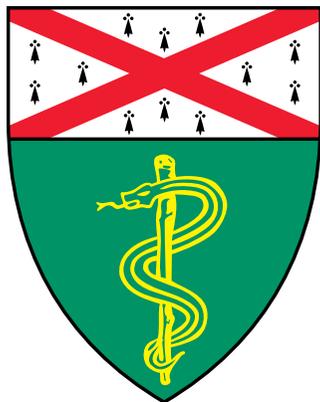


# School of Medicine

## 2012–2013



BULLETIN OF YALE UNIVERSITY

*Series 108 Number 6 July 20, 2012*

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Managing Editor: Linda Koch Lorimer  
Editor: Lesley K. Baier  
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# Calendar

## TWO HUNDRED AND FIRST SESSION

### FALL 2012

June 18	M	Clerkship year for third-year students begins, 8 a.m.
July 30–Aug. 10	M–F	Registration for third- through fifth-year students, 9 a.m.–4:30 p.m.
Aug. 16	TH	Matriculation for first-year students, 8–11 a.m.
Aug. 28	T	First term begins for second-year students
Aug. 29	W	First term begins for first-year students
Aug. 29–Sept. 12	W–W	Registration for second-year students, 9 a.m.–4:30 p.m.
Sept. 3	M	Labor Day. No classes
Sept. 17	M	Rosh Hashanah. No classes
Sept. 26	W	Yom Kippur. No classes
Nov. 19–25	M–SU	Fall recess for first- and second-year students
Dec. 1	SA	Winter recess begins for third- through fifth-year students
Dec. 8	SA	Winter recess begins for second-year students
Dec. 11	T	Winter recess begins for first-year students

### SPRING 2013

Jan. 2	W	Clerkships begin for third- and fourth-year students Winter recess ends, 8 a.m. Second term begins for first- and second-year students, 8:30 a.m.
Jan. 2–11	W–F	Registration for all students, 9 a.m.–4:30 p.m.
Jan. 21	M	Martin Luther King, Jr. Day. No classes
Mar. 4	M	Spring recess begins for first-year students, 5 p.m.
Mar. 8	F	Spring recess begins for second-year students, 5 p.m. (No recess for students on clinical rotations)
Mar. 18	M	Spring recess ends, 8 a.m.
Mar. 29	F	Good Friday. No classes
Apr. 10	W	Classes end for second-year students, 5 p.m.
May 14	T	Student Research Day. No afternoon classes for first-year students
May 17	F	Classes end for first- and fourth-year students, 5 p.m.
May 20	M	University Commencement
June 14	F	Clerkship year for third-year students ends, 5 p.m.

# The President and Fellows of Yale University

## President

Richard Charles Levin, B.A., B.Litt., 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.

Edward Perry Bass, B.S., Fort Worth, Texas

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

Mimi Gardner Gates, B.A., M.A., Ph.D., Seattle, Washington (*June 2013*)

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

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*)

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

Fareed Zakaria, B.A., Ph.D., New York, New York

# The Officers of Yale University

**President**

Richard Charles Levin, B.A., B.Litt., Ph.D.

**Provost**

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

**Vice President and Secretary**

Linda Koch Lorimer, 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

Richard C. Levin, B.A., B.Litt., Ph.D., President of the University

Peter Salovey, 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

David J. Leffell, M.D., Deputy Dean for Clinical Affairs

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

Nancy R. Angoff, M.D., M.P.H., M.Ed., Associate Dean for Student Affairs

Linda K. Bockenstedt, M.D., Director, Faculty Development and Equity

Linda M. Brady, B.A., Associate Dean for Finance and Administration, School of  
Public Health

David Brissette, M.M.Sc., P.A.-C., Interim Director, Physician Associate Program

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. Gerber, 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

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

Jacqueline L. Tucker, M.B.A., Director, Business Management Solutions

Ronald J. Vender, M.D., Associate Dean for Clinical Affairs

Merle Waxman, M.A., Associate Dean and Ombudsperson

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, 2012.

# 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.

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., Special Projects 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
Bob 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
Matthew Wilcox, M.L.S., Epidemiology and Public Health 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 information resources in the library and at their office workstations.

