University of Virginia. *Age-Related Intravenous Induction Dosing in Patients Undergoing Gastrointestinal Surgeries*. Pediatrics/Anesthesiology: Children's Hospital of Boston, Boston, Mass.

Billy Lockhart, B.F.A., New York University; M.H.S., Yale University. *Evaluating Targeted and Immunomodulatory Therapies for Melanoma in a Genetically Engineered Mouse Melanoma Model*. Psychiatry: University of California–San Francisco, San Francisco, Calif.

Jean Lopez, B.A., Yale University. *Localized Knockout of TSC1 during Corticogenesis Generates Tuber-Like Lesions and Reduces Seizure Threshold in Mice*. Neurology: New York Presbyterian Hospital–Columbia, New York, N.Y.

Songprod Jonathan Lorgunpai, B.S., Messiah College. *Therapeutic Competition in Older Adults: Use of Medications That May Adversely Affect a Coexisting Condition*. Internal Medicine: Boston University Medical Center, Boston, Mass.

Alexander Luryi, B.S., Brown University; M.H.S., Yale University. *Positive Margins and Other Factors Associated with Survival in Early Stage Oral Cavity Squamous Cell Cancer: Prognostic Impact and Quality Measure*. Otolaryngology: Yale-New Haven Hospital, New Haven, Conn.

Benjamin James MacDougall, B.S., University of Ottawa. *Simulation-Based Training in Brain Death Determination*. Medicine-Preliminary: Yale-New Haven Hospital, New Haven, Conn.; Anesthesiology: Massachusetts General Hospital, Boston, Mass.

Matthew Marr, B.S., Yale University. *Optimizing the Melanoma Tropism of Mouse Parvovirus 1a for Use as a Viral Immunotherapy Vector*. Pediatrics: Children's Hospital of Philadelphia, Philadelphia, Pa.

James Seiken Martenson, B.A., Northwestern University; Ph.D., Yale University. *Distinct Subunit Roles in GABAA Receptor Biogenesis and Synaptic Localization*. Postdoctoral Associate: Department of Molecular and Cellular Biology, Harvard University, Boston, Mass.

Joshua Ethan Motelow, B.A., Ph.D., Yale University. *Does the Cortex Fall Asleep during Complex Partial Seizures?* Pediatrics: New York Presbyterian Hospital–Columbia, New York, N.Y.

Moustafa Khaled Moustafa, B.S., University of Michigan–Ann Arbor. *Telepsychiatry and Mental Health Care for Syrian Refugees in Turkey*. General Surgery: University of Virginia Program, Charlottesville, Va.

Regina Marie Melendez Nagarajan, B.A., Yale University. *Correlates of Cocaine Use in Pregnancy*. Psychiatry: Yale-New Haven Hospital, New Haven, Conn.

Allen D. Nicholson, B.S., Brigham Young University. *Skeletal Maturity Assessment: Calcaneal Apophyseal Ossification*. Orthopaedic Surgery: Yale-New Haven Hospital, New Haven, Conn.

Summer Agnes Jane Paradise, B.S., Eastern Connecticut State University. *Symptoms of Depression Are Linked to Subsequent Recurrent Chest Pain in Patients Admitted to an Emergency Department Chest Pain Unit*. Psychiatry/Neurology: New York University School of Medicine, New York, N.Y.

Esther You Park, B.S., Yale University. *Incidence of and Risk Factors for Anthracycline- and Trastuzumab-Associated Cardiotoxicity*. Medicine–Preliminary: UCLA Medical Center–Olive View Program, Sylmar, Calif.; Diagnostic Radiology: UCLA Medical Center, Los Angeles, Calif.

Luke R.G. Pike, B.S., Memorial University of Newfoundland; D.Phil., University of Oxford. *The Role of ATF4 in Hypoxia-Induced Cell Death in Cancer*. Medicine–Preliminary: Massachusetts General Hospital, Boston, Mass.; Radiation Oncology: Brigham and Women's Hospital, Boston, Mass.

Crystal Lynne Piper, B.A., Smith College; M.S., Rensselaer Polytechnic Institute. *A 35-Year Analysis of Gender Trends in Radiology Authorship*. Surgery–Preliminary: Icahn School of Medicine at Mount Sinai, New York, N.Y.; Diagnostic Radiology: Yale-New Haven Hospital, New Haven, Conn.

Jennifer L. Quon, B.S., New York University; M.H.S., Yale University. *Multimodal Evaluation of Cerebrospinal Fluid (CSF) Dynamics Following Extradural Decompression for Chiari I Malformation*. Neurosurgery: Stanford University Programs, Stanford, Calif.

Kyle Thomas Ragins, B.A., Claremont Mckenna College; M.B.A., Yale University. *A Model for Short-term Medical Service Trip Evaluation: Impact of a Hand Surgery Trip to Honduras*. Emergency Medicine: UCLA Medical Center, Los Angeles, Calif.

Gladys M. Rodriguez, B.S., Baylor University. *Language and Health in the Hispanic/Latino Population*. Internal Medicine: University of California–San Francisco, San Francisco, Calif.

Jon Santiago, B.A., University of Texas at Austin; M.P.H., University of Washington. *Racial/Ethnic Differences in the Presentation and Management of Severe Bronchiolitis*. Emergency Medicine: Boston University Medical Center, Boston, Mass.

Celestine Shih, B.S., Rice University; M.H.S., Yale University. *Effects of Degradation on Mechanical Properties of Tissue-Engineering Poly(glycolic acid) Scaffolds*. Orthopaedic Surgery: University of Minnesota Program, Minneapolis, Minn.

Bilal Ahmed Siddiqui, A.B., Harvard University. *B Lymphocytes in the Brains of Multiple Sclerosis Patients Mature in Peripheral Lymph Nodes*. Internal Medicine: Beth Israel Deaconess Medical Center, Boston, Mass.

Joome Suh, B.S., University of Rochester. *Progressive Increase in Central Nervous System Immune Activation in Untreated Primary HIV-1 Infection*. Medicine–Preliminary/Neurology: Massachusetts General Hospital, Boston, Mass.; Neurology: Brigham and Women's Hospital/Massachusetts General Hospital, Boston, Mass.

Kai Erik Swenson, A.B., Princeton University. *Evaluation of a 5-Group Classification System for Severe Sepsis by ED Vasopressor Use and Initial Serum Lactate*. Internal Medicine: Stanford University Programs, Stanford, Calif.

Victoria Vanessa Tate, B.S., Yale University. *Three Decades of Abusive Fractures at Yale-New Haven Children's Hospital*. Surgery–Preliminary: Greenville Health System/University of South Carolina Program, Greenville, S.C.

Apoorva Tewari, B.S., Yale University. *Determinants of Quality of Life in Cancer Survivors*. Otolaryngology: New York Presbyterian Hospital–Columbia and Cornell, New York, N.Y.

Emily Herron Thomas, B.A., Brown University; M.S., University of Mississippi. *Patients' Experiences Managing Cardiovascular Disease Risk Factors in Prison*. Internal Medicine/Primary Care: University of California–San Francisco, San Francisco, Calif.

