

# School of Medicine

## 2013–2014



BULLETIN OF YALE UNIVERSITY

*Series 109 Number 6 July 20, 2013*

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# Calendar

## TWO HUNDRED AND SECOND SESSION

### FALL 2013

June 17	M	Clinical year, first term, begins for third- through fifth-year students
Aug. 5–16	M–F	Registration for third- through fifth-year students, 9 a.m.–4:30 p.m.
Aug. 15	TH	Matriculation for first-year students, 8–11 a.m.
Aug. 27	T	First term begins for second-year students
Aug. 27–Sept. 10	T–T	Registration for second-year students, 9 a.m.–4:30 p.m.
Aug. 28	W	First term begins for first-year students
Sept. 2	M	Labor Day. No classes for first- and second-year students
Sept. 5	TH	Rosh Hashanah. No classes for first- and second-year students
Nov. 25–Dec. 1	M–SU	Fall recess for first- and second-year students
Nov. 30	SA	Winter recess begins for third- through fifth-year students
Dec. 22	SU	Winter recess begins for first- and second-year students

### SPRING 2014

Jan. 2	TH	Clinical year, second term, begins for third- through fifth-year students Second term begins for first- and second-year students
Jan. 2–15	TH–W	Registration for all students, 9 a.m.–4:30 p.m.
Jan. 20	M	Martin Luther King, Jr. Day. No classes for first- and second-year students
Mar. 15	SA	Spring recess begins for first- and second-year students
Mar. 23	SU	Spring recess ends
Apr. 7	M	Classes end for second-year students
Apr. 18	F	Good Friday. No classes for first-year students
May 7	W	Student Research Day. No afternoon classes for first-year students
May 16	F	Clinical year ends for fourth-year students
May 19	M	University Commencement
May 30	F	Classes end for first-year students
June 13	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*

Byron Gerald Auguste, B.A., Ph.D., Washington, D.C.

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 (*June 2014*)

Donna Lee Dubinsky, B.A., M.B.A., Portola Valley, California

Charles Waterhouse Goodyear IV, B.S., M.B.A., London, England

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

Neal Leonard Keny-Guyer, B.A., M.P.P.M., Portland, Oregon (*June 2015*)

Margaret Hilary Marshall, B.A., M.Ed., J.D., Cambridge, Massachusetts

Indra Nooyi, B.S., M.B.A., M.P.P.M., Greenwich, Connecticut

Emmett John Rice, Jr., B.A., M.B.A., Bethesda, Maryland (*June 2017*)

Kevin Patrick Ryan, B.A., M.B.A., New York, New York (*June 2018*)

Douglas Alexander Warner III, B.A., Locust Valley, New York

# The Officers of Yale University

**President**

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

**Provost**

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

**Vice President for Global and Strategic Initiatives**

Linda Koch Lorimer, B.A., J.D.

**Secretary and Vice President for Student Life**

Kimberly Midori Goff-Crews, B.A., J.D.

**Vice President and General Counsel**

Dorothy Kathryn Robinson, 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 Development**

Joan Elizabeth O'Neill, B.A.

# 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  
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., Director, Faculty Development and Equity  
Carrie P. Capezone, M.B.A., Associate Dean for Finance  
James P. Comer, M.D., M.P.H., Associate Dean for Student Progress  
Lynn Cooley, Ph.D., Director, Combined Program in the Biological and Biomedical Sciences

Michael H. Ebert, M.D., Associate Dean for Veterans' Affairs  
Kerry L. Falvey, Chief of Staff, Office of the Dean  
Rosemarie L. Fisher, M.D., Associate Dean for Graduate Medical Education  
John N. Forrest, M.D., Director, Office of Student Research  
Susan H. Gudin, M.B.A., Director of Financial Aid  
Janet Hafler, Ed.D., Assistant Dean for Educational Scholarship  
Jancy L. Houck, M.A., Associate Vice President for University Development and Director of Medical Development and Alumni Affairs  
Mary J. Hu, M.B.A., Director of Institutional Planning and Communications  
Anna Maria L. Hummerstone, M.H.A., Director of Human Resources  
James D. Jamieson, M.D., Ph.D., Director, M.D./Ph.D. Program  
Robert G. Kanoff, B.S., Assistant Dean for Finance and Administration, School of Public Health  
Martin Klein, Ph.D., M.P.H., Associate Dean for Development and External Affairs, School of Public Health  
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  
Regina K. Marone, M.L.S., Director, Medical Library  
Carolyn M. Mazure, Ph.D., Associate Dean for Faculty Affairs  
Laura R. Ment, M.D., Associate Dean for Admissions and Financial Aid  
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  
Sara C. Rockwell, Ph.D., Associate Dean for Scientific Affairs  
Michael L. Schwartz, Ph.D., Associate Dean for Curriculum  
Richard A. Silverman, Director, Office of Admissions  
Terri L. Tolson, Registrar for Student 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, Capital Program

**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, 2013.

# 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 Nursing, School of Public Health, Yale-New Haven Hospital (YNHH), Smilow Cancer Hospital, Connecticut Mental Health Center, and the John B. Pierce Laboratory.

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, and History of Medicine.

The Harvey Cushing/John Hay Whitney Medical Library, also located in Sterling Hall of Medicine, houses more than 485,000 volumes and subscribes to more than 10,000 electronic journals and 19,000 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, 20 York Street, is a 944-bed facility with 92 bassinets. The Yale-New Haven Psychiatric Hospital is located nearby at 184 Liberty Street. School of Medicine faculty are attending physicians at YNHH, the School's primary teaching hospital. All medical and surgical specialties are represented at the hospital, which discharged 54,507 inpatients in 2009. During that period, ambulatory services treated 610,936 outpatients and emergency services had 132,565 visits. The hospital also houses the clinical component of Yale Cancer Center, a joint program of YNHH and the School of Medicine. The fourteen-story Smilow Cancer Hospital at Yale-New Haven opened in the fall of 2009. In September 2012, Yale-New Haven Hospital acquired the assets of the Hospital of Saint Raphael, located on Chapel Street in New Haven and now named Yale-New Haven Hospital Saint Raphael Campus. This integration allows YNHH to provide the region with more coordinated, comprehensive care.

The Children's Hospital provides inpatient and outpatient pediatric services, and also includes a rooftop helipad, high-risk maternity and newborn units, and labor, delivery, and postpartum services. The Yale-New Haven Children's Hospital is connected to two other hospital pavilions by a three-story atrium.

YNHH 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. Yale New Haven Health, Connecticut's largest health system, also extends into Rhode Island through its relationship with the Westerly Hospital.

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, 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; and Comparative Medicine.

The YNHHC 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, Neurosurgery, and Orthopaedics and Rehabilitation; 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, and Therapeutic Radiology.

Laboratories of the departments of Ophthalmology and Visual Science and Neurology; the Cardiology section; the Keck Foundation Biotechnology 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, Urology, 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 Pathogenesis, 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>

Regina Kenny Marone, M.L.S., Director and Associate Yale University Librarian	SHM L110
Janene Batten, M.L.S., Nursing Reference Librarian	SHM L107
John Gallagher, M.L.S., Associate Director	SHM L105
Mark Gentry, M.L.S., Clinical Support Librarian and Coordinator, Library Technology Services and Support	SHM L113B
Jan Glover, M.L.S., Education Services and Reference Librarian	SHM L107
Melissa Grafe, M.L.S., Ph.D., Librarian for Medical History	SHM L118
Charles Greenberg, M.L.S., M.Ed., Research Services Librarian	SHM L15
Holly Grossetta Nardini, M.L.S., Coordinator of Liaison Activities	SHM L107
Denise Hersey, M.L.S., Coordinator of Liaison Activities	SHM L107
Robert Hughes, Business Manager	SHM L110
Hongbin Liu, M.L.S., Web Services Librarian	SHM L15
Melanie Norton, M.L.S., Access and Delivery Services Librarian	SHM L111
Nathan Rupp, M.L.S., Head, Collection Development and Management	SHM L15
Lynn Sette, M.L.S., Reference and Communications Librarian	SHM L107
Judy Spak, M.L.S., Curriculum Support Librarian	SHM L107
Lei Wang, M.L.S., Instructional Design Librarian	SHM L107
Susan Wheeler, Curator, Prints and Drawings	SHM L118
Public Health and GIS Librarian	47 College

The Cushing/Whitney Medical Library, a leading research library, serves the Yale-New Haven Medical Center and the health information needs of Yale University. The library is a comprehensive resource for research, patient care, and education materials. The Medical Library is a dynamic and busy place committed to providing students with a supportive place for study and learning, and faculty and staff with seamless access to essential information resources in the library and via our Web site in offices and remotely.

The library's Web site is the gateway to an online library of clinical reference tools, databases, evidence-based practice resources, and electronic books and journals in support of programs in medicine, nursing, public health, and the basic sciences. Our rich collection ensures access to digital collections, electronic resources, images, educational software, and a large unique collection of rare medical books, medical prints, photographs, and memorabilia.

All Yale University students have access to electronic resources including electronic books, journals, and databases from any remote computer. The Medical Library's Web site is available formatted for mobile devices; we also provide free Yale-licensed mobile device applications such as ePocrates and UCentral. Medical Center students can also borrow laptops and recharge their electronic devices at the Circulation Desk.

Medical librarians provide individualized support for all of a student's information needs, from searching the literature to managing references. Yale Links allows students

to go from database to the full article with just a click of a button. Online tutorials are available 24/7 for quick access to instruction on using library resources. To provide the highest level of service to library users, staff provides an outreach service to each medical school department. The Library Liaison Program promotes communication between the library and the departments to ensure that the library is meeting the educational and research needs of busy clinicians and researchers. Library liaisons support collaborative activities with students and faculty to foster communication and assist in the research process.

The Medical Library offers a specially designed program to build competency in information management skills: skills that are increasingly important as a foundation for effective research and practice in health sciences. Our goal for this program is to foster lifelong information management skills by providing medical students a solid foundation throughout their four years of medical school.

During their 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.

As the second-year students begin research for their thesis project, the library offers seminars on information management, including the use of bibliographic database management programs. At the end of the second year and just before the clinical years begin students attend a “Find it Fast” session. This session is designed to prepare students to find the answer to a clinical question efficiently and effectively.

Third- and fourth-year students participate in a variety of seminars, mostly focusing on evidence-based practice and advanced database searching techniques. Emerging trends and rapidly changing technology in academic medical curricula provide opportunities for faculty and librarians to work together using the Web and other electronic resources as teaching tools to enhance students’ educational experience at Yale.

The Library provides space for group study and meetings. Group study rooms include the Gordon Conference Room equipped with a twenty-six-inch computer monitor for small groups and a large conference room with a whiteboard and an overhead projector, both on the main floor. The Betsey Cushing Whitney Group Study Center includes three study rooms located on the lower level: a lounge area plus two smaller rooms, all with wall-mounted monitors. A conference room located in the Cushing Center is equipped with a large monitor, Internet access, and teleconferencing capabilities.

Computers are available in the Information Room and the Computer Resource Laboratory (CRL). In addition, the CRL contains a digital imaging center equipped with a flatbed scanner and software such as Adobe Creative Suite. The CRL is open 24/7.

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,

catalogues, yearbooks, photographs, and other publications and ephemera related to the Yale School of Medicine. In addition, a fine selection of photographs, posters, and other images is available in the Cushing/Whitney Medical Library Digital Library.

The Cushing Center houses a unique resource of materials collected by Dr. Harvey Cushing. A neurosurgeon and pioneer of brain surgery, Dr. Cushing was also an enthusiastic collector. The center is the home of the Harvey Cushing Brain Tumor Registry, which contains approximately 400 brain specimens, glass-plate negatives, and accompanying patient files. The space also displays his rich collection of anatomical and surgical books.

Public health information needs of the School of Public Health and Yale University are provided through the Medical Library. The virtual library connects to extensive electronic collections in public health, epidemiology, biostatistics, health policy, environmental health, international health, chronic disease epidemiology, emerging infectious diseases, and microbiology. The Public Health and GIS Librarian is based in the Medical Library.

Nursing library services are provided to Yale School of Nursing (YSN) faculty, students, and staff through the Medical Library. The Medical Library provides YSN with a rich collection of both print and electronic materials. The print collection for the School of Nursing Library is housed in the Medical Library. The Nursing Information Resources Web site gives the YSN community quick electronic access to important biomedical online resources, as well as other library electronic resources.

Sterling Memorial Library, Yale's main library and the largest library on campus, houses more than four million volumes and serves as the center of the library system. Sixteen libraries comprise the Yale University Library system, including the Center for Science and Social Science Information, the Law Library, and the Divinity Library. EliExpress (Yale Library's book delivery service) couriers transport library books daily among these and the other library units on campus.

## ASSOCIATES OF THE YALE MEDICAL LIBRARY

Gerard Burrow, M.D., Chair

Janene Batten, Secretary

Telephone: 203.785.4354

The associates 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). 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.
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/bulletin](http://www.yale.edu/bulletin).

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
  - General Chemistry
  - Organic Chemistry
  - General Physics

(Acceptable courses in these subjects usually extend over one year and are given six to eight term hours credit.) These courses should be completed in a U.S. or Canadian 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](mailto:amcas@aamc.org). Extensive information can also be obtained at the AMCAS Web site: [www.aamc.org](http://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](mailto: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](http://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](mailto: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-clinical 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-clinical years, the students acquire knowledge and develop clinical skills. In basic science courses, lectures are held to a minimum, and much instruction occurs in small-group seminars or conferences. Students evaluate themselves through anonymous examinations. Their performance is assessed by the faculty through participation in seminars, by an anonymous qualifying examination at the end of each course, and by passing of the United States Medical Licensing Examinations. Student attendance is expected in all skill-building sessions, and competency in performing a complete history and physical examination is assessed at the end of the second year, utilizing standardized patients.

In the first two years 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 interchange between faculty and students to be the most effective means of teaching and evaluation. Students should expect direct questioning at seminars and labs as an important adjunct to the evaluation process. The final decision of acceptable performance for a given course or clerkship will remain with the course/clerkship director of each course or clerkship. Freed from the usual anxieties provoked by 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 an evaluation so that course directors can make changes based on student feedback, which is taken very seriously.

Finally, the Yale System requires each student to engage in a form of research activity, designed to foster development of a lifelong commitment to learning (see Required Thesis, in the chapter on Degree Programs).

### *Curriculum Management*

#### EDUCATIONAL POLICY COMMITTEE (EPC)

The EPC advises the deputy dean for education on policy issues of school-wide importance, including matters related to admissions, 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 and School-Wide Objectives as well as the principles embodied in the Yale System of 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 School-Wide Educational Objectives, or the Educational Mission Statement

### CURRICULUM COMMITTEE (CC)

The CC is currently chaired by the assistant dean for curriculum and provides careful and thorough oversight of the curriculum review process. The CC considers recommendations for curriculum change made by its review committees as well as suggestions from students, faculty, and departments. The CC might also form ad hoc working groups to study and promote integration within related areas of learning and across various disciplines and time periods in the curriculum. The CC improves the curriculum by considering new ideas, developing specific proposals, and implementing changes that promote:

- integration and coordination across and throughout the curriculum
- a curriculum designed to achieve the school-wide educational objectives
- assessment of the curriculum based on analysis of reliable outcome measures
- improvement in the quality of education based on new teaching approaches and modern methods of pedagogy
- adherence to existing and new accreditation standards

### CURRICULUM REVIEW COMMITTEES

Courses Review Committee

Modules Review Committee

Clerkships Review Committee

Electives Review Committee

The Curriculum Review Committees work collaboratively with department-based course, module, clerkship, and elective directors to review and improve individual courses, modules, clerkships, and electives. This includes gathering information, reviewing and analyzing data, and making recommendations that promote:

- course, module, clerkship, and elective content based on specific learning objectives
- congruence of course, module, clerkship, and elective objectives with overall Schoolwide Objectives
- use of the most effective teaching methods to achieve the learning objectives
- effective use of formative, summative, and self-assessment methods
- 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

The Review Committees, through their chairs, report on their activities to the CC 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 CC for consideration and implementation.

#### 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 assure 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.

A more detailed description of these committees including the membership is available on the Office of Education Web site.

#### *Pre-Clinical Curriculum*

The first two years of the curriculum at Yale School of Medicine focus on providing students with a foundation in the science and art of medical practice. In the first year, the science of normal human biology is explored. The structure of the human body is taught in Human Anatomy and Development, via dissections, and in diagnostic imaging. The normal function of the human body is taught in the Molecules to Systems Integrated Curriculum, which includes three departmental courses: Molecular Biochemistry and Biophysics, Cell Biology and Histology, and Medical Physiology. The structure and function of the brain and nervous system are taught in the Neurobiology and Biological Basis of Behavior courses. Teaching the art of medicine begins with the first day of school, which is devoted to discussion of the importance of understanding the patient's and physician's culture in practicing medicine. The Pre-Clinical Clerkship (PC) introduces students to the principles and skills of medical interviewing and physical examination. PC 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 two years 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. Understanding of the patient is achieved in Child and Adolescent Development, which presents a developmental approach to human behavior. The Professional Responsibility course is an opportunity to discuss the attitudes and behaviors of caring and ethical physicians who practice in this complex era of managed care. Integrating the art and science in medical practice requires problem-solving skills, which are developed in the Responsible

Conduct of Research and the Student Research, Study Design, and Thesis Information courses. A major focus of this effort is discussing how to assess the value of information in the medical literature by understanding and applying the basic principles of biostatistics. Throughout the year, students receive various talks on the History of Medicine, which add depth and texture to the curriculum as well as provide some insight into the time continuum within which the practice of medicine exists. The first year ends with a focus on the mechanisms of disease: Pathology, Human Genetics, and Immunobiology.

The second year emphasizes abnormal human biology. During the fall term the major courses are Epidemiology and Public Health, Medical Microbiology, and Pharmacology. Pathology continues with the Pathology Tutorials, which are spread out over the second year. Throughout the year, students participate in The Modules, a large interdisciplinary course. In the modules, content traditionally taught in the disciplines of pathology, pathophysiology, pharmacology, clinical examination, laboratory medicine, and diagnostic radiology is organized according to organs or 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, which emphasizes developing advanced skills in history taking, clinical reasoning, and physical examination. Students continue to meet in small groups with their clinical tutors. In the second year, students are given the opportunity to assess their acquired clinical skills in two complete examinations of Standardized Patients at the University of Connecticut School of Medicine clinical assessment site.

### *Pre-Third Year Requirements*

In order to proceed to the third 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 course.
3. Achieve clinical competence (as ascertained by the UConn assessment).
4. Comply with all immunization requirements.
5. Evaluate all of the basic science required courses and modules.

### *The Third Year*

#### CLINICAL CLERKSHIPS

The third year is devoted almost entirely to clinical clerkships. They include:

Internal Medicine	8 weeks
Ambulatory Medicine	4 weeks
Surgery	8 weeks
Emergency Medicine	2 weeks
Anesthesiology	2 weeks
Pediatrics	8 weeks
Clinical Neuroscience	4 weeks
Obstetrics and Gynecology	6 weeks
Psychiatry	6 weeks

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. It is to the student's advantage to complete as many required clerkships as possible during the third year. In order to change a clerkship schedule after it is assigned, students must (1) fill out a clerkship/elective change form giving reasons for the change and (2) meet with the registrar. Changes are not guaranteed, and no change except in the case of a legitimate emergency will be considered less than four weeks before the start of the scheduled clerkship. Students may receive a lower priority for rescheduling these postponed clerkships in their fourth year than new third-year students. All changes must be approved by the relevant academic adviser and the associate dean for student affairs.

#### USMLE STEP I

All students are required to sit for Step I of the United States Medical Licensing Examination for the first time by the end of December of the third year in medical school (even if the third year is an extended study year), but students are strongly encouraged to take it before starting clinical clerkships. 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](http://www.usmle.org)).

The Office of Student Affairs holds an informational session in January. An online application must be filled out on the NBME (National Board of Medical Examiners) Web site at [www.nbme.org](http://www.nbme.org). Within the application, the student must also indicate one of the three-month eligibility periods during which he or she wishes to sit for the exam. Once the application is finished, the student must print out the certification of identification and authorization form and bring it into the Office of Student Affairs, to have the form signed, certified, and mailed directly to the NBME for processing. The application form must be accompanied by one passport photo and appropriate payment. Students will be notified via e-mail by the NBME within three to five days confirming the completion of the Step I registration, and then a second e-mail will be sent within a week notifying the student that his or her Electronic Scheduling Permit is available to view and print at the NBME Web site. The student can then call any Prometric test site in the world to schedule a specific test day.

#### FAILURE OF USMLE STEP I

If a student fails Step I, he or she may reschedule it at any time before May of the third year or, in consultation with the academic adviser, an alternative timeline may be agreed upon. Three failures of Step I will require consultation with the Progress Committee, and only in extraordinary circumstances will the student receive permission to take it a fourth time. In the absence of that permission, the student will be dismissed from the School of Medicine. In some cases where a student may be having other academic problems, failing Step I once or twice will be enough to require consultation with the Progress Committee and could lead to dismissal. In some unusual cases, students will not be allowed multiple retakes, for example, if the student is unable to progress satisfactorily in the clerkships

or behaves in repeatedly or egregiously unprofessional ways. (See Progress Committee, in the chapter on General Information.) If Step I is failed more than once, the student may be asked to discontinue clinical rotations until he or she takes and passes the exam.

### *The Fourth Year*

The fourth-year curriculum includes a required clerkship and capstone course as follows:

Primary Care	4 weeks
Integrative Clinical Medicine Course	3 weeks

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, residency applications, and the Medical Student Performance Evaluation (MSPE), also known as the dean's letter, but issues of scheduling subinternships, electives, and the thesis requirement are also addressed.

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

A required Primary Care Clerkship is generally completed during the fourth year. This four-week clerkship provides students with an opportunity to experience primary care in an outpatient or office setting. Many students also take a number of clinical electives, including a subinternship in some clinical discipline. The residency application process and completion of the thesis are also major activities of the fourth year.

In the spring, students attend one final required course, entitled Integrative Clinical Medicine. This three-week course provides an opportunity for graduating students to come together one last time before leaving for internships and residencies. It offers 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. Throughout the three weeks there is an emphasis on the interplay among biological, social, and psychological factors in determining the health and illness of our patients as well as ourselves. Also included are sessions on handling medical errors, dealing with difficult patients, end-of-life care, doctor-patient communication, race and gender issues in the hospital, and issues in professionalism and medical ethics.

### USMLE STEP II

Passing USMLE Step I and both parts of Step II (Step II Clinical Knowledge [Step II CK] and Step II Clinical Skills [Step II CS]) is required for graduation from Yale School of Medicine.

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.

The clinical skills exam 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. Test sites include Philadelphia, Atlanta, Los Angeles, Chicago, and Houston.

For the Step II CS exam, students who may have to travel a distance and stay in a hotel the night before the exam may incur increased expenses. Students who feel that lack of money is preventing them from taking the exam should speak with the associate dean for student affairs as early as possible. Students will go to the University of Connecticut early in their fourth year to complete a standardized patient exercise similar to USMLE Step II CS (UConn 4). They will receive feedback on their performance, and remediation will be offered if necessary. This exercise may be completed prior to Step II CS as a way of ensuring readiness to take the exam. Passing UConn 4 is also a graduation requirement.

#### FAILURE OF USMLE STEP II

The reason that USMLE Step II must be taken before December 31 of the fourth year is to give anyone who fails the opportunity to retake the exam and get a passing score in time to graduate. In order to be certain that students have taken it or have plans to take it before that date, the registrar tracks their examinee status on the NBME Web site; if a student has not taken or scheduled both exam dates on or before September 30, the dean's letter will not be sent out on October 1. Disregarding this requirement is considered an unprofessional response. Should a student schedule these exams but later cancel or postpone them after the December 31 deadline, his or her name will be reported to the Progress Committee, the student's residency program will be notified that he or she is in jeopardy of not graduating on time, and the student may also not be allowed to enter a match list into the NRMP.

Students may have three attempts to pass Step II before being dismissed from the School of Medicine.

### *Course Schedules*

#### FIRST YEAR

Anatomy: Human Anatomy and Development  
 Biochemistry: Molecular Biochemistry and Biophysics\*  
 Biological Basis of Behavior  
 Cell Biology: Cell Biology and Histology\*  
 Child and Adolescent Development  
 Genetics: Human Genetics  
 History of Medicine  
 Immunobiology  
 Neurobiology: Structural and Functional Organization of the Human Nervous System  
 Physiology: Medical Physiology\*  
 Pathology: Pathological Basis of Human Disease  
 Pre-Clinical Clerkship  
 Professional Responsibility  
 Responsible Conduct of Research  
 Student Research, Study Design, and Thesis Information  
 Basic Life Support

\*Molecules to Systems Integrated Curriculum

**SECOND YEAR**

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

**THIRD YEAR**

Internal Medicine

Inpatient 8 weeks

Ambulatory 4 weeks

Surgery 8 weeks

Emergency Medicine 2 weeks

Anesthesiology 2 weeks

Pediatrics

Inpatient 4 weeks

Ambulatory 4 weeks

Clinical Neuroscience 4 weeks

Obstetrics, Gynecology, and  
Reproductive Sciences 6 weeks

Psychiatry 6 weeks

**FOURTH YEAR**

Primary Care 4 weeks

Integrative Clinical Medicine 3 weeks

Electives and Subinternships

Research

Thesis

## *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, American Society of Nephrology) 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/mhs>.

## **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; 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. James Jamieson 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 except the Ethical and Practical Issues in Clinical Investigation course and monthly seminars, which must be taken during the master's 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](http://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](mailto: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 either as a two-year program or an eleven-month program for individuals with a doctoral-level degree or to medical school students who have completed their third year in an accredited medical school in the United States. 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 2012, the Yale Physician Associate Program has graduated 1,058 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 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 rigor of the studies often precludes student employment. As a result, students are encouraged to find alternate financial resources during their course of study. Tuition for the 2012–2013 academic year is \$32,570 for first- and second-year students, and \$10,840 for third-year students; fees and other expenses are similar to those estimated for medical students. A Master of Medical Science 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 (lecture and laboratory)	Medicine and Surgery
Clinical Genetics	Microbiology/Infectious Disease
Clinical Practicum	Pathology
Diagnostic Imaging	Pharmacology
History Taking and Physical Examination	Physiology
Introduction to Research	Preventive Medicine
Medical Ethics and Law	

**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 in areas such as Boulder, Chicago, New York, Kentucky, Maine, or Massachusetts. Students should be prepared to provide their own transportation and housing for all rotations away from New Haven. Students may also choose to broaden their experience by selecting rotations abroad. Students have chosen clerkships in Spain, Uganda, and Peru.

In order to graduate from the program, a student must successfully complete all rotations, summative evaluation using standardized patients, 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	Obstetrics and Gynecology
General Surgery	Primary Care I
Geriatrics	Primary Care II
Internal Medicine I	Pediatrics
Internal Medicine II	Psychiatry

**ELECTIVE ROTATIONS**

Ambulatory Medicine	Diagnostic Imaging/Radiology
Anesthesiology	Gastroenterology
Cardiology	Gynecologic Oncology
Cardiothoracic Surgery	Hematology
Dermatology	Hospitalist Medicine

Infectious Disease	Ophthalmology
International Medicine	Orthopedics
Interventional Radiology	Otolaryngology
Medical Intensive Care	Pediatric Cardiology
Neonatology	Plastic Surgery
Nephrology	Surgical Intensive Care
Neurology	Thoracic Surgery
Neurosurgery	Transplant Surgery
Occupational and Travel Medicine	Trauma Surgery
Oncology	Urology

### *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 general biology or zoology with lab, and three upper-division biology courses: one of these must be animal or human physiology at the 200-level or higher, and the others must be at the 300- or 400-level (e.g., immunology, microbiology, neuroscience, etc.). 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.

#### 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.

The application deadline for the class entering in 2013 is September 1, 2012. Program information, in lieu of a printed catalogue, may be accessed 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](http://www.caspaonline.org). The program currently does not require a supplemental application.

### *P.A./M.P.H. Joint-Degree Program*

The P.A./M.P.H. joint-degree program at Yale University 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 requisite 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 P.A. 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 P.A. Program and the School of Public Health as early as possible. For individuals granted an interview with the P.A. Program, the School of Public Health will expedite the review of the application so that applicants can be informed about acceptance to both programs by the end of January.

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. Transfer students are not accepted to the joint-degree program.

# Expenses and Financial Aid

## TUITION AND SPECIAL FEES

Tuition for candidates for the M.D. degree (per academic year)	\$51,480
Yale Health Hospitalization coverage (includes prescription coverage)	\$2,040

Examination fees for candidates for the M.D. degree,

United States Medical Licensing Examination:	2013	2014
Step I	\$560	\$580
Step II – Clinical Knowledge	\$560	\$580
Step II – Clinical Skills	\$1,200	\$1,230

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 \$71,640, 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 \$420 Activity Fee. If a student is enrolled beyond the fourth year, a \$210 Activity Fee is charged. All students are required to pay an annual \$160 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](http://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](http://www.yale.edu/sis/ebep)) are sent to all students at their official Yale e-mail addresses and to all student-designated authorized payers. It is imperative that all students monitor their Yale e-mail accounts on an ongoing basis.

Bills for tuition, room, and board are available to the student 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.

### *Charge for Rejected 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 University eBill-ePay*

There are a variety of options offered for making payments. Yale University eBill-ePay is the preferred means for payment of bills. It can be found at [www.yale.edu/sis/ebep](http://www.yale.edu/sis/ebep). Electronic payments are easy and convenient—no checks to write, no stamps, no envelopes, no hassle. Payments are immediately posted to the student's account. There is no charge to use this service. Bank information is password-protected and secure, and there is a printable confirmation receipt. Payments can be made twenty-four hours a day, seven days a week, up to 4 p.m. Eastern Time on the due date to avoid late fees. (The eBill-ePay system will not be available when the system is undergoing upgrade, maintenance, or repair.) Students can authorize up to three authorized payers to make payments electronically from their own computers to the student's account using Yale's system.

Use of the student's own bank payment service is not authorized by the University because it has no direct link to the student's Yale account. Payments made through such services arrive without proper account identification and always require manual processing that results in delayed crediting of the student's account, late fees, and anxiety. Students should use Yale eBill-ePay to pay online. For those who choose to pay by check, remittance advice with mailing instructions is available on the Web site.

### *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 20. For additional information, please contact Student Financial Services at 203.432.2700 and select "Press 1" from the Main Menu. The enrollment link can be found online in the Yale Payment Plan section of the Student Accounts Web site: [www.yale.edu/sfas/financial/accounts.html#payment](http://www.yale.edu/sfas/financial/accounts.html#payment).

## 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 2013–2014 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](http://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 2013–2014, the last days for refunding federal student aid funds will be October 31, 2013 (Years 1 and 2) and October 16, 2013 (Years 3 and 4) in the fall term, and April 4, 2014 (Year 1), May 16, 2014 (Year 2), May 12, 2014 (Year 3), and March 23, 2014 (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: September 7, 2013 (Year 1), September 6, 2013 (Year 2), and August 22, 2013 (Years 3 and 4) in the fall term, and January 15, 2014 (Years 1 and 4), January 22, 2014 (Year 2), and January 23, 2014 (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 23, 2013 (Years 1 and 2) and September 8, 2013 (Years 3 and 4) in the fall term, and February 5, 2014 (Year 1), February 23, 2014 (Year 2), February 25, 2014 (Year 3), and February 4, 2014 (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 21, 2013 (Year 1), October 20, 2013 (Year 2), and October 5, 2013 (Years 3 and 4) in the fall term, and March 12, 2014 (Year 1), April 25, 2014 (Year 2), April 21, 2014 (Year 3), and March 10, 2014 (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.

**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 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.

**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 Sanford 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.

**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 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 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 Bette 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 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.

**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.

**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.

**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.

**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 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. Hooper Memorial Fund** Established in 1952 by Sarah A. K. Hooper. 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 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.

**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 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 Whitlam 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 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.

**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 William M. Wiefert and Lucille Reed Wiefert Scholarship Fund** Established in 1974 by a gift from an anonymous donor in honor of William M. Wiefert, B.A. 1933, M.D. 1937, and Lucille Reed Wiefert, 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.

**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.

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

**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.

**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 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 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 Paul H. Laviertes, M.D., Summer Research Fellowship Fund** Established in 1991 in honor of Paul H. Laviertes, 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.

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

**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.

**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.

**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.

**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 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.

**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.

**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 2013

**Cum laude** The degree of Doctor of Medicine cum laude will be conferred on students whose academic performance shows unusual merit. Suzanne Jaqueth Forrest, Jeffrey Scott Futterleib, Kevin Koo, Jonathan Craig Levin, John Devin Millet, Jovana Pavisic, Michael Joseph Peluso, Adam Sang, Sounok Sen

**American Academy of Neurology Award** Awarded to recognize a graduating medical student for excellence in clinical neurology. Avital Perry

**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. Julie Mae Xanthopoulos

**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. Julia Rose Lubsen, Carina Preskill, Alexandra Ristow, Adam Sang

**The Campbell Prize** Founded in 1900 by bequest from James Campbell, honorary M.A. 1891, Professor of Obstetrics and Gynecology, 1886 to 1899. Awarded to the graduating students who secure the highest rank on Step II of the National Board Medical Examination. Michael Joseph Peluso

**Connecticut Academy of Family Physicians Award** Established in 1994 to recognize outstanding students entering a career in Family Practice. Nyasha Kianne George, Niyati B. Shah

**Connecticut Chapter of American College of Surgeons Prize** Awarded to a graduating student for excellence in surgical sciences. Joshua Caleb Leinwand

**The Cortlandt Van Rensselaer Creed Award** Established in 1999 in honor of Cortlandt Van Rensselaer Creed, M.D. 1857, the first African American graduate of Yale School of Medicine. 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. Dionne Marie Rudison

**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. William Thomas Clarke, Jennie Duffy, Elisa Mead Jorgensen, Jonathan Craig Levin, John Devin Millet, Lydia Lee Shook, Justin M. Steinberg

**The Dean's Prize for Community Service** This annual award recognizes the graduating students who, by leadership and service, have made major contributions to the School

of Medicine, to the New Haven community, or to the community at large. Julia Rose Lubsen, Warren M. Perry II

**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. Elisa Mead Jorgensen

**The Selma and Karl Folkers Prize in Biomedical Research** Established in 2005 by Dr. and Mrs. James D. Jamieson. This prize is awarded to graduating M.D./Ph.D. students whose thesis research has demonstrated excellence in basic cell and molecular biology. Maya Evelyn Kotas, Katherine Uyhazi

**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. Kenneth E. Ike

**The Marguerite Rush Lerner Award** Awarded to a graduating student for outstanding creative writing. Maya Evelyn Kotas

**The M.D./Ph.D. Alumni Award** Awarded to a graduating M.D./Ph.D. student who has demonstrated outstanding academic achievements, leadership, and service. Jonathan Howard Chen

**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. Jacob Stuart Appelbaum, Martin Dominguez

**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." Jovana Pavisic

**The Parker Prize** Established in 1914 by bequest from Frank J. Parker, Ph.D. 1895, M.D. 1898. Awarded annually to the graduating student who, during the course, has shown the best qualifications for a successful physician. Michael Joseph Peluso

**The Perkins Prize** Awarded to the student who achieves the highest rank on Step I of the National Board Medical Examination. Joshua Caleb Leinwand

**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. Justin M. Steinberg

**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. Julia Rose Lubsen

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

**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. Jovana Pavisic

**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. Kenneth E. Ike

**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. Jonathan Howard Chen

### THESIS PRIZES, MAY 2013

**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. Sounok Sen

**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. Julius Thomas Oatts

**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. Elisa Mead Jorgensen

**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. Chethan Bachireddy

**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. Ebelechukwu Odiari

**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. Michael Joseph Peluso

**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. Jovana Pavisic

**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. Jeffrey Scott Futterleib

**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. Benjamin T. Himes

**The Lidz Prize in Psychiatry** Awarded to a graduating student for an outstanding thesis in the field of psychiatry or neuroscience. Sarah Lacourse Metthe Johnson

**The M.D./Ph.D. Thesis Prize** Awarded to the graduating M.D./Ph.D. student with the most outstanding dissertation. Rachel Kushner Rosenstein

**Dr. Marvin Moser Prize** Established in 2007 by Dr. Marvin Moser for a prize-winning thesis in preventive cardiology, lipid disorders, or hypertension. John Devin Millet

**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. Suzanne Jaqueth Forrest

**The John P. Peters Prize** Established in 1976. To be presented to a student for an outstanding thesis in the area of internal medicine. John P. Peters was Professor of Medicine at Yale, 1927 to 1955. Jonathan Craig Levin

**The Psychiatry Department Thesis Prize** Awarded to a graduating student whose thesis contributes to answering an important question in the field of psychiatry. Rocksheng Zhong

**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. Kevin Koo

**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. Devon Marc Fagel

**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. Adam Sang

## STUDENT RESEARCH DAY ORAL PRESENTATIONS, MAY 7, 2013

Benjamin Himes. *siRNA Therapy in Glioblastoma Stem Cells: Identification of Target Genes and Potential Therapeutic Implications* (Dr. Mark Saltzman, Biomedical Engineering and Cellular & Molecular Physiology)

Sounok Sen. *Understanding Costs, Value, and Patterns of Care of New Radiation Technologies among Older Women with Breast Cancer* (Dr. Cary Gross, Internal Medicine)

Kevin Koo. *Male-Partner Participation in the Prevention of Mother-to-Child HIV Transmission in South Africa* (Dr. Brian Forsyth, Pediatrics)

Michael Peluso. *Biological and Clinical Markers of Neuronal Injury in Primary and Chronic HIV-1 Infection* (Dr. Serena Spudich, Neurology)

Rachel Rosenstein. *Innate Immune Sensing of Allergens* (Dr. Ruslan Medzhitov, Immunobiology)

## AWARDS TO FACULTY AND HOUSE STAFF, MAY 2013

**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(s) of the faculty of the School of Medicine designated by the senior class as the most outstanding teacher(s) of the medical sciences. Dana Wasson Dunne, M.D., Department of Internal Medicine

**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: Robert Lawrence Camp, Ph.D., M.D., Department of Pathology. Clinical Sciences: Auguste Hector Fortin, M.D., M.P.H., Department of Internal Medicine

**The Alvan R. Feinstein Award** Presented to a Yale University 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. Walter Newberry Kernan, M.D., Department of Internal Medicine

**The Leah M. Lowenstein Award** Presented annually by the Office for Women in Medicine to members of the faculty who most clearly represent the highest degree of excellence in the promotion of humane and egalitarian medical education. Andrea Gottsegen Asnes, M.D., Department of Pediatrics

**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. Matthew S. Ellman, M.D., Department of Internal Medicine

**The Betsy Winters House Staff Award** Established in 1972 by the Fourth-Year Class and presented annually to that member or members 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. Edward McGillicuddy, 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 its 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 such as those 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 Association of American Medical Colleges (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.