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 at the Circulation Desk.

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.

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.

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.

The Ira V. Hiscock Virtual Public Health Library supports the public health information needs of the School of Public Health and Yale University. It 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 Librarian is based in the Yale School of Public Health, and the print collection is housed in the Medical Library.

Nursing library services are provided to Yale University 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 Library 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. Eighteen libraries comprise the Yale University Library system, including the new 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 activities and accomplishments, leadership potential, recommendations from premedical committees and individual science teachers, 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 \$85 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 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 the Standardized Patient Program at the University of Connecticut School of Medicine.

### *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 clinical tutors).
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 payment, by check made out to the NBME in the amount of \$535 [2012 fee] or \$560 [2013 fee] (unless the fee was paid online by credit card during the application process). 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. 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. 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 mistakes in medicine, 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.

A clinical skills exam became part of the USMLE in mid-2004, starting with students who graduated in 2005. This exam, Step II CS, is a separate, required component of Step II and must be taken by December 31 of the final year as well; but again, it is to the student's advantage to take it as soon as possible after completing the clinical clerkships. Utilizing standardized patients, this exam is administered at regionally located centers operating year-round. Test sites include Philadelphia, Atlanta, Los Angeles, Chicago, and Houston.

The cost of Step II CK is \$535 [2012 fee] or \$560 [2013 fee]. The cost of Step II CS is \$1,140 [2012 fee] or \$1,200 [2013 fee]. 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. 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.

#### 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

Musculo-Skeletal 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 2011, the Yale Physician Associate Program has graduated 1,007 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
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 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. In the past, students have chosen clerkships in Thailand, Spain, Uganda, Costa Rica, Peru, Tanzania, and England.

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	Dermatology
Anesthesiology	Diagnostic Imaging/Radiology
Cardiology	Gastroenterology
Cardiothoracic Surgery	Gynecologic Oncology

Hematology	Oncology
Hospitalist Medicine	Ophthalmology
Infectious Disease	Orthopaedics
International Medicine	Otolaryngology
Interventional Radiology	Pediatric Cardiology
Medical Intensive Care	Plastic Surgery
Neonatology	Surgical Intensive Care
Nephrology	Thoracic Surgery
Neurology	Transplant Surgery
Neurosurgery	Trauma Surgery
Occupational and Travel Medicine	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)	\$49,500
Yale Health Hospitalization coverage (includes prescription coverage)	\$1,980

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

United States Medical Licensing Examination:	2012	2013
Step I	\$535	\$560
Step II – Clinical Knowledge	\$535	\$560
Step II – Clinical Skills	\$1,140	\$1,200

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, 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 divorced 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 2012–2013 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 2012–2013, the last days for refunding federal student aid funds will be November 2, 2012 (Year 1), October 20, 2012 (Year 2), and October 17, 2012 (Years 3 and 4) in the fall term, and April 7, 2013 (Year 1), May 17, 2013 (Year 2), May 13, 2013 (Year 3), and March 23, 2013 (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 8, 2012 (Year 1), September 5, 2012 (Year 2), and August 23, 2012 (Years 3 and 4) in the fall term, and January 15, 2013 (Years 1 and 4), January 22, 2013 (Year 2), and January 23, 2013 (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 25, 2012 (Year 1), September 19, 2012 (Year 2), and September 9, 2012 (Years 3 and 4) in the fall term, and February 5, 2013 (Year 1), February 23, 2013 (Year 2), February 25, 2013 (Year 3), and February 4, 2013 (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 22, 2012 (Year 1), October 12, 2012 (Year 2), and October 6, 2012 (Years 3 and 4) in the fall term, and March 25, 2013 (Year 1), April 26, 2013 (Year 2), April 22, 2013 (Year 3), and March 10, 2013 (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 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. Wiepert and Lucille Reed Wiepert Scholarship Fund** Established in 1974 by a gift from an anonymous donor in honor of William M. Wiepert, B.A. 1933, M.D. 1937, and Lucille Reed Wiepert, Ph.D. 1930, M.D. 1937. Income to be used to provide scholarship aid for a financially needy student who has demonstrated scholastic achievement.