James Edward Tooley III, B.A., Johns Hopkins University; M.H.S., Yale University. *FcR Non-binding Anti-CD3 mAb (Teplizumab) Inactivates CD8+ Central Memory Cells in Patients with Type 1 Diabetes and Identifies Responders to Treatment*. General Surgery: Stanford University Programs, Stanford, Calif.

Chung Sang Tse, B.S., University of Toronto. *Development, Implementation, and Evaluation of an End-of-Life-Care Online Module for Pre-Clinical Students*. Internal Medicine: Mayo Clinic College of Medicine (Rochester) Program, Rochester, Minn.

Sebastian Urday, A.B., Princeton University; M.Phil., University of Cambridge. *Targeting Secondary Injury in Intracerebral Hemorrhage—Peri-hematomal Edema*. Medicine–Preliminary: Yale-New Haven Hospital, New Haven, Conn.; Neurology: Brigham and Women's Hospital/Massachusetts General Hospital, Boston, Mass.

Eric Paul Venker, Pharm.D., St. Louis College of Pharmacy. *Vasoplegia: A Retrospective Evaluation of Risk Factors and Outcomes in Open-Heart Surgery Patients*. Internal Medicine: New York Presbyterian Hospital–Columbia, New York, N.Y.

Rebecca Vitale, A.B., Harvard University; M.P.H., Yale University. *Effectiveness of a Diabetic Ketoacidosis Prevention Intervention in Children with Type 1 Diabetes*. Medicine/Pediatrics: Yale-New Haven Hospital, New Haven, Conn.

Amanda Rose Wallace, A.B., Harvard University. *Neurocircuitry of Suicidal Behavior in Adolescents and Young Adults with Bipolar and Major Depressive Disorder*. Psychiatry: University of California–San Francisco, San Francisco, Calif.

Chen Wang, B.A., University of Colorado at Boulder; Ph.D., Yale University. *Modulation of Endothelial Cell-T Cell Interactions by Rapamycin*. Medicine–Preliminary: University of Washington Affiliated Hospitals, Seattle, Wash.; Dermatology: Stanford University Programs, Stanford, Calif.

Jessica Shar Wang, B.S., University of Michigan–Ann Arbor. *Effect of Therapeutic Interchange on Medication Errors at Hospital Admission and Discharge*. Internal Medicine/Primary Care: University of California–San Francisco, San Francisco, Calif.

Samantha Xiao Yan Wang, B.A., University of California–Berkeley; M.H.S., Yale University. *Continuous Twenty-Four-Hour Intraocular Pressure Related Ocular Dimensional Profiles Using a Contact Lens Sensor in Ocular Hypertensive Patients*. Internal Medicine: Stanford University Programs, Stanford, Calif.

Ruth Wangechi Wang'ondu, B.A., Wellesley College; Ph.D., Yale University. *Induction of Markers of DNA Damage Signaling upon Reactivation of Epstein-Barr Virus: A Novel Role for ZEBRA and the Pre-replicative Phase of the Viral Lytic Cycle*. Medicine/Pediatrics: Yale-New Haven Hospital, New Haven, Conn.

Austin Weiss, B.S., Duke University. *The Hepatitis C Care Continuum among Hiv-Infected Patients in a Large Urban Outpatient Clinic: Identifying Barriers to Achieving Optimal Outcomes*. Pediatrics: University of California–San Diego, San Diego, Calif.

Risa Liang Wong, B.S., University of Washington. *Student Characteristics Associated with Positive Attitudes toward Interprofessional Education*. Internal Medicine: Massachusetts General Hospital, Boston, Mass.

Carina Martin Woodruff, A.B., Harvard University. *Defining the Dermatologic Needs of Rural Communities in Uganda*. Medicine–Preliminary: Kaiser Permanente Oakland Medical Center, Oakland, Calif.; Dermatology: University of California–San Francisco, San Francisco, Calif.

Maryam Yeganegi, B.S., Ph.D., University of Toronto. *The Effect of Probiotic Lactobacilli on Cytokine Production and Prostaglandins in Gestational Tissues*. Obstetrics and Gynecology–Preliminary: Yale-New Haven Hospital, New Haven, Conn.

Andrew Christopher Young, B.A., Dartmouth College. *Cerebral Metabolite Changes Prior to and after Antiretroviral Therapy in Primary HIV Infection*. Medicine–Preliminary/Neurology: Massachusetts General Hospital, Boston, Mass.; Neurology: Brigham and Women's Hospital/Massachusetts General Hospital, Boston, Mass.

Peter Yu Cheng Zhao, B.A., Dartmouth College. *Tissue Engineering the Neural Retina with Human Embryonic Stem Cells: Exploring the Role of the Retinal Pigment Epithelium*. Medicine–Preliminary: Lankenau Medical Center Program, Wynnewood, Pa.; Ophthalmology: University of Michigan Hospitals–Ann Arbor, Ann Arbor, Mich.

Mojun Zhu, B.A., Mount Holyoke College. *A Naturally Secreted HER3 Isoform Inhibits Melanoma Cell Migration in a Tenascin C-dependent Manner*. Internal Medicine: Yale-New Haven Hospital, New Haven, Conn.

STUDENTS RECEIVING THE M.D. AND PH.D. DEGREES

Feras Akbik
Dylan Frances Davey
Alicia Joan Little
Nicole Ali McNeer
Ellen Marie Vollmers
Qing Yang

STUDENTS RECEIVING THE M.D. AND M.H.S. DEGREES

Jessica Ashley Berger
Rafael Antonio Buerba-Siller
Siobhan Mary Case
Michelle Mizhi Chen
Ethan Wesley Dean
Stephanie Raye Douglas
Asiri Saumya Ediriwickrema
Hao Feng
Michael C. Fu
Matthew Garner
Peter Hashim
Haben Fessehaie Kefella
Vivek Tammaji Kulkarni
Lucinda Shuangyuan Liu
Daniel Yang Lu
Mark Vu Mai
Stephanie Michelle Meller
Oluwarotimi Nettey
Caroline Mei Shan Ong
Miles J. Pfaff
Elizabeth York Rawson
Nathan Chin-Yau Tu
Brooks Van Udelsman
Daniel James Wong
Mikell Margaret Yuhasz

STUDENT RECEIVING THE M.D. AND M.P.H. DEGREES

Jorge Augusto Ramallo Pardo

STUDENTS RECEIVING THE M.D. AND M.B.A. DEGREES

Jason Bae
Neel Mahendra Butala
Christopher Mark Sauer
Bingnan Zhang

STUDENTS RECEIVING THE M.D. DEGREE AND THE CERTIFICATE IN GLOBAL MEDICINE

Jason Bae
Neel Mahendra Butala
Charisse Laura Mandimika
Jordan Avery Sloshower
Daniel Freedman Weisberg

Enrollment for 2014–2015

POSTGRADUATE STUDENTS

Members of the resident staff at Yale-New Haven Hospital and the VA Connecticut Healthcare System's West Haven campus are enrolled as postgraduate students in the School of Medicine. Information on postgraduate students is available from the Office of Postgraduate Medical Education.