### *Racial and Ethnic Harassment*

The Office of Multicultural Affairs, which is headed by an associate dean, is charged with responding to complaints of racial and ethnic insensitivity and harassment at 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 Yale University Office for Equal Opportunity Programs. The Web site is [www.yale.edu/equalopportunity](http://www.yale.edu/equalopportunity). If an informal 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.

### *Student Mistreatment, Abuse, and Harassment 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 beeper 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 School of Medicine. The Dean's Procedure for Students' Complaints is available online at [www.yale.edu/equalopportunity/complaint](http://www.yale.edu/equalopportunity/complaint).

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](http://www.yale.edu/equalopportunity/complaint).

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.

## *Progress Committee*

The Progress Committee is made up of approximately twelve highly respected faculty members from different departments. The registrar and associate dean for student affairs are *ex officio* members, and the committee is chaired by a senior faculty member. Faculty serving on the Progress Committee are thoughtful and fair individuals who have a deep interest in the well-being of students. The committee meets to review the progress of students, to decide whether each student should progress into the next year, and to consider special situations and disciplinary actions. Students' records are reviewed for academic standing, moral and ethical character, professional behavior, good judgment, a sense of responsibility, sensitivity and compassion for individual needs, the ability to synthesize and apply knowledge, and emotional stability, demonstrating that the student is capable of becoming a safe and effective physician. The committee may take into account the academic record of the student, performance on board exams, letters and reports regarding incidents of unprofessional behavior, and personal testimony.

If, in the opinion of the Progress Committee, a student should repeat a course or a year, take a year's leave of absence for special study, be suspended, or be dismissed, the student will be notified in writing of the decision. A student who is put on academic probation or suspension will be advised in writing what must be done to get off academic probation or suspension or the consequences of not progressing satisfactorily over a specified timeline. A student may also be suspended for behavior deemed unprofessional or unethical. The student will be notified in writing of the reason for the suspension, what must be accomplished during the suspension, and when and on what conditions the suspension will terminate. A student having academic or professional problems being considered by the Progress Committee, may be asked to choose or be assigned a neutral faculty advocate who has no responsibility for evaluating or promoting that student. The role of this person is to be available to the student for advice and to keep the student on track. Language regarding disciplinary action taken regarding a student may appear in the student's dean's letter.

If a student protests the decision of the Progress Committee, he or she may petition a hearing of the committee and may appear alone, or with an adviser who is a member of the School of Medicine community.

Final decisions of the Progress Committee may be appealed directly to the dean of the School of Medicine. A student wishing to appeal should submit to the dean (or the dean's designate), within seven days of the final decision of the Progress Committee, a written request describing the basis for the appeal. 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) shall review the appeal, and at his discretion may invite the student to meet with him. 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 decision by letter to the student and to the Progress Committee.

When a question arises which cannot wait for the next full meeting of the Progress Committee, an emergency meeting may be called, a subcommittee may be convened, or members of the Progress Committee may be polled for their opinions by phone or e-mail.

## ADVISING AT YALE SCHOOL OF MEDICINE

Every Yale School of Medicine student is assigned a faculty academic adviser. The four advisers are highly regarded faculty members who have demonstrated dedication to and interest in students and undergraduate medical education. Each adviser has 20 percent of his or her effort supported by the dean for this role. The advisers work closely with the dean for student affairs. The advisers meet periodically with their advisees one-on-one and in groups to help students having academic difficulties or questions and to offer advice on navigating the journey through medical school and beyond. They are responsible for writing their advisees' deans' letters or MSPEs.

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. She or he writes letters of recommendation for students applying for scholarships, fellowships, joint-degree programs, and the like; edits the deans' letters for consistency; and co-signs them. 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.

Finally, the Big Sib/Little Sib Program, which pairs first-year medical students with second-years, is contained within the adviser groups in order to promote inter-class communication and collaboration.

## 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 place a student on a medical leave of absence when, on the recommendation of the director of Yale Health or the chief of the Department of Mental Health and Counseling, the associate dean for student affairs determines that the student is a danger to self or others because of a serious medical problem. 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 policies 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 verbal 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.

Accommodations include furnished single rooms with sinks, a limited number of two-room suites, a popular dining hall, television lounges, kitchenettes, and other recreational rooms. Dormitory room rental rates are \$5,400 to \$7,500 during the 2013–2014 academic year (August 2013 to May 2014). Rent includes wired and wireless Ethernet access, cable television hook-up, and all utilities except telephone. A Marigolds meal plan is mandatory for all residents of Harkness Hall.

The first floor houses a dining and lounge area, known as Marigolds, which is open to the Yale community and provides both intimate and large gathering spaces for socializing, reading, watching television, and other activities. A Steinway baby-grand piano is also available for residents. The building contains limited resident storage including

a bike storage area, an exercise/weight room, a billiard room, and a laundry room. The Class of 1958 Fitness Center contains a wide assortment of cardiovascular and weight-training equipment. All residents of Harkness dormitory are welcome to use this center, where student ID card scanners provide access. There is no fee for Harkness residents. All medical center program students can use the gym on a fee basis. All users are required to register for gym membership.

For additional information about Edward S. Harkness Memorial Hall or other Yale graduate residences, contact the Graduate Housing Office at 203.432.2167 or visit <http://gradhousing.yale.edu>.

### *Dining Services*

Marigolds Dining, located in Edward S. Harkness Hall at the School of Medicine, is open from 7:30 a.m. until 7 p.m., Monday through Friday. For breakfast, Marigolds offers Starbucks coffee, assorted tea, and a seasonal fresh fruit/yogurt bar, as well as a variety of hot breakfast sandwiches, bagels, muffins, and Danish. A complete salad bar, choice of two soups (one vegetarian), pizza by the slice or whole, made-to-order grilled items, selected hot entrées, freshly made sandwiches, snacks, groceries, beverages, and assorted desserts are available for lunch.

Students living in Harkness dormitory are required to participate in a meal plan. The rate for the 2013–2014 academic year is \$3,300 per year for dormitory residents. The meal plan is a debit-balance system allowing students to spend their board points anytime that the dining room is open. Students on this plan can transfer a meal into any Yale Dining location, seven days a week. Pricing is à la carte.

All first- and second-year medical students living off campus will be assessed a mandatory off-campus board fee of \$660 per year. This dining charge was initiated to encourage all medical students to socialize in the Harkness Student Center, regardless of whether they live in the dormitory.

## 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

The Yale University Security Programs Department is located at 79 Howe Street. The Central Alarm Station, located at 57 Lock Street, monitors all alarms and cameras in the School of Medicine area. Security personnel have radio and telephone communications

with all area police and fire departments. Security officers in the Yale department provide a variety of services including checking IDs; parking enforcement; building patrol; monitoring closed circuit television (CCTV) and alarm systems; providing escorts; providing “lock-out” service for individuals locked out of their room, lab, or office; and offering general assistance to Medical Center personnel and the general public.

The Security Department provides walking security escorts twenty-four hours a day, seven days a week for the School of Medicine area and central campus. Uniformed security officers radio the Security Central Alarm Station at the beginning and end of each escort and communicate any problems/unusual situations that may occur.

There are over one hundred security officers employed by the University Security Department. Their role is to provide high visibility, and to observe and report potential problems to the security dispatcher and Yale University Police.

University security officers carry two-way radios for communication. Security personnel respond to a variety of situations on campus and notify the proper police agency when necessary. The officers currently wear a white or lime green uniform shirt with a Yale security patch on each shoulder, black trousers, and a black tie. Each security officer wears a numbered shield over his or her left breast pocket. The University Security Department can be reached twenty-four hours a day at 203.785.5555.

There are emergency telephones in the Medical Center. Yale emergency telephones are designated by a blue light above the telephone and are for use by anyone to get quick police assistance. All outside doors are locked or attended at all times.

## 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 the programs coordinator, 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](mailto:omca@yale.edu); Web site, <http://medicine.yale.edu/education/omca>.

## *Computing at the School of Medicine*

The Cushing/Whitney Medical Library provides computers in the Information Room and the Computer Resources Laboratory (CRL) (<http://library.medicine.yale.edu/services/computing/computers>). Both facilities contain Windows and Macintosh 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, common browser plug-ins, and medical education software.

All computers are equipped with CD-RW and DVD-ROM drives and ports for personal USB portable storage devices. The Medical Library offers two scanning stations (Windows and Macintosh) in the CRL Digital Imaging Center. Software on these computers includes a variety of Adobe graphics applications and Final Cut Pro for video editing and production.

The computers in the Information Room are available during library hours. The CRL is open twenty-four hours a day but requires a Yale ID card for entry and a valid Yale NetID for access to all computers in that location.

The Yale Wireless network is available throughout the Medical Library. Library patrons may bring their own laptops to the library and connect to the Yale network via wired Ethernet laptop stations or via the Yale Wireless network. Full details are available at <http://library.medicine.yale.edu/services/computing/laptop>.

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

Printing, scanning, and photocopying are available from Medical Library computer clusters as well as personal computers by arrangement with Yale Printing & Publishing Services. An account is required to use these services on multifunction machines located throughout the library. For more information see <http://library.medicine.yale.edu/services/computing/photocopy>.

The Medical Library's Group Study and Conference Rooms contain either large plasma monitors or data projectors for group display. Several of the rooms also include a computer connected to the display system. The rooms and equipment can be reserved or used on a first-come, first-served basis.

Computing assistance is available for students by contacting the ITS Help Desk, Monday through Friday from 7 a.m. to 6 p.m. (203.432.9000, or [helpdesk@yale.edu](mailto:helpdesk@yale.edu)). Assistance is also available at the Computer Support Center, Monday through Friday from 8:30 a.m. to 4:30 p.m., located on the lower level of the 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-and-recommendations/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 Computer Support Center (<http://its.yale.edu/centers/help-and-support-centers/computing-support-center-medical-campus>). Hours are Monday through Friday from 8:30 a.m. to 4:30 p.m.

### *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 or \$5, depending on card type (proximity or standard).

### *Yale-New Haven Hospital Identification Badges*

Medical students in their third year and beyond completing clinical rotations will be issued Yale-New Haven Hospital (Y-NHH) ID badges. The badge is the property of Y-NHH and must be returned to the Y-NHH ID office upon expiration (graduation). The first ID badge is free; the replacement cost is \$10. Worn out or defective badges will be replaced at no charge. The Office of Student Affairs at the School of Medicine is responsible for setting up Y-NHH ID badges for upperclass students.

The Y-NHH Photo ID Office is located at 20 York Street, East Pavilion, 1st Floor, Room 11A; 203.688.6094.

### *Parking*

Bicycle parking is available in secured bicycle cages, and keys are available from Yale-New Haven Hospital security. Limited automobile permit parking is available to all Yale faculty, staff, and students in two garages. Off-peak parking (nights and weekends) is also available in designated lots to Yale personnel by application to the Office of Security and Parking.

### *Shuttle Bus Service*

For personnel with a Yale ID, free shuttle bus service is provided on weekdays around the University on a fixed route, to the railroad station, and to various parking lots. In addition, a free shuttle service runs between the VA Connecticut Healthcare System, West Haven, and the School of Medicine on weekdays. There is also a free minibus/night shuttle within designated areas of New Haven seven nights a week from 6 p.m. until 7 a.m.

# 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 outside the United States for nearly two centuries, and international issues have been represented in its curriculum for the past hundred years and more. Today, 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.

In 2005, following a full year of consultation with deans and faculty, the president and vice president published "The Internationalization of Yale, 2005–2008: The Emerging Framework." Activity accelerated further with the publication of the "International Framework: Yale's Agenda for 2009 to 2012." Both are available online at [www.world.yale.edu/framework](http://www.world.yale.edu/framework). Three overarching goals were enunciated in these documents: 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.

International activity is coordinated by several University-wide organizations in addition to the efforts within the individual schools and programs.

The Whitney and Betty MacMillan Center for International and Area Studies is the University's principal agency for encouraging and coordinating teaching and research on international affairs, societies, and cultures. See [www.yale.edu/macmillan](http://www.yale.edu/macmillan).

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

The Office of International Affairs (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. See <http://world.yale.edu/oia>.

The Office of International Students and Scholars (OISS) is a resource on immigration matters and hosts orientation programs and social activities for the University's international community. See description in this bulletin and [www.yale.edu/oiss](http://www.yale.edu/oiss).

The Yale Center for the Study of Globalization 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. See [www.ycsg.yale.edu](http://www.ycsg.yale.edu).

The Yale World Fellows Program 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. See [www.yale.edu/worldfellows](http://www.yale.edu/worldfellows).

Additional information may be found on the "Yale and the World" Web site, including links to the international initiatives across the University and resources for faculty, students, and staff conducting international activities, whether abroad or on campus. See [www.world.yale.edu](http://www.world.yale.edu).

## CULTURAL AND SOCIAL RESOURCES

Two sources of information about the broad range of events at the University are the *YaleNews* Web site at <http://news.yale.edu> and the Yale Calendar of Events, an interactive calendar available online at <http://events.yale.edu/opa>. *YaleNews* also features news about Yale people and programs, as well as videos and slide-shows.

The collections of the Yale Peabody Museum of Natural History comprise more than twelve million specimens and artifacts in thirteen curatorial divisions: anthropology, archives, botany, cryo facility, entomology, historical scientific instruments, invertebrate and vertebrate paleontology, meteorites and planetary science, mineralogy, paleobotany, and invertebrate 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](http://www.artgallery.yale.edu).

The Yale Center for British Art (YCBA) is home to the largest and most comprehensive collection of British paintings, sculpture, prints, drawings, and rare books 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 Kahn. The YCBA is embarking on the first phase of a major renovation, beginning in June 2013 and continuing through January 2014. During this period, there will be limited availability of some services, and the second- and third-floor galleries will be closed. The Reference Library will maintain normal hours, and the permanent collection on the fourth floor will remain on view. The Study Room will be closed, but the collection of prints, drawings, rare books, and manuscripts can be accessed on site by appointment; although the staff will make every effort to accommodate students, faculty, and scholars, two weeks' advance notice is required. Further information, contact details, and updates about the renovation are available at <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 four hundred musical events take place at the University during the academic year. In addition to recitals by graduate and faculty performers, 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. The Yale Summer School of Music/Norfolk Chamber Music Festival presents the New Music Workshop, Chamber Music Session, and Chamber Choir and Conducting Workshop. Many of these concerts stream live on our Web site (<http://music.yale.edu>). In addition, 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 and Jazz bands, 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 numerous special events.

For theatergoers, Yale and New Haven offer a wide range of dramatic productions at the University Theatre, Yale Repertory Theatre, Iseman Theater, 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 [www.yalehealth.yale.edu/understand-your-coverage](http://www.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 [www.yalehealth.yale.edu/understand-your-coverage](http://www.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 ([www.yalehealth.yale.edu](http://www.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 ([www.yalehealth.yale.edu](http://www.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. 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 or to the last day of the term, whichever comes first. Fees will not be prorated or refunded. Students who withdraw are not eligible to enroll in Yale Health Student Affiliate Coverage.

**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 ([www.yalehealth.yale.edu](http://www.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 ([www.yalehealth.yale.edu](http://www.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, 2009. 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, 2013. 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 after January 2013, 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.

*Note:* Students who have not met these requirements prior to arrival at Yale University must receive the immunizations from Yale Health and will be charged accordingly.

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 nearly 4,500 international students, faculty, staff, and their dependents. OISS staff provides 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 can provide 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 [www.yale.edu/oiss/coming/arrival/oiss](http://www.yale.edu/oiss/coming/arrival/oiss).

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 for the spouse and partner community.

The OISS Web site ([www.yale.edu/oiss](http://www.yale.edu/oiss)) 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 provides 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](mailto:oiss@yale.edu) or call 203.432.2305. For information about the center, visit [www.yale.edu/oiss/about/center](http://www.yale.edu/oiss/about/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 ([judith.york@yale.edu](mailto:judith.york@yale.edu)) or through its Web site ([www.yale.edu/rod](http://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 rape, sexual assault (which includes any kind of nonconsensual sexual contact), sexual harassment, intimate partner violence, stalking, and any other conduct of a sexual nature that is nonconsensual, or has the purpose or effect of threatening or intimidating a person or persons. 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, sexual misconduct may lead to civil liability and 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  
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 the Yale Health Center or 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 Dr. Carole Goldberg, the director of SHARE (203.432.0310, [carole.goldberg@yale.edu](mailto:carole.goldberg@yale.edu)), Dr. Jennifer Czincz, assistant director (203.432.2610, [jennifer.czincz@yale.edu](mailto:jennifer.czincz@yale.edu)), Alison Doernberg (203.463.8217, [alison.doernberg@yale.edu](mailto:alison.doernberg@yale.edu)), or John Criscuolo (203.494.6247, [john.criscuolo@yale.edu](mailto: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. The Title IX coordinator for the School of Medicine is Associate Dean Merle Waxman (203.737.4100, merle.waxman@yale.edu). 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 as confidentially as possible, but the coordinator may need to consult with other administrators; at times, the coordinator will need to 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*

203.589.0142 (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/departments-information#sensitivercrimes>

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.robbs@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 to evidence collection 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, 2013.

## ANESTHESIOLOGY

Office: TMP 3, 203.785.2802

<http://medicine.yale.edu/anesthesiology>

**Professors** P.G. Barash, F.R. Braveman, J.G. Collins, J. Ehrenwerth, 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, C.A. Brandt (Emergency Medicine), K. Cheung (Medical Informatics), S. Garwood, T.M. Halaszynski, V. Kurup, L.N. Marengo (Medical Informatics), G.F. McCloskey, W.M. Popescu, R. Ramani, J.J. Schwartz, N. Vadivelu

**Assistant Professors** A.A. Alian, R.T. Aouad, J. Arthur, S.I. Assaad, T. Banack, M.E. Blessing, C. Cantemir, S. Dabu-Bondoc, J. Feinleib, D.J. Gaal, T.J. Golembeski, G.W. Grass, L. Grecu, A.S. Haddadin, L.E. Helgeson, K. Hernandez, A. Herrera, M.J. Higgins, N.F. Holt, B. Horvath, M.G. Hrycelak, J.S. Kersh, J.P. Kim, M. Leonova, T. Levy, A.M. Lobo, S.M. Luczycki, K.E. Marschall, V. Matei, H. Mikhael, R.K. Modak, T. Myslajek, L. Oliver, A.D. Opera, M. Pollock, M. Punjala, R.M. Romero, M.J. Rose, H. Saadat, R.C. Schoenfelder, J. Sherman, D. Snegovskikh, J.L. Sramcik, L. Stephenson, R.G. Stout, H.E. Tantawy, I. Vaitkeviciute, D.W. Vaughn, R. Wardhan, X. Xu, M. Zhang (Adjunct), G.X. Zhou, Q. Zhu, J. Zickmann

**Instructors** E.A. Jakab, A. Ruskis, N. Saidi

**Senior Research Scientist** T.D. Rafferty

**Research Scientist** F.G. Sayward

**Associate Research Scientists** S.J. Frawley, L. Gui, S.J. Jarad, P.G. Mutalik, H. Qian, L. Qu, N. Rajeevan, M.A. Shifman (Medical Informatics), R. Wang

**Clinical Professor** J.D. Katz

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

**Assistant Clinical Professors** C. Ayoub, M.K. Ghori, J. Kim, L.H. Kwan, M. Lomanto, Y.F. Shaheen, L. Wang, J.C. Weinberg, T. Wong

**Clinical Instructors** M.M. Abreu, M. Dudley

**Lecturers** A.M. Deshpande (Medical Informatics), V.N. Garla, B. Kaplan, N. Kashyap, S. LaCoursiere, P. Nadkarni, P.G. Thomas

**ANES 103, Clinical Clerkship** Full-time clinical clerkship for students. Students are assigned throughout the year to Yale-New Haven Hospital for introduction to clinical anesthesiology, including preoperative evaluation of patients, selection of anesthetic technique, and administration of anesthetics under supervision. Perioperative medicine,

airway management, monitoring techniques, clinical pharmacology, and physiology are emphasized. J.J. Schwartz, S. Akhtar, V. Kurup

**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; V. Kurup, J.J. Schwartz

**ANES 141, Anesthesiology Clinical Research Elective** Participation in ongoing research by departmental 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 Basic 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**

Office: SHM C207, 203.737.5603

www.cellbiology.yale.edu

**Professors** 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*), T.D. Pollard (*Molecular, Cellular & Developmental Biology*), J.E. Rothman (*Chair*), M.A. Schwartz (*Medicine*), M. Simons (*Medicine*), E. Ullu (*Medicine*), S.L. Wolin

**Associate Professors** J.S. Bogan (*Medicine*), C.G. Burd, D.A. Calderwood (*Pharmacology*), E.R. Dufresne (*Engineering & Applied Science*), K.M. Reinisch, D.K. Toomre, T. Walther

**Assistant Professors** D. Baddeley, J. Bewersdorf, C. Carroll, D. Colón-Ramos, S.M. Ferguson, M. King, C. Lin, C.P. Lusk, M. Mariappan, T. Melia, P.A. Takizawa, J. Yao, Y. Zhang

**Senior Research Scientist** A.M. Vignery (*Orthopaedics & Rehabilitation*)

**Research Scientists** X.N. Liu, C. Qiu

**Associate Research Scientists** S.J. An, Y. Cai, X. Chen, R.J. Chi, J. Dancourt, A.R. Ferguson, V.K. Gangaraju, Y. Gao, L. Geng, S.S. Krishnakumar, G. Lavieu, I. Lee, F. Li, F. Nakatsu, J. Peng, F. Pincet, H. Qi, S. Sim, N. Tiwari, Z. Xi, Z. Zhang, M. Zhong

**CBIO 502a/b, Molecules to Systems** This full-year 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 in the first term include replication and transcription of the genome; regulation of the cell cycle and mitosis; protein biosynthesis and membrane targeting; cell motility and the cytoskeleton; signal transduction; nerve and muscle function. The second term covers cell and tissue organization of organ systems including respiratory, renal, gastrointestinal, endocrine, and reproductive 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 from September to mid-May and is equivalent to three 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 typically 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 three 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, C. Crews, P. De Camilli, M. King, T. Melia, I.-H. Park, T.D. Pollard, J.E. Rothman, M. 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, C. Crews, P. De Camilli, T. Melia, T.D. Pollard, J.E. Rothman, M. 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. Special emphasis is given to application of state-of-the-art imaging techniques to topical areas covering a wide range of contemporary cell biology. C.P. Lusk, C.G. Burd, S.M. Ferguson, and faculty

**CBIO 611b, Vascular Cell Biology** A lecture course that 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. Focus on cellular and molecular mechanisms. M.A. Schwartz

**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 multi-photon microscopes. 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. F. Slack 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. M. King

**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. C. Hashimoto

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

**CBIO 912b/GENE 912b/MCDB 912b, Second Laboratory Rotation** Second laboratory rotation for Molecular Cell Biology, Genetics, and Development track students. V. Reinke and faculty

**CBIO 913b/GENE 913b/MCDB 913b, Third Laboratory Rotation** Third laboratory rotation for Molecular Cell Biology, Genetics, and Development track students. F. Slack and faculty

## CELLULAR AND MOLECULAR PHYSIOLOGY

Office: 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, 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*), P. Mistry (*Medicine*), P.A. Preisig (*Medicine*), W. Saltzman (*Engineering & Applied Science*), J. Santos-Sacchi (*Surgery*), G.I. Shulman (*Medicine*), F.J. Sigworth, C.L. Slayman, C.W. Slayman (*Genetics*), T. Wang, F.S. Wright (*Medicine*), L.H. Young (*Medicine*), Z. Zhou (*Ophthalmology & Visual Science*)

**Associate Professors** N.A. Ameen (*Pediatrics*), J.B. Demb (*Ophthalmology & Visual Science*), M.E. Egan (*Pediatrics*), M.N. Nitabach, V.A. Pieribone, S. Tomita, D. Zenisek

**Assistant Professors** N.A. Addy (*Psychiatry*), S. Bragiantsev, S. Campbell (*Biomedical Engineering*), E. Gracheva, E. Karatekin, R.G. Kibbey (*Medicine*), J.J. Rinehart, S.K. Singh, X. Yang (*Comparative Medicine*)

**Instructor** J.Q. Leng

**Senior Research Scientist** D.P. Zecevic

**Associate Research Scientists** C.X. Bleau, B.A. Davis, Z. Du, Z. Han, M.E. Hughes, L. Jin, M.A. Reyna, A. Rivetta, H. Shigematsu, D. Sitaraman, M.M. Tomita, L. Wan, 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<sup>U</sup>/ENAS 550a<sup>U</sup>/MCDB 550a<sup>U</sup>/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. E.L. Boulpaep, W.M. Saltzman

**C&MP 560<sup>U</sup>/ENAS 570b<sup>U</sup>/MCDB 560b<sup>U</sup>/PHAR 560b, Cellular and Molecular Physiology: Molecular Machines in Human Disease** This 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** This 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 this 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). S.-E. Jardt, D. Nguyen, S. Tomita

**C&MP 650/PATH 660/PHAR 580, Ethics** 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, M. Robek, S.K. Singh

**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. F.J. Sigworth, C.V. Sindelar

[**C&MP 750b/NSCI 614b/PSYC 750b, Research Topics in the Neurobiology of Learning and Memory** Discussion and analysis of current work on the neurobiological foundations of learning and memory systems in mammals. Informal weekly discussions span several levels of analysis, including molecular and biophysical studies, cellular and systems neurophysiology and neuro-anatomy, and contemporary behavioral neuroscience.]

## CHILD STUDY CENTER

Office: NIHB 208, 203.785.2513

<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, A. Klin (*Adjunct*), 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*), 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 (*Chair*), 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, T.J. McMahon (*Psychiatry*), E.C. Miguel (*Adjunct*), K. Pelphrey, M.E. Schwab-Stone, D. Stubbe, N.E. Suchman (*Psychiatry*), E. Viding (*Adjunct*), C.C. Weitzman (*Pediatrics*)

**Assistant Professors** M.H. Bloch, D. Bridgett (*Adjunct*), P.R. Britto, A.L. Close, M.J. Crowley, R. Feldman (*Adjunct*), E.R. Lebowitz, P. Luyten (*Adjunct*), J.C. McPartland, C. Pittenger (*Psychiatry*), Y.B. Poncin, Z. Qayyum (*Psychiatry*), A. Raefski (*Adjunct*), B. Reichow (*Adjunct*), M.C. Rosario-Campos (*Adjunct*), F. Shic, M.V. Smith (*Psychiatry*), H.E. Stevens, C.S. Stover, D. Sukhodolsky, J.E. Swain (*Adjunct*), V. Weersing (*Adjunct*), M. Yazgan (*Adjunct*)

**Instructors** C.F. Califano, T.V. Fernandez, R.J. Jou, G.L. Lopez-Cohen, J. Meyer

**Senior Research Scientist** G.M. Anderson

**Research Scientist** V.R. Seitz

**Associate Research Scientists** M. Akbar, A. Amiri, K.M. Balestracci, B. Barbot, M. Bentley, L.L. Booth, F.E. Brown, L. Cardona, G. Coppola, C. Dauser, C. Emmons, A.G. Ercan-Sencicek, M. Finn-Stevenson, M.A. Goyette-Ewing, A.R. Gupta (*Pediatrics*), H. Hahn, L. Hart, E.J. Hoffman, K. Koenig, P. Kotapurathu kurup, A. Landeros-Weisenberger, T. Liu, S.L. Macari, C. Marin, M.G. Motlagh, S.S. Nicholls, W. Niu, N. Rakhlin, H.J. Rutherford, N. Salmaso, S.S. Stahl, K.D. Tsatsanis, B. Vander Wyk, P. Ventola, E.M. Warnick, J.M. Wolf, J. Wu, J. Xu

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

**Associate Clinical Professors** 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. Perlschwig, M. Target, A.P. Thies, P. Van Watum

**Assistant Clinical Professors** H.A. Allen, D.M. Aversa, A.J. Avni-Singer (*Pediatrics*), E. Becker-Dunn (*Psychiatry*), M. Best, D. Bober, L.A. Bogen, J.F. Chapman,

P.B. Chappell, J. Chilton, J.T. Collins, C. Epstein, G.E. Epstein-Wilf, 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, W. Hill, I.R. Jennings, H.P. Kahn, M.D. Kaplan, B.A. Keyes, P.K. Leebens, J.W. Loomis, 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. Muralee (*Psychiatry*), S.F. Nagler, F.J. Ninivaggi, B.F. Nordhaus, J.F. Poll, M.D. Powers, D.R. Rau (*Psychiatry*), E. Rodriguez-Keyes, R. Salah, D.A. Sasso, L.P. Siegel, A.G. Smaller, R. Sotsky, S. Werblood, M. Wudarsky, L.D. Zimmerman

**Clinical Instructors** D. Abate, J.M. Ambrosino (*Pediatrics*), J.E. Arias, A. Auja, M. Berkman, J.D. Cunningham, T.S. Davila, M.B. de-Naclerio, L.N. Dennehy, D.M. Dodge, L.M. Donovan, J. Eisenberg, A.L. Fulvio, J.A. Gallalee, N.M. Gentili, J. Gereda, K. Gereda, L.C. Hayden, P. Hetherington, E.M. Kimball, B. Kleine, K.H. Kowats, E. Kressley, T. Lewis, M. Lyons, K. Malensek, W. Marans, C. Martins, B.L. Mason, M. Moca, A.J. Myers, S. Peck, S.L. Peshori, H.C. Pizzanello, R. Plant, K.H. Pracitto, R.G. Pugliese, J. Radawich, B. Reddy, B.N. Rickler, R.A. Ritvo, C.T. Rowland, C. Schaefer, C. Schnaitmann, C. Schwartz, V.M. Shiller, M.M. Silva, M. St. Pierre, B. Taggart, E.O. Tongul, L. Urquiza, K. Voccola, G. Weiss, V.J. Zecchini

**Lecturers** K.F. Bailey, L.G. Barbieri, D.L. Bella, M.A. Ben-Avie, K. Carlson, 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, P.K. Thomas

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 122b, Aspects of Child and Adolescent Development in the Practice of Medicine** CAD explicitly deals with normal development, and specifically emphasizes social, cognitive, and emotional aspects of this lifelong process. It seeks to heighten the student's awareness of how different phases of development intersect with the clinical practice of medicine. It covers different schools of thought and approaches to developmental processes, leading to a better understanding of (among others) cognitive, language, motor, social, sexual, and interpersonal milestones, from birth through senescence. Since it can be challenging to understand the importance of these normative processes in a clinical

vacuum, the course complements the lectures given in the first hour (11 a.m. to noon) with clinical applications and extensive videotaped examples of that developmental phase in the second (noon to 1 p.m.). This approach provides the main “formula” for the course. First year, spring term, 16 hours. A.S. Martin and faculty

**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 Elective in Clinical Research** 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 322, Developmental, Psychiatric, and Psychological Assessment of Infants, Children, and Adolescents** A series of lectures on developmental assessment (DA), psychological testing (P), and the Mental Status Examination (MSE) of children is offered to all students on the Pediatric Clerkship. Students may have the opportunity to observe such evaluations while on the Pediatric Clerkship. Further opportunities to observe DA and P, and to perform mental status examinations of children, are provided during the Child Psychiatry track of the Psychiatry Clerkship. L.C. Mayes, N.L. Close, M.D. Kaplan, and faculty

**CHLD 323, The Child Psychiatry Track of the Psychiatry Core Requirement** This track is offered to four students per six-week rotation (three at the Children’s Psychiatric Inpatient Service [CPIS] of Yale-New Haven Hospital, one at the Consultation-Liaison [CL] track of the pediatrics wards at YNH). The CPIS and CL rotations meet the requirements for the “patient in crisis” and “interface with medicine” requirements of the core psychiatric clerkship of the third year. Both rotations provide extensive opportunities to observe and practice the process used to evaluate, diagnose, and plan the treatment of the child and his or her family. The rotations additionally provide for interview and write-up tutoring experiences, with both child and adult psychiatric patients. The track has three components: (a) a set of core experiences and lectures, (b) a group of optional selective experiences (such as visits to a therapeutic school), and (c) practica and directed readings. The practicum includes interviewing, working up, and writing reports on inpatients under the supervision of a child psychiatry tutor. In addition, each student prepares a written presentation related to an area of interest in child psychiatry. A.S. Martin, D. Stubbe, Y.B. Poncin, L. Cardona, and faculty

**CHLD 325/Psychiatry 325, Child Study Psychiatry Elective, Yale Child Study Center** 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 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. Director: A.S. Martin

## COMPARATIVE MEDICINE

Office: 310 Cedar Street, BML 330, 203.785.2525

<http://medicine.yale.edu/compmed>

**Professors** M.A. Cowley (*Adjunct*), S. Diano (*Obstetrics, Gynecology & Reproductive Sciences*), L.M. Garcia-Segura (*Adjunct*), M. Hajos (*Adjunct*), 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** A.M. Bennett (*Pharmacology*), J.L. Brandsma (*Adjunct*), X. Gao, A.K. Sfakianaki (*Obstetrics, Gynecology & Reproductive Sciences*), P.C. Smith

**Assistant Professors** C.J. Booth, J.A. Goodrich, M.S. Lawrence (*Adjunct*), I. Levy, M.S. Rodeheffer, J.A. Scholz, S.R. Wilson, X. Yang

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

**Associate Research Scientists** M. Cano-Vinas, M.d. Dietrich, M. Koch, Z. Liu

## DERMATOLOGY

Office: LCI 501, 203.785.4092

<http://medicine.yale.edu/dermatology>

**Professors** R.J. Antaya, J.L. Bologna, D.E. Brash (*Therapeutic Radiology*), 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, S.E. Cowper, C.J. Ko, R. Lazova, A. Subtil

**Assistant Professors** K.A. Choate, J. Choi, J.N. Choi, O.R. Colegio, A. Galan, V. Greco (*Genetics*), A.M. Hanlon, S. Imaeda, B.A. King, M.M. Tomayko

**Instructors** S.R. Christensen, R.Q. Klein, B. Srivastava

**Senior Research Scientists** I.M. Braverman, R. Halaban, L.M. Milstone

**Associate Research Scientists** D.J. Hanlon, V. Muthusamy

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

**Associate Clinical Professors** S.H. Bender, A. Bronin, F.M. Castiglione, I.S. Cohen, D.M. Davidson, L.M. Donofrio, J.S. Dover, J.W. Edelglass, R.S. Kahan, T.P. Kugelman, R.C. Langdon, P.I. Schneiderman, P.E. Shapiro, L.A. Sibrack, A. Zalka

**Assistant Clinical Professors** M.R. Alexiades-Armenakas, J.N. Alter, A.V. Atton, S.H. Barrett, P.M. Bevilacqua, D.L. Bilinski, S.E. Book, C.B. Carroll, T. Chartier, C. Chess, D. Correale, L.A. Daman, K.M. Diette, S.B. Dietz, D.L. Feinberg, M.A. Gohara, B. Goldberg, M.J. Goldstein, D.R. Greene, W.S. Jacoby, M. Kaminer, J.D. Knispel, S.A. Kolenik, 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, J. Moss, E. Naidorf, M.P. Noonan, W.A. Notaro, R.G. Oshman, B.J. Richter, J.G. Sansing, N.K. Sherline, N.R. Silverman, J.R. Zirn, B. Zubkov

**Clinical Instructors** S. Chavel, M.P. Coolidge, T. Futoryan, J.M. Grant-Kels, M.I. Oestreicher, D. Robinson, S.B. Sloan, E. Smith

**Lecturer** L.K. Friedlaender

**DERM 120, Dermatology 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 VA Connecticut Healthcare System, West Haven, 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 student every four weeks. Director: S. Imaeda

**DERM 302, Dermatology 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 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

Office: TE-2, 203.785.6938

<http://medicine.yale.edu/diagnosticradiology>

**Professors** J.J. Abrahams, H. Blumberg (*Psychiatry*), 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*), R.J. Gusberg (*Surgery*), D. Hyder, G.M. Israel, L.D. Katz, E. Kier, J.P. Lawson (*Emeritus*), G.F. Mason, S.M. McCarthy, B.L. McClellan (*Emeritus*), L.E. Philpotts, J. Pollak, I. Prohovnik (*Adjunct*), A.T. Rosenfield (*Emeritus*), D.L. Rothman, R.R. Salem (*Surgery*), L.M. Scoutt, C. Shaw (*Emeritus*), A.J. Sinusas (*Medicine*), B. Sumpio (*Surgery*), J.H. Sunshine (*Adjunct*), G. Sze, H.D. Tagare, I. Tocino, F.J. Wackers (*Emeritus*), J.C. Weinreb, R.I. White (*Emeritus*), B.L. Zaret (*Medicine*)

**Associate Professors** J.E. Aruny, S. Bokhari, D.W. Cheng, D. Cornfeld, R. de Graaf, R.K. Fulbright, T.R. Goodman, A.H. Haims, Y.H. Huang, K.M. Johnson, M.H. Johnson, C.R. Miller, H.R. Mojibian, E.D. Morris, X. Papademetris, D. Pelletier (*Neurology*), E. Reiner, A.N. Rubinowitz, R.R. Russell (*Medicine*), L.H. Staib, C.R. Taylor, S.W. Woods (*Psychiatry*)

**Assistant Professors** L. Andrejeva, M.H. Arici, R.R. Ayyagari, K.E. Baker, R. Butler, P.A. Cedeno, M. Chen, M.A. Choma, K.P. Cosgrove (*Psychiatry*), M. Djekidel, I. Doddamane, M.A. Durand, L. Ehrlich, I. Esterlis (*Psychiatry*), A.R. Gafton, G. Galiana, J. Geisel, G. Gunabushanam, M. Hampson, R.J. Hooley, L.J. Horvath, C. Juchem, R.H. Kent, J.D. Kirsch, A.W. Lischuk, C. Liu, A. Mahajan, A. Mallhotra, C.C. Matouk (*Neurosurgery*), R.D. Messina, F.J. Minja, J. Morgan, J.A. Obando, J.K. Pahade, D.C. Peters, C. Poon (*Adjunct*), M. Raghu, M.V. Revzin, C.J. Silva, P. Varma

**Instructors** I. Latich, J.C. Perez Lozada, W.A. Williams

**Senior Research Scientists** R.G. Shulman (*Molecular Biophysics & Biochemistry*), R.I. White

**Research Scientists** D.E. Befroy, F. D'Errico

**Associate Research Scientists** S.V. Chelikani, D. Coman, H. De Feyter, J. Gallezot, B.S. Ganganna, P. Herman, L. Jiang, D.C. Labaree, K. Lim, S. Lin, N. Nabulsi, M. Naganawa, M. Negishi, V. Neklesa, E. Park, M. Qiu, J.R. Ropchan, X. Shen, M. Zheng

**Clinical Professors** D.B. Nunez, 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, J.K. Crowe, A.R. Daftary, P.A. Dinauer, W.N. Friedman, J. Gagliardi, H.W. Gahbauer, R. Gonzalez, B.D. Griffith, A.I. Jonisch, A. Kalyanpur, J. Kim, R.A. Knobelmann, C.T. Kubiak, H. Moukaddam, A.R. Niakosari, G.S. Novick, I. Onyiuke, J.R. Pannese, A. Pathak,

Z. Protopapas, R. Sadar, B.D. Simonds, S.J. Sullivan, R.R. Tash, N.W. Tishkoff,  
J. Wruble, W.B. Zucconi

**Clinical Instructor** M. Spektor

**Lecturers** J. Arora, J. Bhawnani, G.J. Conlogue, F. Tokoglu

**DIAG 121, Diagnostic Radiology 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 Clinical 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: M.H. Arici; J. Pollak, J.E. Aruny

**DIAG 135, Pediatric Diagnostic Imaging Clinical 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: T.R. Goodman

**DIAG 137, Neuroradiology Clinical 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 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 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>

**Sect Ed 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

**Sect Ed 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

**Sect Ed 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

**Sect Ed 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

**Sect Ed 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 end-of-life care. The format of the course involves several 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. An integral part of the Pre-Clinical Clerkship is the tutorial program in which groups of four students meet with their tutor(s) weekly over a two-year period to practice their newly learned skills on patients in the hospital or clinic.