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

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

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

#### **The Yale Club of Central New Jersey Scholarship Fund**

Armed Forces Scholarships are available upon application.

### **LOAN FUNDS**

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

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

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

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

**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 2012

**Cum laude** The degree of Doctor of Medicine cum laude will be conferred on students whose academic performance shows unusual merit. Danielle Barber, Oliver Mullin Barry, Marko Boskovski, Panos George Christakis, Pete Duncan, Corey Scott Frucht, Don Hoang, Cheryl Lynn Maier Jackson, Anant Mandawat, Henry Soo-Min Park, Jill Carol Rubinstein, Alla Vickery Lescure Smith, John Michael Thomas, Anant Vasudevan

**American Academy of Neurology Award** Awarded to recognize a graduating medical student for excellence in clinical neurology. Benjamin Neil Blond

**ACP-ASIM Internal Medicine Award** Awarded to graduating students who will be entering a categorical or primary care internal medicine residency in Connecticut and have demonstrated outstanding academic achievement and community service. Lin Shen, John Michael Thomas

**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. Ryan William Blum, Anne Colleen Cooper, Olatokunbo Musili Famakinwa, Andrew Joshua Kobets, Marie Ann Rymut Schaefer

**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 Two of the National Board Examination. Alisse K. Hauspurg

**Connecticut Academy of Family Physicians Award** Established in 1994 to recognize outstanding students entering a career in Family Practice. Lauren Kathleen Graber, Marie Ann Rymut Schaefer

**Connecticut Chapter of American College of Surgeons Prize** Awarded to a graduating student for excellence in the surgical sciences. Jill Carol Rubinstein

**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 University School of Medicine. Awarded through peer nomination to graduating, underrepresented, minority students in medicine and public health who has demonstrated outstanding academic achievement, exemplary leadership, and a significant commitment to the community at large. Olatokunbo Musili Famakinwa, Odayme Quesada

**Miriam Kathleen Dasey Award** Established in 1950 in honor of Miriam Kathleen Dasey, Registrar from 1921 to 1950. To be presented annually to students who by strength of character, personal integrity, and academic achievement give promise of fulfilling the ideal of the compassionate physician. Anne Colleen Cooper, Lauren Kathleen Graber, Kiavash Nikkhou, Michael David Otremba

**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. Olatokunbo Musili Famakinwa, Lauren Kathleen Graber, Odayme Quesada

**Endocrinology Society Medical Student Achievement Award** Established in 1997 to recognize a graduating senior who has shown special achievement and interest in the general field of endocrinology. Charisse Marie Orme

**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. Charisse Marie Orme, Cheryl Lynne Maier Jackson

**The Peter A. T. Grannum Prize** Established in 1990. Awarded to outstanding African American graduates. This annual award is supported by the Shirley, Maggie and Hugh Comer Fund. Cicely Ann Williams, Rashele Patrice (Cross) Yarborough

**The M.D./Ph.D. Alumni Award** Awarded to graduating M.D./Ph.D. students who have demonstrated outstanding academic achievements, leadership, and service. Danielle Barber

**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. Saif Shafique Rathore, Jill Carol Rubinstein

**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." Alla Vickery Lescure Smith

**The Parker Prize** Established in 1914 by bequest from Frank J. Parker, Ph.D. 1895, M.D. 1898. Awarded annually to the graduating students who, during the course, have shown the best qualifications for a successful physician. Michael Christopher Dewan, Aaron Joshua Feinstein, Henry Soo-Min Park, Alla Vickery Lescure Smith

**The Perkins Prize** Awarded to the student who achieves the highest rank on Step One of the National Board Examination. John Webster Gilbert

**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. Jessica Dara Bod

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

**The Leonard Tow Humanism in Medicine Award Presented 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. Lauren Kathleen Graber

**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. J. Hale Season

**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. Jocelyn Bosco Chandler

## THESIS PRIZES, MAY 2012

**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. Henry Soo-Min Park

**The Association for Academic Surgery–Novartis Research Award** Awarded to the senior medical student entering a surgical field, who has done outstanding research during medical school. Hadiza Shu'aib Kazaure