REGISTERED FOR THE DEGREE OF DOCTOR OF MEDICINE

Tsion Aberra
Parwiz Abrahimi
Jeremy Ader
Deborah Ahove
Alexandra Albert
Caroline Albert
Benjamin Albright
Andre Alcon
Mehida Alexandre
Nancy Allen
Aimee Alphonso
Marcus Altman
Sarah Amalraj
Nidharshan Anandasivam
Amber Anders
John Andrews
Prince Antwi
Damian Apollo
Nicholas Apostolopoulos
Adeolu Aromolaran
Ryan Michael Aronberg
Michael Astudillo
David Asuzu
Wardah Athar
Deepak S. Atri
Raghav Badrinath
Paul S. Bagi
Aditi Balakrishna
Zev Balsen
Michaela Bamdad
Ezra Baraban
Jacob F. Baranoski
Mary Barden
Daniel Barron
Daniel Barson
Christopher M. Bartley
Bryce Alexander Basques
Alexander Bazazi
Jessica Elizabeth Mirabito Becker
Nicholas Bergfeld
Juliana Berk-Krauss
Rohan Bhandari
Shivani Bhatt
Dipankan Bhattacharya
Xiao Bi
William Biche
Sean Bickerton
Meredith Binford
Vicki Bing
Remy Bizimungu
Adriana Blakaj
Hadley Bloomhardt
Daniel David Bohl
Paul Bourdillon
Gregory Breuer
Eric David Kenny Brooks
Cortlyn Brown
Jason Robert Brown
Adam Brownstein
Emily Marie Bucholz
Jessica Buckley
Katherine Buesser
Daniel Bui
Lucas Butler
Raysa Cabrejo
Elizabeth Calle

Allison M. Campbell
Herbert Castillo Valladares
Ignacio Cerdena
Barbara Hirschman Chaiyachati
Harry Chang
Michael Chang
Nashid Chaudhury
Tafadzwa Chaunzwa
Nicholas Chedid
Elizabeth Chen
Jessica Chen
Lihui Chen
Serene I. Chen
Connie Cheng
Joyce Cheng
Zola Chihombori Quao
Jennie Choe
Eun Sook Choi
Raj Chovatiya
Carolyn Chuang
Katherine Chuang
Sakil Chundydyal
Shang-Lin Chung
Sophie Chung
Victoria Clark
Matthew Coffman
Stephanie Cohen
Emily Coleman
Susan Elizabeth Combs
Jonathan Cui
William Culligan
Elizabeth Cummings
Benoit Cyrenne
Kate Davis
Dimitri De Kouchkovsky
Flavia De Souza
Di Deng
Uma Deshmukh
Sasha Deutsch-Link
Isha Di Bartolo
Jenny Dohlman
Alexander Domingo
Moises Dominguez
Swethasri Dravida
Linna Duan
Eamon Duffy
Anna Ruth Duncan
Hannah Dzimitrowicz
Gulus Emre
Katherine Epstein
Jeffrey Erfe
Matthew Erlendson
Nkemka Esiobu
Harib Ezaldein
Caroline Greenberg Falker
Maxwell Farina
Louis Edward Fazen
Erin Feeney
Rebecca Fine
Jennifer Fischer
Kelly Fitzgerald
Whitney Fu
Rance Fujiwara
Kara Furman
Jonathan Gaillard
Sarah Gao
Cyril Gary
John Gaudet
Samir Gautam
Angela Gauthier
Charuta Gavankar
Rahiwa Gebre
Erik John Geiger
Mohammed Ghare
Maryam Ghiassi-Nejad
Juliet Fraser Gibson
Erica Giles
Thomas Candler Gilliland
David Goldstein
Nicholas Stephen Golinvaux
Dan Ang Gong
Anand Gopal
Simon Gray
Jessica Greenberg
Abigail Greene
Tyler Greenway
John Grotberg
Karl Grunseich
Zachary Grunwald
Jordan Alexander Gruskay

Paul Guillod
Abhijeet Gummadavelli
George Guo
Jennifer Nai-Zhen Guo
Xiaoyue Guo
Akash Gupta
Ravi Gupta
Sasha Gupta
Stefan Gysler
Muhamed Hadzipasic
Ido Haimi
Adrian Haimovich
Michael Hajek
Andy Han
Jacquelyn Gayle Hancock
William Hancock-Cerutti
Eileen Harder
Xin He
Joseph Heng
Edward Herman
Amanda Hernandez
Kayleigh Herrick-Reynolds
Melissa Herrin
Peter Hetzler
Tara Holder
Soonwook Hong
Woo Suk Hong
Corey Horien
Joan How
Melody Hu
Brendan Huang
Ken Yon Hui
Nancy Huynh
Woong Hwang
Emily Hyun
Dame Idossa
Adesuwa Ighodaro
Jeremy Jacox
Vikram Jairam
Zainab Jaji
Frances Grace Javier
Nicole Jawitz
Oliver Jawitz
Amanda Jeng
Ruoyi Jiang
Sarah Jin
Jessica Johnston
Katelyn Kane
Myriam Kane
Ankit Kansal
Edi Kapetanovic
Alanna Kaplan
Samantha Kaplan
Maya Kasowski
Adam Craig Kaufman
Habib Khan
Rabeea F. Khan
Shihan Khan
Ramak Khosravi
Nour Kibbi
Simon Kigwana
Marquita Kilgore
Changhyun Michael Kim
Chang-Yeon Kim
Clara Kim
Daniel Kim
Richard Kim
Roger Kim
Sa Rang Kim
Yunsoo Kim
Amanda King
Rachel Klausner
Zachary Kloos
Derek Kong
Dedeepya Konuthula
Idil Kore
Nicole Krenitsky
Lauren Norell Krumeich
Irina Krykbaeva
Heide Kuang
Tambudzai Kudze
Alexander James Kula
David R. Kull
Adam Kundishora
Yukiko Kunitomo
Phoebe Kuo
Lovemore Kuzomunhu
Ashton Lai
Natalie Caballero Lastra
Olga Laur

Thomas Lazzarini
Alison Lee
Angela Lee
Eric Lee
Katherine Leiby
Benjamin Lerner
Brian Letzen
Erik Levinsohn
Jonathan Levinsohn
Evan Levy
Alice Li
Alvin Li
Charles Li
Don Li
Hong Li
Ningcheng Li
Wendy Li
Xiang Li
Jonathan Liang
Nathan Lifton
Taber Lightbourne
Young Lim
Christina Lin
George Linderman
Jacob Lister
Geoffrey Zhi-Je Liu
Jia Liu
Lucy Liu
Rebecca Liu
Billy Lockhart
Kelsey Loeliger
Carla Lopez
Jean Lopez
Songprod Jonathan Lorgunpai
Jeffrey Low
Alex Lu
Alice Lu
Amanda Lu
Elizabeth Ludwig
Adam Lukasiewicz
Valerie Luks
Alexander Luryi
Benjamin Jame MacDougall
Abiodun Mafolasire
Renee Maina
Brian Marcus
Chris Marfo
Alexandria Marino
Sean Maroongroge
Jonathan Marquez
Matthew Marr
James Seiken Martenson
Pierre Martin
Eunice Martins
Nareh Marukian
Sean Mbachu
Ian McConnell
Patrick McGillivray
Ryan McLynn
Blair McNamara
Matthew Meizlish
Bethlehem Mekonnen
Sarah Meller
William Meyerson
Goran Micevic
Matthew Mikhail
Jessica Minor
Kavita Mistry
Alyssa Mitson-Salazar
Amit Mittal
Julio Montejo
Elliot Morse
Joshua Ethan Motelow
Moustafa Khaled Moustafa
Azim Munivar
Kimberly Murdaugh
Farhan Murshed
Regina Marie Melendez Nagarajan
Hiam Naiditch
Sifon Ndon
Rejoice Ngongoni
Belinda Nhundu
Allen D. Nicholson
Neal Nolan
Alyssa Nylander
Elizabeth O'Brien
Michael Oh
Emmanuel Ohuabunwa
Daniel Okin
Nathaniel Ondeck