In the first year, students learn the basics of interviewing patients in formal sessions and the clinical tutorials. Emphasis is placed on a patient-centered approach utilizing standardized patients. Students also learn how to perform a complete physical examination in structured, supervised sessions in which they examine one another. Other activities include practicing their observation skills in an art museum, understanding the skills needed in the care of children, and understanding how to assess geriatric patients, as well as end-of-life care.

During their second year, students learn more sophisticated skills in obtaining a medical history, the components of a proper patient write-up, and the elements of oral patient presentations. Standardized patients are used again for teaching interviewing skills, but also for breast, pelvic, scrotal, and rectal examinations. At the beginning of their second term, students are evaluated on their ability to perform a complete history and physical examination at the Clinical Skills Assessment Program at UConn utilizing their standardized patients.

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). Limited to medical students. M.J. Bia

**Sect Ed 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 pre-clinical 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. Course is limited to second-year medical students. Director: M.P. DiGiovanna

**Sect Ed 107b, Professional Responsibility** Through a series of lectures and small group case discussions, this course examines physicians' responsibilities to their patients, their colleagues, their communities, and to society at large. The course examines the nature of the physician-patient relationship and its ethical underpinnings, as well as the legal, social, and economic contexts in which it operates. It focuses on the physician's obligations in several areas, including care for the underserved and vulnerable, respect for patients' privacy and confidentiality, obtaining informed consent for treatment, respecting the right to refuse treatment, respecting reproductive choices, and dealing with issues at the end of life. Finally, the course examines the structure, flaws, and strengths of the U.S. health care system, and the personal and social consequences of recent changes in the way health care is organized and financed in this country. J.S. Hughes

**Sect Ed 108b, Integrative Clinical Medicine** This three-week 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. Throughout the three weeks the emphasis is on the interplay among biological, social, and psychological factors that determine the health and illness of our patients and ourselves. Much of the course takes place in small groups of ten to twelve students under the guidance of an experienced clinician facilitator. Several of the small group sessions deal with the management of a clinical case with a view toward preparation for internship, but also including the social context of the case and the impact of economic, family, and societal factors as determinants of illness. In addition there are a number of clinical review sessions, including an ICU "crash course," several lectures on emergency medicine, a review of empiric antibiotic choices, instruction on how to sign out to colleagues, sessions on how to discuss DNR orders with patients, how to provide adequate pain relief for palliative care, and an intern panel discussion of what life is really like on and off the wards. The course includes a number of optional sessions on "nonbiological" topics throughout the course, including lectures on topics in the history of medicine, how to avoid "burnout," sessions on leadership and team functioning on the wards, the role of spirituality in medicine, updates on the political economy of the health care system, and the microeconomics of real-world medical practice. Also included are sessions on mistakes in medicine, dealing with difficult patients, end-of-life care, doctor-patient communication, and issues in professionalism and medical ethics. The course concludes with a session on "What you need to know about internship that nobody else will tell you" and finishes just before noon on Match Day. Director: J.S. Hughes

**Sect Ed 109, Student Research, Study Design, and Thesis Information—Office of Student Research** 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. Limited to medical students. J.N. Forrest, faculty, and staff

**Sect Ed 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 *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. J.R. Bender, faculty adviser

**Sect Ed 158, Primary Care Clerkship** The 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. Director: P. Ellis; with a faculty made up of physician educators who share a commitment to practice-based teaching

**Sect Ed 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 pre-clinic conferences which include Journal Club and primary care case-centered topics presented by students or specialty attendings. Students also become acquainted with the administration of outpatient clinic medicine. 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 primary care requirement provided that students also complete the Primary Care Clerkship Workshop

Program. 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: K.P. White; staffed by rotating attending physicians

**Sect Ed 159, Human Anatomy and Development** This course, designed specifically for first-year medical students, provides an opportunity to dissect or observe all structures of the human body. Lectures, conferences, models, radiology, and Web-based curriculum materials are included. Four students are assigned to each cadaver; students work collaboratively; interpersonal and group process skills are stressed. L.J. Rizzolo and staff

**Sect Ed 160a/b, Special Dissections in Anatomy** A laboratory designed to meet the needs of individual students. Any part of the cadaver may be dissected. Alternatively, students may develop anatomical and teaching skills by helping teach Sect Ed 159. Each student is assigned an anatomist and/or clinical specialist to act as consultant(s). Prerequisite: Sect Ed 159. Staff

**Sect Ed 501b, Responsible Conduct of Research** 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. Lectures with group discussion and case studies. Six 1.5-hour sessions. S. Alfano, M.J. Caplan, L. Cohen, F. Gorelick, R.J. Levine, D. Lewin, J.D. Macy, M. Picciotto, D.G. Schatz, S.S. Spangler, M. Waxman

**Sect Ed 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

**Sect Ed 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. Rabinowitz

**Sect Ed 510, 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 literature; (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

**Sect Ed 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: S.E. Rosener

**Sect Ed 601, Subinternship in Family Medicine, Middlesex Hospital** This advanced elective 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: S.E. Rosener

**Sect Ed 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 optimal 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

Office: 464 Congress Avenue, Suite 360, 203.785.4404  
<http://medicine.yale.edu/emergencymed>

**Professors** C.A. Brandt, D.C. Cone, G. D’Onofrio (*Chair*), S.M. Powsner (*Psychiatry*), F. Vaca

**Associate Professors** S.L. Bernstein, M.S. Bogucki, J.D. Dziura, A.L. Hsiao (*Pediatrics*), L. Jagminas, L. Marengo, C. Moore, L.A. Post, M. Shapiro

**Assistant Professors** K.L. Dodge, L.V. Evans, A.R. French, K.J. Jubanyik, B.M. Kirrane, S. Kotlyar, E.G. Marcolini, E.P. Monico, H.C. Moscovitz, M. Murphy, B. Safdar, J.E. Sather, I. Schwartz, A.F. Tarabar, A. Tomassoni, C.R. Wira

**Instructors** C.L. Barsky, R. Carter, S. Gadiraju, K. Goldflam, R. Jermyn, C.H. Lee, R. Liu, M.W. Mossey, M.A. Passo, B. Rice, R.A. Taylor

**Research Scientist** M.V. Pantalon

**Associate Research Scientist** F. Abujarad

**Associate Clinical Professors** J. Maisel, M.J. Werdmann

**Assistant Clinical Professor** C. Rambus

**Clinical Instructors** P. Agrawal, A. Aydin, S. Battistich, J.W. Bonz, S.A. Chekijian, A. Coppola, E. Melnick, S. Thomas, A. Tsyrluk

**Lecturers** R.D. Austin, K. Baker, M.L. Blundon, C. Bogan, J. Borsotti, K.J. Burns, R.E. Chen, T.E. Cohen, M. Czako, C. Dill, G.M. Faherty, D. Garland, A.L. Glick, K. Haskins, A. Hirschman, J. Kagan, E.W. Kelleher, T. Kimberly, K. Koncewicz, J. Lockel, L. Long, D.S. MacMillan, A. Meiman, T.A. Morris, M.C. Persinger, H. Puciata, M.T. Strong, D.E. Tichy, A. Uhuad, C.D. Walker, M. Wegman, H.B. White

**EMER 103, Clerkship in Emergency Medicine** A mandatory two-week rotation taken during the third year, with the emphasis on learning to care for patients who present to the emergency department with potentially life-threatening chief complaints. Students work shifts in the critical care area, where principles of stabilization and resuscitation are taught under close supervision of an attending Emergency Medicine physician and senior resident. Students are given the opportunity to perform a number of procedures as well, including bedside ultrasound, peripheral line placement, arterial blood gas sampling, and lumbar puncture. Goals of the rotation are to teach students to utilize a range of communication and interpersonal skills to elicit a focused biomedical and psychosocial history, to become competent in the full range of commonly used examination techniques essential to the practice of Emergency Medicine, and to formulate reasonable hypotheses and implement management strategies consistent with the acuity of the illness as well as patient’s preferences. Didactic teaching from Emergency Medicine faculty is done in small groups and includes interactive case conferences, workshops on palliative care and injury prevention, and one-on-one computerized microsimulation sessions with faculty to strengthen Advanced Cardiac Life Support skills. K.J. Jubanyik

**EMER 105, Subinternship in Emergency Medicine, Yale-New Haven Hospital** Students participating in this four-week elective 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 elective 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 to maintain clinical skills while away from the wards. Prerequisites: Internal Medicine and General Surgery Clerkships. Maximum of eight students every four weeks. Director: K.J. Jubanyik

**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 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. May be taken as a four-week half-time elective. One student every two or four weeks. R. Liu

**EMER 115, Medical Simulation Course** The medical student clinical simulation course is a mandatory twelve-week course taken during the third year. 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

## GENETICS

Office: SHM I308, 203.785.2649  
<http://medicine.yale.edu/genetics>

**Professors** A.E. Bale, S.J. Baserga (*Molecular Biophysics & Biochemistry*), W.R. Breg (*Emeritus*), J.H. Cho (*Medicine*), L. Cooley, D.C. DiMaio, B.G. Forget (*Medicine*), P.G. Gallagher (*Pediatrics*), J.E. Gelernter (*Psychiatry*), P.M. Glazer (*Therapeutic Radiology*), J.R. Gruen (*Pediatrics*), M. Gunel (*Neurosurgery*), A.L. Horwich, K.K. Kidd, R.P. Lifton (*Chair*), H. Lin (*Cell Biology*), M.J. Mahoney, C.M. Radding (*Emeritus*), M.R. Seashore, G.S. Shadel (*Pathology*), C.W. Slayman, S. Somlo (*Medicine*), J.B. Sweasy (*Therapeutic Radiology*), P.J. Tattersall (*Laboratory Medicine*), S.M. Weissman, T. Xu, H. Zhao (*Public Health*)

**Associate Professors** M. Brueckner (*Pediatrics*), A.J. Giraldez, M.K. Khokha (*Pediatrics*), P. Li, A. Mani (*Medicine*), M.N. Nitabach (*Cellular and Molecular Physiology*), V. Reinke, Z. Sun

**Assistant Professors** C. Cotsapas (*Neurology*), V. Greco, M. Hammarlund, N.B. Ivanova, T. Kim, J. Lim, J. Lu, J. Noonan, I. Park, S.D. Weatherbee, A. Xiao, H.Z. Zhang

**Senior Research Scientist** S.M. Mane

**Research Scientists** W.A. Fenton, E.C. Goodwin, A.M. Hudson, E.T. Matloff, J.M. McGrath (*Comparative Medicine*), A.J. Pakstis

**Associate Research Scientists** L.M. Boyden, A. Canaan, J. Cheng, D. Cifuentes Buirra, R. El Bejjani, S. Guo, W. Ji, S. Landrette, D. Li, J. Lian, J.F. Lopez-Giraldez, J. Lu, Y. Lu, D.N. Nguyen, J. Overton, X. Pan, L.M. Petti, F. Qian, M.D. Seay, S. Shibata, A.M. Szekely, Z. Wang, J. Zhang

**GENE 500b, Principles of Human Genetics** A genetics course taught jointly for graduate students and medical students, covering current knowledge in human genetics as applied to the genetic foundations of health and disease. A.E. Bale

**GENE 603b/IBIO 603b, Teaching in the Science Education Outreach Program (SEOP)** TAs, along with volunteers, teach three projects in genetics to seventh-graders in two or three New Haven schools. In addition, TAs take a short course on teaching and serve as science judges. Dates and times to be determined. For more details visit [www.seop.yale.edu](http://www.seop.yale.edu). Contact Professor Kavathas. P.B. Kavathas

**GENE 625a/MB&B 625a<sup>U</sup>/MCDB 625a<sup>U</sup>, 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, parametric and nonparametric linkage analysis, population-based association studies, family-based association studies, next-generation sequencing data analysis, genome-wide association studies, genetic risk prediction models, and DNA fingerprinting. Prerequisites: genetics; BIS 505a and b, or equivalent; and 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 staff

**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 for 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 genetics and mammalian anatomy and physiology. C.J. Zeiss

[GENE 734a/MB&B 734a/MBIO 734a/PATH 634a, **Molecular Biology of Animal Viruses** Offered every other year]

**GENE 743b/MB&B 743b<sup>U</sup>/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, P. Sung

**GENE 749a/MB&B 749a<sup>U</sup>, 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, M.W. Hochstrasser, I.G. Miller, A.D. Miranker, D.G. Schatz, T.A. Steitz, P. Sung, 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 genomic approaches but who have had little prior experience in genomics or bioinformatics. 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 and plant 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** Clinical rotation offering medical and graduate students the opportunity to participate in the Genetic Consultation Clinic, genetic rounds, consultation rounds, and genetic analysis of clinical diagnostic problems. M.R. Seashore

**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. F. Slack 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. M. King

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

**GENE 912b/CBIO 912b/MCDB 912b, Second Laboratory Rotation** Second laboratory rotation for Molecular Cell Biology, Genetics, and Development track students. V. Reinke and faculty

**GENE 913b/CBIO 913b/MCDB 913b, Third Laboratory Rotation** Third laboratory rotation for Molecular Cell Biology, Genetics, and Development track students. F. Slack and faculty

**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. Thematic lectures focus on the social and biological determinants of health and global health practice in the field, and the modules in 2013–2014 focus on noncommunicable diseases. Readings and class discussion. Each module concludes with student projects. Required for students in the Global Health Concentration at YSPH and for students in the Certificate in the Science and Practice of Medicine in the Global Context at YSM. Faculty advisers: G. Friedland, T. Rabin, S. Sheno (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 case-based seminar designed for students in all of the health profession programs as well as residents and other members of the Yale community interested in global health. The goal is to provide participants with a broad knowledge base in current globally important health issues. Each session is case-based and clinically relevant, though medical diagnosis and management are not the priority. The course provides a forum for interactive discussions of the health issues that pose unique challenges in resource-limited settings. Most sessions are collaborative – the faculty speaker is paired with one or two students, and the team works together to research and present the topic. This course considers student involvement to be vital to its success. A student leadership team, typically comprised of students from each program who took the course in the previous year, works closely with the course director to oversee academic content and assist in running the course. 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

Office: SHM L132, 203.785.4338  
<http://medicine.yale.edu/histmed>

**Professors** D. Kevles (*History*), S.E. Lederer (*Adjunct*), F. Snowden (*History*), B.J. Strasser (*Adjunct*), W.C. Summers (*Therapeutic Radiology*), J.H. Warner (*Chair*)

**Associate Professor** N. Rogers

**Assistant Professors** P. Bertucci (*History*), J. Radin

Yale College and Graduate School courses open to medical students:

**HSHM 206b/AMST 176b/EVST 206b/HIST 144b/HUMS 323b, Science and Technology in the United States** The development of science and technology in American society from the colonial period through the late twentieth century. The rise of the United States to a world-class scientific and technological power; the American scientific community and the tensions it has faced in a democratic society; the role of science and technology in exploration, agriculture, industry, national defense, religion, culture, and social change. D. Kevles

**HSHM 212b/HIST 146b/HLTH 280b, Historical Perspectives on Global Health** The broader historical context of contemporary practices, policies, and values associated with the concept of global health. Historical formations around ideas about disease, colonialism, race, gender, science, diplomacy, security, economy, and humanitarianism; ways in which these formations have shaped and been shaped by attempts to negotiate problems of health and well-being that transcend geopolitical borders. J. Radin

**HSHM 215a/HIST 140a, Public Health in America, 1793–2000** A survey of public health in America from the yellow fever epidemic of 1793 to AIDS and breast cancer activism at the end of the past century. Focusing on medicine and the state, topics include quarantines, failures and successes of medical and social welfare, the experiences of healers and patients, and organized medicine and its critics. N. Rogers

**HSHM 235a/HIST 234a, 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 242b/HIST 193b, Molecules, Life, and Disease: Twentieth Century** The emergence of the molecular vision of life and disease in the twentieth century. Topics include the role of technology and research practices, intellectual and political migrations, science policy and philanthropic foundations, constructions of risks and patenting of life, big science and biotechnology, politics of memory, and popular representation of science. Relationships to broad intellectual, social, cultural, and political changes. W. Summers

**HSHM 424b/HIST 155Jb, Science, Invention, and the Visual Arts since Darwin** The influence of scientific theories and technologies on the visual arts from the mid-nineteenth century to the present. Understandings and misunderstandings of scientific concepts and inventions as they appear in artistic works. Topics include relativity, quantum mechanics, medical images inside the human body, and images from space. Focus on American and European artists and art movements. B. Kevles

**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 317a, 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 460b/HIST 257Jb/HUMS 356b, Art, Technology, and Science from Antiquity to 1800** Changes in the notions of art and science in the West through 1800. The association of the term “art” with the fine arts as a legacy of the Enlightenment; implications of this semantic shift for early modern European culture. Visual and material cultures of science, including anatomical and natural history illustrations, curiosity cabinets and *Wunderkammern*, microscopy and astronomy, Greek and Roman military technology and warfare, and Leonardo and the engineers of the Renaissance. Use of rare books, manuscripts, and historical scientific instruments from library and museum collections at Yale. P. Bertucci

**HSHM 464a/HIST 142Ja, The Cultural History of Mental Illness** The construction of madness and mental illness in Western thought and culture. The rise and fall of the asylum system; the development of psychoanalytic theory; twentieth-century medical practices such as psychopharmaceutical treatments and lobotomy; the antipsychiatry movement; patients’ rights and contested diagnoses; portrayals of the mentally ill in society and popular culture; issues surrounding gender and sexuality. C. Thompson

**HSHM 470a and 471b, Directed Reading** Readings directed by members of the faculty on topics in the history of science, medicine, or public health not covered by regular course offerings. Subjects depend on the interests of students and faculty. Weekly conferences; required papers. J. Radin

**HSHM 634a<sup>U</sup>/AMST 879a<sup>U</sup>/HIST 914a<sup>U</sup>, Media and Medicine in Modern America** Relationships among medicine, health, and the media in the United States from 1880 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. Berland

**HSHM 676b/HIST 938b/LAW 21441, The Engineering and Ownership of Life** The seminar explores the historical development of intellectual property protection in living matter. Focusing on the United States in world context, it examines arrangements outside the patent system as well as within it. Topics include agriculture, medicine, biotechnology, and law. May be taken as a reading or research course. D. Kevles

**HSHM 680a<sup>U</sup>/HIST 911a<sup>U</sup>, History of Chinese Science** A study of the major themes in Chinese scientific thinking from antiquity to the twentieth century. Emphasis on non-Western concepts of nature and the development of science in China, East-West scientific exchanges, and China's role in modern science. W. Summers

**HSHM 701a/AMST 878a/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 writing on health care, illness experiences, 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** Close study of recent secondary literature in the history of the physical and life sciences. An inclusive overview of the emergence and diversity of scientific ways of knowing, major scientific theories and methods, and the role of science in politics, capitalism, war, and everyday life. Discussions focus on historians' different analytic and interpretive approaches. P. Bertucci

**HSHM 710a/HIST 921a, Methods for the Social Studies of Science, Technology, and Medicine** 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 emphasizes the debates on constructivism and relativism and provides critical tools to address the relationships among science, technology, medicine, and society. J. Radin

**HSHM 716a/HIST 936a, Early Modern Science and Medicine** The course focuses on recent works in the history of science and medicine in the early modern world. We discuss how interdisciplinary approaches — including economic and urban history, sociology and anthropology of science, gender studies, art and colonial history — have challenged the classic historiographical category of “the Scientific Revolution.” We also discuss the avenues for research that new approaches to early modern science and medicine have opened up, placing special emphasis on the circulation of knowledge, practices of collecting, and visual and material culture. P. Bertucci

**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

Office: TAC S625, 203.785.3857

<http://medicine.yale.edu/immuno>

**Professors** J.R. Bender (*Medicine*), A.L. Bothwell, H. Bottomly (*Emeritus*), L. Chen, J.E. Craft (*Medicine*), P. Cresswell, M.V. Dhodapkar (*Medicine*), J.A. Elias (*Medicine*), R.A. Flavell (*Chair*), D. Hafler (*Neurology*), K. Herold, A. Iwasaki, P.B. Kavathas (*Laboratory Medicine*), R.M. Medzhitov, J.S. Pober, D.G. Schatz, M.J. Shlomchik (*Laboratory Medicine*)

**Associate Professors** T.H. Chi, Tarek Fahmy (*Biomedical Engineering*), D.R. Goldstein (*Medicine*), S. Kaech, E.R. Meffre, W.D. Shlomchik (*Medicine*), B. Su

**Assistant Professors** S.C. Eisenbarth (*Laboratory Medicine*), M.A. Kriegel, J.P. Pereira, C.V. Rothlin

**Senior Research Scientist** H. Bottomly

**Research Scientists** E.E. Eynon, M.S. Kluger

**Associate Research Scientists** T.O. Bondar, W. Chae, P.R. Clark, T. Ghazi, N. Iijima, W. Ip, H. Kanda, N.C. Kirkiles-Smith, E.B. Kopp, Y. Kumamoto, A.S. Lazorchak, T.D. Manes, Y. Okabe, A. Rongvaux, D. Schenten, R.B. Seth, A.J. Williams, T. Willinger, G. Zhu

For a complete listing of immunology-related courses, see <http://info.med.yale.edu/bbs>.

**IBIO 530a/MCDB 530a<sup>U</sup>, 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. J.P. Pereira and faculty

**IBIO 532b, Inflammation** This course covers fundamentals of inflammation from a broad biological perspective. Both physiological and pathological aspects of inflammation are the focus. R.M. Medzhitov

**IBIO 536a, Advanced Immunology Seminar: Mucosal Immunity and Microbiome** This seminar course covers key concepts in immune responses against pathogens in mucosal tissues. We cover seminal studies that probe how microbiota and virobiota regulate the

immune system and vice versa in health and disease states, and how dysbiosis impacts human health. A. Iwasaki, R.M. Medzhitov, M.A. Kriegel

**IBIO 600a, Introduction to Research: Faculty Research Presentations** Introduction to the research interests of the faculty. Required for all first-year Immunology/BBS students. Pass/Fail. A.L. Bothwell 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 for first-year Immunobiology students, first-year CB&B students, and training grant-funded postdocs. Pass/Fail. A.L. Bothwell and faculty

**IBIO 603b/GENE 603b, Teaching in the Science Education Outreach Program (SEOP)** TAs, along with volunteers, teach three projects in genetics to seventh-graders in two or three New Haven schools. In addition, TAs take a short course on teaching and serve as science judges. Dates and times to be determined. For more details visit [www.seop.yale.edu](http://www.seop.yale.edu). For teaching credit. In Immunobiology, this TA position must follow a TA position in a regular course. Contact Paula Kavathas. P.B. Kavathas

**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 Giamattei 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. 16–Dec 6. (1 course credit; minimum of 20 hours/week). Required for all first-year Immunology/BBS students. A.L. Bothwell and faculty

**IBIO 612b, Research Rotation 2** See description under IBIO 611a. Course dates are Jan. 6–March 14. A.L. Bothwell and faculty

**IBIO 613b, Research Rotation 3** See description under IBIO 611a. Course dates are March 17–May 23. A.L. Bothwell and faculty

## INTERNAL MEDICINE

Office: 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, P.K. Bondy (*Emeritus*), J.L. Boyer, A.E. Broadus, R. Bucala, L.M. Buckley, G.N. Burrow (*Emeritus*), H.S. Cabin, C. Canessa (*Cellular & Molecular Physiology*), L.G. Cantley, L. Chen (*Immunobiology*), J.H. Cho, M.W. Cleman, L.S. Cohen (*Emeritus*), D.L. Coleman (*Emeritus*), J.P. Concato, L.M. Cooney, D.L. Cooper, J. Costa (*Pathology*), P.V. Coveney (*Adjunct*), J.E. Craft, J.E. Deanfield (*Adjunct*), L. Dembry, G.V. Desir, V.T. DeVita, M.V. Dhodapkar, M.A. Drickamer, T.P. Duffy, A. Eichmann, J.A. Elias (*Chair*), D.G. Federman, D.A. Fiellin, E. Fikrig, R.L. Fisher, B.G. Forget (*Emeritus*), J.N. Forrest, F.M. Foss, T.R. Fried, G. Friedland, L. Friedman, G. Garcia-Tsao, J.B. Gee (*Emeritus*), R.H. Gifford (*Emeritus*), T.M. Gill, J.A. Goffinet (*Emeritus*), F. Gorelick, M.L. Green, 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*), P.A. Jamidar, A.C. Justice, F.S. Kantor, C.R. Kapadia, W.N. Kernan, A.I. Ko (*Epidemiology*), M.J. Kozal, H.M. Krumholz, M. Kryger, L. Laine, M. Landry (*Laboratory Medicine*), F.A. Lee, R.J. Levine, R.P. Lifton (*Genetics*), T.J. Lynch (*Chair*), R.L. Mahnensmith, S.E. Malawista, M.J. Mamula, J.C. Marsh (*Emeritus*), J.F. Martin (*Adjunct*), R.A. Matthay (*Emeritus*), W.J. McKenna (*Adjunct*), P.K. Mistry (*Pediatrics*), V. Mohsenin, M.H. Nathanson, P.G. O'Connor, M.A. Perazella, K.F. Petersen, P.A. Preisig, D.D. Proctor, V.J. Quagliarello, A. Rastegar, C. Redlich, H.M. Rinder (*Laboratory Medicine*), M.E. Robert (*Pathology*), S.H. Rosenbaum (*Anesthesiology*), M.B. Russi, R. Safirstein, M.A. Schwartz, W.C. Sessa (*Pharmacology*), R.S. Sherwin, G.I. Shulman, M.D. Siegel, M. Simons, A.J. Sinusas, B.R. Smith (*Laboratory Medicine*), S. Somlo, R. Soufer, R.L. Steinbrook (*Adjunct*), M. Strazzabosco (*Adjunct*), M. Sznol, L. Tanoue, M.E. Tinetti, E. Ullu, 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, N.R. H.G. Allore, Angoff, H.R. Aslanian, J.M. Baehring (*Neurology*), C. Ben Mamoun, G.K. Berland, J.S. Bogan, 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*), S.T. Crowley, J.P. Curtis, M.P. DiGiovanna, B.R. Doolittle, D.L. Dries, J.D. Dziura (*Emergency Medicine*), M.S. Ellman, J. Evans, L.E. Fiellin, R.N. Formica, A.H. Fortin, L. Fraenkel, I. Genao, S.N. Gettinger, F.J. Giordano, D.R. Goldstein, C.P. Gross, B.I. Gulanski, S.G. Haskell, J.B. Henrich, J. Hwa, Y. Iwakiri, D. Jain (*Pathology*), E.A. Jonas, M. Juthani-Mehta, A. Kamarulzaman (*Adjunct*), I. Kang, J.M. Kapo, B.I. Kazmierczak, J.E. Kerstetter (*Adjunct*), H. Kluger, J. Koo, J.D. Kravetz, S. Kulkarni (*Surgery*), J. Lacy, R.J. Lampert, A.J. Lansky, C. Lee, P. Lee, J.K. Lim, Y. Liu, A. Mani,

M.A. Marieb, S. Mark (*Adjunct*), P. Marks, R.A. Marottoli, K.A. Martin, R.A. Martinello, R.L. McNamara, T.P. Meehan (*Adjunct*), E.R. Meffre (*Immunobiology*), W.Z. Mehal, R.R. Montgomery, J.P. Moriarty, A.B. Nagar, C.R. Parikh, A.J. Peixoto, S.E. Pfau, M.A. Pisani, P. Protiva, P.M. Rabinowitz, A.B. Reisman, M.S. Remetz, C. Rochester, M.G. Rose, J.R. Rosenbaum, L.E. Rosenfeld, F.J. Roux, C.B. Ruser, K.S. Russell, R.R. Russell, M.M. Sadeghi, V.T. Samuel, M. Schilsky, S.E. Seropian, J.F. Setaro, A.C. Shaw, W.D. Shlomchik, A.N. Sofair, L. Solomon, L. Sugeng, R. Sutton, O.A. Taiwo, C.A. Thompson, T.K. Trow, M.S. Villanueva, L.M. Walke, D.M. Windish, H.K. Yaggi

**Assistant Professors** A.K. Abu-Alfa (*Adjunct*), A.M. Ahasic, K.M. Akgun, A. Annamalai (*Psychiatry*), D.E. Antin-Ozerkis, W.S. Asch, D.B. Banach, L.A. Barakat, M.R. Basso (*Adjunct*), W.C. Becker, L. Bellumkonda, P.S. Bhatt, I.M. Birnbaum (*Adjunct*), G.R. Brescia, R.S. Brienza, D. Brissette, R.D. Bruce, C.M. Brunet, B.C. Cambi, O. Chan, H. Chao, L. Chaptini, S. Chatterjee, A. Chiang, H.J. Chun, G.G. Chung, J.F. Clancy, S. Coca, S. Cole, G. Connors, D.J. Curran, N.K. Dahl, C.S. Dela Cruz, H.A. Deshpande, L. Dugdale, D.W. Dunne, E.J. Edelman, S.C. Eisenbarth (*Laboratory Medicine*), P.J. Ellis, B. Emu, L. Fabris (*Adjunct*), W.H. Fares, M.K. Fikrig, R. Fogerty, B.E. Fortune, C.A. Fragoso, J.S. Francis, 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, F. Hasan, S.F. Hay, J. Herrin (*Adjunct*), R.I. Herzog, E.L. Herzog, B.L. Hiatt, E.W. Hofstatter, E.H. Holt, S.R. Holt, S. Honiden, R. Hoque, L.I. Horwitz, C.J. Howes, M.E. Hurwitz, A. Hyson, A.B. Imaeda, S. Ishibe, I. Isufi, D.L. Jacoby, F. Jadbabaie, S.S. Jakab, S. Jeffery (*Adjunct*), G.Y. Jenq, S. Jin, M. Kang, A.K. Karihaloo, S.S. Kashaf, R.G. Kibbey, N. Kim, J. Koff, R. Koski (*Adjunct*), N. Krishnan, C. Kumar, P. Kumar, R.E. Laff, A.I. Lee, J. Li, A.H. Liapakis, B.C. Lupsa, U. Makris (*Adjunct*), M. Malinis, B.J. Malm, P. Mannam, P.S. Marshall, J. Mathur, R.J. McCrimmon (*Adjunct*), K.C. McKenzie, E.C. McNay (*Adjunct*), J.L. Meadows, P. Meier (*Adjunct*), C.I. Mena, G.C. Michaud, T.A. Molisse, D. Morgensztern, V.A. Morris, M. Murakami (*Adjunct*), T.E. Murphy, S. Nicoli, M. Nunez-Smith, O.E. Ogbuagu, I. Oikonomou, P. Oray-Schrom, J.C. Paeng (*Adjunct*), S. Parikh (*Epidemiology*), T.L. Parker, D.O. Persky, N.A. Podoltsev, J.D. Possick, J.T. Puchalski, Y. Qyang, A.M. Reed, R.A. Rienzo, J.S. Ross, C. Ruhrberg (*Adjunct*), C.J. Sakr (*Adjunct*), M.J. Sanchez, L. Sanders, T. Sanft, C.B. Sankey, J.R. Satchell-Jones, R. Scandrett, S.M. Schnittman (*Adjunct*), A.R. Schwartz, S. Sheno, A.C. Shirali, J.M. Siner, J.F. Spelman, C. Spirli, S.A. Springer, S.M. Stein, S. Steinberg (*Adjunct*), M.P. Strout, L.G. Suter, E.S. Swenson, T.H. Taddei, S. Takyar, J. Talwalkar, J.M. Testani, J.M. Tetrault, D.G. Tobin, J. Turner, J.N. Van Houten, L.S. Vasquez, E. Wang, Y. Wang (*Adjunct*), L.M. Whitman, C. Won, E.Y. Wong, R. Worthington (*Adjunct*), X. Yao

**Instructors** H. Amjad, A. Arwady, R. Belfort-Deaguiar, J. Canterino, F. Chan, W. Chang, E. Cristea, J.K. Forrest, J.L. Gomez Villalobos, A.M. Jastreboff, J. Joseph, G. Kayingo, F. Knaufl, C.S. Kournioti, K.J. Lipska, E.P. Marin, J.P. Meyer, B. Miner, A. Panda, C.C. Price, L. Puglisi, T. Rabin, M. Rastegar, P. Reddy, C. Ritsema, D.I. Rosenthal, A. Sahakian, R. Scatena, J. Schwartz, S. Soares, J. Yu