**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. Alla Vickery Lescure Smith

**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. John Christopher Binford

**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. Marko Boskovski

**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. Badri Gunvant Modi

**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. Panos George Christakis

**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. Pete Duncan

**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. Catherine S. Yang

**The Lidz Prize in Psychiatry** Awarded to a graduating student for an outstanding thesis in the field of psychiatry. Benjamin Neil Blond

**The M.D./Ph.D. Thesis Prize** Awarded to the graduating M.D./Ph.D. student with the most outstanding dissertation. Corey Scott Frucht

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

**The Dr. Louis H. Nahum Prize** Founded in 1973 by bequest from Louis H. Nahum, M.D. 1916. Awarded annually to members of the senior class of the School of Medicine, who merit such award by virtue of the excellence of the thesis that they have written as required for the medical degree. John Michael Thomas, Anant Vasudevan

**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. Narae Ko

**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. Oliver Mullin Barry

**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, 1972 to 1974. Don Hoang

**The Abraham White Prize** The Abraham White Prize is given yearly to a Yale medical student for outstanding student 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. Kwame B. Atsina

## STUDENT RESEARCH DAY ORAL PRESENTATIONS, MAY 8, 2012

Daniel Duncan. *Endothelial-mesenchymal transition driven by TGF- $\beta$  is a significant mediator of stenosis in tissue engineered vascular grafts* (Dr. Christopher Breuer, Surgery)

Badri Modi. *Langerhans cells facilitate mutagenesis and squamous cell carcinoma* (Dr. Michael Girardi, Dermatology)

Marko Boskovski. *The novel congenital heart disease gene, Galnt11, modifies notch to alter left-right patterning* (Dr. Martina Brueckner, Pediatrics)

Don Hoang. *Leptin: a novel hormone of the parathyroid gland* (Dr. Deepak Narayan, Surgery)

John Thomas. *Foretelling the future of prognostication: a historically inspired domain-based approach for the elderly* (Dr. Terri Fried, Internal Medicine)

Corey Frucht. *The role of microRNA181a in avian auditory hair cell regeneration* (Dr. Dhasakumar Navaratnam, Neurology and Neurobiology)

## AWARDS TO FACULTY AND HOUSE STAFF, MAY 2012

**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. Andre Sofair, M.D., M.P.H., Associate Professor of Medicine (General Medicine); and Cyrus Kapadia, M.D., Professor of Medicine (Digestive Diseases)

**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: Lawrence Rizzolo, Ph.D., Associate Professor of Surgery (Gross Anatomy) and of Ophthalmology and Visual Science. Clinical Sciences: Lloyd Cantley, M.D., C.N.H. Long Professor of Medicine (Nephrology) and Professor of Cellular and Molecular Physiology

**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. Margaret Drikamer, M.D., Professor of Medicine (Geriatrics) and Associate Professor of Nursing

**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. Mark Mercurio, M.D., M.A., Professor of Pediatrics (Neonatology)

**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. David Hersh, M.D., Ph.D., Assistant Professor of Pediatrics

**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. Nicholas Blondin, M.D.; and Jason Prescott, M.D., Ph.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 that 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 the School is free from discrimination and acts of intolerance such as those based on sex, race, color, religion, age, disability, status as a special disabled veteran, veteran of the Vietnam era or other covered veteran, national or ethnic origin, sexual orientation, or gender identity or expression. 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. The YSM Grievance Board on Sexual Misconduct responds to requests for information and is a venue for informal resolution of sexual misconduct cases within the Yale School of Medicine. The board stresses confidentiality, takes steps to protect complainants from retaliation, and explores alternative channels for redress. Copies of the procedures and a list of members (including student members) are available on the Web site (<http://medicine.yale.edu/sha>). Faculty, medical students, and postdoctoral fellows may consult any of the members of the board informally, or may opt to bring an informal or a formal complaint to the University-Wide Committee on Sexual Misconduct. 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 Committee on Multicultural Affairs, chaired by the assistant dean for multicultural affairs, was created to combat racial and ethnic insensitivity and harassment throughout the School of Medicine. Vigorous steps are taken to investigate any allegation, to counsel the offender, and to recommend disciplinary action, if necessary.