Eve Overton
Cassie Pan
Laura Pappalardo
Summer Agnes Jane Paradise
Esther You Park
Jea Young Park
Gerneiva Parkinson
Jay Patel
Kevin Perkins
Curtis Perry
Max Petersen
Luke R.G. Pike
Crystal Lynne Piper
Nathan Pirakitikulr
Lauren Provini
Taha Qarni
Jack Qian
Jennifer L. Quon
Kyle Thomas Ragins
Elham Rahimy
Anusha Raja
Marco Ramos
Julia Raney
Micha Sam Raredon
Vinay Rathi
Shuaib Raza
James Reed
Tehreem Rehman
Duncan Reid
Adele Ricciardi
Nathaniel Robinson
Talia Robledo-Gil
Robert Rock
Gladys M. Rodriguez
Juan Rodriguez Guzman
Danilo Rojas-Velasquez
Rahil Rojiani
Joshua Rosen
Robert Rosen
Brian Rosenberg
Robert Ross
Giulio Rottaro
Megan Rowlands
Luis Rubio
Ronnye Rutledge
Praneeth Sadda
Anton Safonov
Andre Samuel
Britt Sandler
Jason Sandler
Jon Santiago
Tejas Sathe
Rollin Say
Susan Scanlon
Alexander Scherer
Amy Schettino
Zachary Schwam
Cortlandt Sellers
Reginald Severe
Lorenzo Sewanan
Andi Shahu
Daniel Shaw
Veronica Shi
Allen Shih
Celestine Shih
Sophia Shimer
Bilal Ahmed Siddiqui
Jacob Siegel
Joshua Siewert
Nicole Sitkin
Andrew Smith
James Smithy
Whitney Soble
Shalom Sokolow
Samuel Sondalle
Joongyu Song
Anirudh Sreekrishnan
Hans Stabenau
Gregory Stachelek
Katherine Standish
Anna Stein
Alex Stewart
Kevin Su
Harry Subramanian
Joome Suh
Brandon Sumpio
Haosi Sun
Jared Sun
Thomas Yang Sun
Minhee Sung

David Suwondo
Alexander Svoronos
Matthew Swallow
Kai Erik Swenson
Laurel Tainsh
Kaoru Takasaki
Victoria Vanessa Tate
Melissa Taylor
Lise Tchouta
Apoorva Tewari
Durga Thakral
Minh Than
Nicholas Theodosakis
Alexandra Thomas
Alyssa Thomas
Eleanor Thomas
Emily Herron Thomas
Andrew Timberlake
James Edward Tooley III
Rebecca Treger
Cynthia Tsay
Chung Sang Tse
Jack Turban
Noel Turner
Evgeniya Tyrtova
Sebastian Urday
Ritchell Van Dams
Radovan Vasic
Aaron Vassall
Eric Paul Venker
Kenneth Vera
Rebecca Vitale
Linh Vu
Amanda Rose Wallace
John Walsh
Chen Wang
Elyn Wang
Hanbing Wang
Jake Wang
Jessica Shar Wang
Mike Wang
Priscilla Wang
Samantha Xiao Yan Wang
Ruth Wangechi Wang'ondu
Jacob Weatherly
Matthew Webb
Urs Weber
Jason Weed
Karrin Weisenthal
Austin Weiss
Nicholas Wilcox
Joel Winer
Kenneth Wong
Risa Liang Wong
Yao Wong
Carina Martin Woodruff
Aileen Wright
Paula Wu
Robin Wu
Tina Xia
Siyu Xiao
Wendy Xiao
Bingchan Xie
Chaoying Xu
Xiaolu Xu
Zhenzhen Xu
Kathleen Yan
Alina Yang
Daniel Yang
Genevieve Yang
Jenny Yang
Ava Yap
Jessica Ye
Maryam Yeganegi
Emily Yin
Lee Ying
Laura Yockey
Jin Woo Yoo
Andrew Christopher Young
Mark Youngblood
Amy Yuan
Bianca Yuh
Tiffany Yuh
Alp Yurter
Samir Zaidi
Theodore Zaki
Osama Zayyad
Ke Zhang
Lucy Zhang
Yuemei Zhang

Bixiao Zhao
Peter Yu Cheng Zhao
Daniel Zheng
David Zhu
Mojun Zhu
Rebecca Zhu
Victor Zhu
Radoslav Zinoviev
Christopher Zirker
Hannah Zornow
Alyssa Zupon

Total, 527

REGISTERED FOR THE COMBINED M.D./PH.D. DEGREE

Parwiz Abrahimi
Alexandra Albert
Nancy Allen
Wardah Athar
Daniel Barson
Christopher M. Bartley
Alexander Bazazi
Shivani Bhatt
Dipankan Bhattacharya
Sean Bickerton
Adriana Blakaj
Gregory Breuer
Jason Robert Brown
Emily Marie Bucholz
Allison M. Campbell
Barbara Hirschman Chaiyachati
Nashid Chaudhury
Raj Chovatiya
Victoria Clark
William Culligan
Dimitri De Kouchkovsky
Swethasri Dravida
Louis Edward Fazen
Erin Feeney
Kelly Fitzgerald
Kara Furman
Samir Gautam
Simon Gray
Abigail Greene
Jennifer Nai-Zhen Guo
Muhamed Hadzipasic
Adrian Haimovich
William Hancock-Cerutti
Edward Herman
Amanda Hernandez
Corey Horien
Brendan Huang
Ken Yon Hui
Woong Hwang
Jeremy Jacox
Amanda Jeng
Ruoyi Jiang
Jessica Johnston
Alanna Kaplan
Maya Kasowski
Adam Craig Kaufman
Shihan Khan
Ramak Khosravi
Daniel Kim
Amanda King
Zachary Kloos
Irina Krykbaeva
Ashton Lai
Angela Lee
Katherine Leiby
Jonathan Levinsohn
Alice Li
Don Li
Jonathan Liang
Young Lim
Christina Lin
George Linderman
Jacob Lister
Rebecca Liu
Kelsey Loeliger
Alice Lu
Alexandria Marino
Jonathan Marquez