**Senior Research Scientists** M. Ananthanarayanan, H.J. Binder, L.S. Cohen (*Emeritus*), R.J. Groszmann (*Emeritus*), R.A. Matthay, W.M. Philbrick, C.J. Soroka, L. Wen, A.V. Wisnewski, B.L. Zaret

**Research Scientists** S. Alfano, D.I. Baker, D.E. Befroy (*Diagnostic Radiology*), A.A. Belperron, C.Y. Cai, S. Cai, A.K. Chakraborty, J. Choi, L. Han, A.A. Lanahan, L. Leng, S. Narasimhan, E.C. Thrower, D. Tirziu, P.H. Van Ness, H. Velazquez, C.M. Viscoli, Z. Zhuang

**Associate Research Scientists** F. Ahangari, M. Ahsan, K.N. Alavian, M. Aslan, R.L. Barnes, S.N. Brown, M. Budatha, S.S. Chang, W. Cho, M.D. Corral, J.C. Costa, C.J. Cutter, Y. Dai, N. De Rekeneire, Y. Deng, K. Dong, H.A. Doyle, X. Du, M. Duggal, X. Fan, R. Fiorotto, V.A. Fortuna, A. Gallagher, N. Gotoh, K. Granic, M.T. Guerra, W.K. Gurr, M. Haslip, C.H. He, M. Hedl, K. Hieftje, Y. Hu, C. Hu, Y. Huang, I.M. Jaba, S.K. Jeong, Z. Jiang, L.B. Jilaveanu, R. Ju, M.J. Jurczak, K. Kim, S. Koduru, A.S. Kunte, T.C. Kyriakides, S. Lal, B.B. Larrivee, D.M. Lazar, Y.A. Lazebnik, S.H. Lee, M. Li, L. Liu, Q. Liu, B. Ma, M. Ma, R. Mamillapalli, A. Marlier, G.J. McAvay, S. Mohanty, L. Nie, C.R. Oladele, X. Ouyang, M. Ouyang, H. Park, D. Qi, F. Qian, L. Qin (*Public Health*), V.S. Ramgolam, M. Razavian, Y. Ren, J.M. Rhodes, H. Shen, W. Shi, M. Shin, A. Silver, R. Singh, M.H. Stowe, B. Sun, S. Sutton, B. Szepietowska, N. Tai, J.P. Tate, T.M. Thompson, R.B. Thomson, X. Tian, X. Tian, V. Wali, W.E. Walker, P. Wang, Y. Wang, P. Wang, F. Wei, J. Wickersham, B. Xu, M. Yang, T. Yarovinsky, W. Zhang, X. Zhang, P. Zhang, J. Zhang, J. Zhang, P. Zhang, Y. Zhou

**Clinical Professors** J. Belsky, J.M. Borak (*Epidemiology*), J.M. Boyce, M.H. Brand, E. Citkowitz, K.L. Cohen, N. Dainiak, F.O. Finkelstein, D.S. Fischer, L. Friedman, P.N. Herbert, A.S. Kliger, N.J. Marieb, C.A. McPherson, M. Moser, 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, T.J. Balczak, M.C. Bennick, S.T. Bogardus, S.D. Brenner, G.K. Buller, J.P. Cleary, W.B. Crede, C.A. Disabatino, K.J. Dobuler, A.B. Douglass, S.M. Epstein, E.L. Etkind, D.I. Geisser, R.A. Gelfand, J. Gerber, M.P. Golden, A.V. Granata, L.E. Grauer, H.L. Haronian, G.J. Hutchinson, K.A. Hutchinson, S.G. Jones, G.J. Kerins, S.J. Kra, G.I. Lancaster, J.D. Lawrason, 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, R.J. Nardino, P.B. Nussbaum, J.M. Perlotto, J.L. Renda, J.H. Revkin, J.R. Sabetta, M.L. Schwartz, M.F. Simms, D.S. Smith, J.D. Smith, J.F. Sullivan, H.L. Taubin, R. Torres, E. Vosburgh, S.B. Weissman, S. Wolfson, K.H. Yang, S.W. Zarich

**Assistant Clinical Professors** R.M. Aaronson, A.J. Accomando, E.D. Agin, O.T. Akande, J. Alexander, R. Alfano-Kostenka, Y. Amoateng-Adjepong, C.A. Arnold, S. Asefaw, P. Asiedu, P. Bahuguna, J.M. Banatoski, G.V. Bedarida, A. Bedford, A.M. Bekui, L. Berman, M.L. Blitzer, J.M. Blumberg, N.A. Bonheim, B. Boyd, T. Braverman, J.A. Brier, D. Brock, A.R. Cadariu, C.A. Caldwell, L.L. Calo, E.M. Carlson, B.J. Chan, J.J. Chang, V.A. Chang, D.M. Chess, J.L. Cho, L.M. Chou, J.J. Chuong, M.I. Chustecki, M.A. Ciampi, P.R. Cimino, G.M. Cohen, M. Cohen, R.B. Cooper, J.A. Cosgriff, A.J. Cusano, S.B. D'Cunha, M.A. Demetrius, 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, R. Elias, J.M. Elser, J.J. Ernstoff, N. Fahmi, E. Fan, I. Feintzeig, D. Fine, A.F. Fisher, F.A. Flatow, J.F. Flint, M.H. Floch, R.S. Folman, M.J. Franco, J.H. Fullerton, T.M. Fynan, J.E. Gage, L.S. Galante, P.N. Geimer, S. Geller, P. Genecin, R.S. Generoso, B.J. Gerstenhaber, A.E. Ghantous, P. Gibbs, R.D. Gibbs, P.A. Goldberg, G. Goldenberg, S.M. Gordon-Dole, D.I. Grayer, M.S. Grogan, E.M. Grubman, M.S. Guoth, S. Gupta, T.K. Gupta, K.A. Haedicke, S.S. Hahn, L.W. Hammers (*Diagnostic Radiology*), J.H. Hansson, D.J. Hass, J.K. Henchel, G. Henry, D.G. Hill, C.F. Hollander, D. Hollister, X. Hong, L.J. Huang, K.J. Hunt, R.G. Huntley, J. Iannarone, C.D. Illick, O.T. Imevbore, S.S. Jacoby, P.E. Jaffe, P.M. Jenei, L. Jung, S.V. Kanade, H.P. Kaplan, A. Karne, D. Kaufman, R.E. Kaufman, M.A. Kazakoff, G. Kelley, J. Kleinstein, H. Knight, C.R. Kramer, H.M. Kramer, M.L. Kraus, S.H. Kunkes, S.P. Lagarde, J.M. Lai, S. Lam, R.A. Lanzani, M. Lataillade, U. Latif, R.E. Lebson, M. Lee, R.J. Lewis, E. Liben, H.M. Likier, L.S. Lim, M. Litchman, R.I. Lovins, 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, J.A. Merritt, K. Michels-Ashwood, S.P. Mickleby, D.T. Miller, E.A. Mirabile-Levens, A. Mohammad, J. Morris, M.M. Munteanu, J.I. Nadelmann, 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.A. Orell, J.R. Ouellette, W.T. Panullo, W.N. Pearson, B. Peck, M. Perrotti, L. Pham, D. Phanumas, S.E. Possick, 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. Rocklin, D. Roer, P.R. Rogol, S.E. Rosener, S.D. Rossner, M.C. Rubinstein, L. Saberski, D.M. Sack, R.T. Sadock, O.V. Sakharova, J.A. Salvana, S.L. Saunders, A. Schaffner, J.A. Schmierer, H.M. Schwartz, J. Seltzer, N. Shah, J.C. Shepherd, 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, J. Stepczynski, B.S. Thomas, P. Tietjen, M.K. Tighe, J. Toksoy, J. Tomanelli, J.E. Topal, P.C. Tortora, K.J. Twohig, J.G. Uberti, H.D. Uderman, A.S. Ulku, R. Umashanker, S. Urciuoli, S. Varano, M.D. Virata, H. Ward, W.S. Warren, K.E. Webb, R.B. Wein, K.P. White, D.M. Wolfsohn, A. Wormser, J. Yu, M. Zain, C.S. Zalis, F. Zarcu-Power, J.S. Zaretsky, J.S. Zesk, J.J. Zumpano, F.R. Zwas

**Clinical Instructors** L. Alaparathi, S.K. Alavi, D. Alcantara-Cadillo, S.A. Alston, L. Ameti, S.J. Angelo, V.S. Argento, H.H. Atkins, L. Bakkali, S. Banerjee, K.M. Baran, J.M. Belcher, S.M. Bernheim, D.J. Berube, R.M. Brammer, J. Breen, R. Breier, C. Brown, J.A. Brunetti, R.M. Bryan, N.C. Bunawan, K.E. Calia, A.W. Camp, H. Carey, D. Casablanca (*Nursing*), J.P. Chandler, E.H. Chanko, C. Chen, D. Chia, J.M. Chua-Reyes, T.M. Clarke, D.L. Copen, M.B. Courtney, W.L. Cushing, L.J. Cuzzone, S.A. D'Souza, M.L. Dam, A.R. Datunashvili, A. DeLisle, J.D. Demayo, M. Derosa, S. Dey, P. Dhawan, D.H. Dumont, A.M. Dunn, C.M. Edelmann, C.M. Elrington, D.E. Evans, S.J. Farber, R. Flores, M. Franco Vega, E.H. Francois, E. Frawley, G. Gangu, M.W. Garber, H.B. Garfinkel, V. Gassman, T. Genese, C.E. Glass, O.J. Green, M. Gupta, W.B. Hale, I.E. Hall, C.M. Hamill, J. Hauser, D.G. Heacock, J.C. Hlawitschka, S.M. Hoq, J. Huang, S.C. Huen, R. Johnson, S.R. Joshi, K.A. Kaplove, D.L. Katz, J.D. Kenkare, R. Khodzinsky, L. Knoll, A. Kohli-Pamnani,

A.A. Kramer, E.D. Kulaga, M.E. Kulaga, C. Kurlander, C. Ligon, S.R. Lin, F.A. Loria, L. Magras, N.T. Manickam, A. Margaryan, A.J. McCabe, R. McLeod-Labissiere, C.J. Michos, J.D. Miller, R.L. Miller, D. Moll, E. Montesino, A.R. Morrison, R.F. Morrison, T. Muniraj, A.S. Murray, K.G. Nair, K. Nakashima, G.J. Napolitano, E.R. Nash, S. Nawaz, S.N. Novack, J. Oen-Hsiao, E. Ofori-Mante, R. Ohene-Adjei, M. Orias, J.R. Orlinick, O.I. Otolorin, J.K. Pacini, L.A. Panzini, W.W. Paramanathan, B. Patel, T.E. Pellechi, A.E. Petersen, J.F. Pezzimenti, K.C. Pham, L.J. Phillips, M. Plavec, P.T. Porello, H.R. Pun, N.G. Ragovis, S. Raissi, R.F. Ramos, N. Rizk, A.J. Rodriguez, R.R. Rohatsch, M. Rosenthal, S.T. Rottinghaus, S. Samarany, L.S. Samson, J. Samuel, S.M. Santana, R.R. Savino, 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, G.P. Shields, C.M. Signore, B.A. Skudlarska, A. Smith, G. Spivack, D.C. Stair, A.J. Stannard, R.H. Stember, R.P. Streeter, K.P. Swan, R. Tafuri, S. Tandon, A. Taneja, A. Tarabar, J.N. Thompson, G.E. Tratt, J.S. Urbanetti, A. Uzunpinar, D.J. Van Rhijn, I. Vashist, L.Q. Vo, J.S. Waldman, O.G. Weis, S.C. Widman, D.H. Witt, B. Yeboah, A. Yee, M. Yoo, R.A. Zlotoff

**Lecturers** O. Abreu-Lanfranco, D. Acampora, B. Adelsberg, A. Alfirii, M. Amuchastegui, S.K. Apgar, A. Apoltan, M. Barnes, T. Boron, J. Carroll, M. Chomiak, P.C. Cremer, O.M. Deshpande, R. Desouza, P.B. Dieffenbach, D.L. Dobkin, M. Evans, G.E. Ferrucci, C.L. Giordano, J. Gobin, J. Goetz (*Nursing*), M.O. Guzman, R. Hao, K.T. Hartmann, R. Henry, J. Honig, P.R. Huvelle, C.N. Ionescu, S. Ionescu, D. Kearney, K.G. Kett, M. Kyrger, J.A. Leach, R. Leventhal, P.G. Levinson, R. Linden, G. Lucas, P. Maher, K.T. Maloney, V. Marer, J. Marino, S. McGarvey, D. McGowan, D. McKee (*Economics*), N. Merchant, R. Nadkarni, M. Oen-Hsiao, O.O. Olusesi, J.M. Oshlick, S. Pasha, A.E. Perrin, F. Petruzzello, J.L. Quaranta, A. Radebold, E. Rippel, R.T. Rozett, S.R. Rubenstein, V. Sawicki, R. Schane, W. Shaib, M.D. Slade, J. Sokhn, J.A. Sparer, L. Street, L. Sussman, Y. Titko, L.M. Toledo-Franco, R.N. Tuktamyshev, Y. Wang, R. Weissberger, B. Wilkinson, S. Williams, J. Yezak

**Internal Medicine 103, Core Medicine Clerkship** The Internal Medicine Clerkship comprises three one-month rotations: Hospital Medicine I, Hospital Medicine II, and Ambulatory Medicine. Students are assigned to complete these rotations in a specific order determined by the clerkship directors. During the Hospital Medicine clerkships, students serve as clinical clerks at participating hospitals. Students interview and examine patients, write admission and progress notes, and work with medical teams in the care of patients. Between Hospital Medicine I and Hospital Medicine II, students receive graduated responsibility for patient care. Conferences and teaching rounds are held daily. During the Ambulatory Medicine component of the clerkship, students complete a curriculum including general medicine practice, subspecialty practice, and classroom instruction. Clinical preceptors enable students to have an active part in patient evaluation and treatment commensurate with each student's experience and capability. Students interview and examine patients, develop differential diagnoses, present to preceptors, discuss treatment with patients, and write visit notes. At all clinical sites, students

routinely telephone patients in follow-up. The overall course director is D.W. Dunne. The director for the ambulatory component is W.N. Kernan. Clinical precepting and classroom teaching involves over 100 physicians in the Department of Medicine.

**Internal Medicine 122, Endocrinology Elective, Yale-New Haven Hospital** 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 and has the opportunity to attend selected endocrine clinics. The student also participates in the regularly scheduled metabolism-endocrine conferences. Full-time. One student every four weeks. Director: S.E. Inzucchi

**Internal Medicine 123, Inpatient 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. This elective, which requires full-time participation, is offered at Yale-New Haven Hospital and the VA Connecticut Healthcare System, West Haven. One student every two or four weeks. Director: J. Turner

**Internal Medicine 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. A.B. Nagar and Digestive Disease faculty

**Internal Medicine 137, Clinical Gastroenterology (Digestive Diseases) 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. Codirectors: I. Oikonomou, S.S. Jakab

**Internal Medicine 141, Cardiology Elective** The student participates in the daily activities of the cardiology service, including rounds, consultations, conferences, and special 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. 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: M.S. Remetz (Yale-New Haven Hospital); B.J. Malm (VA Connecticut Healthcare System, West Haven)

**Internal Medicine 142, Infectious Diseases Elective** Students participate as active members of the consultative service and training program in infectious diseases at Yale-New Haven Hospital and VA Connecticut Healthcare System, West Haven. Activities include daily work rounds, daily attending rounds, microbiology rounds four times a week, two weekly clinical conferences, and one didactic conference. One student every four weeks. Director: O. Ogbuagu

**Internal Medicine 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. Director: T.P. Duffy

**Internal Medicine 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. O.A. Taiwo

**Internal Medicine 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: P.M. Rabinowitz; M. Gulati, A. Mohammad, C. Redlich, M.B. Russi, J.A. Sparer, O.A. Taiwo

**Internal Medicine 155, Subinternship in Internal Medicine** 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; VA Connecticut Healthcare System, West Haven; 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. Offered throughout the year for periods of four weeks each, to students who have completed Internal Medicine Clerkships I and II. Codirectors: M.D. Siegel, D.W. Dunne

**Internal Medicine 156, Clinical Hepatology Elective, Yale-New Haven Hospital** 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. Codirectors: S.S. Jakab, K. Lawhorn

**Internal Medicine 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

**Internal Medicine 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 VA Connecticut Healthcare System, West Haven. 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

**Internal Medicine 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 Connecticut Healthcare System, West Haven, can be arranged as well. Maximum of three students every two or four weeks. Director: H.A. Deshpande

**Internal Medicine 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

**Internal Medicine 195, Medical Intensive Care Unit Advanced 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. Prerequisite: Internal Medicine Clerkship. No overnight responsibilities. One or two students every two or four weeks. Director: S. Honiden

**Internal Medicine 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

**Internal Medicine 306, Allergy and Clinical Immunology Elective** Students attend the Allergy & Immunology Clinic for adults at the Yale Physicians Building 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

**Internal Medicine 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: M.A. Drickamer

**Internal Medicine 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 at 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 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

**Internal Medicine 360, General Medicine Consult Service 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 medical resident, performs pre-operative evaluations and general medicine recommendations, and evaluates patients for possible transfer to the internal medicine service. Students are responsible for their own patients and perform independent evaluations of all three types of consults. Daily didactic sessions are held with the attending and medical resident. In addition, a general medicine consult syllabus is provided. Prerequisite: Internal Medicine Clerkship. One student every two or four weeks. Director: V.A. Morris

**Internal Medicine 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 advanced 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). Permission of director required. Director: H.M. Krumholz

### *Yale-New Haven Hospital Saint Raphael Campus Electives*

**Internal Medicine 203, Subinternship in Internal Medicine** This subinternship provides an opportunity for senior students to manage acute medical problems such as chest pain, shortness of breath, acute renal failure, hyperkalemia, diabetic ketoacidosis, and GI bleeding. Students are the primary providers under the supervision of a resident and clinician educator. Responsibilities include writing orders; doing procedures; and arranging consults, family meetings, and hospital follow-up of patients with the same clinician educator. Students develop and receive feedback on clinical skills. No overnight call. One or two students every four weeks. Director: B.J. Wu

**Internal Medicine 308, Gastroenterology Elective** Senior students work up and follow patients with a variety of gastrointestinal problems on the consultative service. Working on a team that includes a Yale GI fellow and attending physician, students follow patients requiring procedures in the GI laboratory, intensive care units, inpatient service, and outpatient clinic. One or two students every two or four weeks. Director: B.J. Wu; M. Cohen, M.H. Brand

**Internal Medicine 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 or two students every two or four weeks. Director: B.J. Wu; G.J. Kerins

**Internal Medicine 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 or two students every two or four weeks. Director: B.J. Wu; H. Knight, R. Elias, A. Uzunpinar

**Internal Medicine 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 two interns, 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. Students attend the daily noon conference and weekly Grand Rounds. One or two students every two or four weeks. Director: B.J. Wu

## *Humanities in Medicine*

The courses listed below are offered through the Program for Humanities in Medicine. Further information is available from Dr. Thomas Duffy or Clara Gyorgyey at 203.785.6102. Schedules of courses are flexible. Students who are interested in any (or all) of the following courses, or have other interests that could be addressed through this program, are asked to indicate this on the sign-up sheet. No obligation even if students sign up.

**Internal Medicine 505, 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. P.D. Kirwin, T.P. Duffy

**Internal Medicine 509b, Pregnancy and Neonatal Loss** For first-year students. This elective centers around what a physician feels when his/her patient dies and how he/she can come to a resolution with regard to this loss. In particular, focus on the expression of feelings through letter writing, poetry, and face-to-face encounters with family members. Introduction to “case histories” based upon the lecturer’s experiences. Course schedule: six meetings at a mutually determined time. Please contact the instructor by e-mail: berman@hygeia.org. M.R. Berman

## INVESTIGATIVE MEDICINE

Office: 2 Church Street South, Suite 115, 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 29–August 9, 2013. E.D. Shapiro

**IMED 630a, Ethical and Practical Issues in Clinical Investigation** This term-long course addresses topics that are central to the conduct of clinical investigation, including ethics of clinical investigation, scientific fraud, technology transfer, and interfacing with the pharmaceutical industry. Practical sessions include scientific presentations and teaching, NIH peer review process, journal peer review process, and career development models of academia. The course provides guidelines and a framework for the clinical investigator to obtain funding for, conduct, and present a clinical study. Format consists of didactic presentation followed by discussion. Consent of instructor required. H.J. Binder

**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 15–26, 2013. H.J. Binder

**IMED 655b, Writing Your First Big Grant Proposal** In this term-long 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 provide 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

Office: PS 2, 203.688.2286

<http://medicine.yale.edu/labmed>

**Professors** A. Baumgarten (*Emeritus*), F.J. Bia (*Medicine*), 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, J.L. Sklar (*Pathology*), B.R. Smith (*Chair*), E.L. Snyder, P.J. Tattersall

**Associate Professors** S.M. Campbell, S. Chang, M.E. Hodsdon, J.G. Howe, G.E. Stack, Y. Wu

**Assistant Professors** T. Eid, S.C. Eisenbarth A.M. Haberman, J.H. McClaskey, T.S. Murray (*Adjunct*), C.A. Tormey, R. Torres, M.L. Xu (*Pathology*)

**Instructor** D.R. Peaper

**Senior Research Scientist** S.F. Cotmore

**Research Scientist** G.M. Anderson (*Child Study Center*)

**Associate Research Scientists** M. Coman, A.D. D'Souza, L. Devine, P. Gu, C. Keeler, L. Li, I.S. Mihaylov, R. Rai, Y. Wang, P. Zhang

**Clinical Professors** B.P. Griffith, R.A. Levine, S.C. Wardlaw

**Associate Clinical Professors** P.N. Fiedler (*Pathology*), D.R. Mayo, I. Nash

**Assistant Clinical Professors** I.V. Kaplan, H. Malkus, C.A. Rauch, H. Sanchez, N. Shafi, M. Velleca

**Clinical Instructor** B.R. Spencer

**Lecturers** D.J. Barchi, S.A. Cohen, D. Ferguson, P.E. Marone, R.L. Ross

**LMED 102b** This lecture, laboratory, and seminar course deals with scientific use of clinical laboratories (hematology, clinical chemistry, immunology, blood banking) as a basis for the understanding, diagnosis, and treatment of disease. Emphasis is on the selection and interpretation of laboratory tests used in the practice of medicine as well as on acquiring some understanding of the technology used in the clinical laboratories. Lectures and laboratories are integrated into the new organ-based modular system of clinical instruction for second-year medical students. Second-year course. M. Landry and associates

**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, and associates

**LMED 131, Laboratory Medicine 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: M. Landry, G.K. Haines

**Laboratory Medicine Teaching Sessions for Third-Year Medical Students** The purpose of the Laboratory Medicine Teaching Sessions is to introduce third-year students on their clinical rotations to basic concepts of laboratory diagnosis. On the first afternoon of their Internal Medicine 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. Third-year course. M. Landry and associates

## MICROBIAL PATHOGENESIS

Office: 295 Congress Avenue, 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** H.F. Agaisse, C. Ben Mamoun (*Medicine*), B.I. Kazmierczak (*Medicine*), B.D. Lindenbach, J.D. MacMicking, W.H. Mothes, R. Sutton (*Medicine*)

**Assistant Professors** J.M. Crawford (*Chemistry*), A. Goodman, P. Kumar (*Medicine*)

**Associate Research Scientists** I. Derre, S.S. Ivanov, B. Kim, P. Kumar, M.D. Lara-Tejero, E. Lee, S. Lee, M.D. Lefebvre, A. Shenoy, S. Spano, 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. Prerequisites: immunology and microbiology. D. McMahon-Pratt

**MBIO 670, 671, 672, Laboratory Rotations** Rotation in three laboratories. Required for all first-year graduate students. C.R. Roy

**MBIO 680a/EMD 680a, Molecular and Cellular Processes of Parasitic Eukaryotes** 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, C. Tschudi

**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. H.F. Agaisse

**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. C.R. Roy

**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. C.R. Roy

[**MBIO 734a/GENE 734a/MB&B 734a/PATH 634a, Molecular Biology of Animal Viruses** Offered every other year]

## MOLECULAR BIOPHYSICS AND BIOCHEMISTRY

Offices: JWG 304, 203.432.2077; SHM C106, 203.785.4246

<http://medicine.yale.edu/mbb>

**Professors** K.S. Anderson (*Pharmacology*), S.J. Baserga, R. Breaker (*Molecular, Cellular & Developmental Biology*), G.W. Brudvig (*Chemistry*), D.M. Crothers (*Emeritus*), E.M. De La Cruz, D.C. DiMaio (*Genetics*), D.M. Engelman, A. Garen, M.B. Gerstein, N.D. Grindley (*Emeritus*), M.W. Hochstrasser, A.J. Koleske, W.H. Konigsberg, P. Lengyel (*Emeritus*), J.P. Loria (*Chemistry*), I.G. Miller (*Pediatrics*), A.D. Miranker, P.B. Moore (*Chemistry; Emeritus*), N. Moran (*Ecology & Evolutionary Biology*), 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** T. Biederer, M.R. Koelle, Y.E. Modis, A.E. Rhoades, Y. Xiong

**Assistant Professors** R. Baxter (*Chemistry*), D.S. Greenbaum (*Adjunct*), C. Schlieker, M. Simon, C.V. Sindelar, C.J. Wilson (*Engineering & Applied Science*)

**Senior Research Scientists** N.D. Grindley, J. Howard, C.M. Joyce, K. Neugebauer

**Research Scientists** J.L. Burton, E.J. Folta-Stogniew, E. Gulcicek, Y. Kong, J.S. Rozowsky, K. Tycowski, J. Wang

**Associate Research Scientists** A. Abyzov, A. Alexandrov, S. Balasubramanian, M. Behlauer, I.C. Berke, C. Bruce, W. Cao, S. Chen, C.M. Colangelo, K. Collins, J. Daley, M. Dessau, J.I. Elliott, M. Englert, R. Fang, J. Graham, D.A. Hiller, M.N. Islam, E. Khurana, J. Ko, Y. Kwon, L. Lai, T.T. Lam, Y. Li, Y. Lin, I. Lomakin, S. Longerich, P. O'Donoghue, D. Ostapenko, R. Park, G. Pimienta-Rosales, D. Saro, S. Seetharaman, K.J. Smith, Y. Sun, G. Wang, Y. Wang, S. Xia, K. Yan, X. Yan, H. Yang, M. Zanic, K. Zhang, Y. Zuo

**Lecturers** C.A. Bascom-Slack (*Molecular, Cellular & Developmental Biology*), K.T. Kucera, A.B. Pawashe

**MB&B 500b<sup>U</sup>/MCDB 500b<sup>U</sup>, 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. Breaker, N. Clay, D.M. Engelman

**MB&B 517b3/ENAS 517b/MCDB 517b3/PHYS 517b3, Methods and Logic in Interdisciplinary Research** This half-term IGPPEB class is intended to introduce students to integrated approaches to research. Each 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 for students in IGPPEB. L.J. Regan,

E.M. De La Cruz, E. Dufresne, T. Emonet, P. Forscher, M. King, M. Levene, S. Mochrie, C. O'Hern, T.D. Pollard, A.E. Rhoades, C.J. Wilson, 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 for students in IGPPEB. L.J. Regan and staff

**MB&B 523a/ENAS 541a/PHYS 523a, Biological Physics** An introduction to the physics of several important biological phenomena, including molecular motors, protein folding, bacterial locomotion, and allostery. The material and approach are positioned at the interface of the physical and biological sciences. S. Mochrie, E. Dufresne, C. O'Hern, A.E. Rhoades

**MB&B 545b<sup>u</sup>, Methods and Logic in Molecular Biology** An examination of fundamental concepts in molecular biology through analysis of landmark papers. Development of skills in reading the primary scientific literature and in critical thinking. Open only to MB&B students pursuing the B.S./M.S. degree. M.W. Hochstrasser, D.M. Engelman, D.G. Söll

**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, D.M. Engelman, and staff

**MB&B 591b/ENAS 991b/MCDB 591b/PHYS 991b, Integrated Workshop** This required course for students in IGPPEB 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 are acquired, and students learn from each other. Receives no course credit toward MB&B graduate course requirements. With permission of the DGS, can be used by IGPPEB 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. Mochrie, C. O'Hern

**MB&B 600a<sup>u</sup>, 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<sup>u</sup>, 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, J.A. Steitz

**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, C. Crews, P. De Camilli, M. King, T. Melia, I.-H. Park, T.D. Pollard, J.E. Rothman, M. Schwartz

**MB&B 625a<sup>U</sup>/GENE 625a/MCDB 625a<sup>U</sup>, 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. A. Pyle and staff

**MB&B 635a<sup>U</sup>/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. Howard, C. O'Hern, C.V. Sindelar

**MB&B 650, Lab Rotation for First-Year Students** Required for all first-year BBSB graduate students. Credit for full year only. M.J. Solomon

**MB&B 675a, Seminar for First-Year Students** Required for all first-year BBSB graduate students. C.V. Sindelar

**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 for 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** An in-depth introduction to numerical simulations including molecular dynamics, discrete element modeling, Monte Carlo methods, and Markov chains. These techniques are applied to simulate liquids, granular media, polymers, and proteins. Experience with C++, Fortran, or Matlab is required. C. O'Hern

**MB&B 720a<sup>u</sup>, 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. Y. Xiong, D.M. Engelman, A.D. Miranker, T.A. Steitz

**MB&B 722b3, Optical Spectroscopy of Biomolecules** The course covers optical spectroscopy and microscopy ranging from basic UV, visible, and IR approaches, as well as cutting-edge single molecule and high-resolution imaging techniques. Prerequisites: introductory biochemistry, biophysics, and physical chemistry. A.E. Rhoades

**MB&B 723b4, Macromolecular Interactions: Atoms to Networks** This 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.J. Solomon, E.M. De La Cruz, A.J. Koleske, L.J. Regan, M. Simon, and staff

[**MB&B 734a/GENE 734a/MBIO 734a/PATH 734a, Molecular Biology of Animal Viruses**  
Offered every other year]

**MB&B 743b<sup>u</sup>/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, P. Sung

**MB&B 749a<sup>u</sup>/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, M.W. Hochstrasser, I.G. Miller, A.D. Miranker, D.G. Schatz, T.A. Steitz, P. Sung, and staff

**[MB&B 750a2, Biological Membranes]**

**MB&B 752a<sup>U</sup>/CB&B 752a/CPSC 752a<sup>U</sup>/MCDB 752a<sup>U</sup>, 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 for data integration. Prerequisites: biochemistry and calculus, or permission of the instructor. M.B. Gerstein

**MB&B 753a1, 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 754a2, 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 760b3, 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. Y. Xiong, T.A. Steitz

**[MB&B 761b4, X-ray Crystallography Workshop]**

**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. M.J. Solomon

**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. M.J. Solomon

**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. M.J. Solomon

## NEUROBIOLOGY

Office: SHM C303, 203.785.4323

<http://medicine.yale.edu/neurobiology>

**Professors** A.F. Arnsten, H. Blumenfeld (*Neurology*), 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*), 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*), M.N. Potenza (*Psychiatry*), P. Rakic (*Chair*), J. Santos-Sacchi (*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, R.J. DiLeone (*Psychiatry*), J. Grutzendler (*Neurology*), E.A. Jonas (*Medicine*), M. Laubach, C. Li (*Psychiatry*), A. Louvi (*Neurosurgery*), J.A. Mazer, D.S. Navaratnam (*Neurology*), V.A. Pieribone (*Cellular & Molecular Physiology*), M.L. Schwartz

**Assistant Professors** J.A. Cardin, B. Chen (*Ophthalmology & Visual Science*), K.P. Cosgrove (*Psychiatry*), M.J. Higley, I. Kim (*Ophthalmology & Visual Science*), I. Levy (*Comparative Medicine*), J.V. Verhagen

**Senior Research Scientists** N. Carnevale, M. Hines

**Research Scientists** A. Duque, C.D. Paspalas, L.D. Selemon, M. Wang

**Associate Research Scientists** J.B. Ackman, J.I. Arellano, A.E. Ayoub, C. Chiu, Y.K. Imamura, H.J. Kang, Y. Morozov, T.M. Morse, B.G. Rash, R.N. Sachdev, H. Seo, M. Shibata, B. Tahvildari, Y. Xie, H. Xu, X. Xu, Y. Yu

**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 735bU/NSCI 504b, Seminar in Brain Development and Plasticity** Weekly seminars and discussion sessions to explore recent advances in our understanding of brain development and plasticity, including neuronal determination, axon guidance, synaptogenesis, and developmental plasticity. W. Zhong, S.S. Chandra, M.C. Crair

**NBIO 507b/NEUR 108b/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 pathophysiological understanding to therapeutics is considered. S.S. Chandra

**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 recombinant 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 for all first-year Neuroscience graduate students. Rotation period is one term. Both terms required. Grading is Satisfactory/Unsatisfactory. C.A. Greer

**NBIO 513a/b/NSCI 513a/b, Second-Year Thesis Research** Required for all second-year Neuroscience graduate students. Both terms required. Grading is Satisfactory/Unsatisfactory. M.C. Crair

**NBIO 532a/NSCI 532a, Neurobiology of Cortical Systems** This is a lecture, reading, and discussion-based course focused on the mammalian cerebral cortex. Students learn about the evolution, development, function, and dysfunction of the cortex. Significant emphasis is placed on examining unique aspects of the cortex, including cortical circuit structure, plasticity, cognition, and models of higher-order cognitive processing. We also examine disease processes in which cortical dysfunction is specifically implicated. M.C. Crair

[NBIO 535b/NSCI 535b, **History of Modern Neuroscience**]

**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** Offered every other year]

**NBIO 595a/NSCI 595a, Seminar in Visuomotor Neurophysiology** Review and discussion of seminal papers in neurophysiological and computational studies of visual system, covering papers on the receptive field physiology of neurons in the retina and central visual pathway, motor cortex, and computational theories of vision and motor control. The course largely focuses on the literature in primates, but also draws on behavioral and neurophysiological studies in other mammals, such as cats and humans. Contact instructor for first class date and time. D. Lee, J.A. Mazer

[NBIO 596a/NSCI 596a, **Seminar in Neurophysiology of Decision Making**]

**NBIO 597b/NSCI 597b, Neuroeconomics** This course introduces some of the main topics in human decision-making research. We discuss how behavioral economics methods are combined with neuroscientific tools, in particular functional MRI and single-neuron recordings, to study the neural mechanisms underlying decision and valuation processes. The course includes both introductory presentations by the instructors and paper presentations by the students. D. Lee, I. Levy

**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, E.J. Sigworth

**NBIO 720a/MCDB 720a<sup>U</sup>/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

Office: LCI 912, 203.785.5947

<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, R.H. Mattson (*Emeritus*), L.R. Ment (*Pediatrics*), G. Miller (*Pediatrics*), 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, R.B. Duckrow, J.M. Goldstein, J. Grutzendler, D.S. Navaratnam, J.W. Pan (*Neurosurgery*), H.S. Patwa, D. Pelletier, O.A. Petroff, S. Spudich, J. Thomas

**Assistant Professors** K.P. Becker, F.C. Brown, G. Buchanan, W.B. Cafferty, S.S. Chandra, C. Cotsapas, K. Detyniecki, D.B. DiCapua, E.J. Gilmore, H. Hamid, D.Y. Hwang, C. Juchem (*Diagnostic Radiology*), B. Khokhar, D.G. Machado, E.G. Marcolini (*Emergency Medicine*), S. Novella, H.B. Nygaard, K.C. O'Connor, D. Pitt, D. Richardson, J. Schindler, K.N. Sheth, J.J. Sico, H. Tokuno, D.C. Volpe, F.S. Winstanley

**Instructors** M. Alkawadri, M.A. Bailey, P. Farooque, L.L. Huh, R. Nowak, N. Rampal

**Senior Research Scientists** S.D. Dib-Hajj, R.H. Mattson

**Research Scientist** J.A. Black

**Associate Research Scientists** O. Abdul Samad, E.J. Arroyo, J. Bai, X. Cheng, M. Dominguez-Villar, N.R. Driesen (*Psychiatry*), M. Estacion, M. Furman, E.C. Gunther, C. Han, J. Hyun, I. Kim, M. Kleinewietfeld, K. Lankford, G.D. Ponath, K. Raddassi, S. Shields, M. Stagi, A.M. Szekely (*Genetics*), H. Takahashi, A. Tan, D. Vasylyev, X. Wang, S.A. Wilson, M. Wolfel, Y. Wu, H.P. Zaveri, P. Zhao

**Clinical Professors** R.L. Lesser (*Ophthalmology & Visual Science*), S.R. Levy (*Pediatrics*), F.M. Testa (*Pediatrics*), 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, A. Katz, J.H. Mashman, D.S. Russell (*Psychiatry*), K.N. Sena, M.J. Stransky