In addition, any student, employee, or applicant for programs or employment at Yale who is concerned about affirmative action, equal opportunity, sexual harassment, racial harassment, or fairness in admissions or employment at Yale, either in a general sense or with respect to his or her own situation, is encouraged to contact the Office for Equal Opportunity Programs. 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, who can be accessed anonymously if desired, are trained each year in a session with the director of

mental health services at Yale Health. Those problems that need a higher level of attention are brought to the advisory committee, which is made up of all the Peer Advocates as well as the director of mental health services, the assistant dean for multicultural affairs, the ombudsperson, the associate dean for graduate medical education, several respected faculty, and the associate dean for student affairs. 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. Any members of the advisory committee may be contacted directly by a student.

### *Power Day*

Issues of abuse of power as experienced by students at all levels are made the topic of discussion at Power Day I, before the students in the third year start their clinical rotations, 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/grievance](http://www.yale.edu/equalopportunity/grievance).

Complaints of sexual misconduct, including sexual harassment and sexual assault, may be brought to a Title IX Coordinator, to the YSM Grievance Board on Sexual Misconduct (for inquiries and/or informal resolution), 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/grievance](http://www.yale.edu/equalopportunity/grievance).

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 regularly 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. When a question arises that 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.

The Progress Committee determines whether a student is making appropriate progress toward becoming a safe and effective physician by reviewing his or her record for academic standing, the ability to synthesize and apply knowledge, moral and ethical character, professional behavior, evidence of good judgment and a sense of responsibility, sensitivity and compassion for individual needs, and emotional stability. 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, an action needs to be taken that in some way alters the normal progress of a student through the curriculum, the student will be notified in writing of the committee's decision. Such actions include but are not limited to:

- Repeating a portion of the curriculum (a single course or a full year)
- Taking a leave of absence
- Placement on academic probation
- Suspension from matriculation
- Dismissal

The terms of the decision, including the requirements for return to fully matriculated student status and the consequences of not progressing satisfactorily over a specified timeline, will be clearly defined in the written notification. 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 a member or members of the faculty. Final decisions of the Progress Committee may be appealed directly to the dean of the School of Medicine.

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 by the Progress Committee may appear in the student's dean's letter.

Students requesting to take more than five years to complete medical school (more than six years for a joint-degree student in business or public health, more than seven years for a joint-degree student in law), must petition the Progress Committee in writing.

## 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 \$5,200 to \$7,500 during the 2012–2013 academic year (August 2012 to May 2013). 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 information about Edward S. Harkness Memorial Hall or other Yale graduate residences, contact the Graduate Housing Office at 203.432.2167; or visit the Web site [www.yale.edu/gradhousing/incoming/buildings.html](http://www.yale.edu/gradhousing/incoming/buildings.html).

### *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 2012–2013 academic year is \$3,150 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 \$628 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

Yale University has its own police force, and at least one officer patrols the Medical Center twenty-four hours a day. At strategic times, two officers patrol a wider area. The officers are in police uniform, are armed, and have full police powers similar to New Haven police officers. 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 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.

Yale–New Haven Hospital also has a security force. They check IDs at hospital entry points, patrol the interior and exterior of hospital property, and provide contractual security services at the Air Rights Garage and the Yale School of Nursing.

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 software (SAS, SPSS, and EPI Info), 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, and a third station is located in the Information Room. 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 into the room.

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 electronic devices including digital cameras, HD digital video cameras, and related video accessories. This equipment may be borrowed by anyone with a valid Yale ID. The Medical Library also provides a laptop computer loaner program for Medical Center students. Sixteen Windows laptops are available for students needing a computer for temporary use.

The Medical Library's Group Study and Conference Rooms contain either large plasma monitors or data projectors for group display of computer output. 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 XP computers and a laser printer.

Yale has negotiated agreements with computer vendors enabling students to buy computers (IBM, Dell, or Apple), supplies, and software at discounted prices. The University provides online ordering through its e-portal, [www.yale.edu/eportal](http://www.yale.edu/eportal). 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 ([www.yale.edu/its/help/cmc.html](http://www.yale.edu/its/help/cmc.html)). Hours are Monday through Friday from 8:30 a.m. until 4:30 p.m.