James Seiken Martenson
Matthew Meizlish
Sarah Meller
Goran Micevic
Jessica Minor
Kavita Mistry
Alyssa Mitson-Salazar
Joshua Ethan Motelow
Alyssa Nylander
Daniel Okin
Laura Pappalardo
Kevin Perkins
Curtis Perry
Max Petersen
Nathan Pirakitikulr
Marco Ramos
Micha Sam Raredon
Adele Ricciardi
Brian Rosenberg
Robert Ross
Susan Scanlon
Alexander Scherer
Lorenzo Sewanan
Andrew Smith
Samuel Sondalle
Gregory Stachelek
Alexander Svoronos
Durga Thakral
Minh Than
Nicholas Theodosakis
Alexandra Thomas
Eleanor Thomas
Andrew Timberlake
Rebecca Treger
John Walsh
Chen Wang
Ruth Wangechi Wang'ondu
Wendy Xiao
Bingchan Xie
Genevieve Yang
Jessica Ye
Lee Ying
Laura Yockey
Mark Youngblood
Samir Zaidi
Ke Zhang
Bixiao Zhao

Total, 115

REGISTERED FOR THE COMBINED M.D./M.H.S. DEGREE

Deepak S. Atri
Michaela Bamdad
Jacob F. Baranoski
Bryce Alexander Basques
Eric David Kenny Brooks
Flavia De Souza
Anna Ruth Duncan
Erik John Geiger
Stefan Gysler
Michael Hajek
Adam Craig Kaufman
Alexander Kula
Olga Laur
Billy Lockhart
Alexander Luryi
Michael Oh
Jennifer L. Quon
Luis Rubio
Celestine Shih
Lise Tchouta
James Edward Tooley III
Ritchell Van Dams
Samantha Xiao Yan Wang
Matthew Webb
Joel Winer
Jenny Yang
Victor Zhu

Total, 27

REGISTERED FOR THE COMBINED M.D./M.B.A. DEGREE

Xin He
Jeffrey Low
Kyle Thomas Ragins
Britt Sandler
Rollin Say
Jared Sun
Hanbing Wang
Radoslav Zinoviev

Total, 8

REGISTERED FOR THE COMBINED M.D./M.P.H. DEGREE

Whitney Soble
Rebecca Vitale

Total, 2

REGISTERED FOR THE PHYSICIAN ASSOCIATE PROGRAM

Kellie Acosta
Nathanial Anderson
Thuy Bach
Ye Eun Bae
Ofer Barniv
Jodi Bartlett
Brandon Beattie
Lindsey Belliveau
Daniel Binelli
Jenny Binning
Trisha Blake
Lauren Bloom
Michael Brask
Natalie Brim
Paul Buonocore
Laura Burgstahler
Maria Canonizado
Natalie Chrismer
Erin Clair
Jennifer Clauss
Kathleen Coffin
Sarah Coffin
Lauren Collin
Kyle Craven
John D'Agata
Samantha DelNegro
Matthew Dodd
Camille Dupont
Marcella Elpers
Zena Falk
Jonathan Fausey
Miriam Feinstein
Kiah Francil
Susanna Franks
Lyle Franzman
James Frederick
Audrey Fritzinger
Natalie Geisler
Hiwot Girma
Chandra Goff
Tyler Gorman
Becket Greten-Harrision

Emily Gruetzmacher
Justin Guzman
Elisa Hoellerich
Brittany Hogan
Hannah Holland
Eleanor Holtz-Eakin
Natalie Hutchison
Jessica Jean
Meredith Keppel
Ethan Kohn
Blaise Lampugnale
Rodrigo Landeros
Gregory Larson
Peter Leafblad
Philip Logan
Iris Looi
Elyse Macksoud
Kathleen Marcinkowski
Sarah Massey
Imelda Mata
Alison McPherson
Octavian Mihai
Alison Mittelsteadt
Jaina Morar
Jodi Morin
Eline Mul
Lindsay Novak
Lara Novak
Kali O'Dell
Kelsey O'Dell
Hunter Paddock
Nisha Parikh
Krystle Peterson
Caitlin Pray
Travis Rabbit
Emily Richards
Timothy Riddell
Alison Robb
Kathleen Roeder
Olivia Rojas
Rachel Rutledge
Devra Schlar
Jennifer Schloth
Kristine Schuette
Anna Sloman
Kevin Sullivan
Karen Tsai
Emma Turnquist
Alexandra Vitek
Mark Volpe
Ashley Weber
Amy Wegesser
Samantha Werner
Claire Westcott
Jayna Whitcomb
Sarah Wills
Jillian Wollet
Philip Yinger
Varin Zimmerman

Total, 101

REGISTERED FOR THE COMBINED M.M.SC./M.P.H DEGREE

Kristine Gauthier
Janet Li
Krysta Peterson
Kara Stencel
Bridget Winterhalter
Maureen Wright

Total, 6

The Work of Yale University

The work of Yale University is carried on in the following schools:

Yale College Est. 1701. Courses in humanities, social sciences, natural sciences, mathematical and computer sciences, and engineering. Bachelor of Arts (B.A.), Bachelor of Science (B.S.).

For additional information, please visit http://admissions.yale.edu, e-mail student.questions@yale.edu, or call 203.432.9300. Postal correspondence should be directed to Office of Undergraduate Admissions, Yale University, PO Box 208234, New Haven CT 06520-8234.

Graduate School of Arts and Sciences Est. 1847. Courses for college graduates. Master of Advanced Study (M.A.S.), Master of Arts (M.A.), Master of Science (M.S.), Master of Philosophy (M.Phil.), Doctor of Philosophy (Ph.D.).

For additional information, please visit http://gsas.yale.edu, e-mail graduate.admissions@yale.edu, or call the Office of Graduate Admissions at 203.432.2771. Postal correspondence should be directed to Office of Graduate Admissions, Yale Graduate School of Arts and Sciences, PO Box 208323, New Haven CT 06520-8323.

School of Medicine Est. 1810. Courses for college graduates and students who have completed requisite training in approved institutions. Doctor of Medicine (M.D.). Postgraduate study in the basic sciences and clinical subjects. Five-year combined program leading to Doctor of Medicine and Master of Health Science (M.D./M.H.S.). Combined program with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Doctor of Philosophy (M.D./Ph.D.). Master of Medical Science (M.M.Sc.) from the Physician Associate Program.

For additional information, please visit http://medicine.yale.edu/education/admissions, e-mail medical.admissions@yale.edu, or call the Office of Admissions at 203.785.2643. Postal correspondence should be directed to Office of Admissions, Yale School of Medicine, 367 Cedar Street, New Haven CT 06510.

Divinity School Est. 1822. Courses for college graduates. Master of Divinity (M.Div.), Master of Arts in Religion (M.A.R.). Individuals with an M.Div. degree may apply for the program leading to the degree of Master of Sacred Theology (S.T.M.).

For additional information, please visit http://divinity.yale.edu, e-mail divinity.admissions@yale.edu, or call the Admissions Office at 203.432.5360. Postal correspondence should be directed to Admissions Office, Yale Divinity School, 409 Prospect Street, New Haven CT 06511.