**Clinical Instructors** O. Avitzur, C.H. Gottschalk, T.B. Toothaker, J. Yim

**Lecturers** L. Bangalore, J.L. Gross, S. Kadimi, P.J. McAllister, A. Quan Hong, D.J. Shiling, K.C. Siegel, D.M. Zagar

**NEUR 102, Clinical Neuroscience Core Clerkship** The primary goal of this four-week clinical clerkship is to provide students with a fundamental approach to the nervous system. Specifically, this means the history, examination, diagnostic imaging, and treatment in the context of specific patients. Additionally, there is a series of lectures covering the broad range of conditions students are likely to encounter, such as trauma, stroke, infections, tumors, dementias, and seizures. Students take call with neurology residents once a week at Yale-New Haven Hospital; students assigned to neurosurgery take call with the residents on that service. After having given input on their preferences, students are placed on one of the following services for their clerkships: adult inpatient neurology, adult neurology consultation service, pediatric neurology, neurosurgery. All rotations are done at YNH and the VA Connecticut Healthcare System, West Haven. H.S. Patwa, L.R. Ment, C.C. Duncan, H. Blumenfeld

**NEUR 106b, Clinical Neurophysiology** Seminars and demonstrations in clinical applications of neurophysiology: electromyography and electroencephalography. Basic electronics are taught along with standard practice of recording and interpreting neurophysiology studies. J.M. Goldstein, H.S. Patwa, S. Novella

**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. Contact instructor for first class date and time. D.S. Navaratnam, S.M. Strittmatter, S.G. Waxman

**NEUR 112b, Neuro-Oncology** Neurological complications occur in approximately 20 percent of hospitalized oncology patients. The neurological complications of systemic cancer, as well as of primary CNS tumors, are discussed in depth. Issues regarding diagnosis and management of metastatic disease involving the nervous system as well as treatment-related complications are reviewed. In addition, metabolic and vascular disturbances and infections unique to the oncology patient that involve the nervous system are discussed. Specific cases are presented and arrangements are made to see specific patients during the elective period. This course is offered every three weeks with two lectures each week and is limited to three or four students per session. J.M. Baehring

**NEUR 114b, Physiology of the Mammalian Nervous System** The overall objective of this laboratory course is to introduce the student by hands-on experience to a variety of cellular electrophysiological techniques used in the study of the mammalian nervous system. Students set up a small electrophysiology laboratory and carry out experiments with the supervision of faculty. Laboratories include sucrose gap in whole nerve, single microelectrode current and voltage clamp recording of sensory neurons, field potential studies in rat hippocampal slice, and patch clamp analysis of cultured neurons. This course is limited to six to eight students. Permission of instructor is required for enrollment, 203.937.3802. J.D. Kocsis

### *Clinical Neurology Elective*

In this four-week elective, the student chooses to work on the clinical neurology ward service, the clinical neurology consultation service, or the neurology ambulatory care service (see below for detailed descriptions). The student works directly with attending faculty, chief residents, and junior residents as well as other medical students, rotators, and support staff. A series of special didactic conferences on the most important topics in neurology is provided. The student also participates in departmental conferences and seminars. An assessment of the history taking, neurological examining skills, and problem assessment is performed by an attending faculty member with each student. An evaluation of the student's performance is provided, using input from the attending faculty and the chief resident(s). At times, other customized electives may be designed with the program director in areas such as epilepsy, stroke, movement disorders, neuroimmunology, etc., as well as clinical neurophysiology and research methods. Students may request a choice, but assignments are made to ensure that there is a balanced distribution of the students on the required neuroscience clerkship and the student doing an elective, in order to allow an optimal learning experience for all students. One student every four weeks. Director: H.S. Patwa

**NEUR 200, Clinical Neurology Ward Service Elective** Under appropriate supervision, students directly examine, diagnose, and manage patients on the neurology ward service at Yale-New Haven Hospital and attend daily teaching rounds and conferences. The VA Connecticut Healthcare System, West Haven, is also available for this rotation. One student every four weeks. Director: H.S. Patwa

**NEUR 201, Clinical Neurology Consultation 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 clinics and academic activities of the department. The VA Connecticut Healthcare System, West Haven, is also available for this rotation. One student every four weeks. Director: H.S. Patwa

**NEUR 300, Neurology Ambulatory Care Service Elective** Students electing this rotation are assigned to various clinics that include general neurology, neuroimmunology, stroke, movement disorders, epilepsy, and private faculty offices. Associated Neurologists of Southern Connecticut, Fairfield, is also available for this rotation. One student every four weeks. Director: H.S. Patwa

## NEUROSURGERY

Office: 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, H.P. Hetherington (*Adjunct*), C.C. LaMotte (*Emeritus*), J.A. Persing (*Surgery*), J.M. Piepmeier, D.E. Redmond, Jr. (*Psychiatry*), K.J. Ruskin (*Anesthesiology*), D.D. Spencer (*Chair*), A.N. Van den Pol

**Associate Professors** J.M. Baehring (*Neurology*), K.R. Bulsara, V.L. Chiang, R.B. Duckrow (*Neurology*), M.H. Johnson (*Diagnostic Radiology*), J.T. King, A. Louvi, J.W. Pan, A. Williamson (*Adjunct*)

**Assistant Professors** K.M. Abbed, I. Cavus (*Psychiatry*), M.L. DiLuna, T. Eid (*Laboratory Medicine*), D.J. Gaal (*Anesthesiology*), J.L. Gerrard, M.S. Laurans, C.C. Matouk, J. Schindler (*Neurology*), J. Zhou

**Research Scientist** K. Yasuno

**Associate Research Scientists** K. Bilguvar, A.O. Caglayan, O.I. Henegariu, F. Imamura, K. Mishra, A.S. Mobley, S. Nishimura, S.B. Omay, J.C. Paglino, D.J. Rodriguez-Gil, G. Wollmann, K. Wu

**Clinical Professor** J.F. Kveton (*Surgery*)

**Associate Clinical Professors** I. Goodrich, D.E. Nijensohn

**Assistant Clinical Professors** P.S. Dickey, A.F. Douglas, P.B. Senatus, J.G. Strugar

**Clinical Instructors** E.W. Akeyson, K.E. Holmes

**NEUS 101, Subinternship in Neurological Surgery** 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 inpatient and outpatient neurosurgical clinical material 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, take call one to two nights per week, 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, with department approval, 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, K.P. Vives); stimulation of the brain for chronic neurological diseases (K.P. Vives, 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). Clinical research includes spine disease and clinical trials (K.M. Abbed), epilepsy surgery (D.D. Spencer, K.P. Vives), pediatric neurosurgery outcomes (C.C. Duncan, M.L. DiLuna), neurooncology (J.M. Piepmeier, J.M. Baehring), basic mechanisms in CNS lymphoma (J.M. Baehring), and stereotactic radiosurgery (V.L. Chiang, K.P. Vives). Available throughout the year. Arrangements made with C.A. Greer

## OBSTETRICS, GYNECOLOGY, AND REPRODUCTIVE SCIENCES

Office: FMB 307, 203.785.4212, Jill Aulenti, Manager of Medical Education  
<http://medicine.yale.edu/obgyn>

**Professors** A.M. Arici, M.B. Bracken (*Epidemiology*), F.R. Braveman (*Anesthesiology*), J.A. Copel, T. D’Hooghe (*Adjunct*), S. Diano, A.J. Duleba (*Adjunct*), R.A. Ehrenkranz (*Pediatrics*), M. Hickey (*Adjunct*), R.B. Hochberg, T.L. Horvath (*Comparative Medicine*), E.I. Kohorn (*Emeritus*), C. Leranath, P.E. Levi Setti (*Adjunct*), C.J. Lockwood (*Adjunct*), W.E. Longo (*Surgery*), M.J. Mahoney (*Genetics*), N.J. Maihle, S.M. McCarthy (*Diagnostic Radiology*), G.G. Mor, M.J. Paidas, P. Patrizio, S. Pecorelli (*Adjunct*), T.J. Rutherford, 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*), S.A. Higgins (*Therapeutic Radiology*), Y. Huang, P. Hui (*Pathology*), J.L. Illuzzi, M. Lee (*Adjunct*), U. Magriples, L. Pal, D. Sakkas (*Adjunct*), E.U. Seli, A.K. Sfakianaki, N.S. Stachenfeld, N.L. Stanwood

**Assistant Professors** S. Abdel-Razeq, R.S. Bercik, K.H. Campbell, L.L. Fan, A. Gariepy, M.K. Guess, C.S. Han, J. Johnson, P.H. Kodaman, N.E. Kummer, H.S. Lipkind, W. Mak, J. Martin, R. Menon (*Adjunct*), C.M. Pettker, E. Ratner, J.A. Shaw, D. Silasi, M. Silasi, X. Xu

**Instructors** K.L. Archabald, S.N. Cross, M. Dick, L.F. Doherty, C.M. Duzyj Buniak, D. English, S. Ghazal, C.P. Gheorghe, J.T. Hardy, A.W. Johnson, A.N. Kallen, A. Lake, M.E. McCarthy, A.M. McPencow, R. Papanna, D. Roque, S. Torrealday, J. Varughese

**Senior Research Scientists** S.M. Guller, G.B. Huszar

**Research Scientists** A. Alvero, H.J. Kliman, G. Krikun

**Associate Research Scientists** S. Bellone, H. Du, C.A. Flannery, L. Lundsberg, M. Maduro

**Clinical Professors** M.R. Berman, D. Greenfeld, V.A. Lynch, M. Minkin, H.J. Sauer, J.S. Silidker, S.S. Spangler, L.J. Wartel

**Associate Clinical Professors** R.D. Auerbach, Y. Barnhard, S.E. Casper, R.A. Cwik, S.J. Fleischman, T.M. Hanson, R.B. Kaump, P.S. Marcus, L. Mikhail, N.A. Ravski, S.M. Richman, S. Shahabi, H. Shaw, B.B. Silverman, H. Simon, R.J. Stiller, L.H. Zamore

**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, E.A. Fine, S.M. Flaherty, W.P. Fleming, K.C. Fletcher, M.E. Gillette, D. Gottschall, L.C. Hanlon, C.L. Kandall,

B.D. Karsif, G.E. Kleinman, S.A. Laifer, P.M. Lamastra, M.R. Laser, A. Lee, D.M. Lima, E. Luchansky, S. Mark (*Medicine*), R.D. Moscarelli, S. Pace, S.R. Pathy, L. Plisic, R. Pringle, B.F. Rigney, D.M. Roth, D.J. Russell, L.A. Starace-Colabella, A. Strong, H.I. Suesserman, E.A. Topran, O.J. Vincent, M.J. Wise, T. Zreik

**Clinical Instructors** A. Acharya, N. Adsuar, M.C. Asis, K.R. Aversa, C. Bernier, E.E. Blair, S.M. Cassell, K. Chacho, K. Despot, M. Dube, G. Dunston-Boone, A.Y. Edusa, L. Geer-Yan, R. Goldberg, J.T. Grosso, C.E. Herrick, C.R. Huttler, N. Kaushal, R. Kaza, N.R. Kellett (*Office of Medical Education*), D.R. Kopel, H. Lope De Haro, G. Lynch, B.L. Maloy, A. Ofer, E. Palluotto, C.E. Presnick, K.M. Rath, M.S. Reel, J.A. Reinshagen (*Office of Medical Education*), M.C. Rhee, E. Sauter, D. Sivak, M.L. Speranza, M. Szeto, K.A. Thomas, A.L. Tirado, D. Tonzola, M.M. Tse, A.V. Vash-Margita, S.R. Vaz, J.D. Vulte (*Office of Medical Education*), R. Wineland

**Lecturers** L. Browning (*Office of Medical Education*), F.P. Haseltine, A.E. Moss (*Office of Medical Education*), S.R. Pathy, M. Reault (*Office of Medical Education*)

**OBGY 103, Core Clerkship** This core clerkship is a six-week rotation in which students serve as clinical clerks on the following services: obstetrics (two weeks), gynecology (two weeks), and ambulatory OB/GYN (two weeks). Yale-New Haven Hospital and Bridgeport Hospital serve as the main clinical sites for this rotation. During the first week of the six-week clerkship, all students attend an in-depth evening teaching session with the Gynecologic Teaching Associates (GTA), where they are carefully taught pelvic and breast examination techniques, and practice these techniques with the GTA. These practice sessions, in addition to other simulation sessions, prepare students to adeptly handle actual patient examinations, review techniques and instruments, as well as understand how to manage patient encounters. During the Obstetrics portion of the rotation (one week Day Float and one week Night Float), the clinical clerk is assigned to the Labor and Delivery Unit and is expected to actively participate in patient care commensurate with his or her experience. Students are expected to work up and follow patients during the labor and delivery process, write notes during the intrapartum period, participate in vaginal deliveries, scrub in and assist in cesarean deliveries, and participate in the patient's postpartum care. Students on the Gynecology services become familiar with the common disorders encountered in gynecological practice. They scrub for both major and minor surgeries, including those performed for gynecologic malignancy. The rotation offers an opportunity for the student to learn preoperative and postoperative management of gynecologic patients and to review pelvic and abdominal anatomy. The students spend two weeks in the ambulatory OB/GYN setting where they actively participate in antenatal care of pregnant patients as well as preventative and urgent health care visits for non-pregnant women. Students are supervised by attendings, physician associates, midwives, and residents as they learn to take histories, perform pelvic and breast exams, and gain experience in conducting normal obstetrical visits and routine gynecological care. The student is expected to gain experience in topics such as contraceptive counseling, family planning, menopause management, and other common patient complaints. Subspecialty experiences in Reproductive Endocrinology, Maternal-Fetal Medicine, Family Planning,

Gynecologic Oncology, and Urogynecology are integrated into the clerkship. Throughout the rotation, a didactic curriculum is delivered to cover the core topics in Obstetrics and Gynecology, which includes seminars, lectures, standardized patients to practice patient counseling, clinical reasoning workshops, discussions, and student presentations and debates on controversial topics in OB/GYN. Evaluation of the student is based on clinical performance and knowledge, professionalism and attendance, participation at rounds and didactics, student presentations, and submitted write-ups for the student portfolio. The recommended text for this elective is *Obstetrics and Gynecology at a Glance* by Errol Norwitz and John Schorge. Clerkship director: J.L. Illuzzi

**OBGY 107, Subinternship in Maternal Fetal Medicine** 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. There are two weekend calls on this elective. One student every four weeks. Director: F. Galerneau

**OBGY 108, Subinternship in Reproductive Endocrinology and Infertility** The Reproductive Endocrine and Infertility (REI) division offers a four-week elective to fourth- and fifth-year students. In addition to gaining knowledge about human reproductive endocrine function, students are introduced to disruptions in physiology and function that 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, Subinternship in Gynecology/Oncology** The purpose of this elective is to enhance the student's knowledge of the diagnosis and management of women's 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, Subinternship at the 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/Reproductive Choice 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 includes insertion of long-acting reversible contraceptive methods (LARC, IUDs, and implants). In addition, the student participates in first-trimester ultrasound, medical and surgical abortions, and medical and surgical management of early pregnancy failures and intrauterine fetal demise. Evaluation is based on clinical performance in patient encounters and procedures, and on an evidence-based presentation on a family planning topic. During this rotation, it is necessary to travel back and forth between Yale-New Haven Hospital, Summit Medical Center at 3787 Main Street, Bridgeport, and Planned Parenthood in New Haven. Prerequisite: OBGY 103 or equivalent. One student every two or four weeks. Codirectors: N.L. Stanwood, A. Gariepy, S.M. Richman

**OBGY 208, Outpatient/Ambulatory 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. Prerequisite: OBGY 103 or equivalent. One student every two or four weeks. Director: J.L. Illuzzi

**OBGY 270, Subinternship in General Obstetrics/Gynecology, 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: P.S. Marcus

## OPHTHALMOLOGY AND VISUAL SCIENCE

Office: 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*), J.C. Tsai (*Chair*), Z. Zhou

**Associate Professors** J.B. Demb, J.J. Hoh (*Epidemiology*), J.J. Huang, M.A. Materin, L.J. Rizzolo (*Surgery*), K.M. Stoessel, C.J. Zeiss (*Comparative Medicine*), D. Zenisek (*Cellular & Molecular Physiology*)

**Assistant Professors** B. Chen, J.H. Chow, J.A. Galvin, T.M. Grippo, J.E. Kempton, I. Kim, F. Levin, P.C. Palmisano, J.J. Servat, A. Shayegani

**Instructors** S.P. Karim, J. Liu

**Associate Research Scientists** B. Borghuis, S. Lee, J. Lin

**Clinical Professors** I. Abrahams, R.L. Lesser, P.E. Liggett, D.E. Silverstone, T.J. Walsh

**Associate Clinical Professors** B.M. DeBroff, S.H. Forster, P.H. Haffner, A.J. Levada, M.S. Milner, J.J. Olson, D.W. Parke, 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, A.J. Fezza, P. Gaudio, J. Geffin, P.C. Guida, S.B. Hersh, M.A. Howard, W.I. Larrison, E.S. Lim, J.F. Martone, A.W. Mead, A. Musto, R.J. Noecker, R.L. Petrelli, A. Romania, 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, A.M. Hwang, Y. Kostina-O'Neil, D.H. Levinson, P.A. Marks, P.E. Masi, S.W. Meskin, J.J. Pasternack, R. Scartozzi, S.P. Shah, M.R. Shapiro, D.P. Shore, 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 VA Connecticut Healthcare System, West Haven; 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

Office: YPB 133, 203.785.2579  
<http://medicine.yale.edu/ortho>

**Professors** M.R. Baumgaertner, C.G. Carpenter, T.O. Carpenter (*Pediatrics*), G.E. Friedlaender (*Chair*), 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.N. Grauer, A.H. Haims (*Diagnostic Radiology*), M.J. Medvecky, P.G. Whang, J.J. Yue

**Assistant Professors** C.W. Carter, V.P. Eswarakumar, P.C. Ivancic, M.P. Leslie, D.M. Lindskog, J.S. Reach, M. Sharkey, K.M. Sutton, C.R. Swigart, S. Tommasini

**Instructors** J. Bullock, E.J. Carlson, A.M. Ferrucci, T. Fishler, A. Socci

**Senior Research Scientist** A.M. Vignery

**Associate Research Scientist** J.A. Fretz, L. Li, A. Sachpatzidis

**Clinical Professors** J.K. Lynch, U.H. Weil

**Associate Clinical Professors** H.B. Bradburn, E.J. Sella

**Assistant Clinical Professors** M.P. Altman, J.M. Aversa, A.L. Axtmayer, 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, D.S. Rosenblum, 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** N. Babu, J.M. Beiner, P.A. Blume, C.A. Callahan, M.R. Clain, R. Diana, A.H. Feldman, R.B. Feldman, R.P. Hendrikson, N.R. Kaplan, J.D. Kelley, J.J. Key, K.M. Kramer, J.S. Marsh, J.M. Perlman, D.P. Sakalkale, P.M. Sethi, R.A. Stanton, P.B. Stovell

**Lecturers** L.R. Brenner, G.A. Gorecki, M.J. Parisi, R.E. Stevenson, B.T. Zazulak

**ORTH 102, Surgical Clerkship** Twelve weeks total. Students in the first clinical year spend six weeks on the general surgical service of one of the following: Yale-New Haven Hospital, Yale-New Haven Hospital Saint Raphael Campus, or VA Connecticut Healthcare System, West Haven. Each student is integrated into the clinical team and assigned to specific patients. Responsibilities include taking histories and performing physical examinations on their patients, participating in the evaluation and management of these patients, following patients' progress, and participating as assistants in the surgical operations performed upon their assigned cases. In addition, the students are expected to participate in the evaluation and care of the critically ill patient in the intensive care unit

and the injured patient in the emergency room. Emphasis is placed on involving students in the process of clinical problem solving with the guidance of the residents and the attending preceptors. Conferences, case study groups, and rounds are held emphasizing this problem-oriented approach. Staff

The remaining six-week period is spent as a clinical clerk in the surgical specialties. Seven specialties are offered: cardiothoracic, otolaryngology, neurosurgery, orthopaedics, pediatric, plastic and reconstructive, and urology. Each student elects three of these specialties and spends two weeks on each. While on the specialty of choice, the student is assigned patients in rotation and carries out complete histories, physical examinations, and certain procedures on these patients. While on the orthopaedic service, the student is assigned to one of the subspecialty teams, which include pediatric orthopaedics, spine, joint reconstruction, trauma, oncology, foot and ankle, hand, and sports medicine. The student is expected to participate, whenever possible, in the operative procedures performed on these patients and in their postoperative care. The student is also invited to attend the outpatient clinics in his or her assigned specialty. A series of one-hour lectures, rounds, or demonstrations is given each afternoon by the surgical specialties so that the student has the opportunity of gaining knowledge of the wide field of specialties even though he or she does not participate in every specialty as a clinical clerk. Directed by individual surgical specialty chiefs

**ORTH 104, Subinternship in Orthopaedics, Yale-New Haven Hospital** Limited to third, fourth, and fifth clinical years. Students are active members of one of the orthopaedic teaching teams. 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

Office: LH 108, 203.785.2759  
<http://medicine.yale.edu/pathology>

**Professors** R. Bucala (*Medicine*), D. Chhieng, Y. Choi, J. Costa, S.E. Downing (*Emeritus*), G.E. Friedlaender (*Orthopaedics & Rehabilitation*), P.G. Gallagher (*Pediatrics*), E.J. Glusac, R.J. Homer, S.D. Hudnall, M. Kashgarian (*Emeritus*), J.H. Kim (*Emeritus*), D.S. Krause (*Laboratory Medicine*), G. Kupfer (*Pediatrics*), P.M. Lizardi, J.A. Madri, N.J. Maihle (*Obstetrics, Gynecology, & Reproductive Sciences*), V.T. Marchesi, J.M. McNiff (*Dermatology*), J.S. Morrow (*Chair*), J.S. Pober (*Immunobiology*), 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.B. West

**Associate Professors** M.W. Bosenberg (*Dermatology*), D. Braddock, J.L. Brandsma (*Adjunct*), S. Chang (*Laboratory Medicine*), S.E. Cowper (*Dermatology*), G. Haines, L. Hao, P. Hui, D. Jain, S.H. Kleinstein, Y. Kluger, C.J. Ko (*Dermatology*), D. Kowalski, M.O. Krauthammer, T. Kyriakides, R. Lazova (*Dermatology*), R. Means, W. Min, G. Moeckel, R. Morotti, V. Parkash, M. Prasad, M. Robek, A. Subtil (*Dermatology*), A.O. Vortmeyer, Z. Walther

**Assistant Professors** A. Adeniran, V. Bossuyt, N. Buza, G. Cai, P. Cohen, A. Domfeh, A. Galan (*Dermatology*), J.A. Gibson, M. Harigopal, S. Hattangadi (*Pediatrics*), A.J. Huttner, S.G. Katz, S. Khelifa, A. Levi, K.A. Mitchell, D. Nguyen, M.M. Pinto, K. Politi (*Medicine*), Y. Qyang (*Medicine*), O. Saglam, N. Wajapeyee, M.L. Xu, Q. Yan

**Instructor** R.K. Virk

**Senior Research Scientists** M. Kashgarian, J.H. Kim

**Research Scientists** J. Li, M.M. Wan

**Associate Research Scientists** S. Agarwal, R.A. Albright, Y. Bai, Y. Bao, R.L. Camp, A. Chattopadhyay, D. Chen, C.D. Cianci, R. Cong, P. Gershkovich, Q. Huang, S.M. Lang, Q. Li, Z. Liu, X. Ma, V. Neumeister, N.F. Rose, K. Schalper, L. Shao, M.C. Stankewich, J. Thakar, J. Wang, G. Yang, L. Yu, H. Zhang

**Clinical Professors** G.L. Davis, D.M. Lowell

**Associate Clinical Professors** P.N. Fiedler, D.F. Miller

**Assistant Clinical Professors** W. Carver, R.N. Eisen, N.A. Gelfman, J. Gill, G.M. Golenwsky, B.C. Kenney, R.N. Kranwinkel, A. Neto

**Clinical Instructors** W.G. Frederick, A. Katsnelson, S.L. Wain

**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 617, Anatomic Pathology Elective** The department offers an elective to medical students in the third and fourth years 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: G.K. Haines

**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: M. Landry, G.K. Haines

**PATH 620a and b, Laboratory Rotations in Experimental Pathology** Laboratory rotations for first-year graduate students. M. Robek

**PATH 630b/ENAS 535b<sup>U</sup>, 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 634a/GENE 734a/MB&B 734a/MBIO 734a, **Molecular Biology of Animal Viruses**  
Offered every other year]

**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, Ethics** 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, M. Robek, S.K. Singh

**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. J.A. Madri, M. Kashgarian, J.S. Morrow, J.L. Sklar, A.B. West

**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). S.-E. Jordt, D. Nguyen, S. Tomita

**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. M. Robek

## PEDIATRICS

Office: LMP 4085, 203.785.4638  
<http://medicine.yale.edu/pediatrics>

**Professors** W.A. Andiman, R.J. Antaya (*Dermatology*), R.S. Baltimore, G.P. Beardsley, L.M. Buckley (*Medicine*), M. Cappello, S. Caprio, T.O. Carpenter, M.G. Caty (*Surgery*), J.H. Cho (*Medicine*), J.A. Copel (*Obstetrics, Gynecology & Reproductive Sciences*), D.F. Donnelly, C.C. Duncan (*Neurosurgery*), R.A. Ehrenkranz, S.H. Emre (*Surgery*), J.T. Fahey, R.L. Fisher (*Medicine*), B.W. Forsyth, A.H. Friedman, P.G. Gallagher, M. Genel (*Emeritus*), W.D. Graf, I. Gross, J.R. Gruen, J.P. Hafler, W.E. Hellenbrand, A.L. Horwich (*Genetics*), D.M. Komp (*Emeritus*), G. Kupfer, J.F. Leckman (*Child Study Center*), J.M. Leventhal, J. Lichtor (*Anesthesiology*), G. Lister (*Chair*), M.J. Mahoney (*Genetics*), L.C. Mayes (*Child Study Center*), P.L. McCarthy, L.R. Ment, M.R. Mercurio, G. Miller, I.G. Miller, P.K. Mistry, H.A. Pearson (*Emeritus*), S.A. Rooney (*Emeritus*), E.D. Shapiro, B.A. Shaywitz, S.E. Shaywitz, R.N. Shiffman, B.G. Smith (*Orthopaedics & Rehabilitation*), B.R. Smith (*Laboratory Medicine*), N.S. Talner (*Emeritus*), W.V. Tamborlane, F.R. Volkmar (*Child Study Center*), J. Woolston (*Child Study Center*)

**Associate Professors** N.A. Ameen, L.D. Arnold, C.R. Baum, A. Bazy-Asaad, K.A. Bechtel, V. Bhandari, M.J. Bizzarro, C.W. Bogue, M. Brueckner, K. Chawarska (*Child Study Center*), L. Chen, E.R. Colson, K. Dhodapkar, B.R. Doolittle (*Medicine*), M.E. Egan, J.N. Grauer (*Orthopaedics & Rehabilitation*), A.L. Hsiao, N. Kadan-Lottick, M.K. Khokha, R.A. Martinello (*Medicine*), J.M. McNamara, R. Morotti (*Pathology*), J.M. Panisello, D.S. Pashankar, F.D. Pashankar, L.E. Rosenfeld (*Medicine*), S.A. Ryan, K. Santucci, A. Tufro, M. Vazquez, S.A. Weinzimer, C.C. Weitzman

**Assistant Professors** P.L. Aronson, A.G. Asnes, J.D. Asnes, M. Auerbach, A.K. Berkwitz, E.M. Bruscia, E. Cengiz, S.D. Chirnomas, M.A. Choma (*Diagnostic Radiology*), E.R. Christison-Lagay (*Surgery*), M.X. Cicero, A.I. Del Valle-Segarra (*Adjunct*), M.L. DiLuna (*Neurosurgery*), K.B. Dorsey, A.S. El-Guindy, A.E. Esquibies, E.V. Faustino, A.M. Fenick, J.A. Galvin (*Ophthalmology & Visual Science*), J.S. Giuliano, Jr., J.E. Goodwin, M.R. Grossman, E.K. Hall, S. Hattangadi, D.C. Hersh, A.B. Hittelman (*Urology*), L.C. Johnston, S. Kandil, M. Langhan, O. Levit, K.F. Liem, J. Loyal, N.E. Major, M.E. McCabe, E. Michaelides (*Surgery*), D.E. Ozgediz (*Surgery*), E. Paintsil, A.D. Patel, U.P. Phatak, E. Pinter, A.F. Porto, A. Riera, M.I. Rodriguez-Davalos (*Surgery*), D.M. Steinbacher (*Surgery*), J.J. Vermeire, B.P. Weeks, C.G. Weismann, P.G. Weiss, H.Z. Zhang (*Genetics*)

**Instructors** L. Beslow-Kaye, D.R. Camenga, A. Chatterjee, E. Deniz, J.N. Flyer, R. Fortune, A.M. Jastreboff (*Medicine*), G.J. Kim, E.A. Nozetz, L. Pavlovic, S.G. Pels, C.C. Price (*Medicine*), N.D. Romberg, J.L. Sherr, D.M. Wetzel

**Senior Research Scientists** M. Genel, P.J. Krause (*Epidemiology*)

**Research Scientists** E. Drye, J.M. McGrath (*Comparative Medicine*), K.C. Schneider

**Associate Research Scientists** A. Ali, J.M. Ambrosino, L. Balsamo, X. Chen, A.R. Gupta, R. Jakab, D.V. Kravtsov, R. Kursawe, M. Li, J. Liu, K.E. Marchione, N. Niederstrasser, R. Rana, M.S. Rosenthal, N. Santoro, V. Schulz, S.S. Stahl (*Child Study Center*), Y. Wu, K. Yu

**Clinical Professors** R. Angoff, H.D. Fink, P. Goldstein, H. Jacobs, R.G. LaCamera, S.R. Levy, B.M. McDonald, C. Randolph, M.W. Sklaire, S.Z. Spiesel, F.M. Testa, J.H. Zelson

**Associate Clinical Professors** K.M. Berkwits, H.D. Bornstein, C. Canny, R.D. Chessin, S.I. Escalera, S.B. Fishberger, M.B. Flaherty-Hewitt, J.S. Fong, 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, R.L. Shelling, E.L. Stone, S.N. Sudikoff, S.C. Updegrove, P.P. Wang, C.C. Wood, R.S. Young

**Assistant Clinical Professors** R.J. Anderson, L. Ardeshirpour, A.J. Avni-Singer, S. Baker (*Surgery*), J.W. Blanton, S. Bogursky, S. Boulware, J. Burger, C.G. Butler, J.G. Calderon, A. Cameron, D.P. Cheromcha, B.V. Citarella, M.S. Cohen, N. Condulis, N. Czarkowski, M.E. Dilorenzo, C.L. Dorfman, D.H. Dreyfus, A. Driggers, D.P. Durante, M. Ellison, T. Etkin, K.A. Fearn, C.A. Fischbein, M. Gaeta, B. Gardner, E.H. Gleich, A. Golioto, A. Gork, L.E. Gray, D.L. Griffin, J.A. Gruskay, R.B. Halperin, D.L. Idelson, M.K. Ikeda, L.R. Jayanthi, D.E. Karas (*Surgery*), S.J. Lavietes, M.A. Lee, A. Liebling, D.A. Listman, A. Matczuk, C. Menzies, J.L. Morgan, C.L. Morrison, 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, M. Siev, E.C. Springhorn, J.M. Stein, C.P. Summers, S. Tsalbins, A. Vaezy, S.A. Walsh, G.R. Wanerka, S.A. Weiner, N. Weinstein, E. Wiesner, R.D. Windom, J. Wynne, J. Young

**Clinical Instructors** P.M. Alvino, C.E. Anderson, A. Antman, C.N. Asomugha, F. Beig, C.A. Brown, K.R. Burke, M.F. Canarie, R.S. Caplan, M.C. Caserta, A.M. Coughlin, E.S. Cuoco, M.R. Dillaway, R.G. Dorr, B.G. Freeman, K.Y. Goldberg, Y.F. Gozzo, J.E. Harwin, S. Hassan, K.M. Hesse, B.A. Hillman, M.S. Hogan, D.L. Idelson, J.C. Jennings, L. Kappus, H. Kipperman, J. Koziel, K. Koziol-Dube, J.T. Lau, R. Lockhart, J.C. Long, A.J. Maley, K. Mozny, C. Nicolosi, L. Pavlovic, M. Pouliot, R.F. Ramos (*Medicine*), R.C. Rastetter, C.A. Rowan, L.K. Rudich, A. Sahakian, J.C. Samuel, E.C. Schumacher, L.T. Siew, D.J. Springer, J.H. Stein, K.R. Stephenson, S.M. Storeygard, L.E. Sude, D.C. Torres, V.P. Tsuei, L. Visscher, L.M. Walby, L.A. Waldman, N.G. Wijesekera, M. Williams, J.L. Young, Y. Zhang, R.A. Zlotoff (*Medicine*)

**Lecturers** L. Alonso, S. Anderson, K.M. Baker, S. Baum, A. Beitel, N.B. Brown, A.J. Carlson, J. Chinchilla-Karolicki, A.V. Cohen, M.C. DeLucia, L.M. DiMauro, D.B. Flanagan, S. Frank, M.H. Gad, L. Glassman-Wisnewski, L.L. Gould, E. Herz, A.M. Hoefler, C.M. Keanna, C.M. Kennedy, K. Kinsella, S.E. Kuhn, S. Kurian, E.M. Lawrence, B.M. Liebler, C.E. Macken, S.P. Martinello, P. Murtagh, R. Nolfo, J.E. O'Connor, K. Pae, E.N. Rice (*Nursing*), H.J. Sadinsky, Z.A. Scates, R. Seligson, M.J. Sheehan, S.J. Slattery, K. Vassell, K. Wallis, E. Wolfson

**PEDS 103, Third-Year Clerkship** The Pediatric Third Clerkship is an eight-week required rotation based on a national curriculum developed specifically for students beginning their clinical rotations. The students spend four weeks in the inpatient setting and four weeks in the outpatient setting. During the outpatient rotation, students are exposed to primary care as well as specialty care in the ambulatory setting. The inpatient portion of the rotation takes place at Yale–New Haven Hospital or Bridgeport Hospital. The objectives of the eight-week clerkship include improvement in knowledge as well as clinical skills such as history taking, physical examination skills, and problem solving. During the rotation, students are observed performing these skills by designated supervisors. They have the opportunity to supplement and complement their clinical experiences by doing self-directed reading, completing computer-based cases, working with a simulated model, and interviewing standardized adolescent patients. Attention is paid to optimizing exposure to all pediatric age groups. The clinical experience is enhanced by a weekly interactive teaching session run by pediatric faculty members specifically for the third-year students. E.R. Colson, A.G. Asnes, M.J. Bizzarro

**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 139, Pediatric Neurology Elective** Students choosing to participate in this elective work in the pediatric neurology clinics, make rounds on neurology patients on the pediatric wards, and attend relevant conferences. One student every four weeks. Director: B.A. Shaywitz

**PEDS 143/SURG 176, Subinternship in Pediatric Surgery** 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 or two students every four weeks. Director: B.P. Weeks

**PEDS 146, Pediatric Infectious Diseases 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, Subinternship in Pediatrics** 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 on being a good team member, taking ownership of one's patients, and demonstrating improvement in intern skills (communication with patients/families, organization, prioritization, presentation, and efficiency). 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 Diseases Elective** Students are exposed to a wide variety of activities in the section of 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 have the opportunity to rotate through both the inpatient and outpatient services, pulmonary function laboratory, and children's sleep center. Students are expected to participate in seminars, journal club, and patient rounds. One student every two or four weeks. Director: P.G. Weiss

**PEDS 155, Pediatric Emergency Medicine Elective, Yale-New Haven Hospital** 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 and Y-NHH Epic inpatient training and Epic ED e-learning. Director: P.L. Aronson

**PEDS 307, Pediatric Neonatal-Perinatal Medicine Elective** 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 a fourth- or fifth-year medical student to participate as a member 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: M.E. McCabe

**PEDS 316, Foundations of Applied High-Fidelity Health Care Simulation Elective** Students in this elective (1) gain familiarity with and understanding of advanced simulation technology and equipment; (2) learn key applications of simulation and debriefing within the complex medical environment; (3) participate in educational simulation sessions at 730 Howard Avenue, 733-WP, and situ simulations throughout the hospital; (4) participate in day-to-day activities and strategic operations of the simulation center; (5) develop one deliverable curricular module, including scenarios, relevant references, associated goals/objectives, and other curricular materials; this session will ideally be delivered to a peer group of other medical students; the module will be considered shared work product, and the simulation center reserves the right to incorporate it into future or existing curricula; and (6) may opt to participate in novel or ongoing simulation-based research projects; appropriate funding must be identified for new proposals submitted by the student. Approximately thirty hours per week. One student every two or four weeks. Director: S.N. Sudikoff; J. Zigmont

## PHARMACOLOGY

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<http://medicine.yale.edu/pharm>