For more information on student computing resources, see [www.yale.edu/its/students/med\\_students.html](http://www.yale.edu/its/students/med_students.html).

### *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

In a speech entitled “The Global University,” Yale President Richard C. Levin declared that as Yale enters its fourth century, its goal is to become a truly global university—educating leaders and advancing the frontiers of knowledge not simply for the United States, but for the entire world: “The globalization of the University is in part an evolutionary development. 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. But creating the global university is also a revolutionary development—signaling distinct changes in the substance of teaching and research, the demographic characteristics of students, the scope and breadth of external collaborations, and the engagement of the University with new audiences.”

Yale University’s goals and strategies for internationalization are described in a report entitled “International Framework: Yale’s Agenda for 2009 to 2012,” which is available online at [www.world.yale.edu/framework](http://www.world.yale.edu/framework).

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

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 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 description in this bulletin and [www.yale.edu/macmillan](http://www.yale.edu/macmillan).

Opened in fall 2010, 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 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).

For additional information, the “Yale and the World” Web site offers a compilation of resources for international students, scholars, and other Yale affiliates interested in the University’s global initiatives. 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 the artifacts excavated at the ancient Roman city of Dura-Europos; the Jarves, Griggs, and Rabinowitz collections of early Italian paintings; the Société Anonyme Collection of early-twentieth-century European and American art; Impressionist, modern, and contemporary works; Asian art; African art; art of the ancient Americas; and Indo-Pacific art. The gallery is in the final phase of a comprehensive expansion project that began with the restoration and renovation of the landmark Louis Kahn building (1953), completed in 2006, and continues today with the renovation and restoration of the Old Yale Art Gallery (1928) and Street Hall (1866). The current phase of construction will unite all three buildings into a cohesive whole opening in December 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 is home to the largest and most comprehensive collection of British paintings, sculpture, prints, drawings, and rare books outside the United Kingdom. Given to the University by Paul Mellon, Yale Class of 1929, it is housed in a landmark building by Louis Kahn.

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 Onepo 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. 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. These resources are coordinated and/or supported through the University Chaplaincy (located on the lower level of Bingham Hall on Old Campus); the Yale University Church at Battell Chapel, an open and affirming church; and Yale Religious Ministry, the on-campus association of clergy and nonordained representatives of various religious faiths. The ministry includes the Chapel of St. Thomas More, the parish church for all Roman Catholic students at the University; the Joseph Slifka Center for Jewish Life at Yale, a religious and cultural center for students of the Jewish faith; Indigo Blue: A Center for Buddhist Life at Yale; several Protestant denominational ministries and nondenominational ministries; and student religious groups such as the Baha'i Association, the Yale Hindu 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., and Sunday evenings from 5 to 11 p.m. Additional information is available at [www.yale.edu/chaplain](http://www.yale.edu/chaplain).

## 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, 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, 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 [www.yhpstudentwaiver.yale.edu](http://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. Yale Health Prescription Plus Coverage may be added at an additional cost. 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. Prescription Plus Coverage may also be added for an additional cost. 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.

### YALE HEALTH PRESCRIPTION PLUS COVERAGE

This plan has been designed for Yale students who purchase Yale Health Hospitalization/Specialty Coverage and student dependents who are enrolled in either the Two-Person Plan, the Student Family Plan, or Student Affiliate Coverage. Yale Health Prescription Plus Coverage provides protection for some types of medical expenses not covered under Yale Health Hospitalization/Specialty Coverage. Students are billed for this plan and may waive this coverage. The online waiver ([www.yhpstudentwaiver.yale.edu](http://www.yhpstudentwaiver.yale.edu)) 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. For a detailed explanation, please refer to the *Yale Health Student Handbook*.

### *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 and/or Yale Health Prescription Plus 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 and Yale Health Prescription Plus 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 must 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, 2008. 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, 2012. 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 2012, 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 polio, 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. In addition, those who are working in areas where they might encounter blood or fluid exposure must contact the Student Health Department (203.432.0312) at Yale Health. Such students will be given a seven-day 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. In addition, the center has nine work carrels that can be reserved by academic departments for short-term international visitors. 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/icenter](http://www.yale.edu/oiss/about/icenter).