Law School Est. 1824. Courses for college graduates. Juris Doctor (J.D.). For additional information, please visit www.law.yale.edu, e-mail admissions.law@yale.edu, or call the Admissions Office at 203.432.4995. Postal correspondence should be directed to Admissions Office, Yale Law School, PO Box 208215, New Haven CT 06520-8215.

Graduate Programs: Master of Laws (LL.M.), Doctor of the Science of Law (J.S.D.), Master of Studies in Law (M.S.L.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. For additional information, please visit www.law.yale.edu, e-mail gradpro.law@yale.edu, or call the Graduate Programs Office at

203.432.1696. Postal correspondence should be directed to Graduate Programs, Yale Law School, PO Box 208215, New Haven CT 06520-8215.

School of Engineering & Applied Science Est. 1852. Courses for college graduates. Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit http://seas.yale.edu, e-mail grad.engineering@yale.edu, or call 203.432.4252. Postal correspondence should be directed to Office of Graduate Studies, Yale School of Engineering & Applied Science, PO Box 208267, New Haven CT 06520-8267.

School of Art Est. 1869. Professional courses for college and art school graduates. Master of Fine Arts (M.F.A.).

For additional information, please visit http://art.yale.edu, e-mail artschool.info@yale.edu, or call the Office of Academic Affairs at 203.432.2600. Postal correspondence should be directed to Office of Academic Affairs, Yale School of Art, PO Box 208339, New Haven CT 06520-8339.

School of Music Est. 1894. Graduate professional studies in performance, composition, and conducting. Certificate in Performance, Master of Music (M.M.), Master of Musical Arts (M.M.A.), Artist Diploma, Doctor of Musical Arts (D.M.A.).

For additional information, please visit http://music.yale.edu, e-mail gradmusic.admissions@yale.edu, or call the Office of Admissions at 203.432.4155. Postal correspondence should be directed to Yale School of Music, PO Box 208246, New Haven CT 06520-8246.

School of Forestry & Environmental Studies Est. 1900. Courses for college graduates. Master of Forestry (M.F.), Master of Forest Science (M.F.S.), Master of Environmental Science (M.E.Sc.), Master of Environmental Management (M.E.M.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit http://environment.yale.edu, e-mail fesinfo@yale.edu, or call the Office of Admissions at 800.825.0330. Postal correspondence should be directed to Office of Admissions, Yale School of Forestry & Environmental Studies, 195 Prospect Street, New Haven CT 06511.

School of Public Health Est. 1915. Courses for college graduates. Master of Public Health (M.P.H.). Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit http://publichealth.yale.edu, e-mail ysph.admissions@yale.edu, or call the Admissions Office at 203.785.2844.

School of Architecture Est. 1916. Courses for college graduates. Professional degree: Master of Architecture (M.Arch.); nonprofessional degree: Master of Environmental Design (M.E.D.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit http://architecture.yale.edu, e-mail gradarch.admissions@yale.edu, or call 203.432.2296. Postal correspondence should be directed to the Yale School of Architecture, PO Box 208242, New Haven CT 06520-8242.

School of Nursing Est. 1923. Courses for college graduates. Master of Science in Nursing (M.S.N.), Post Master's Certificate, Doctor of Nursing Practice (D.N.P.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit http://nursing.yale.edu or call 203.785.2389. Postal correspondence should be directed to Yale School of Nursing, Yale University West Campus, PO Box 27399, West Haven CT 06516-7399.

School of Drama Est. 1925. Courses for college graduates and certificate students. Master of Fine Arts (M.F.A.), Certificate in Drama, One-year Technical Internship (Certificate), Doctor of Fine Arts (D.F.A.).

For additional information, please visit http://drama.yale.edu, e-mail ysd.admissions @yale.edu, or call the Registrar/Admissions Office at 203.432.1507. Postal correspondence should be directed to Yale School of Drama, PO Box 208325, New Haven CT 06520-8325.

School of Management Est. 1976. Courses for college graduates. Master of Business Administration (M.B.A.), Master of Advanced Management (M.A.M.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit http://som.yale.edu. Postal correspondence should be directed to Yale School of Management, PO Box 208200, New Haven CT 06520-8200.

Travel Directions

See also http://medicine.yale.edu/maps/index.aspx. Additional parking is available at the Amistad, Howard Avenue, and Temple garages, and at Yale-New Haven Hospital's Emergency Department and Children's Hospital.

BY AIR

Tweed–New Haven Airport is the closest airport and is approximately four miles from the Yale campus. It is serviced by USAirways (800.428.4322). Local taxi service, Metro Cab (203.777.7777), is available at the airport. Connecticut Limousine Service (800.472.5466) to New Haven services Kennedy International Airport (New York), La Guardia Airport (New York), Newark International Airport (Newark, New Jersey), and Bradley International Airport (Windsor Locks, Connecticut, near Hartford).

BY TRAIN

There is hourly Metro-North (800.638.7646) service to New Haven from Grand Central Station in New York every day of the week. Amtrak (800.872.7245) service is scheduled daily from Boston, Washington, D.C., or New York (Penn Station).

BY CAR

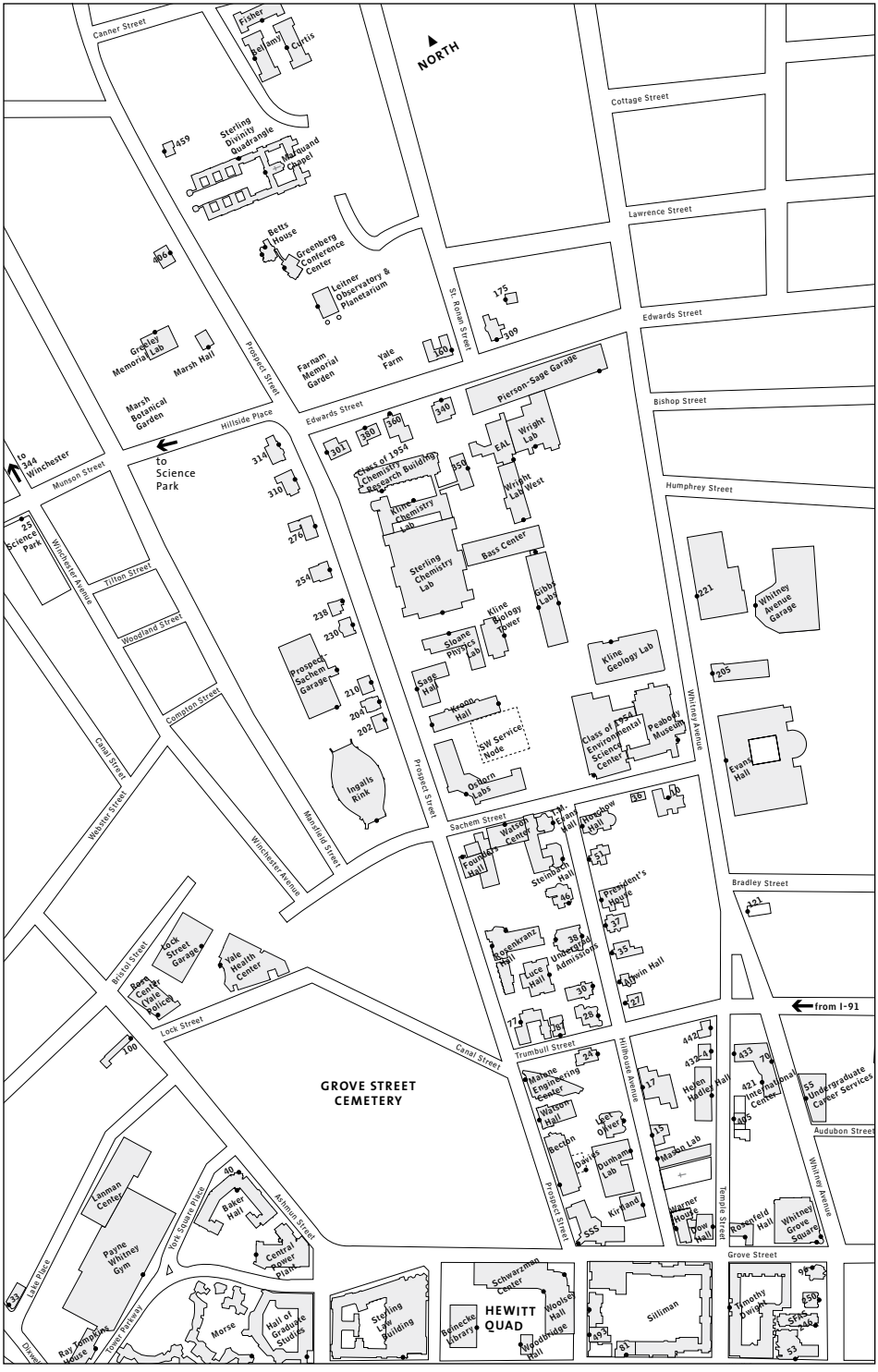
From I-95 North or South Take Exit 47 (Route 34) to Exit 1. Visitor parking is available in the Air Rights Garage, which can be entered from North or South Frontage Roads, or from York Street.