**Professors** K.S. Anderson, A.M. Bennett, E.S. Canellakis (*Emeritus*), 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, A.C. Nairn (*Psychiatry*), M. Picciotto (*Psychiatry*), S. Rockwell (*Therapeutic Radiology*), G. Rudnick, A.C. Sartorelli, J. Schlessinger (*Chair*), W.C. Sessa, S.G. Waxman (*Neurology*), D. Wu

**Associate Professors** T. Boggon, D.A. Calderwood, M.P. DiGiovanna (*Medicine*), Y. Ha, M.E. Hodsdon (*Laboratory Medicine*), S. Jordt, I. Lax, D. Spiegel (*Chemistry*), B.E. Turk

**Assistant Professors** V.P. Eswarakumar (*Orthopaedics & Rehabilitation*), E. Paintsil (*Pediatrics*)

**Senior Research Scientist** J.R. Cooper

**Associate Research Scientists** J. Bae, M. Baldassarre, R.P. Baumann, M. Bouaouina, M. Brown, A. Caceres Bustos, C.H. Calderwood, L. El Hassar, L. Fan, K.A. Grabinska, F. Guan, S. Hamill, J. Hu, R. Hu, Z. Jiang, R. Josyula, E.J. Kaftan, J. Kronengold, W. Lam, H. Lee, S. Lee, Y. Lee, Z. Lin, B. Liu, J.W. Murphy, P.G. Penketh, S. Raghavan, C. Rajagopal, D. Rajasekaran, A.V. Reshetnyak, K. Shyam, A.L. Stiegler, A.A. Surguchev, W. Tang, S. Tavoulari, C. Wang, Y. Wang, Y. Xue, Y. 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). S.-E. Jordt, D. Nguyen, S. Tomita

**PHAR 504a, Principles of Pharmacology** Lectures covering antibiotics, immunotherapy, and chemotherapy. 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]

**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 neuropsychiatric 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. K.P. Cosgrove, H. Blumberg, I. Esterlis

**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 550a/C&MP 550a<sup>U</sup>/ENAS 550a<sup>U</sup>/MCDB 550a<sup>U</sup>, 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. Boulpaep, W.M. Saltzman

**PHAR 560b/C&MP 560b<sup>U</sup>/ENAS 570b<sup>U</sup>/MCDB 560b<sup>U</sup>, 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. Boulpaep, F. Sigworth

**PHAR 580/C&MP 650/PATH 660, Ethics** 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, M. Robek, S.K. Singh

## PSYCHIATRY

Office: 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*), S.J. Blatt (*Emeritus*), H. Blumberg, B.S. Bunney (*Emeritus*), T.D. Cannon (*Psychology*), K.M. Carroll, J.P. Comer (*Child Study Center*), L. Davidson, R.S. Duman, M.H. Ebert, J.E. Gelernter, E.H. Griffith (*Emeritus*), C.M. Grilo, K.A. Hawkins, G. Heninger (*Emeritus*), J. Hirsch, 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, A.S. Martin (*Child Study Center*), S. Martino, G.F. Mason (*Diagnostic Radiology*), J.W. Mason (*Emeritus*), C. Mazure, T.H. McGlashan (*Emeritus*), A.C. Nairn, S.S. O'Malley, G.D. Pearson, 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, R. Sinha, W.H. Sledge, D.L. Snow (*Emeritus*), S.M. Southwick, M.W. State (*Child Study Center*), J.S. Strauss (*Emeritus*), J.R. Taylor, J.K. Tebes, 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, A. Buchanan, V.D. Calhoun (*Adjunct*), M.C. Chawarski, C. Chiles, C. Connell, J.M. Cook, N.L. Cooney, C.A. Crusto, E. Diaz, R.J. DiLeone, D.C. D'Souza, N.C. Epperson (*Adjunct*), J.M. Fiszdon, D.C. Glahn, L.S. Godleski, J. Gruber (*Psychology*), N. Hansen, I. Harpaz-Rotem, R.A. Hoff, J. Kaufman, J.S. Kaufman, P.D. Kirwin, S. Krishnan-Sarin, H.B. Lee, C. Li, S. McKee, T.J. McMahon, P.T. Morgan, E.D. Morris (*Diagnostic Radiology*), M.A. Norko, M. Paris, S.G. Resnick, M.I. Rosen, M. Rowe, D. Small, M. Sofuoglu, V.H. Srihari, J.L. Steiner, M.C. Stevens (*Adjunct*), T.H. Styron, N.E. Suchman, G.D. Tamagnan (*Adjunct*), C. Tek, D.F. Tolin (*Adjunct*), B.A. Toll

**Assistant Professors** N.A. Addy, K. Ahn, B.M. Anderson (*Adjunct*), A. Annamalai, E. Ansell, A. Arias, M. Assaf (*Adjunct*), G. Balf, A. Barkil-Oteo, D. Barry, J.E. Beauvais, R.D. Beech, C.D. Bellamy, Z. Bhagwagar (*Adjunct*), M.O. Bonarrigo, R. Branch, J.A. Brewer, I. Cavus (*Adjunct*), T. Chaplin, L.G. Chepenik, S. Corbera (*Adjunct*), P.R. Corlett, K.P. Cosgrove, M. Day (*Adjunct*), I.E. De Araujo, M.E. Delphin, P.H. Desan, J.C. Deviva, G.J. Diefenbach (*Adjunct*), C. Dike, E.L. Edens, L.M. Edwards, J.A. Encandela, I. Esterlis, D.C. Fehon, E.H. Flanagan, A. Forray, H. Fox, L. Fucito, D.M. Gordon, J.L. Goulet, H. Hamid (*Neurology*), J.O. Hannestad (*Adjunct*), A.A. Heapy, D.M. Higgins, M.G. Hunt, T. Iheanacho, J. Ikomi, J.K. Johannesen, R. Kapoor, B. Kiluk, A.S. Klee, H. Kober, S.D. Kruger, D.M. LaPaglia, R.F. Leeman, S. Madonick (*Adjunct*), C. Marienfeld, R. Masheb, R.S. McWilliam (*Child Study Center*), P.M. Morrissey (*Adjunct*), S. Muvvala, C.J. Oleskey, S. Parke, R.H. Pietrzak, D. Pilkey, C. Pittenger, A.N. Ponce, M. Prabhu, Z. Qayyum, E. Ralevski, M. Ranganathan, D.A. Ross, C. Sanislow (*Adjunct*), C.E. Sartor, J.C. Scott, J.J. Sellinger, R.A. Sewell, M.A.

Silva, A.A. Simen (Adjunct), P.D. Skosnik, P. Skudlarski (*Adjunct*), M.V. Smith, H.R. Steinberg, S. Steinberg (*Adjunct*), T.P. Sullivan, J.L. Tondora, J. Tsai, K. Tuit, T.C. VanDeusen, D. Vojvoda, F. Wang, N. Ward, A.H. Weinberger, M.A. White, K.M. Wilkins, J. Xu, K. Xu, B. Yang, H. Zhang, P. Zimbrea, L.D. Zimmerman (*Child Study Center*), Z. Zimolo, L. Zuo

**Instructors** G.A. Angarita-Africano, N. Hamlett, E.D. Hermes, R.A. Miller, M. Steinfeld

**Senior Research Scientists** G.K. Aghajanian, J.D. Elsworth, E.H. Griffith, G. Heninger, P.I. Jatlow (*Laboratory Medicine*), T.H. McGlashan, D.L. Snow, B.E. Wexler

**Research Scientists** S.A. Castner, J. Olausson, G.V. Williams

**Associate Research Scientists** A. Anticevic, I.M. Balodis, M. Banasr, R.D. Barnes, A.C. Black, D.L. Boggs, F. Bois, D.A. Cavallo, A. Chen, G.M. Chowdhury, A.D. Dager, A. Desrosiers, E.E. DeVito, L. Dorflinger, N.R. Driesen, C.H. Duman, C.T. Dyer, H.M. Fichtenholtz, A. Herman, E.D. Jackson, J.S. Jane, A. Kaffman, W.J. Kaspro, G. Kong, L.H. Linke, J. Liu, R. Liu, X. Luo, Y.S. Mineur, B.A. Moore, J.A. Noah, E.E. O'Brien, P. Pal, V.M. Pogorelov, D. Rodriguez-Moreno, K.A. Sanders, S.N. Sathyanesan, T.U. Schaller, C.J. Schmidt, B. Schweinsburg, D.J. Sells, D. Seo, E.A. Stefanovics, M.J. Strambler, A. Thompson, M.G. Veldhuizen, L. Wei, M. Wu, C. Yang, S. Zhang, X. Zhang

**Clinical Professors** D.N. Berg, D.A. Carlson, D.G. Greenfeld, L.L. Harkness, D. Laub, D.O. Lewis, E. Prelinger, L.W. Reiser, H.L. Ruben, L.D. Siggins, J.L. Young

**Associate Clinical Professors** J. Allison, V.A. Altshul, R.M. Balsam, S. Boltax-Stern (*Child Study Center*), E.A. Brett, J.J. Ciarcia, V. Coric, J. De Figueiredo, J. Geller, R.L. Goettsche, K. Grady, 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, B. McKee, S. Mohamed, C.A. Morgan, M.S. Okasha, R.B. Ostroff, H.R. Pearsall, E.A. Perlschwig (*Child Study Center*), R. Peters, J. Phillips, S.H. Phillips, S.G. Possick, M. Rubenstein, E.R. Ryan, S.J. Schreiber, A.P. Siegal, E.W. Snyder, R. Stern, T.D. Stewart, R.R. Tampi, A.P. Thies (*Child Study Center*), L.A. Trevisan, P. Van Watum (*Child Study Center*), G.J. Watstein (*Retired*), T. Zanker

**Assistant Clinical Professors** C. Abdallah, L.J. Adams, A.C. Adis, J. Aguilar-Zanatta, A.T. Albrecht, A.M. Almai, J.A. Amatruda, P.T. Amble, 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, M. Beitel, C. Bemis, J.G. Bejarano, S. Bender, D.E. Bendor, E.H. Berger, R.L. Bergeron, T. Bergherr, S. Bers, L.A. Blakley, Y.S. Blanco, H.C. Blue, D. Boltas, Z. Boutaeva, D.M. Brandt, D. Brockett, T.E. Brown, J. Bullock, A. Buonopane, R. Casey, L.I. Chaikovsky, A. Chang, J. Charney, 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, L.W. Cross, W.F. Dailey, S. De Asis, R.S. Dealy, R.S. Denkin,

C. Doebrick, N.S. Downs, V.M. Dreisbach, S.M. Drew, L. Driscoll, 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, E.R. Frazer, R. Freeman, T.A. Freeman, C.C. Frick, D. Fried, T. Glinberg, L.I. Goldstein, S.F. Gomez-Luna, M.J. Graham, L.R. Greene, A. Grier, M.C. Groner, E.G. Grottolo, C.S. Grove, L.B. Grunebaum, C. Gulrajani, H. Gunduz-Bruce, J.C. Harland, D.D. Hawkins, S.R. Hill, W. Hill, M. Hillbrand, K. Holtzman, J.M. Horowitz, S.J. Houlding, D.D. Jacobson, N. Jain, R.R. Kaminsky, A. Kaner, M. Kang, K.G. Kennedy, K.E. Kerfoot, B. Kerner, S. Khan, S. Kidd, B. Klink, B.E. Knox, F.E. Koerner, R.E. Kravitz, J. Kremer, J.F. Kulas, J. Kurt, M.M. Kurtz, A. Lamba, H.M. Lankenau, K.M. Lazzarini, M. Leddy, B. Lee, C.J. Lee, N.E. Legow, L.N. Levenson, R.C. Lewis, S.V. Lewis, S. Lim, 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, S.L. Matlin, D. Matuskey, R.W. McCleary, B.B. McConnell, B. Meandzija, A.W. Meisler, N.C. Mellos, S. Meshberg-Cohen, R.M. Meyer, S.J. Migdole, E.S. Millman, R.M. Milstein, V.R. Morrow, F.C. Mueller, P.V. Mulinski, D.S. Mundy, S. Muralee, J. Myer, M. Nakic, E.D. Nasper, M.P. Nespoli, J. Niels, F.J. Ninivaggi (*Child Study Center*), P. Noulas, D.O. Nudel, K.F. Nuro, N.D. Olson, C.A. Opsahl, A.G. Oren, S. Ottenheimer, R.M. Ownbey, M.V. Pantalon (*Emergency Medicine*), N. Panza, A. Papsun, F. Perepletchikova, H.V. Phan, J. Poling, J.F. Poll (*Child Study Center*), D.J. Powell, M.L. Prevey, A.E. Pusey, J. Rakfeldt, I.S. Rathbone, D.R. Rau, N. Reddy, M.D. Rego, A. Resnick, G. Richardson, J.P. Robbins, J.E. Robinson, L. Robinson, S.H. Rodrigues, A. Romeo, V.C. Rosen, B.S. Rothschild, M.P. Roy, N. Roy, J.M. Rozanova, R. Rubin, S. Rubin, D.S. Russell, J.A. Sabbatino, N. Sahay, D.K. Sakheim, S. Salant, K.M. Salisbury, C. Sanders, L.C. Sanfilippo, A.P. Sawyer, J.O. Schechter, B. Schweinsburg, J.L. Scott, J.P. Seibyl (*Diagnostic Radiology*), K.A. Sevarino, M.A. Shamsi, C. Shankar, R. Shenouda, J.K. Shepard, D.E. Sholomskas, S.H. Silverstein, M.F. Sperrazza, A.D. Spivack, S. Sreenivasan, D.A. Stayner, M. Stefanovic, W.A. Stewart, M. Stitelman, K. Subramanyam, D.C. Tate, E.S. Tek, A.N. Tessler, S.E. Thomas, B. Tobin, K. Trueblood, M. Tupper, G.W. Valentine, J.J. Vanderploeg, D.C. Vogel, J. Walia, D.J. Wallington, J.M. Wexler, R.S. White, M.L. Whitson, A.M. Winkler, J. Wolf, P. Wupperman, C.M. Young, W. Zito, L. Zonana

**Clinical Instructors** S. Agrawal, E.G. Ahlert-Smith, O. Alpert, M. Bailey, N.M. Campo, V.V. Carvalho, J. Chardavoyne, R.L. Cohen, D.H. David, J.E. Farber, D.J. Flanigan, C. Grazia, M.C. Grenough, C.M. Hunnicutt, W. Levy, N.M. Lustman, M. McCarthy, B.C. Moore, R. Plant (*Child Study Center*), P.G. Rao, J.N. Rascati, S.J. Rathi, M.F. Shaw, D.J. Suscovich, M.B. Vollmar, E. Weiss

**Lecturers** J.D. Alvaro, C. Atkins, C.M. Barber, J.L. Barron, L.E. Bedregal, R.H. Berger, D.A. Berv, R.A. Cole, C. Conrad, H.F. Crabbe, G.H. Davis, M. Debor, A.R. Demac, C.E. Desmond, P.J. Dileo, P.A. Dillon, M. Emmanuel, S.G. Goodson, J.B. Gordon, G. Greenberg, F. Grossman, C. Jean, M.A. Kalacznik, A. Kalafa, B.C. Klein, R.H. Klein, J. Klugman, A.S. Koleszar, K.K. Krusong, A.L. Labruzzo, L. Lager, L.M. Lothstein, L.M. Madden, J.J. Magnavita, R.B. Makover, K. Marcus, A. Massa, D.M. Mender, J.H. Meyer, M.L. Mitchell, D.C. Moore, M.J. Orlosky, J.M. Palumbo,

J. Pelletier, E. Peters, J.M. Pisciotta, S.J. Purcell, W.N. Reich, S.D. Romano, E.B. Rubin, S.L. Satel, M.N. Savage, J.M. Schnitt, A.J. Sholomskas, G.H. Sirkin, P.F. Thomas, R.K. Westheimer, P.J. Whang, J.R. Zigun

The Department of Psychiatry teaches in both preclinical and clinical years. The pre-clinical course is a study of medical behavioral science, rather than an introduction to clinical psychiatry. Specific clinical skills, such as interviewing and the recognition and management of psychiatric syndromes, are taught later in the curriculum and especially during the required clinical clerkship in Psychiatry. Electives are available for students with special interest in selected areas. All advanced clinical electives are numbered in the 200s. The required clinical clerkship (Psychiatry 106) is a prerequisite for enrollment in any of these advanced clinical electives; an advanced clinical elective may not be taken instead of the required clinical clerkship. *Please note:* All students signing up for a seminar elective must also register with the Medical Student Education Office, Department of Psychiatry, 203.785.2089 (pending approval of the instructor).

**Psychiatry 101a, Patient-Centered Interviewing: The Patient's Story** This segment of the Pre-Clinical Clerkship focuses on the experience of illness – how people react to and cope with illness. The various psychosocial factors and psychological defenses which impact on the experience of illness, such as age, gender, social supports, socioeconomic status, and coping style, are examined. There is an emphasis on the patient interview and techniques for eliciting the patient's story in an empathic and effective manner. The format includes lectures, demonstration interviews, and practice with standardized patients. R. Belitsky and Departments of Psychiatry and Medicine faculty

**Psychiatry 101b, Biological Basis of Behavior** Lectures are integrated with the Neurology course, and include principles and neural mechanisms of learning and memory; neural systems involved in fear and anxiety; neural systems involved in reward and drug addiction; neural systems involved in stress; and neural systems involved in attention. Following each lecture, a psychiatrist interviews patients diagnosed with obsessive-compulsive disorder, panic disorder, cocaine abuse, post-traumatic stress disorder, and schizophrenia. These 1.5-hour clinical presentations, which include time for questions, link psychiatric symptoms to the neural mechanisms discussed in the lecture on that day. 2.5 hours per week. Department of Psychiatry faculty

**Psychiatry 106, Clinical Clerkship** Skills and knowledge needed for the general practice of medicine are acquired in a clinical psychiatric setting. There is a "Patients in Crisis" component that emphasizes: conducting a competent screening interview in order to identify symptoms of a psychiatric or substance abuse disorder; performing a complete mental status examination of a patient who is emotionally disturbed or mentally ill; making a differential diagnosis, and planning for further evaluation and tests that would be useful in deciding among various diagnostic possibilities; making recommendations for biological, psychosocial, and/or social treatment interventions; assessing whether or not dangers to or from a patient exist; and understanding indications and procedures for lawful involuntary commitment of a patient to a mental hospital for treatment. There is also a "Psychiatry at the Interface with Medicine" component designed to provide

students with an understanding of the presentation of psychiatric illness in patients with co-morbid medical disorders. Emphasis is placed on screening interviews, including mental status examination; identification of symptoms; and differential diagnosis and initial treatment recommendations of patients with co-morbid medical and psychiatric illness. Special emphasis is placed on evaluation of psychiatric emergencies and competency to make informed medical decisions. Additionally, students have the opportunity to learn and develop clinical skills through carefully designed outpatient experiences. K. Wilkins, J.L. Barron, and Department of Psychiatry faculty

**Psychiatry 203, Subinternship in Hospital Psychiatry, Inpatient Division, Connecticut Mental Health Center (CMHC)** This subinternship 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; M. Jean-Baptiste, R.D. Beech

**Psychiatry 206, Law and Psychiatry Elective, Connecticut Mental Health Center** 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, Subinternship in Hospital Psychiatry, Inpatient Division, Yale-New Haven Psychiatric Hospital** This subinternship 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 Y-NHPH; 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, Subinternship in Clinical Neuroscience, Clinical Neuroscience Research Unit Inpatient Division** This subinternship 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; R.T. Malison, G. Heninger, M. Bloch, G.A. Angarita-Africano

**Psychiatry 234, Subinternship in Adolescent Inpatient Psychiatry, Yale-New Haven Psychiatric Hospital** The purpose of this subinternship 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 subinternship 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; S. Muralee, C.J. Oleskey

**Psychiatry 238, Subinternship in Early Psychosis: 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. Prerequisite: Psychiatry 106. Open to fourth-year students only. One student every four weeks. Director: R.M. Rohrbaugh; V.H. Srihari (clinic director), J. 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. Saks (CBT coordinator, STEP clinic), B. Walsh (clinical coordinator, PRIME clinic)

**Psychiatry 325/CHLD 325, Child Study Psychiatry Elective, Yale Child Study Center**  
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 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. Director: A.S. Martin

## PUBLIC HEALTH

Office: 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*), P. Boyle (*Adjunct*), M.B. Bracken (*Epidemiology*), E.H. Bradley, R. Bucala (*Medicine*), M. Cappello (*Pediatrics*), E.B. Claus, P.D. Cleary (*Dean*), L. Dembry (*Medicine*), V.T. DeVita (*Medicine*), P. Diggle (*Adjunct*), A.B. Du Bois (*Emeritus*), D.A. Fiellin (*Medicine*), E. Fikrig (*Medicine*), D. Fish (*Epidemiology*), H.P. Forman (*Diagnostic Radiology*), G. Friedland (*Medicine*), A. Gerber (*Political Science*), T.M. Gill (*Medicine*), R. Heimer (*Epidemiology*), T.R. Holford (*Public Health*), S.M. Horwitz (*Emeritus*), J.R. Ickovics (*Epidemiology*), J.F. Jekel (*Emeritus*), A.C. Justice (*Medicine*), E.H. Kaplan (*School of Management*), S.V. Kasl (*Emeritus*), A.I. Ko (*Epidemiology*), H.M. Krumholz (*Medicine*), B.P. Leaderer (*Epidemiology*), L.S. Levin (*Emeritus*), R.W. Makuch (*Public Health*), L.E. Marks (*Epidemiology*), S.T. Mayne, R. McCorkle (*Nursing*), D. McMahon-Pratt, I. Miller (*Pediatrics*), A.D. Paltiel (*Public Health*), C.L. Patton (*Emeritus*), P.N. Peduzzi, R. Perez-Escamilla, 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 (*Public Health*), J.T. Stitt (*Emeritus*), J.A. Stolwijk (*Emeritus*), J.K. Tebes (*Psychiatry*), G.H. Tignor (*Emeritus*), M.E. Tinetti (*Medicine*), C. Tschudi, H. Yu (*Adjunct*), D. Zelterman, H. Zhang (*Public Health*), H. Zhao (*Public Health*), T. Zheng

**Associate Professors** M.S. Bogucki (*Emergency Medicine*), S.H. Busch, M.M. Desai, R. Dubrow, A.P. Galvani (*Epidemiology*), E.L. Grigorenko (*Child Study Center*), C. Gross (*Medicine*), J.J. Hoh (*Epidemiology*), M.L. Irwin, T. Kershaw, K. Khoshnood, Q. Lan (*Adjunct*), B. Levy (*Epidemiology*), T.T. Lewis (*Adjunct*), J.H. Lichtman, H. Lin, S. Ma, X. Ma, I. Nembhard (*Public Health*), L.M. Niccolai, J. Pachankis, M.M. Pettigrew, J.P. Ruger (*Public Health*), A.N. Sofair (*Medicine*), N.S. Stachenfeld (*Obstetrics, Gynecology & Reproductive Sciences*), R. Stolzenberg-Solomon (*Adjunct*), Y. Zhang, Y. Zhu

**Assistant Professors** R.D. Bruce (*Medicine*), X. Chen (*Public Health*), Z.N. Cooper (*Public Health*), F.W. Crawford, A.J. Cross (*Adjunct*), A.T. Dewan, M.A. Diuk-Wasser, A.S. Ettinger, B.E. Gould Rothberg (*Medicine*), J. Gupta, D. Keene, E.F. Long (*School of Management*), J.E. Monin, M. Nunez-Smith (*Medicine*), S. Parikh (*Epidemiology*), V.E. Pitzer, G.D. Ribeiro (*Adjunct*), F.M. Shebl, M. Smith (*Psychiatry*), S. Wang, Z. Wang, D.M. Weinberger, M.A. White (*Psychiatry*), B. Zhou

**Senior Research Scientists** K. Belanger (*Epidemiology*), A. Caccone (*Ecology & Evolutionary Biology*), J.E. Childs (*Epidemiology*), L. Curry (*Public Health*), P.J. Krause (*Epidemiology*), L.E. Munstermann, M.B. Schwartz (*Psychology*)

**Research Scientists** N. Abdala, G.M. Attardo, B. Cartmel (*Epidemiology*), J.F. Gent, R. Gueorguieva, B.A. Jones (*Epidemiology*), N. Sun

**Associate Research Scientists** E. Buta, L. Calvocoressi, M.E. Canavan, T.M. Castilho, L.M. Chung, M.M. Ciarleglio (*Public Health*), F. Dai, L.M. Ferrucci, L.E. Grau, G. Han, L. Hou, A.J. Hromi-Fiedler, H. Huang, H. Jo, M.J. Kane, N.G. Kolev, T.C. Kyriakides (*Medicine*), E.C. Leifheit-Limson, L. Lu, L. Qin (*Public Health*), K.M. Talbert-Slagle (*Public Health*), J. Wang, R. Wang, B.L. Weiss (*Epidemiology*), E. White, E.A. Wunder, Q. Yan, C.W. Yeckel (*Epidemiology*), A.J. Zullo

**Clinical Professor** J.B. Borak (*Epidemiology*)

**Associate Clinical Professors** M.L. Cartter, J.L. Hadler, D. Shenson, H. Wang

**Assistant Clinical Professors** A.M. Miller, L.E. Sosa

**Clinical Instructors** D.L. Humphries, J.E. Rawlings

**Lecturers** E. Anderson, J.F. Anderson, T.G. Andreadis, D.D. Aye, T.J. Balczak (*Medicine*), K. Belanger (*Epidemiology*), M. Booss, M.P. Borgstrom, E.A. Bortnichak, M.M. Callaway (*Public Health*), P.F. Canny, G.L. Capozzalo, B. Cartmel (*Epidemiology*), G. Charnley, J.E. Childs (*Epidemiology*), M.M. Ciarleglio (*Public Health*), K.H. Clark, H. Cohen (*Medicine*), L. Curry (*Public Health*), 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 (*Public Health*), B. Jennings, B.A. Jones (*Epidemiology*), M. Klein, P.J. Krause (*Epidemiology*), M. Lee, L.S. Levin (*Public Health*), D. Li, E.L. Linnander, L.G. Marc, J.A. Mattera, J.E. McGovern, D. McKee (*Economics*), Z. McNatt, S.M. Merz, (*Medicine*), M. Moore (*School of Management*), L.M. Mueller, J.M. Mullen (*Epidemiology*), E. O'Keefe, J.E. Otero, C. Petit, J.M. Rozanova (*Psychiatry*), T.W. Ruger, B. Schachtel, R.L. Skolnik, M. Skonieczny, M.D. Slade (*Medicine*), J.P. Smith, M.V. Smith (*Psychiatry*), S.S. Spangler, J.A. Sparer (*Medicine*), D.E. Stevens, J.A. Stolwijk (*Public Health*), M.H. Stowe (*Medicine*), K.M. Talbert-Slagle (*Public Health*), P.H. Van Ness (*Medicine*), B.L. Weiss (*Epidemiology*), C.W. Yeckel (*Epidemiology*), K.A. Yonkers (*Psychiatry*), 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

Office: FMB 102, 203.785.2697

<http://yalesurgery.org>

**Professors** J.J. Abrahams (*Diagnostic Radiology*), L.M. Bartoshuk (*Emeritus*), M.G. Caty, M. Centrella, K.A. Davis, F.C. Detterbeck, S.J. Dudrick (*Emeritus*), J.A. Eleftheriades, S.H. Emre, J.P. Geibel, B.G. Green, R.J. Gusberg, G.L. Hammond (*Emeritus*), G.M. Israel (*Diagnostic Radiology*), B. Kinder (*Emeritus*), G.S. Kopf, D.R. Lannin, S.B. Leder, D.J. Leffell (*Dermatology*), A. Lofqvist (*Adjunct*), W.E. Longo, L.M. Manuelidis, D. Narayan, 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, C.T. Sasaki, I.R. Schwartz (*Emeritus*), L.M. Scoutt (*Diagnostic Radiology*), J.H. Seashore (*Emeritus*), Y.H. Son (*Therapeutic Radiology*), B. Sumpio, G. Tellides, J.G. Thomson, R.J. Touloukian, R. Udelsman (*Chair*), W. Yarbrough, D.D. Yuh

**Associate Professors** J.E. Aruny (*Diagnostic Radiology*), S. Bokhari (*Diagnostic Radiology*), C.H. Cha, A.B. Chagpar, R. Cowles, A. Dardik, A. Duffy, R.N. Formica (*Medicine*), S. Hashim, M.H. Johnson (*Diagnostic Radiology*), L.J. Kaplan, S. Kulkarni, B.E. Muhs, M.F. Perkal, M. Prasad (*Pathology*), K.E. Roberts, M. Schilsky (*Medicine*), K. Schuster, W. Stewart, T. Tsangaris

**Assistant Professors** A.F. Au, B. Bhattacharya, M.S. Bianchi, D.J. Boffa, P.N. Bonde, L.M. Bow, G. Callender, T. Carling, E.R. Christison-Lagay, U.M. Darr, R. Decker (*Therapeutic Radiology*), H.A. Deshpande (*Medicine*), M.L. Dewar, M.F. Ditillo, H. Einarsdottir, A. Geirsson, D. Han, N.R. Horowitz, J. Indes, N. Isaeva, D.C. Johnson, B. Judson, S. Kahn, B. Killelea, A.W. Kim, D. Kowalski (*Pathology*), S.L. Kwei, S.M. Luczycki (*Anesthesiology*), F.Y. Lui, L.L. Maerz, R. Manes, A.A. Mangi, A. Maung, E. Michaelides, G. Nadzam, C. Ochoa Chaar, D.E. Ozgediz, G.L. Piper, C. Quinn, V. Reddy, M.I. Rodriguez-Davalos, T. Sam, D.M. Steinbacher, H.E. Tantawy (*Anesthesiology*), P.S. Yoo, N. Young

**Research Scientist** M.S. Kidd

**Associate Research Scientists** X. Guo, R. Korah, L. Qin, T. Rampias, L. Song, J. Zhou

**Clinical Professors** S. Ariyan, J.E. Fenn, J.F. Kveton, R.S. Stahl, E. Yanagisawa

**Associate Clinical Professors** N.A. Atweh, Z.N. Chicarilli, R.C. Fazio, J.P. Kelly, K. Lee, R.A. Lowlicht, J.T. Schulz

**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, J. Henley, R.H. Hirokawa, G.E. Horblitt, D.E. Karas, D.B. Keck, A.S. Kenler, J.C. Kirchner, S.B. Levine, D.J. Muller, S. Natkin, M.K. O'Brien, G. Opim, P.M. Opim, M.T. Pronovost, J.C. Salomon, R.F. Schlessel, J.F. Schmidt, 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** C.B. Beckman, R. Crombie, A. Czibulka, M. D'Agostino, K. Discepolo, S. Drukteinis, P.L. Fortgang, C. Haberland, E. Honigsberg, J. Kerner, J.R. Klenoff, T.H. Lesnik, R. Radmand, H.F. Reilly, T. Takoudes, M.N. Waltzman

**Lecturers** L. Acton, L. Copes, J.P. Escandon, A. Ferruggiaro, B.C. Fichandler, D.D. Hendrick, N.M. Hewitt, J. Hopper, J.S. Hundal, H.M. Keiser-Pedersen, V. Lee, E.A. Likins-Graham, J. Mendes, C. Powell, C. Rodolfo, L. Romanelli, P.G. Sasaki, B.J. Sperrazza, H.L. Warner

**SURG 103, Surgery Clerkship** The twelve-week Surgery Clerkship Block includes four weeks of General Surgery and four weeks of Surgical Specialties, as well as two weeks of Anesthesiology and two weeks of Emergency Medicine. Students have an opportunity to complete a preference form for site assignments but are not guaranteed a specific assignment, nor are they able to indicate which rotation will be done first; this is determined by the clerkship administrator based on space availability.

The four-week General Surgery Core rotation can be completed at Yale–New Haven Hospital the West Haven VA Medical Center. Service preferences include Gastrointestinal Surgery, Oncology Surgery, Trauma/Emergency Surgery, and VAMC Surgery.

The mandatory four-week special services rotation is divided into two weeks on the Anesthesiology service and two weeks on Emergency Medicine.

For the four weeks of surgical subspecialty rotations, students may select two, two-week subspecialty services, which are completed at YNH. Service preferences include: Cardiac Surgery, Endocrine, Orthopaedic Surgery, Otolaryngology–ENT, Pediatric Surgery, Peripheral Vascular, Plastic Surgery, Thoracic Surgery, Transplant, or Urology.

There is a surgery mentoring program throughout the twelve-week block. The Surgery Clerkship Block may not be done away and must be completed by the end of the third year. Clerkship director: R.J. Gusberg

**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, Subinternship in Cardiac Surgery** 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, Subinternship in General Thoracic Surgery** The student is expected to be a valuable contributing team member during daily rounds, in the operating room, in the outpatient clinic, 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 that is undertaken in 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** The surgical intensive care unit (SICU) 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, Subinternship in Trauma and Emergency General Surgery** 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, Subinternship in Plastic and Reconstructive Surgery** Students participate in the evaluation and reconstructive surgery of deformities of congenital, traumatic, and neoplastic origin. Includes inpatient, outpatient, and operating room experience, supplemented by regular conferences. Prerequisite: completion of third-year clerkships. One or two students every four weeks. Director: J.A. Persing

**SURG 151, Subinternship in Gastrointestinal General Surgery** 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. Director: W.E. Longo

**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, Subinternship in Otolaryngology** 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. Director: M.S. Bianchi

**SURG 159, Subinternship in Urology** 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, Subinternship in Vascular Surgery** 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, Subinternship in Transplantation Surgery** 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, Subinternship in Surgical Oncology** 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: R.R. Salem

**SURG 176/PEDS 143, Subinternship in Pediatric Surgery** 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, Fourth-Year Techniques in 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 their special interest. Ample opportunity is provided to interact with the faculty and to develop a mentor relationship. One or two students every two weeks. Director: M.S. Bianchi

**SURG 204, General Surgery Elective, Yale-New Haven Hospital Saint Raphael Campus** 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 an 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: J.T. Schulz

**SURG 209, Congenital Heart Surgery Elective** Students 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, Subinternship in Surgical Critical Care, VA Connecticut Healthcare System, West Haven** 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 four weeks. Director: M.F. Perkal

**SURG 217, Subinternship in Endocrine Surgery** 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 student every four weeks. Director: T. Carling

## THERAPEUTIC RADIOLOGY

Office: SCH LL507, 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*), R. Nath, R.E. Peschel, S. Rockwell, W. Rupp, R.J. Schulz (*Emeritus*), Y.H. Son, W.C. Summers, P. Sung (*Molecular Biophysics and Biochemistry*), J.B. Sweasy, L.D. Wilson

**Professor (Adjunct) of Research** K. Low

**Associate Professors** V.L. Chiang (*Neurosurgery*), J. Deng, S.A. Higgins, M.S. Moran, K.B. Roberts, J.B. Weidhaas, Z. Yun

**Assistant Professors** R.S. Bindra, D.J. Carlson, B.W. Chang, J.N. Contessa, S. Damast, R. Decker, S.B. Evans, F. Guo, J.E. Hansen, R.B. Jensen, S. Kamath, W. Lui, B. McGibbon, A.A. Patel, F.A. Rogers, F. Su, J.B. Yu

**Senior Research Scientist** D.E. Brash

**Associate Research Scientists** M. Kaushik, D. Kidane, Q. Lin, Y. Lu, T.S. Paranjape

**Clinical Professor** D.E. Brash

**Associate Clinical Professor** P.M. Pathare

**Assistant Clinical Professors** M. Ahmad, J. Albanese, J.E. Bond, A. Chu, J.Y. Chung, C.A. Knowlton, S. Mani

**Lecturers** H.M. Lincoln, R. Vera

**THER 101, Radiation Oncology Elective** A flexible program designed to introduce the medical 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 teaching sessions. One or two students every four weeks. Director: S.A. Higgins

**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 L.D. Wilson

**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 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

Office: FMP 300, 203.737.6038  
<http://medicine.yale.edu/urology>

**Professors** H.E. Foster, B. Lytton (*Emeritus*), P. Schulam (*Chair*), R.M. Weiss

**Associate Professor** J.W. Colberg

**Assistant Professors** A.B. Hittelman, D. Singh, C.N. Walker

**Instructor** H.Z. Kaimakliotis

**Associate Research Scientists** R.E. Fan, M. Lu

**Assistant Clinical Professors** R.J. Dean, P.A. Kraus, R.F. Stroup

**Clinical Instructors** P. Demir, J.J. Williams

**Lecturer** M.G. Maher

Urology electives are listed under the Department of Surgery.