## 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: Advocacy, Information, and Support*

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 to discuss sexual misconduct with any member of the Yale community. SHARE counselors offer confidential or anonymous support and help callers make informed decisions. 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 complaint. 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. 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 speak with Dr. Carole Goldberg, the director of SHARE, she can be reached at 203.432.0290 during business hours or via e-mail at [carole.goldberg@yale.edu](mailto:carole.goldberg@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 Title IX coordinator. Coordinators provide information, track and resolve complaints, and address issues relating to gender-based discrimination and sexual misconduct within their respective schools. Coordinators are knowledgeable about, and will provide information on, all options for complaint resolution, and can initiate institutional action when necessary. They also work closely with the SHARE Center, the University-Wide Committee on Sexual Misconduct, and the Yale Police Department.

### *University-Wide Committee on Sexual Misconduct*

203.432.1834 (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 strives to address allegations of sexual misconduct fairly and expeditiously and has procedures for both formal and informal resolutions. Core UWC members can answer 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*

24/7 hotline: 203.432.4400

<http://publicsafety.yale.edu/department-information#sensitivedcrimes>

The Yale Police Department (YPD) offers 24-hour availability by telephone and walk-in for confidential consultations regarding possible criminal investigations and actions. 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 Robbins-Hoffman, the Sensitive Crimes coordinator, she can be reached at 203.432.9547 during business hours or via e-mail at [marnie.robbs@yale.edu](mailto:marnie.robbs@yale.edu). The YPD works closely with the New Haven State's Attorney, the Yale SHARE Center, the University's Title IX coordinators, and various other departments within the University. Talking to the YPD does not commit you to collecting evidence or pressing charges; with few exceptions, all decisions about how to proceed are up to you.

# Departments and Sections

This section provides information for all departments and some sections in the School of Medicine. Each listing provides a roster of faculty, fellows, and associates, as well as descriptions of courses.

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, 2012.

## 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, P.L. Miller (*Medical Informatics*), L.E. Niklason, T.H. Oh (*Emeritus*), A.C. Perrino, T. 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, K. Haspel, 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, M.E. Blessing, C. Cantemir, S. Dabu-Bondoc, M.W. Diu, J. Feinleib, S.A. Franco, 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, S. Khan, J.P. Kim, T. Levy, J. Li, A.M. Lobo, S.M. Luczycki, K.E. Marschall, V. Matei, H. Mikhael, R.K. Modak, T. Myslajek, A.D. Opera, M. Punjala, R.M. Romero, M.J. Rose, H. Saadat, R.C. Schoenfelder, B. Sherman, 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** J.S. Kersh, M. Pollock, T. Wong

**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, J. Zhou

**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, P.A. Blume (*Orthopaedics & Rehabilitation*), A. Cherro, M.K. Ghori, J. Kim, L.H. Kwan, M. Lomanto, Y.F. Shaheen, L. Wang, K.T. Watson, J.C. Weinberg

**Clinical Instructors** M.M. Abreu, M. Dudley, D.B. Glassman

**Lecturers** A.M. Deshpande (*Medical Informatics*), 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; S.-M. Wang, R.H. LaMotte, C. Ma, D.G. Silverman, K.H. Shelley

## 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. Galan (*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. Simons (*Medicine*), E. Ullu (*Medicine*), S.L. Wolin

**Associate Professors** J.S. Bogan (*Medicine*), C.G. Burd, D.A. Calderwood (*Pharmacology*), E. Dufresne (*Engineering & Applied Science*), K.M. Reinisch, E. Stein (*Molecular, Cellular & Developmental Biology*), D.K. Toomre, A.M. Vignery (*Orthopaedics & Rehabilitation*), T. Walther

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

**Senior Research Scientist** T.L. Lentz

**Research Scientist** X.N. Liu

**Associate Research Scientists** S.J. An, Y. Cai, C. Carroll, X. Chen, A.R. Ferguson, V.K. Gangaraju, L. Geng, S.S. Krishnakumar, G. Lavieu, I. Lee, F. Li, I. Milosevic, F. Nakatsu, M.J. Nolde, F. Pincet, C. Qiu, S. Sim, N. Tiwari, J. Wang, Z. Xi, 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 staff