From I-91 South Take Exit 1 (Route 34) to Exit 1. Continue to the Air Rights Garage, as above.

From Merritt Parkway (Rte. 15) North Take Exit 57 to Route 34 East into New Haven. Turn right onto Ella T. Grasso Boulevard (Rte. 10) and then left onto South Frontage Road (Legion Avenue). Follow Yale-New Haven Hospital and Rte. 34 signs. Continue to the Air Rights Garage, as above.

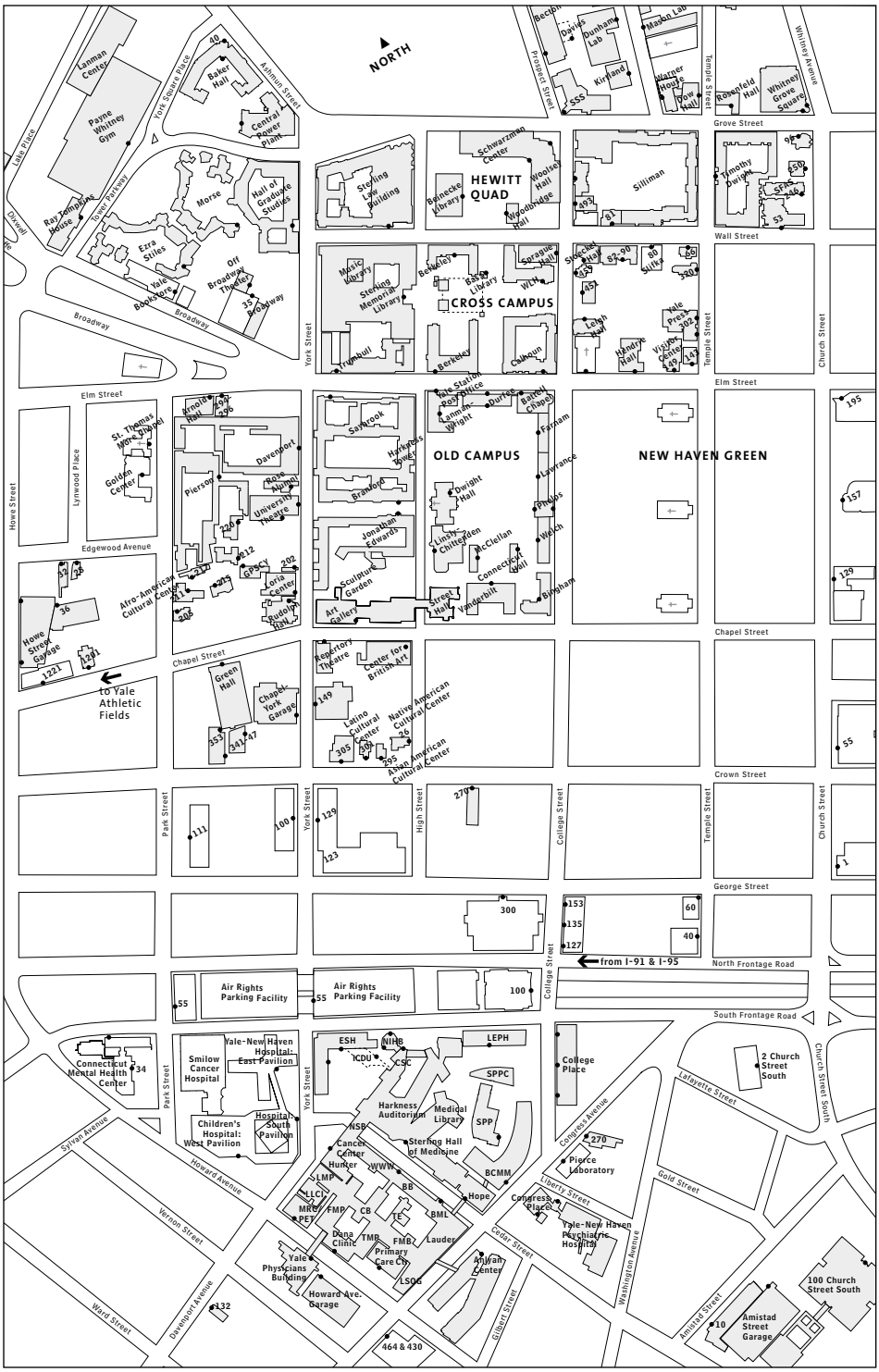
From Wilbur Cross Parkway (Rte. 15) South Take Exit 59 immediately after the tunnel. Go right at end of ramp. Merge left onto Whalley Avenue at light. Stay on Whalley until you see signs for Yale-New Haven Hospital at Park Street. Follow hospital signs, then make a left turn onto South Frontage Road. Continue to the Air Rights Garage, as above.