# Yale Cancer Center

Office: WWW 205, 203.785.4095

Director: T.J. Lynch

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## MEMBERSHIP

**Professors** K.S. Anderson (*Pharmacology*), S. Ariyan (*Surgery*), P.W. Askenase (*Internal Medicine*), A.E. Bale (*Genetics*), L.M. Bartoshuk (*Surgery*), S. Baserga (*Biophysics & Biochemistry*), J.R. Bender (*Internal Medicine*), J.L. Bolognia (*Dermatology*), A.L.M. Bothwell (*Immunobiology*), E.H. Bradley (*Public Health*), D.E. Brash (*Therapeutic Radiology*), R.R. Breaker (*Molecular, Cellular & Developmental Biology*), R. Bucala (*Internal Medicine*), L.G. Cantley (*Internal Medicine*), N. Carrasco (*Cellular & Molecular Physiology*), R.E. Carson (*Diagnostic Radiology & Biomedical Engineering*), 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*), P. De Camilli (*Cell Biology*), F. Detterbeck (*Surgery*), V.T. DeVita, Jr. (*Internal Medicine*), M.V. Dhodapkar (*Internal Medicine*), D.C. DiMaio (*Genetics*), J.S. Duncan (*Diagnostic Radiology*), R.L. Edelson (*Dermatology*), 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*), J. Geibel (*Surgery*), M. Girardi (*Dermatology*), P.M. Glazer (*Therapeutic Radiology*), E.J. Glusac (*Pathology*), M. Gunel (*Neurosurgery; Neurobiology*), R. Herbst (*Internal Medicine*), H. Hetherington (*Neurosurgery*), H. Hochster (*Medical Oncology*), 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*), G. Kupfer (*Pediatrics*), D.R. Lannin (*Surgery*), D.J. Leffell (*Dermatology*), P. Lengyel (*Emeritus; Molecular Biophysics & Biochemistry*), R. Lifton (*Genetics*), H. Lin (*Cell Biology*), P.M. Lizardi (*Pathology*), E. Lolis (*Pharmacology*), K.B. Low (*Therapeutic Radiology*), T.J. Lynch (*Cancer Center*), J.A. Madri (*Pathology*), N.J. Maible (*Obstetrics, Gynecology & Reproductive Sciences*), M.J. Mamula (*Internal Medicine*), S.T. Mayne (*Public Health*), R. McCorkle (*School of Nursing*), J.M. McNiff (*Dermatology*), R. Medzhitov (*Immunobiology*), I.G. Miller (*Pediatrics*), S.J. Miller (*Chemistry*), G.G. Mor (*Obstetrics, Gynecology & Reproductive Sciences*), J.S. Morrow (*Pathology*), D. Narayan (*Surgery*), R. Nath (*Therapeutic Radiology*), S. O'Malley (*Psychiatry*), P. Peduzzi (*Public Health*), R.E. Peschel (*Therapeutic Radiology*), D. Petrylak (*Medicine*), A. Phillips (*Chemistry*), J.M. Piepmeier (*Neurosurgery*), J.S. Pober (*Pathology*), L. Pusztai (*Medicine*), A.M. Pyle (*Molecular Biophysics & Biochemistry*), L. Regan (*Molecular Biophysics & Biochemistry; Chemistry*), D.L. Rimm (*Pathology*), H.A. Risch (*Public Health*), S. Rockwell (*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*), J. Schlessinger (*Pharmacology*), P.E. Schwartz (*Obstetrics, Gynecology & Reproductive Sciences*), W.C. Sessa (*Pharmacology*), G. Shadel (*Pathology; Genetics*), M.J. Shlomchik (*Laboratory Medicine*), J. Sklar (*Pathology*), F.J. Slack (*Molecular, Cellular & Developmental Biology*), B.R. Smith (*Laboratory Medicine*), E.L. Snyder (*Laboratory Medicine*), M.J. Solomon (*Molecular Biophysics & Biochemistry*), 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*), H.S. Taylor (*Obstetrics, Gynecology & Reproductive Sciences*), P.J. Tattersall (*Laboratory Medicine*), R.E. Tigelaar (*Dermatology*), R. Udelsman (*Surgery*), A.N. Van den Pol (*Neurosurgery*), 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** J.M. Baehring (*Neurology; Neurosurgery*), S.J. Baserga (*Molecular Biophysics & Biochemistry*), A.M. Bennett (*Pharmacology*), S.L. Bernstein (*Emergency Medicine*), D.J. Boffa (*Surgery*), T. Boggon (*Pharmacology*), M.W. Bosenberg (*Dermatology*), D. Braddock (*Pathology*), J.L. Brandsma (*Comparative Medicine*), D.A. Calderwood (*Pharmacology*), C. Cha (*Surgery*), A.B. Chagpar (*Surgery*), S. Chang (*Laboratory Medicine*), H.H. Chao (*Internal Medicine*), J.W. Colberg (*Urology*), C.M. Crews (*Molecular, Cellular & Developmental Biology*), J. Deng (*Therapeutic Radiology*), K. Dhodapkar (*Pediatrics*), M.P. DiGiovanna (*Cancer Center*), R. Dubrow (*Public Health*), T. Fahmy (*Biomedical Engineering*), S.N. Gettinger (*Cancer Center*), C.P. Gross (*Internal Medicine*), J. Grutzendler (*Neurology; Neurobiology*), Y. Ha (*Pharmacology*), S.A. Higgins (*Therapeutic Radiology*), M. Hodsdon (*Laboratory Medicine*), J. Hoh (*Public Health; Ophthalmology & Visual Science*), M.L. Irwin (*Public Health*), A. Iwasaki (*Immunobiology*), B.A. Jones (*Public Health*), S.E. Jordt (*Pharmacology*), N.S. Kadan-Lottick (*Pediatrics*), S.M. Kaech (*Immunobiology*), J. Kapo (*Medicine*), S.H. Kleinstein (*Pathology*), H.M. Kluger (*Cancer Center*), Y. Kluger (*Pathology*), J.P. Koo (*Medicine*), D.S. Krause (*Laboratory Medicine*), M. Krauthammer (*Pathology*), J. Lacy (*Medicine*), R. Lazova (*Dermatology*), C.G. Lee (*Pulmonary Medicine*), H. Lin (*Public Health*), S. Ma (*Public Health*), X. Ma (*Public Health*), M.A. Materin (*Ophthalmology & Visual Science*), 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. Nicolai (*Epidemiology*), M. Prasad (*Pathology*), M. Robek (*Pathology*), K.B. Roberts (*Therapeutic Radiology*), M.G. Rose (*Cancer Center*), T.J. Rutherford (*Obstetrics, Gynecology & Reproductive Sciences*), A. Schepartz (*Chemistry; Molecular, Cellular & Developmental Biology*), S. Seropian (*Internal Medicine*), W.D. Shlomchik (*Internal Medicine*), M. Sofuoglu (*Psychiatry*), D.A. Spiegel (*Chemistry*), J.A. Sosa (*Surgery*), R. Sutton (*Internal Medicine*), B. Toll (*Psychiatry*), D.K. Toomre (*Cell Biology*), B. Turk (*Pharmacology*), J.B. Weidhaas

(*Therapeutic Radiology*), Y. Xiong (*Molecular Biophysics & Biochemistry*), Z. Yun (*Therapeutic Radiology*), Y. Zhang (*Public Health*), Y. Zhu (*Public Health*)

**Assistant Professors** M. Abu Khalaf (*Cancer Center*), M. Azodi (*Obstetrics, Gynecology & Reproductive Sciences*), K.P. Becker (*Neurology*), R.S. Bindra (*Therapeutic Radiology*), T. Carling (*Surgery*), D.J. Carlson (*Therapeutic Radiology*), B. Chang (*Therapeutic Radiology*), D. Chirnomas (*Hematology; Oncology*), J.N. Choi (*Dermatology*), G.G. Chung (*Cancer Center*), O.R. Colegio (*Dermatology*), J.N. Contessa (*Therapeutic Radiology*), S. Damast (*Therapeutic Radiology*), R.H. Decker (*Therapeutic Radiology; Surgery*), H.A. Deshpande (*Cancer Center*), M. Djekidel (*Radiology*), A.S. El-Guindy (*Pediatrics: Infectious Disease*), S.B. Evans (*Therapeutic Radiology*), R. Fan (*Biomedical Engineering*), A.J. Giraldez (*Genetics*), B.E. Gould-Rothenberg (*Medical Oncology*), V. Greco (*Genetics*), A. Haberman (*Laboratory Medicine*), S. Halene (*Hematology*), J.E. Hansen (*Therapeutic Radiology*), S. Herzon (*Chemistry*), M.W. Hochstrasser (*Molecular Biophysics & Biochemistry*), E.W. Hofstatter (*Medical Oncology*), V. Horsley (*Molecular Cellular & Developmental Biology*), M. Hurwitz (*Medical Oncology*), N. Ivanova (*Genetics*), R.B. Jensen (*Therapeutic Radiology*), B. Judson (*Surgery/Otolaryngology*), A.W. Kim (*Surgery*), T.H. Kim (*Genetics*), M.C. King (*Cell Biology*), P. Kumar (*Medicine*), S. Kwei (*Plastic Surgery*), J. Li (*Comprehensive Cancer Center*), P. Li (*Genetics*), B. Lindenbach (*Microbial Pathogenesis*), D.M. Lindskog (*Orthopaedics & Rehabilitation*), W. Liu (*Therapeutic Radiology*), J. Lu (*Genetics*), S. Mani (*Therapeutic Radiology*), M.A. Materin (*Ophthalmology & Visual Science*), R.E. Means (*Pathology*), K. Miller-Jensen (*Biomedical Engineering; Molecular, Cellular & Developmental Biology*), A. Molinaro (*Public Health*), D. Morgenstern (*Comprehensive Cancer Center*), D. Nguyen (*Pathology*), J.P. Noonan (*Genetics*), M. Nuñez-Smith (*Medicine*), A.A. Patel (*Therapeutic Radiology*), D.A. Patel (*Obstetrics, Gynecology & Reproductive Sciences*), J.P. Pereira (*Immunobiology*), D.O. Persky (*Hematology*), N.A. Podoltsev (*Hematology*), K. Politi (*Pathology*), J.T. Puchalski (*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*), D. Sells (*Psychiatry*), F.M. Shebl (*Epidemiology*), B. Shuch (*Medicine*), S. Stein (*Medical Oncology*), M. Strout (*Medicine*), N. Wajapeyee (*Pathology*), S. Wang (*Epidemiology*), A.H. Weinberger (*Psychiatry*), A. Xiao (*Genetics*), M.L. Xu (*Pathology; Laboratory Medicine*), Q. Yan (*Pathology*), X. Yang (*Comparative Medicine; Cellular & Molecular Physiology*), J.B. Yu (*Therapeutic Radiology*), J. Zhou (*Neurosurgery; Biomedical Engineering*)

**Senior Research Scientist** R. Halaban (*Dermatology*)

**Research Scientists** B. Cartmel (*Public Health*), F. D'Errico (*Diagnostic Radiology*), A.M. Haberman (*Laboratory Medicine*), Z. Hu (*Obstetrics, Gynecology & Reproductive Sciences*), M.S. Kidd (*Surgery*), S.M. Mane (*Molecular Biophysics & Biochemistry*), E.T. Matloff (*Genetics*), J.M. McGrath (*Comparative Medicine*), D.J. Schulman-Green (*School of Nursing*)

**Associate Research Scientists** D.J. Hanlon (*Dermatology*), E. Ercolano (*School of Nursing*), L.M. Ferrucci (*Epidemiology: Chronic Diseases*), H. Jo (*Epidemiology: Environmental Health*), D. Sells (*Psychiatry*)

**Clinical Professors** S. Ariyan (*Surgery*), L. Farber (*Medicine/Medical Oncology*), A.L. Levy (*Medicine*), S. Mani (*Therapeutic Radiology*), A.L. Silber (*Medicine*), P. Sprenkle (*Medicine*)

**Instructors** S. Halene (*Medicine*), M.P. Strout (*Hematology*)

The center supports a \$100 million research base to promote translational research through collaborations between and within eight 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 Research, and one epidemiological program, Cancer Prevention and Control. The center also supports eight shared facilities that are available for oncological research: Flow Cytometry, Cesium 137 Irradiator, Rapid Case Ascertainment, Clinical Trials Office, Biostatistics, Microarray, Yale Pathology Tissue Services, and the 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 for pediatric nurse practitioner and family nurse practitioner students in the first year of specialization; open to others with permission of the instructor. Two hours per week. M. Meadows-Oliver

**NURS 723a/HPM 592a, Concepts and Principles of Aging** 1.5 credit hours. This multidisciplinary course is designed to introduce students to the major concepts and principles of gerontology and to a variety of biopsychosocial theories on aging. Delivery systems of care for older adults are explored along with the current social policy initiatives as they relate to this growing population. Research initiatives are discussed, and students are encouraged to explore geriatric care issues in their own specialty/discipline as well as in related disciplines. Required for gerontological nurse practitioner students; open to others with permission of the instructor. One and one-half hours per week. G. Marrocco

**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 in the final year for all students in the diabetes care concentration. Two hours per week. 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, Urology, Vascular Surgery, and a Transitional Year Program; 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, and Oral Maxillofacial Surgery. Subspecialty residency programs are offered in the following specialties:

Anesthesiology	Neurosurgery
Cardiothoracic Surgery	Nuclear Medicine
Child Psychiatry	Obstetrics and Gynecology
Dermatology	Pathology and Laboratory Medicine (AP/CP)
Diagnostic Radiology	Pediatric Surgery
Emergency Medicine	Pediatrics
Internal Medicine	Psychiatry
Medical Genetics	Transplant Surgery
Neurology	Vascular Surgery

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](http://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. The School of Medicine also facilitates the presentation of continuing education programs for allied health personnel.

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](mailto:cme@yale.edu).

# Doctors of Medicine

## CLASS OF 2013

Pending completion of all requirements

Johannes Adomako-Mensah, B.A., Middlebury College. *Molecular and Cellular Mechanisms of Corticospinal Tract Formation by Semaphorin Signaling*. Neurobiology Research: Piscataway, N.J.

Rahul Agarwal, B.A., Johns Hopkins University. *Urinary Biomarkers and Association with Recovery from Severe AKI*. Internal Medicine/Primary: Hospital of the University of Pennsylvania, Philadelphia, Pa.

Lisa An, B.S., Massachusetts Institute of Technology. *Do Women Tell Their Contraceptive Care Providers about When They Have Abortions?* Obstetrics and Gynecology: Oregon Health and Science University, Portland, Ore.

Sanjay Aneja, B.S., Columbia University. *Geographic Analysis of the Radiation Oncology Workforce: Assessing the Impact on Prostate Cancer Management and Outcomes*. Transitional: Memorial Sloan-Kettering, New York, N.Y.; Radiation Oncology: Yale-New Haven Hospital, New Haven, Conn.

Jacob Stuart Appelbaum, B.A., Amherst College; Ph.D., Yale University. *Arginine Topology Guides Escape of Cationic Miniature Proteins from Early Endosomes to the Cytoplasm*. Internal Medicine. University of California–San Francisco, San Francisco, Calif.

Chethan Bachireddy, A.B., Harvard University. *HIV Risk Behaviors, Attitudes toward Treatment, and Integrated Health Services among HIV-infected People Who Inject Drugs in Malaysia and Ukraine*. Internal Medicine/Primary: Brigham and Women's Hospital, Boston, Mass.

Harrison Xiao Bai, B.A., Yale University. *Breast Conservation Therapy for Ductal Carcinoma In-Situ (DCIS): Does Presentation of Disease Affect Long-term Outcomes?* Diagnostic Radiology: Hospital of the University of Pennsylvania, Philadelphia, Pa.

Danny M. Balkin, B.A., Northwestern University; Ph.D., Yale University. *OculoCerebro-Renal Syndrome of Lowe: Insights into the Molecular Pathogenesis of Lowe Syndrome & Dent's Disease*. Plastic Surgery: University of California–San Francisco, San Francisco, Calif.

Joel Stanley Beckett, B.A., Kenyon College; M.H.S., Yale University. *Dysmorphology and Dysfunction in the Brain and Calvarial Vault of Nonsyndromic Craniosynostosis*. Neurosurgery: UCLA Medical Center, Los Angeles, Calif.

Ellen Rachel Bradley, B.A., Stanford University. *Postpartum Depression in a Pediatric Emergency Department*. Psychiatry: University of California–San Francisco, San Francisco, Calif.

Jonathan Howard Chen, B.S., University of Chicago; Ph.D., Yale University. *Prostaglandins in Chronic Viral Infection*. Pathology–Anatomical and Clinical: Massachusetts General Hospital, Boston, Mass.

William Thomas Clarke, B.S., University of California—Los Angeles. *Less Intensive Therapy for Older AML Patients*. Internal Medicine: University of California—San Francisco, San Francisco, Calif.

Nika Cyrus, B.A., University of California—Berkeley. *The Role of Tumor-associated Macrophages in Human Skin Cancer*. Medicine—Preliminary: Pennsylvania Hospital, Philadelphia, Pa.; Dermatology: University of Texas Southwestern Medical School, Dallas, Tex.

Martin Hoeller Dominguez, B.S., Ph.D., Yale University. *Spatiotemporal Control of Cerebral Cortex Neuron Diversity by Pou3f Transcription Factors*. Internal Medicine: New York Presbyterian Hospital/Columbia University Medical Center, New York, N.Y.

Jennie Duffy, B.S., University of California—Davis; M.H.S., Yale University. *Child Maltreatment and Risk Patterns among Participants in a Child Abuse Prevention Program*. Obstetrics and Gynecology: University of California—Irvine, Orange, Calif.

Chineme I. Enyioha, B.S., William Carey College. *Central Lymph Node Dissection in Patients with Papillary Thyroid Cancer: A Population Level Analysis of 14,257 Cases*. Emergency Medicine: Johns Hopkins Hospital, Baltimore, Md.

Devon Marc Fagel, B.A., University of California—Los Angeles; J.D., Southwestern University School of Law. *Neuroregeneration Following Chronic Perinatal Hypoxia: Unlocking the Mechanism of Recovery in Preterm Children*. Senior Associate: Healthcare Consulting, New York, N.Y.

Suzanne Jaqueth Forrest, B.A., Wellesley College. *Natural History of Tricuspid Regurgitant Jet Velocity and a New Association with Proteinuria in Children with Sickle Cell Disease*. Pediatrics: Boston Children's Hospital, Boston, Mass.

Amy Kathleen Forrestel, B.S., University of Florida. *HIV-related Kaposi Sarcoma in Africa: The Difficult Road to Diagnosis*. Medicine—Preliminary: Temple University Hospital, Philadelphia, Pa.; Dermatology: Hospital of the University of Pennsylvania, Philadelphia, Pa.

Jonathan Fu, B.S., Massachusetts Institute of Technology; M.H.S., Yale University. *The Impact of Young Unlicensed Driving on Passenger Restraint Use: Concern for Risk Spillover Effect*. Emergency Medicine: University of California—San Francisco, San Francisco, Calif.

Jeffrey Scott Futterleib, B.S., University of Connecticut; M.H.S., Yale University. *The Glucocorticoid-Induced Leucine Zipper and Immunomodulation in Extracorporeal Photocoagulation*. Medicine—Preliminary: Massachusetts General Hospital, Boston, Mass.; Dermatology: Case Western/University Hospitals, Cleveland, Ohio

Nyasha Kianne George, B.S., Howard University; M.S., Stanford University. *Using Respiratory Variations of Plethysmographic Waveforms to Track Changes in Intravascular Volume during Hemodialysis*. Family Medicine: Thomas Jefferson University, Philadelphia, Pa.

Vladimir Glinskii, B.S., Harvard University. *Brain-derived Neurotrophic Factor: A Foray into Predicting Neonatal Outcomes in Premature Infants*. Internal Medicine: New York Presbyterian Hospital/Weill Cornell Medical Center, New York, N.Y.

Sarah Goss, B.S., United States Military Academy. *Prevalence and Categorization of Incidental Findings on Computed Tomography for Possible Renal Colic*. Emergency Medicine: Madigan Army Medical Center, Tacoma, Wash.

Ramy Said Goueli, B.S., Michigan State University; M.H.S., Yale University. *Combination Thermochemotherapy for the Treatment of Non-Muscle Invasive Bladder Cancer*. Surgery—Preliminary: New York Presbyterian Hospital/Weill Cornell Medical Center, New York, N.Y.; Urology: New York Presbyterian Hospital/Weill Cornell Medical Center, New York, N.Y.

Lewis Dirk Hahn, A.B., Harvard University. *Spatial Spectral Imaging for Classification of Thyroid Fine Needle Aspirates*. Transitional: Yale-New Haven Hospital, New Haven, Conn.; Diagnostic Radiology: Stanford University Programs, Stanford, Calif.

Clayton Haldeman, B.S., Indiana University; M.H.S., Yale University. *Effect of the Ketogenic Diet on Seizures in the Methionine Sulfoximine Model of Mesial Temporal Lobe Epilepsy*. Neurosurgery: University of Wisconsin Hospital and Clinics, Madison, Wis.

Benjamin T. Himes, B.A., University of Pennsylvania; M.H.S., Yale University. *siRNA Therapy in Glioblastoma Stem Cells: Identification of Target Genes and Potential Therapeutic Implications*. Neurosurgery: Mayo School of Graduate Medical Education, Rochester, Minn.

John Hsi-en Ho, B.S., McGill University. *Altered Circulating Follicular Helper T-Cell Phenotype in Systemic Lupus Erythematosus*. Internal Medicine: Beth Israel Deaconess Medical Center, Boston, Mass.

Jing Huang, B.S., Yale University. *Detection of Blood Involvement in Cutaneous T-Cell Lymphoma: Spectrum of Clinical Practice and Reliability of Blood Markers*. Transitional: Albert Einstein Medical Center, Philadelphia, Pa.; Dermatology: New York Presbyterian Hospital/Weill Cornell Medical Center, New York, N.Y.

Joshua William Hustedt, B.A., Stanford University; M.H.S., Yale University. *Effect of Biofeedback Devices in Partial Weight-Bearing Orthopaedic Patients*. Orthopaedic Surgery: Banner Good Samaritan Medical Center, Phoenix, Ariz.

Madison Morgan Hustedt, B.S., Brigham Young University. *Improving Documentation in Shoulder Dystocia*. Obstetrics and Gynecology: Banner Good Samaritan Medical Center, Phoenix, Ariz.

Kenneth E. Ike, B.A., Baylor University. *Statin Inhibition of Macrophage Integrin-Induced Rac2-Myosin IIA Interaction: An Anti-inflammatory Effect*. Anesthesiology: Stanford University Programs, Stanford, Calif.

Sarah Lacourse Metthe Johnson, B.S., United States Air Force Academy. *Hippocampal Shape Abnormalities of Childhood-Onset Schizophrenia Patients and Their Healthy Siblings*. Psychiatry: Palmetto Health Richland, Columbia, S.C.

Soledad Jorge, A.B., Harvard University. *The Rho-GEF AKAP-Brx Is a Co-Activator of Progesterone Receptor B in Uterine Leiomyoma Cells*. Obstetrics and Gynecology: New York Presbyterian Hospital/Columbia University Medical Center, New York, N.Y.

Elisa Mead Jorgensen, B.S., University of Michigan. *Bisphenol A Exposure In Utero Programs Adult Estrogen Responsiveness in the Uterus and Mammary Glands*. Obstetrics and Gynecology: Yale–New Haven Hospital, New Haven, Conn.

Talia Rosenberg Kaden, A.B., Harvard University. *Autophagy, Mitophagy, and Mitochondrial Dynamics in the Retina and Liver of Hibernating Ground Squirrels*. Transitional: Memorial Sloan–Kettering, New York, N.Y.; Ophthalmology: New York University, New York, N.Y.

Stacey Michelle Kallem, B.A., Stanford University. *Novel Strategies in the Prevention and Treatment of Childhood Obesity: The Importance of Lifestyle Counseling and Psychological Resiliency*. Pediatrics: The Children’s Hospital of Philadelphia, Philadelphia, Pa.

Derek Brian Kennedy, B.A., Duke University; M.A., Loyola Marymount University. *Performance on Computerized Cognitive Remediation of Students with Attention Deficit Hyperactivity Disorder*. Emergency Medicine: Wayne State University/Detroit Medical Center, Detroit, Mich.

Srdan Serge Kobsa, B.S., Drake University; Ph.D., Yale University. *Development of Controlled Release Bioengineered Constructs for Tissue Regeneration and Repair*. General Surgery: New York Presbyterian Hospital/Columbia University Medical Center, New York, N.Y.

Kevin Koo, B.A., M.P.H., Harvard University; M.Phil., University of Cambridge. *Male-Partner Participation in the Prevention of Mother-to-Child HIV Transmission in South Africa*. Surgery–Preliminary: Dartmouth–Hitchcock Medical Center, Lebanon, N.H.; Urology: Dartmouth–Hitchcock Medical Center, Lebanon, N.H.

Maya Evelyn Kotas, B.S., Ph.D., Yale University. *Investigations into the Role of the Immune System in Metabolic Homeostasis and Disease*. Internal Medicine: New York Presbyterian Hospital/Columbia University Medical Center, New York, N.Y.

Whitney Leigh McGiffin Kress, A.B., Harvard University. *Parent-Adolescent Discrepancies in Parental Knowledge: Understanding Their Relationship to Adolescent Risk-Taking*. Internal Medicine: Beth Israel Deaconess Medical Center, Boston, Mass.

Gregory August Kuzmik, B.A., Cornell University; M.H.S., Yale University. *Correlations between Intracranial Aneurysms and Thoracic Aortic Aneurysms*. Neurosurgery: Yale–New Haven Hospital, New Haven, Conn.

Joshua Caleb Leinwand, B.S., CUNY Brooklyn College. *Intraperitoneal Chemotherapy for the Treatment of Malignant Peritoneal Mesothelioma*. General Surgery: New York Presbyterian Hospital/Columbia University Medical Center, New York, N.Y.

Felicity Madeleine Beverly Lenés-Voit, B.S., University of Texas. *Assessment of H1N1 Vaccine Effectiveness in Preventing Hospitalization in Children*. Otolaryngology: University of Texas Southwestern Medical School, Dallas, Tex.

Rachel Brett Lentz, B.A., M.H.S., Yale University. *Radiation Therapy and Expander-Implant Breast Reconstruction: Analysis of Timing and Complications*. Plastic Surgery: University of California–San Francisco, San Francisco, Calif.

Jonathan Craig Levin, B.S., Brown University. *Improvement of Asthma Control and Inflammation in Pediatric Patients Undergoing Adenotonsillectomy*. Pediatrics: Boston Children's Hospital, Boston, Mass.

Kristina Jing Liu, A.B., Harvard University; M.H.S., Yale University. *Marker Characterization of ECP-Induced Monocyte-Derived Dendritic Cells*. Medicine—Preliminary: Beth Israel Deaconess Medical Center, Boston, Mass.; Dermatology: Massachusetts General Hospital, Boston, Mass.

Julia Rose Lubsen, A.B., Harvard University. *The Role of Family Functioning in a Family-Based Diabetes Prevention Program*. Family Medicine: University of Wisconsin School of Medicine and Public Health, Madison, Wis.

Sarah Mallik, B.S., SUNY at Stony Brook. *Role of Home Practice in Randomized Controlled Trial of Mindfulness Training for Smoking Cessation*. Internal Medicine/Primary: Einstein/Montefiore Medical Center, Bronx, N.Y.

Heather Michelle McGee, B.A., University of California—Berkeley; M.Phil., University of Cambridge; Ph.D., Yale University. *A Role for Interleukin-22 in Fibroblast-Mediated Wound Repair*. Surgery—Preliminary: University of California—San Francisco, San Francisco, Calif.

David Michael Merrick, B.S., Johns Hopkins University; Ph.D., Yale University. *Transcriptional Regulation by the Cleaved Polycystin-1 Tail*. Internal Medicine/Research: Hospital of the University of Pennsylvania, Philadelphia, Pa.

John Devin Millet, B.A., Oberlin College; M.H.S., Yale University. *Computer-assisted Detection of Proximal Arterial Stenosis on Doppler Ultrasound*. Transitional: Yale-New Haven Hospital, New Haven, Conn.; Diagnostic Radiology: University of Michigan Hospitals, Ann Arbor, Mich.

Regina Maree Myers, B.S., Cornell University. *A Prospective Study of Anxiety, Depression, and Behavioral Changes in Children with Acute Lymphoblastic Leukemia*. Pediatrics: New York Presbyterian Hospital/Columbia University Medical Center, New York, N.Y.

Eberechi Nkele Nwogu, B.A., CUNY Lehman College; M.H.S., Yale University. *Relationship of Structural and Functional Asymmetry to Sleep Position in Open Angle Glaucoma*. Internal Medicine: Hospital of the University of Pennsylvania, Philadelphia, Pa.

Julius Thomas Oatts, B.S., Emory University; M.H.S., Yale University. *Intraocular Pressure, Aqueous Humor Dynamics, and Fibrosis Using a Novel Glaucoma Drainage Pathway*. Medicine—Preliminary: Yale-New Haven Hospital, New Haven, Conn.; Ophthalmology: University of California—San Francisco, San Francisco, Calif.

Ebelechukwu Odiari, B.S., CUNY City College. *Pravastatin Does Not Prevent Antiphospholipid Antibody Effects on Human First Trimester Trophoblast Function*. Emergency Medicine: Baylor College Medical, Houston, Tex.

Charles Kwesi Amoatey Odonkor, B.S., University of the South; M.S., Washington University of St. Louis. *Walk This Way: Predicting Postoperative and Discharge Outcomes among Ambulatory Surgical Patients*. Medicine—Preliminary: Yale–New Haven Hospital, New Haven, Conn.; Physical Medicine and Rehabilitation: Johns Hopkins Hospital, Baltimore, Md.

Oluwatosin Oluwafunke Onibokun, B.S., Rutgers University. *Treatment and Outcomes of Female Patients Who Underwent Mastectomy for Breast Cancer at Yale–New Haven Hospital from 2000 to 2005: Examination of Recurrence Rates*. Obstetrics and Gynecology: Brigham and Women's Hospital, Boston, Mass.

Micaela Bea Owusu, A.B., Harvard University; M.S., University of Oxford. *A Systematic Review of the Interactions between and Characteristics Associated with Obesity and Depressive Symptoms in the Pediatric Population*. Psychiatry: Massachusetts General Hospital, Boston, Mass.

Babita Panigrahi, B.A., B.S., University of Virginia. *Implicit and Explicit Motivation in a Murine Model of Parkinson's Disease*. Transitional: Georgetown University Hospital, Washington, D.C.; Diagnostic Radiology: Johns Hopkins Hospital, Baltimore, Md.

Jovana Pavicic, B.S., Duke University. *Childhood Cancer in the Cinema: How the Celluloid Mirror Reflects Psychosocial Care*. Pediatrics: Stanford University Programs, Stanford, Calif.

Michael Joseph Peluso, B.A., Columbia University; M.Phil., University of Cambridge; M.H.S., Yale University. *Biological and Clinical Markers of Neuronal Injury in Primary and Chronic HIV-1 Infection*. Internal Medicine: Brigham and Women's Hospital, Boston, Mass.

Avital Perry, B.S., University of Maryland. *Cushing Disease: Intraoperative ACTH Tissue Measurement, Pathology Correlation, and Clinical Outcomes*. Neurosurgery: Mayo School of Graduate Medical Education, Rochester, Minn.

Warren M. Perry II, B.S., North Carolina State University. *Identification of Factors Associated with Acute Pyelonephritis Complicated by Ureteral Stones*. Emergency Medicine: Yale–New Haven Hospital, New Haven, Conn.

Tammi-Marie K. Phillip, B.A., Johns Hopkins University. *Gender and Age Trends in the Trier Social Stress Test for Children (TSST-C) and a Placebo Comparison Condition*. Psychiatry: Yale–New Haven Hospital, New Haven, Conn.

Carina Preskill, B.A., Brown University. *Characterization of a Functional BRCA1 Variant: A Marker of Aggressive Breast Cancer*. Internal Medicine: Mayo School of Graduate Medical Education, Rochester, Minn.

Kavita Radhakrishnan, B.S., Massachusetts Institute of Technology. *Reduced Toxicity Conditioning and Stem Cell Transplantation in Children with Sickle Cell Disease*. Internal Medicine: University of California–San Francisco, San Francisco, Calif.

Alexandra Ristow, B.A., Claremont McKenna College. *Assessing the Ability of Yale Internal Medicine Residents to Self-Audit the Quality of Discharge Summaries*. Internal Medicine/Primary: University of California–San Francisco, San Francisco, Calif.

Rachel Kushner Rosenstein, B.A., Princeton University; Ph.D., Yale University. *Innate Immune Sensing of Allergens*. Medicine–Preliminary: Icahn School of Medicine at Mount Sinai, New York, N.Y.; Dermatology: New York University School of Medicine, New York, N.Y.

Dionne Marie Rudison, B.S., Xavier University *The Effect of Mental and Physical Stress on Brain Temperature as Measured via Brain Temperature Tunnel*. Medicine–Preliminary. Greenwich Hospital, Greenwich, CT Anesthesiology. Yale–New Haven Hospital, New Haven, Conn.

Ferrin Katarina Ruiz, B.A., Scripps College. *Patient Assessment in Orthopedics: Spine and Trauma*. Medicine/Pediatrics: UCLA Medical Center, Los Angeles, Calif.

Kyan Safavi, B.S., M.B.A., Yale University. *Variation in Admission Rates to ICUs for Heart Failure Patients across Hospitals in the United States*. Medicine–Preliminary: Brigham and Women’s Hospital, Boston, Mass.; Anesthesiology: Massachusetts General Hospital, Boston, Mass.

Adam Sang, B.A., Harvard University. *Gene Expression Signature as a Diagnostic Test for Thoracic Aortic Aneurysms: A Validation Study*. General Surgery: Stanford University Programs, Stanford, Calif.

Amy Rachel Schoenfeld, A.B., Harvard University. *Sign-out Snapshot: Evaluation of Written Sign-outs among Specialties and Role of Hospitalist Sign-out*. Internal Medicine: Massachusetts General Hospital, Boston, Mass.

Sounok Sen, B.S., University of Pennsylvania. *Evaluating New Radiation Technologies in Older Women with Early Stage Breast Cancer: Understanding the Role of Hospital Ownership Status and Estimating Cost-Effectiveness*. Internal Medicine: Massachusetts General Hospital, Boston, Mass.

Niyati B. Shah, B.A., Tufts University. *Impact of Group Well-Child Care on Health Outcomes and Health-Seeking Behaviors during Early Childhood*. Family Medicine. University of Michigan Hospitals, Ann Arbor, Mich.

Lydia Lee Shook, B.A., Yale University. *Calcifying Nanoparticles as Novel Etiologic Agents of Idiopathic Preterm Birth and Preterm Premature Rupture of the Membranes*. Obstetrics and Gynecology: Yale–New Haven Hospital, New Haven, Conn.

Justin M. Steinberg, B.A., Carleton College; M.B.A., University of Chicago. *Pilot Study of a Somatosensory Intervention to Improve Medical Adherence in Patients with Uncontrolled Hypertension*. Emergency Medicine: Hennepin County Medical Center, Minneapolis, Minn.

Daniel Tran, B.S., University of California–Irvine. *Assessment of the Impact of a Fatty Meal on the Vasodilatory Function of the Microcirculation*. Anesthesiology: Yale–New Haven Hospital, New Haven, Conn.

Jerry Trejo, B.S., Massachusetts Institute of Technology; M.H.S., Yale University. *Targeted siRNA-directed Therapy to Increase Chemosensitivity in Drug-Resistant Bladder Cancer Cells*. Vascular Surgery: Yale-New Haven Hospital, New Haven, Conn.

Katherine Elizabeth Uyhazi, B.S., College of New Jersey; Ph.D., Yale University. *Pumilio Proteins Regulate Translation in Stem Cells and are Essential for Embryonic Development*. Transitional: Albert Einstein Medical Center, Philadelphia, Pa.; Ophthalmology: Scheie Eye Institute/University of Pennsylvania, Philadelphia, Pa.

Tavé Annamey van Zyl, A.B., Harvard University. *Prescheduled Appointments as a Strategy to Improve Follow-up Rates Among At-risk Individuals Identified during Community-based Glaucoma Screenings*. Transitional: Yale-New Haven Hospital, New Haven, Conn.; Ophthalmology: Harvard Medical School–Massachusetts Eye and Ear Infirmary, Boston, Mass.

Neil Vasan, A.B., M.A., Harvard University; Ph.D., Yale University. *Structural Studies of the GARP Tethering Complex*. Internal Medicine: Massachusetts General Hospital, Boston, Mass.

Judah D. Weathers, B.S., Northeastern University; Ph.D., University of Oxford. *Cognitive Functioning in Bipolar Disorder*. Psychiatry: Yale-New Haven Hospital, New Haven, Conn.

Rany Woo, B.S., Massachusetts Institute of Technology. *Aggressive Posterior Retinopathy of Prematurity: Quantitative Analysis of Vascular Features and Analysis of Inter-expert Agreement*. Transitional: Metrowest Medical Center, Framingham, Mass.; Ophthalmology: University of California–Los Angeles, Los Angeles, Calif.

Julie Mae Xanthopoulos, B.S., Lafayette College; Ph.D., Yale University. *Clonal Development, Age-dependent Polyploidization, and Thyroid Hormone Induced Metaplasia in Pancreatic Acinar Cells*. Internal Medicine/Research: Yale-New Haven Hospital, New Haven, Conn.

Nazlee Zebardast, B.A.S., M.A.Sc., University of Toronto. *Comparing the Impact of Refractive and Nonrefractive Vision Loss on Disability: The Salisbury Eye Evaluation*. Transitional: Yale-New Haven Hospital, New Haven, Conn.; Ophthalmology: Wilmer Eye Institute–Johns Hopkins University, Baltimore, Md.

Ze Zhang, B.A., B.S., University of Southern California. *Outflow Tract Ablation using a Conditionally Cytotoxic Feline Immunodeficiency Viral Vector*. Medicine–Preliminary: Tulane University, New Orleans, La.; Ophthalmology: Tulane University, New Orleans, La.

Rocksheng Zhong, A.B., Harvard University; M.H.S., Yale University. *So You're Sorry? The Role of Remorse in Criminal Law*. Psychiatry: Hospital of the University of Pennsylvania, Philadelphia, Pa.

STUDENTS RECEIVING THE  
M.D. AND PH.D. DEGREES

Jacob Stuart Appelbaum  
Danny M. Balkin  
Jonathan Howard Chen  
Martin Hoeller Dominguez  
Srdan Serge Kobsa  
Maya Evelyn Kotas  
Heather Michelle McGee  
David Michael Merrick  
Rachel Kushner Rosenstein  
Katherine Elizabeth Uyhazi  
Neil Vasan  
Judah D. Weathers  
Julie Mae Xanthopoulos

STUDENT RECEIVING THE  
M.D. AND M.B.A. DEGREES

Kyan Safavi

STUDENTS RECEIVING THE  
M.D. AND M.H.S. DEGREES

Joel Stanley Beckett  
Jennie Duffy  
Jonathan Fu  
Jeffrey Scott Futterleib  
Ramy Said Goueli  
Clayton Haldeman  
Benjamin T. Himes  
Joshua William Hustedt  
Gregory August Kuzmik  
Rachel Brett Lentz  
Kristina Jing Liu  
John Devin Millet  
Eberechi Nkele Nwogu  
Julius Thomas Oatts  
Michael Joseph Peluso  
Jerry Trejo  
Rocksheng Zhong

STUDENT RECEIVING THE  
M.D. AND M.P.H. DEGREES

Kevin Koo

STUDENTS RECEIVING THE  
M.D. DEGREE AND THE  
CERTIFICATE IN GLOBAL MEDICINE

Chineme I. Enyioha

Amy Kathleen Forrestel

Stacey Michelle Kallem

Oluwatosin Oluwafunke Onibokun

Michael Joseph Peluso

Adam Sang

# Enrollment for 2012–2013

## 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

Aaron Abajian	Mary Barden
Tsion Aberra	Sabiha Barot
Parwiz Abrahami	Christopher Bartley
Alexandra Adler	Bryce Basques
Johannes Adomako-Mensah	Alexander Bazazi
Rahul Agarwal	Jessica Becker
Deborah Ahowe	Anne Beckett
Feras Akbik	Joel Beckett
Alexandra Albert	Jonathan Belman
Caroline Albert	Gal Ben-Josef
Benjamin Albright	Elyssa Berg
Andre Alcon	Jessica Berger
Nancy Allen	Nicholas Bergfeld
Michael Alpert	Rohan Bhandari
Lisa An	Dipankan Bhattacharya
Sanjay Aneja	Xiao Bi
Jacob Appelbaum	Sean Bickerton
Ryan Aronberg	Meredith Binford
Alexander Arzeno	Vicki Zhu Jun Bing
Michael Astudillo	Remy Bizimungu
David Asuzu	Adriana Blakaj
Deepak Atri	Daniel Bohl
Chethan Bachireddy	Olatunde Bosu
Raghav Badrinath	Ellen Bradley
Jason Bae	Gregory Breuer
Preetpaul Bagi	Eric Brooks
Harrison Bai	Cortlyn Brown
Aditi Balakrishna	Jason Brown
Daniel Balkin	Emily Bucholz
Zev Balsen	Jessica Buckley
Michaela Bamdad	Rafael Buerba Siller
Ezra Baraban	Neel Butala
Jacob Baranoski	Lucas Butler

Allison Campbell  
 Siobhan Case  
 Barbara Chaiyachati  
 Iris Chandler  
 Harry Chang  
 Michael Chang  
 Katherine Chau  
 Nashid Chaudhury  
 Elizabeth Chen  
 Jonathan Chen  
 Michelle Chen  
 Ruijun Chen  
 Serene Chen  
 Connie Cheng  
 Joyce Cheng  
 David Choi  
 Raj Chovatiya  
 Carolyn Chuang  
 Philip Chui  
 Sakil Chundydyal  
 Victoria Clark  
 William Clarke  
 Matthew Coffman  
 Stephanie Cohen  
 Susan Combs  
 William Culligan  
 Nika Cyrus  
 Dylan Davey  
 Katherine Davis  
 Dimitri De Kouchkovsky  
 Flavia De Souza  
 Ethan Dean  
 Uma Deshmukh  
 Sasha Deutsch-Link  
 Isha Di Bartolo  
 Alexander Domingo  
 Martin Dominguez  
 Stephanie Douglas  
 Nicholas Downing  
 Jennifer Duffly  
 Anna Duncan  
 Hannah Dzimitrowicz  
 Asiri Ediriwickrema  
 Gulus Emre  
 Chineme Enyioha

Nkemka Esiobu  
 Harib Ezaldeen  
 Devon Fagel  
 Louis Fazen  
 Hao Feng  
 Kathleen Fenn  
 Jennifer Fieber  
 Kelly Fitzgerald  
 Dinah Foer  
 Suzanne Forrest  
 Amy Forrestel  
 Juliet Fraser  
 Marianna Freudzon  
 Jonathan Fu  
 Michael Fu  
 Kara Furman  
 Jeffrey Futterleib  
 Sarah Gao  
 Matthew Garner  
 Samir Gautam  
 Rahiwa Gebre  
 Erik Geiger  
 Nyasha George  
 Maryam Ghiassi-Nejad  
 Erica Giles  
 Thomas Gilliland  
 Vladimir Glinskii  
 Jessica Gold  
 Nicholas Golinvaux  
 Dan Gong  
 Sarah Goss  
 Ramy Goueli  
 Conor Grady  
 Simon Gray  
 Caroline Greenberg  
 Karl Grunseich  
 Jordan Gruskay  
 Wei Gui  
 Paul Guillod  
 Abhijeet Gummadavelli  
 Jennifer Na Guo  
 Xiaoyue Guo  
 Akash Gupta  
 Ravi Gupta  
 Sasha Gupta

Stefan Gysler  
Muhammed Hadzipasic  
Farhaan Hafeez  
Lewis Hahn  
Adrian Haimovich  
Michael Hajek  
Clayton Haldeman  
Laura Hall  
Yong Han  
Jacquelyn Hancock  
Eileen Harder  
Peter Hashim  
Xin He  
Joseph Heng  
Edward Herman  
Amanda Hernandez  
Melissa Herrin  
Lauren Hibler  
Benjamin Himes  
Hsi-En Ho  
Tara Holder  
Zhe Hou  
Chi-Joan How  
Brendan Huang  
Jing Huang  
Laura Huang  
Ken Hui  
Joshua Hustedt  
Madison Hustedt  
Dame Idossa  
Adesuwa Ighodaro  
Kenneth Ike  
Jacob Izenberg  
Jeremy Jacox  
Vikram Jairam  
Oliver Jawitz  
Sarah Jin  
Sarah Johnson  
Jessica Johnston  
Soledad Jorge  
Elisa Jorgensen  
Talia Kaden  
Stacey Kallem  
Ankit Kansal  
Samantha Kaplan

Maya Kasowski  
Adam Kaufman  
Haben Kefella  
Derek Kennedy  
Rabeea Khan  
Sabrina Khan  
Shihan Khan  
Ramak Khosravi  
Dhruv Khullar  
Nour Kibbi  
Simon Kigwana  
Marquita Kilgore  
Changhyun Kim  
Chang-Yeon Kim  
Richard Kim  
Roger Kim  
Yunsoo Kim  
Amanda King  
Srdan Kobsa  
Maria Koenigs  
Derek Kong  
Kevin Koo  
Idil Kore  
Maya Kotas  
Whitney Kress  
Lauren Krumeich  
Alexander Kula  
Vivek Kulkarni  
David Kull  
Adam Kundishora  
Eric Kuo  
Phoebe Kuo  
Gregory Kuzmik  
Ashton Lai  
Natalie Lastra  
Samantha Lau  
Olga Laur  
Timothy Law  
Angela Lee  
Eric Lee  
Joshua Leinwand  
Felicity Lenes  
Rachel Lentz  
Benjamin Lerner  
Brian Letzen

Jonathan Levin  
Jonathan Levinsohn  
Evan Levy  
Alice M. Li  
Alice Y. Li  
Charles Li  
Ningcheng Li  
Nathan Lifton  
Taber Lightbourne  
Young Lim  
Christina Lin  
Jacob Lister  
Alicia Little  
Elise Liu  
Geoffrey Liu  
Jia Liu  
Kristina Liu  
Lucinda Liu  
Rebecca Liu  
Billy Lockhart  
Kelsey Loeliger  
Jean Lopez  
Songprod Lorgunpai  
Jeffrey Low  
Alex Lu  
Alice Lu  
Daniel Lu  
Julia Lubsen  
Kaysia Ludford  
Adam Lukasiewicz  
Alexander Luryi  
Benjamin Macdougall  
Abiodun Mafolasire  
Mark Mai  
Sarah Mallik  
Charisse Mandimika  
Brian Marcus  
Benjamin Margolis  
Alexandria Marino  
Matthew Marr  
James Martenson  
Carina Martin  
Leisel Martin  
Pierre Martin  
Nareh Marukian

Susan Maya  
Sean Mbachu  
Heather McGee  
Nicole McNeer  
Matthew Meizlish  
Bethlehem Mekonnen  
Regina Melendez  
Stephanie Meller  
David Merrick  
Goran Micevic  
Matthew Mikhail  
John Millet  
Kavita Mistry  
Amit Mittal  
Amy Moreno  
Joshua Motelow  
Moustafa Moustafa  
Azim Munivar  
Farhan Murshed  
Regina Myers  
Hiam Naiditch  
Maria Nardell  
Allen Nicholson  
Eberechi Nwogu  
Alyssa Nylander  
Julius Oatts  
Elizabeth O'Brien  
Ebelechukwu Odiani  
Charles Odonkor  
Michael Oh  
Emmanuel Ohuabunwa  
Daniel Okin  
Oluwarotimi Okunade  
Caroline Ong  
Oluwatosin Onibokun  
Eve Overton  
Micaela Owusu  
Babita Panigrahi  
Summer Paradise  
Esther Park  
Gerneiva Parkinson  
Aniruddh Patel  
Jay Patel  
Joseph Patterson  
Jovana Pavisic

Michael Peluso  
Maria Perez  
Kevin Perkins  
Avital Perry  
Curtis Perry  
Warren Perry  
Max Petersen  
Miles Pfaff  
Tammi-Marie Phillip  
Luke Pike  
Nathan Pirakitikulr  
Carina Preskill  
Jack Qian  
Jennifer Quon  
Kavita Radhakrishnan  
Kyle Ragins  
Jorge Ramallo Pardo  
John Ramirez  
Marco Ramos  
Vinay Rathi  
Elizabeth Rawson  
Duncan Reid  
Adele Ricciardi  
Alexandra Ristow  
Nathaniel Robinson  
Gladys Rodriguez  
Juan Rodriguez Guzman  
Danilo Rojas-Velasquez  
Joshua Rosen  
Brian Rosenberg  
Graeme Rosenberg  
Rachel Rosenstein  
Robert Ross  
Giulio Rottaro  
Megan Rowlands  
Luis Rubio  
Dionne Rudison  
Ferrin Ruiz  
Kyan Safavi  
Anton Safonov  
Andre Samuel  
Britt Sandler  
Jason Sandler  
Adam Sang  
Jonathan Santiago

Christopher Sauer  
Ameya Save  
Rollin Say  
Susan Scanlon  
Alexander Scherer  
Amy Schoenfeld  
Zachary Schwam  
Sounok Sen  
Lorenzo Sewanan  
Niyati Shah  
Veronica Shi  
Yushane Shih  
Irina Shklyar  
Lydia Shook  
Bilal Siddiqui  
Jacob Siegel  
Joshua Siewert  
Jordan Sloshower  
Andrew Smith  
James Smithy  
Whitney Soble  
Shalom Sokolow  
Samuel Sondalle  
Anirudh Sreekrishnan  
Hans Stabenau  
Gregory Stachelek  
Katherine Standish  
Anna Stein  
Justin Steinberg  
Robert Stretch  
Garth Strohhahn  
Kevin Su  
Gloria Sue  
Joome Suh  
Nataly Sumarriva  
Jared Sun  
Thomas Yang Sun  
Minhee Sung  
Christine Sunu  
Alexander Svoronos  
Kai Swenson  
Laurel Tainsh  
Kaoru Takasaki  
Victoria Tate  
Melissa Taylor

Lise Tchouta	Laura West
Apoorva Tewari	Margaret Whicker
Durga Thakral	Theresa Williamson
Nicholas Theodosakis	Joel Winer
Alexandra Thomas	Lauren Wiznia
Eleanor Thomas	Daniel Wong
Emily Thomas	Kenneth Wong
Andrew Timberlake	Risa Wong
Colin Tominey	Rany Woo
James Tooley	Aileen Wright
Daniel Tran	Julie Xanthopoulos
Rebecca Treger	Wendy Xiao
Gerardo Trejo	Chaoying Xu
Chung Sang Tse	Kathleen Yan
Nathan Tu	Daniel Yang
Jack Turban	Genevieve Yang
Brooks Udelsman	Jenny Yang
Sebastian Urday	Qing Yang
Katherine Uyhazi	Jessica Ye
Ritchell Van Dams	Maryam Yeganegi
Tave Van Zyl	Lee Ying
Neil Vasan	Laura Yockey
Aaron Vassall	Andrew Young
Eric Venker	Mark Youngblood
Rebecca Vitale	Amy Yuan
Ellen Vollmers	Bianca Yuh
Linh Vu	Tiffany Yuh
Caroline Walker	Mikell Yuhasz
Amanda Wallace	Samir Zaidi
Chen Wang	Nazlee Zebardast
Chenyang Wang	Bingnan Zhang
Hanbing Wang	Ke Zhang
Jake Wang	Yuemei Zhang
Jessica Wang	Ze Zhang
Priscilla Wang	Bixiao Zhao
Xiao Yan Wang	Yu Cheng Zhao
Ruth Wang'onde	Daniel Zheng
Brian Wayda	Rocksheng Zhong
Jacob Weatherly	David Zhu
Judah Weathers	Mojun Zhu
Matthew Webb	Victor Zhu
Jason Weed	Radoslav Zinoviev
Molly Weiner	
Daniel Weisberg	<i>Total, 513</i>
Austin Weiss	

REGISTERED FOR THE COMBINED  
M.D./PH.D. DEGREE

Parwiz Abrahami	Shihan Khan
Feras Akbik	Ramak Khosravi
Alexandra Albert	Amanda King
Nancy Allen	Srdan Kobsa
Jacob Appelbaum	Derek Kong
Daniel Balkin	Maya Kotas
Mary Barden	Ashton Lai
Christopher Bartley	Angela Lee
Alexander Bazazi	Alice M. Li
Jonathan Belman	Alicia Little
Dipankan Bhattacharya	Rebecca Liu
Sean Bickerton	Kelsey Loeliger
Adriana Blakaj	Alice Lu
Gregory Breuer	Alexandria Marino
Jason Brown	James Martenson
Emily Bucholz	Heather McGee
Allison Campbell	Nicole McNeer
Barbara Chaiyachati	Matthew Meizlish
Nashid Chaudhury	David Merrick
Jonathan Chen	Goran Micevic
Raj Chovatiya	Kavita Mistry
Victoria Clark	Joshua Motelow
William Culligan	Alyssa Nylander
Dylan Davey	Daniel Okin
Dimitri De Kouchkovsky	Kevin Perkins
Martin Dominguez	Curtis Perry
Louis Fazen	Max Petersen
Kelly Fitzgerald	Nathan Pirakitikulr
Kara Furman	Marco Ramos
Samir Gautam	Adele Ricciardi
Simon Gray	Brian Rosenberg
Jennifer Na Guo	Rachel Rosenstein
Muhammed Hadzipasic	Robert Ross
Adrian Haimovich	Susan Scanlon
Edward Herman	Alexander Scherer
Amanda Hernandez	Lorenzo Sewanan
Brendan Huang	Andrew Smith
Ken Hui	Samuel Sondalle
Jeremy Jacox	Gregory Stachelek
Jessica Johnston	Durga Thakral
Maya Kasowski	Nicholas Theodosakis
Adam Kaufman	Alexandra Thomas

Eleanor Thomas  
 Andrew Timberlake  
 Colin Tominey  
 Rebecca Treger  
 Katherine Uyhazi  
 Neil Vasan  
 Ellen Vollmers  
 Chen Wang  
 Ruth Wang'onde  
 Judah Weathers  
 Molly Weiner  
 Laura West  
 Julie Xanthopoulos

Wendy Xiao  
 Genevieve Yang  
 Qing Yang  
 Jessica Ye  
 Lee Ying  
 Laura Yockey  
 Mark Youngblood  
 Samir Zaidi  
 Ke Zhang  
 Bixiao Zhao  
  
*Total, 107*

**REGISTERED FOR THE COMBINED  
 M.D./M.H.S. DEGREE**

Joel Beckett  
 Jessica Berger  
 Rafael Buerba Siller  
 Siobhan Case  
 Michelle Chen  
 Ethan Dean  
 Stephanie Douglas  
 Jennifer Duffy  
 Asiri Ediriwickrema  
 Hao Feng  
 Jonathan Fu  
 Michael Fu  
 Jeffrey Futterleib  
 Matthew Garner  
 Ramy Goueli  
 Clayton Haldeman  
 Peter Hashim  
 Benjamin Himes  
 Joshua Hustedt  
 Haben Kefella  
 Vivek Kulkarni

Gregory Kuzmik  
 Rachel Lentz  
 Kristina Liu  
 Lucinda Liu  
 Daniel Lu  
 Mark Mai  
 Stephanie Meller  
 John Millet  
 Eberechi Nwogu  
 Julius Oatts  
 Oluwarotimi Okunade  
 Caroline Ong  
 Michael Peluso  
 Miles Pfaff  
 Elizabeth Rawson  
 Gerardo Trejo  
 Nathan Tu  
 Brooks Udelsman  
 Daniel Wong  
 Mikell Yuhasz  
 Rocksheng Zhong  
  
*Total, 42*

**REGISTERED FOR THE COMBINED  
M.D./M.B.A. DEGREE**

Jason Bae  
Neel Butala  
Kyan Safavi  
Christopher Sauer  
Bingnan Zhang

*Total, 5*

**REGISTERED FOR THE COMBINED  
M.D./M.P.H. DEGREE**

Kevin Koo  
Jorge Ramallo Pardo

*Total, 2*

**REGISTERED FOR THE  
PHYSICIAN ASSOCIATE PROGRAM**

Jon-Michael Allen	Zena Falk
Justin David Arnold	Tia Jean Ferrarotti
Ye Eun Bae	Jennifer Rachelle Fischer
Ofer Barniv	Casandra Francis
Richard David Bennett	James Frederick
Clarence Collin Bone	Kristine Gauthier
Jonathon Mark Bostwick	Natalie Geisler
Michael Brask	Hiwot Girma
Jason Christopher Browder	Chandra Goff
Jennifer Lauren Burg	Tyler Gorman
Suzanne Castner	Zachary Greenier
Kelly Lauren Cederquist	Natalie Marie Grome
Jenny Chang	Emily Gruetzmacher
Christina Chao	Joel David Minoru Hamaguchi
John Matthew Corsi	Ryan Patrick Hausfeld
Laura Ann Cronin	Elisa Hoellerich
Thomas Todd De Vries	Justin Hogan
Audra Veronica DiCaro	Eleanor Holtz-Eakin
Jessica DiStefano	Tamara Lynn Houston
Colleen Elizabeth Driscoll	Natalie Hutchison
Caroline M. Dudley	Crystal Huynh
Margot Ebling	Ivan Islamaj
Deanne Margot Santos Enriquez	Jessica Jean
Raina Ericson	Meredith Keppel

Stacy Anne Landers  
Peter Leafblad  
Brittany Ann Maillet  
Garrett Michael Manthey  
Megan Marie McInnis  
Daniel Thomas McNamara  
Vanessa Renee Meiser  
Dena Mentel  
Martha Mohr  
Christina Laura Mok  
Lauren Catherine Monoxelos  
Jaina Morar  
Eline Mul  
Marc Daniel Musco  
Laura Kathleen Nos  
Lindsay Novak  
Natalie Nicole O'Brien  
Kelsey O'Dell  
Richard Christian Ombrebowski  
Daniel James Ozinga  
Noren Panjwani  
Efthimia Domna Papadimitropoulos  
Nisha Parikh  
Nicole Rachel Peter  
Krysta Peterson  
Krystle Peterson  
Ryan Michael Petrowsky  
Natalie Xaythavone Phouyaphone

Scott Pusateri  
Travis Rabbit  
Harrison Leo Reed  
Kathleen Roeder  
Rachel Rutledge  
Lauren Elizabeth Sawarynski  
Devra Schlar  
Jennifer Schloth  
Kerry MacCarthy Shanley  
Anna Sloman  
Dhara Sanatkumar Soni  
Belinda Bin Sun  
Sarah Sydow  
Jeremy Takahashi  
Angelica Torres  
Emma Turnquist  
Lisa Christine Van Horn  
Joseph Benjamin Wills  
Sarah Wills  
Jillian Wollet  
Daniel A. Wood  
Maureen Wright  
Sarah Y. Zhong  
Stacy Eloise Zickl  
Kyle Zigelsky  
Varin Zimmermann  
*Total, 102*

# 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>, write to 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 Arts (M.A.), Master of Science (M.S.), Master of Philosophy (M.Phil.), Doctor of Philosophy (Ph.D.).

For additional information, please visit [www.yale.edu/graduateschool](http://www.yale.edu/graduateschool), write to 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.). Post-graduate 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>, write to 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>, write to 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](http://www.law.yale.edu), write to 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](http://www.law.yale.edu), write to [gradpro.law@yale.edu](mailto: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>, write to [grad.engineering@yale.edu](mailto:grad.engineering@yale.edu), or call 203.432.4250. 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>, write to [artschool.info@yale.edu](mailto: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>, write to [gradmusic.admissions@yale.edu](mailto: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 [www.environment.yale.edu](http://www.environment.yale.edu), write to [fesinfo@yale.edu](mailto: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>, write to [ysph.admissions@yale.edu](mailto: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 [www.architecture.yale.edu](http://www.architecture.yale.edu), write to [gradarch.admissions@yale.edu](mailto: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.

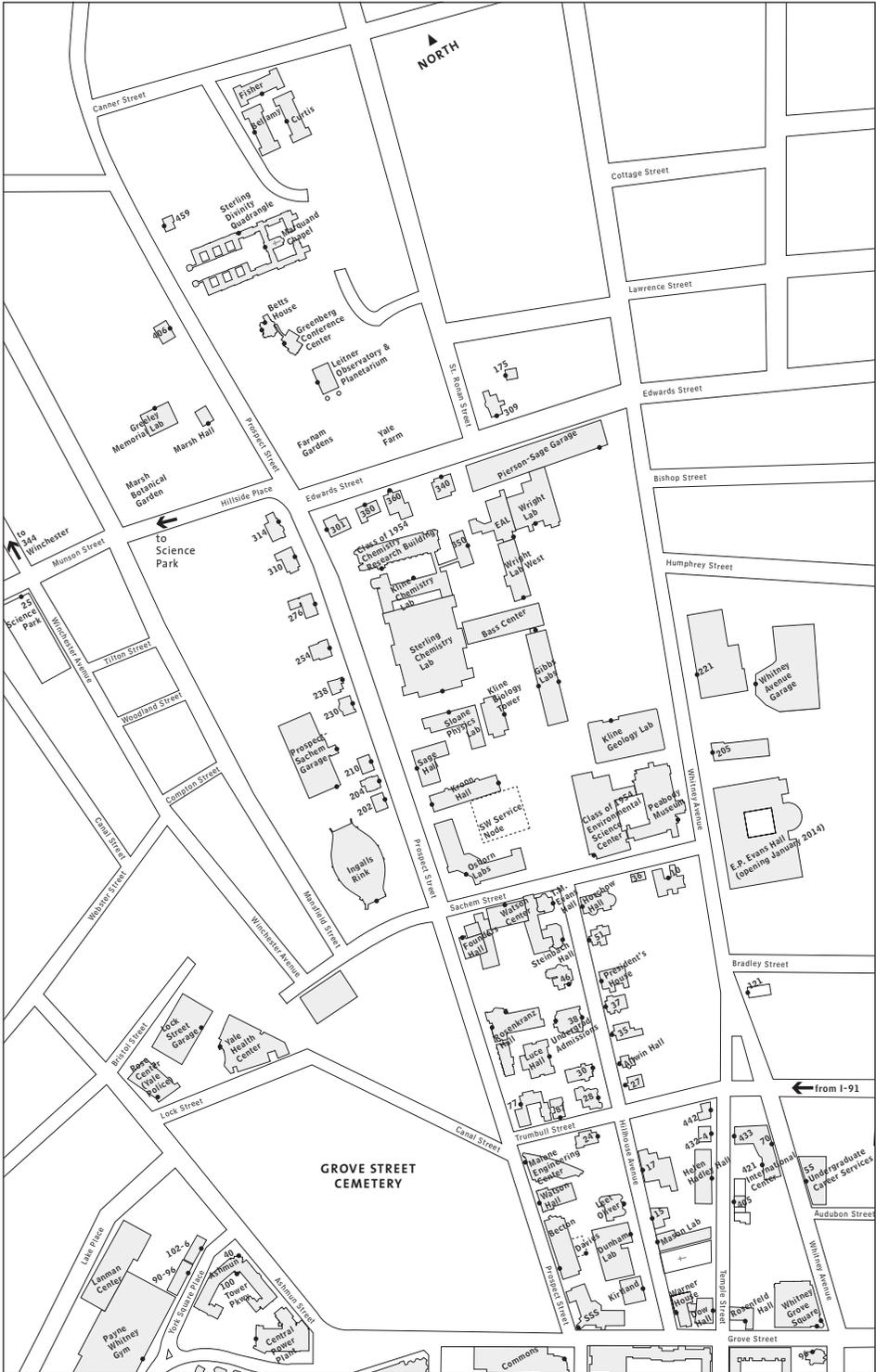
**School of Drama** Est. 1925. Courses for college graduates and certificate students. Master of Fine Arts (M.F.A.), Certificate in Drama, One-year Technical Internship (Certificate), Doctor of Fine Arts (D.F.A.).

For additional information, please visit <http://drama.yale.edu>, write to [ysd.admissions@yale.edu](mailto:ysd.admissions@yale.edu), or call the Registrar's Office at 203.432.1507. Postal correspondence should be directed to Registrar's Office, 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.

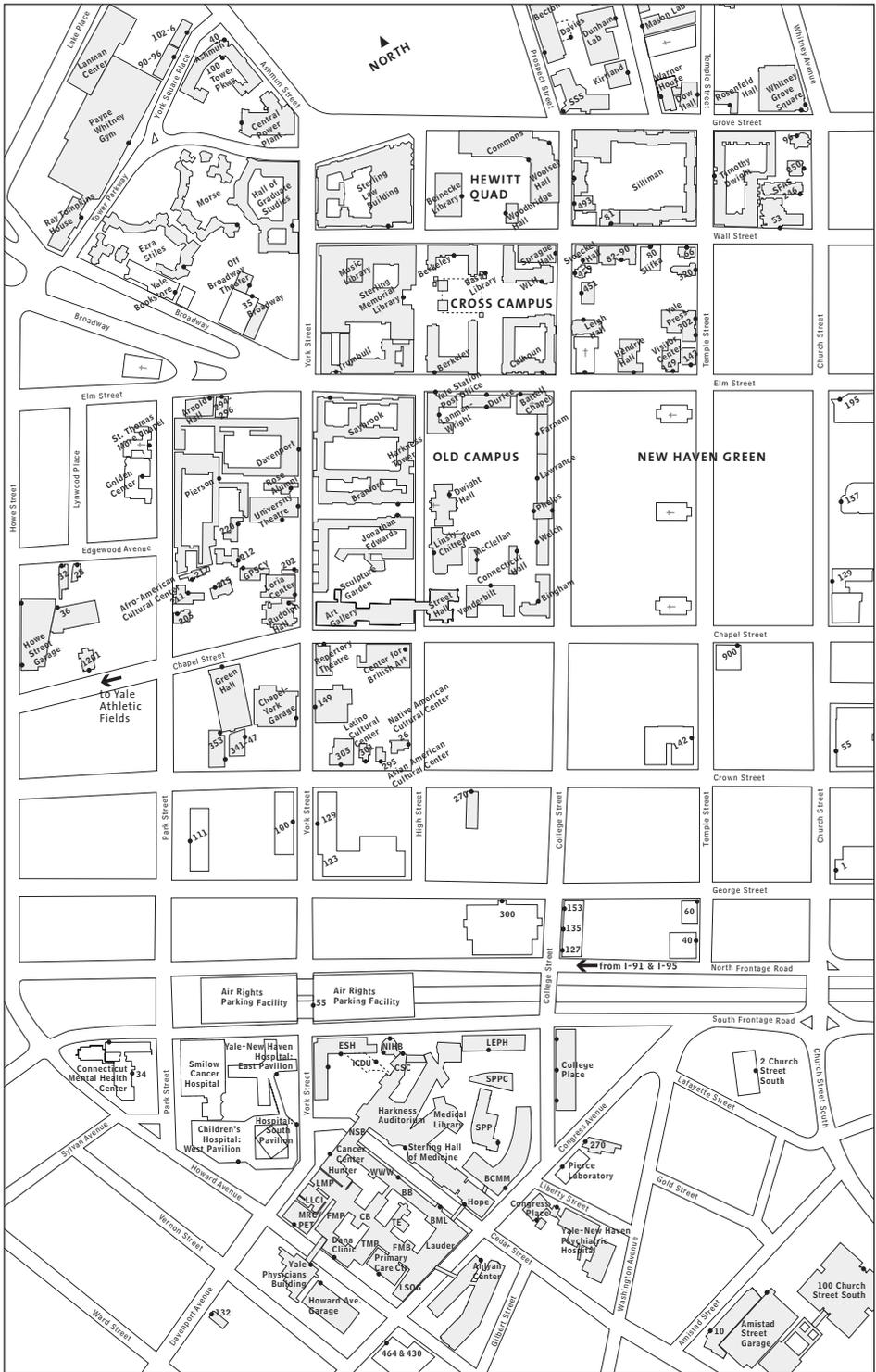
For additional information, please visit <http://som.yale.edu>. Postal correspondence should be directed to Yale School of Management, PO Box 208200, New Haven CT 06520-8200.

# YALE UNIVERSITY CAMPUS NORTH

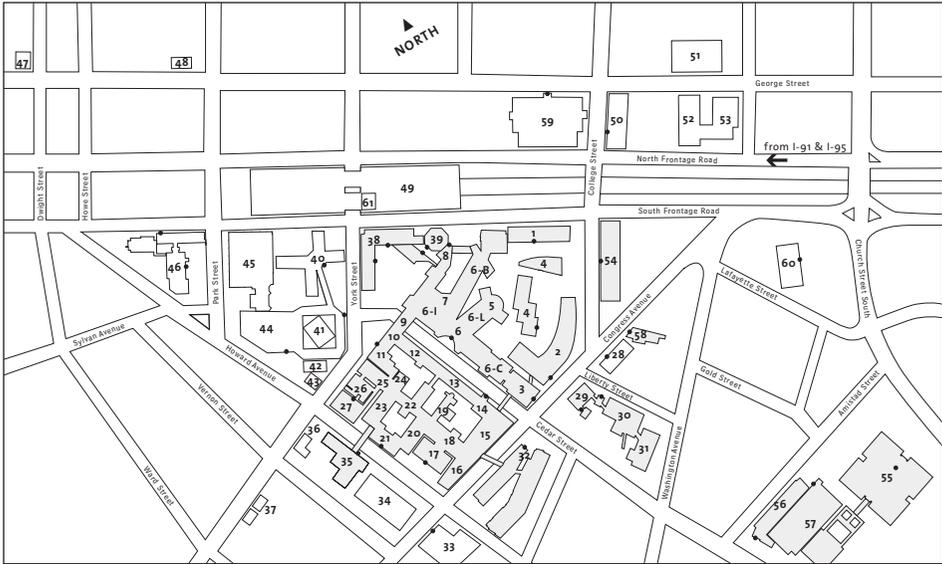


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# YALE UNIVERSITY CAMPUS SOUTH & YALE MEDICAL CENTER



# YALE MEDICAL CENTER BUILDINGS AND ADDRESSES



- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Laboratory of Epidemiology and Public Health, 60 College St.</li> <li>2. Boyer Center for Molecular Medicine</li> <li>3. Jane Ellen Hope Building</li> <li>4. Sterling Power Plant and Sterling Power Plant Co-Gen</li> <li>5. Harvey Cushing/John Hay Whitney Medical Library</li> <li>6. Sterling Hall of Medicine, 333 Cedar St.<br/>Wings: B, C, I &amp; L</li> <li>7. Mary S. Harkness Memorial Auditorium</li> <li>8. Child Study Center</li> <li>9. Nathan Smith Building (Bridge)</li> <li>10. Yale Cancer Center</li> <li>11. Hunter Building, 15 York St.</li> <li>12. William Wirt Winchester Building</li> <li>13. Boardman Building, 330 Cedar St.</li> <li>14. Brady Memorial Laboratory, 310 Cedar St.</li> <li>15. Lauder Hall</li> <li>16. Laboratory for Surgery, Obstetrics and Gynecology</li> <li>17. Primary Care Center</li> <li>18. Farnam Memorial Building</li> <li>19. Tompkins East</li> <li>20. Tompkins Memorial Pavilion</li> <li>21. Charles A. Dana Building, 789 Howard Ave.</li> <li>22. Clinic Building</li> <li>23. Fitkin Memorial Pavilion</li> <li>24. Fitkin Amphitheater</li> <li>25. Laboratory for Medicine and Pediatrics</li> <li>26. Lippard Laboratory of Clinical Investigation</li> <li>27. P.E.T. Center</li> <li>28. John B. Pierce Laboratory, 290 Congress Ave.</li> <li>29. Congress Place, 301 Cedar St.</li> <li>30. Yale-New Haven Psychiatric Hospital 2, 184 Liberty St.</li> <li>31. Yale-New Haven Psychiatric Hospital 3, 184 Liberty St.</li> </ol> | <ol style="list-style-type: none"> <li>32. Anlyan Center for Medical Research and Education, 300 Cedar St.</li> <li>33. 430 and 464 Congress Ave. and 726 Howard Ave.</li> <li><b>34. Howard Ave. Garage</b></li> <li>35. Yale Physicians Building, 800 Howard Ave.</li> <li>36. 110 Davenport Ave. (YNHH Day Care Center)</li> <li>37. 132–138 Davenport Ave. (Lead Program)</li> <li>38. Edward S. Harkness Memorial Hall A and D, 367 Cedar St.</li> <li>39. Neison and Irving Harris Building, Child Study Center, 230 S. Frontage Rd.</li> <li>40. East Pavilion, 20 York St.<br/>(Yale-New Haven Hospital Main Entrance)</li> <li>41. South Pavilion, 20 York St.</li> <li><b>42. Emergency Services Parking</b></li> <li><b>43. Children's Hospital Parking Garage</b></li> <li>44. Children's Hospital (West Pavilion)</li> <li>45. Smilow Cancer Hospital, 20 York St.</li> <li>46. Connecticut Mental Health Center</li> <li>47. Ronald McDonald House, 501 George St.</li> <li>48. 425 George St.</li> <li><b>49. Air Rights Parking Garage</b></li> <li>50. 127, 135, and 153 College St.</li> <li>51. New Haven Hotel, 229 George St.</li> <li><b>52. Temple Garage</b></li> <li>53. Temple Medical Center, 40–60 Temple St.</li> <li>54. College Place, 47 College St.</li> <li>55. Medical Center South, 100 Church St. South</li> <li>56. 10 Amistad St.</li> <li><b>57. Amistad Garage</b></li> <li>58. 270 Congress Ave.</li> <li>59. 300 George St.</li> <li>60. 2 Church St. South</li> <li>61. 55 York St.</li> </ol> |
|---|--|

# 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 2. 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 2. 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.



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, 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 covered veterans.

Inquiries concerning these policies may be referred to the Director of the Office for Equal Opportunity Programs, 221 Whitney Avenue, 203.432.0849. For additional information, see [www.yale.edu/equalopportunity](http://www.yale.edu/equalopportunity).

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 Associate Vice President for 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 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

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