YALE UNIVERSITY CAMPUS NORTH

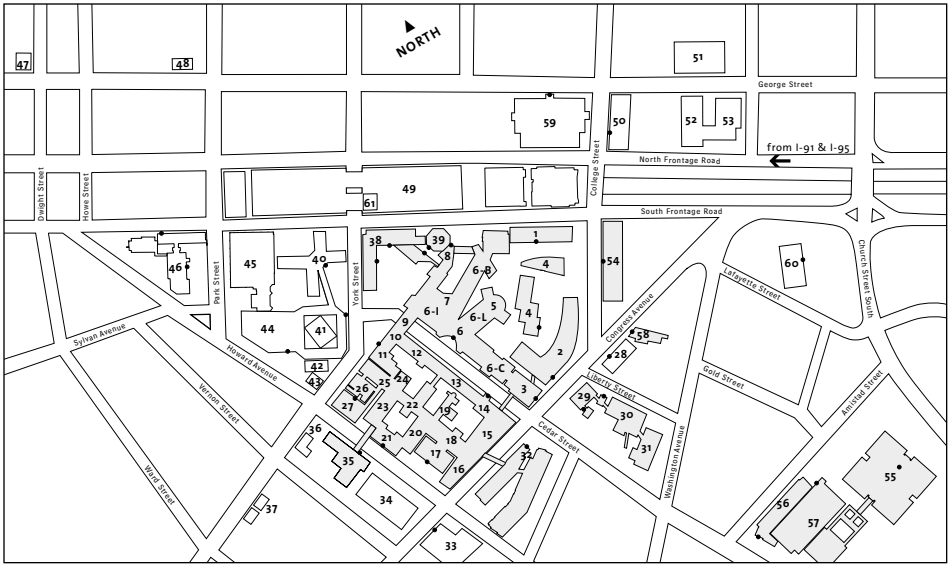


Continued on next page

YALE UNIVERSITY CAMPUS SOUTH & YALE MEDICAL CENTER



YALE MEDICAL CENTER BUILDINGS AND ADDRESSES



1. Laboratory of Epidemiology and Public Health, 60 College St.
2. Boyer Center for Molecular Medicine
3. Jane Ellen Hope Building
4. Sterling Power Plant and Sterling Power Plant Co-Gen
5. Harvey Cushing/John Hay Whitney Medical Library
6. Sterling Hall of Medicine, 333 Cedar St. Wings: B, C, I & L
7. Mary S. Harkness Memorial Auditorium
8. Child Study Center
9. Nathan Smith Building (Bridge)
10. Yale Cancer Center
11. Hunter Building, 15 York St.
12. William Wirt Winchester Building
13. Boardman Building, 330 Cedar St.
14. Brady Memorial Laboratory, 310 Cedar St.
15. Lauder Hall
16. Laboratory for Surgery, Obstetrics and Gynecology
17. Primary Care Center
18. Farnam Memorial Building
19. Tompkins East
20. Tompkins Memorial Pavilion
21. Charles A. Dana Building, 789 Howard Ave.
22. Clinic Building
23. Fitkin Memorial Pavilion
24. Fitkin Amphitheater
25. Laboratory for Medicine and Pediatrics
26. Lippard Laboratory of Clinical Investigation
27. P.E.T. Center
28. John B. Pierce Laboratory, 290 Congress Ave.
29. Congress Place, 301 Cedar St.
30. Yale-New Haven Psychiatric Hospital 2, 184 Liberty St.
31. Yale-New Haven Psychiatric Hospital 3, 184 Liberty St.
32. Anlyan Center for Medical Research and Education, 300 Cedar St.
33. 430 and 464 Congress Ave. and 726 Howard Ave.
34. **Howard Ave. Garage**
35. Yale Physicians Building, 800 Howard Ave.
36. 110 Davenport Ave. (YNHH Day Care Center)
37. 132–138 Davenport Ave. (Lead Program)
38. Edward S. Harkness Memorial Hall A and D, 367 Cedar St.
39. Neison and Irving Harris Building, Child Study Center, 230 S. Frontage Rd.
40. East Pavilion, 20 York St. (Yale-New Haven Hospital Main Entrance)
41. South Pavilion, 20 York St.
42. **Emergency Services Parking**
43. **Children's Hospital Parking Garage**
44. Children's Hospital (West Pavilion)
45. Smilow Cancer Hospital, 20 York St.
46. Connecticut Mental Health Center
47. Ronald McDonald House, 501 George St.
48. 425 George St.
49. **Air Rights Parking Garage**
50. 127, 135, and 153 College St.
51. New Haven Hotel, 229 George St.
52. **Temple Garage**
53. Temple Medical Center, 40–60 Temple St.
54. College Place, 47 College St.
55. Medical Center South, 100 Church St. South
56. 10 Amistad St.
57. **Amistad Garage**
58. 270 Congress Ave.
59. 300 George St.
60. 2 Church St. South
61. 55 York St.

The University is committed to basing judgments concerning the admission, education, and employment of individuals upon their qualifications and abilities and affirmatively seeks to attract to its faculty, staff, and student body qualified persons of diverse backgrounds. In accordance with this policy and as delineated by federal and Connecticut law, Yale does not discriminate in admissions, educational programs, or employment against any individual on account of that individual's sex, race, color, religion, age, disability, status as a protected veteran, or national or ethnic origin; nor does Yale discriminate on the basis of sexual orientation or gender identity or expression.

University policy is committed to affirmative action under law in employment of women, minority group members, individuals with disabilities, and protected veterans.

Inquiries concerning these policies may be referred to Valarie Stanley, Director of the Office for Equal Opportunity Programs, 221 Whitney Avenue, 3rd Floor, 203.432.0849. For additional information, see www.yale.edu/equalopportunity.

Title IX of the Education Amendments of 1972 protects people from sex discrimination in educational programs and activities at institutions that receive federal financial assistance. Questions regarding Title IX may be referred to the University's Title IX Coordinator, Stephanie Spangler, at 203.432.4446 or at titleix@yale.edu, or to the U.S. Department of Education, Office for Civil Rights, 8th Floor, 5 Post Office Square, Boston MA 02109-3921; tel. 617.289.0111, fax 617.289.0150, TDD 800.877.8339, or ocr.boston@ed.gov.

In accordance with federal and state law, the University maintains information on security policies and procedures and prepares an annual campus security and fire safety report containing three years' worth of campus crime statistics and security policy statements, fire safety information, and a description of where students, faculty, and staff should go to report crimes. The fire safety section of the annual report contains information on current fire safety practices and any fires that occurred within on-campus student housing facilities. Upon request to the Office of the Deputy Vice President for Human Resources and Administration, PO Box 208322, 2 Whitney Avenue, Suite 810, New Haven CT 06520-8322, 203.432.8049, the University will provide this information to any applicant for admission, or prospective students and employees may visit http://publicsafety.yale.edu.

In accordance with federal law, the University prepares an annual report on participation rates, financial support, and other information regarding men's and women's intercollegiate athletic programs. Upon request to the Director of Athletics, PO Box 208216, New Haven CT 06520-8216, 203.432.1414, the University will provide its annual report to any student or prospective student. The Equity in Athletics Disclosure Act (EADA) report is also available online at http://ope.ed.gov/athletics.

For all other matters related to admission to the School of Medicine, please telephone the Office of Admissions, 203.785.2696.

BULLETIN OF YALE UNIVERSITY
New Haven CT 06520-8227

Periodicals postage paid
New Haven, Connecticut