**CBIO 601a/b, Molecular and Cellular Basis of Human Disease** The course emphasizes the connections between diseases and basic science using a lecture and seminar format. It is designed for students who are committed to a career in medical research, those who are considering such a career, or students who wish to explore scientific topics in depth. The first half of the course is organized in four- to five-week blocks that topically parallel CBIO 502a/b. Examples of blocks from past years include “Diseases of protein folding”

and “Diseases of ion channels.” Each topic is introduced with a lecture given by the faculty. The lecture is followed by sessions in which students review relevant manuscripts under the supervision of a faculty mentor. The second half of the course focuses on the relationship of basic science to disease processes while emphasizing translational and clinical research. In addition, sessions are devoted to academic careers and cover subjects such as obtaining an academic position, promotions, and grant writing. The course is open to M.D. and M.D./Ph.D. students who are taking or have taken C BIO 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 staff

**C BIO 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

**C BIO 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 C BIO 602a lecture schedule. Thus, concurrent enrollment in C BIO 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

**C BIO 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

**C BIO 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. K.M. Reinisch and faculty

**C BIO 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

**C BIO 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 913a/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*), 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*), B. Forbush, J.P. Geibel (*Surgery*), G.H. Giebisch (*Emeritus*), J.F. Hoffman (*Emeritus*), L.K. Kaczmarek (*Pharmacology*), P.A. Preisig (*Medicine*), W.M. Saltzman (*Engineering & Applied Science*), J. Santos-Sacchi (*Surgery*), G.I. Shulman (*Medicine*), F.J. Sigworth, C.L. Slayman, C.W. Slayman (*Genetics*), T. Wang, F.S. Wright (*Medicine*), L.H. Young (*Medicine*), Z. Zhou (*Ophthalmology & Visual Science*)

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

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

**Instructor** J.Q. Leng

**Senior Research Scientists** G.H. Giebisch, J.F. Hoffman

**Research Scientist** D.P. Zecevic

**Associate Research Scientists** C.X. Bleau, G. Cao, B.A. Davis, Z. Du, R. Homma, L. Jin, T. Li, M.A. Reyna, A. Rivetta, H. Shigematsu, 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 535a/NSCI 645a/PSYC 535a, Foundations of Behavioral Neuroscience]

**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 560b<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, 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, E.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. Jordt, 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. No specific prerequisites. However, parts of the course deal with diffraction theory and physical principles of image formation. Therefore, knowledge of calculus and basic physics is advantageous. E.J. Sigworth, C.V. Sindelar

**[C&MP 750/NSCI 614b/PSYC 750, 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** J.P. Comer, 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*), R. Sinha (*Psychiatry*), D.L. Snow (*Psychiatry*), P. Snyder (*Adjunct*), S.M. Southwick (*Psychiatry*), M.W. State, 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*), H. Blumberg (*Psychiatry*), K. Chawarska, B.W. Forsyth (*Pediatrics*), W.S. Gilliam, E.L. Grigorenko, S.M. Horwitz (*Public Health*), J. Kaufman (*Psychiatry*), Y. Kim, T.J. McMahon (*Psychiatry*), K. Pelphrey, L.D. Scahill (*Nursing*), 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*), N.L. Close, R. Feldman (*Adjunct*), P. Luyten (*Adjunct*), J.C. McPartland, C. Pittenger (*Psychiatry*), Y.B. Poncin, A. Raefski (*Adjunct*), M.C. Rosario-Campos (*Adjunct*), M.V. Smith (*Psychiatry*), H.E. Stevens, C.S. Stover, J.E. Swain (*Adjunct*), V. Weersing (*Adjunct*), M. Yazgan (*Adjunct*)

**Instructors** D.M. Aversa, R.J. Jou, G.L. Lopez-Cohen, J. Meyer

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

**Research Scientists** V.R. Seitz, D. Sukhodolsky

**Associate Research Scientists** M. Akbar, K.M. Balestracci, M.J. Bentley, S.J. Bishop-Josef, D. Blum, L.L. Booth, P.R. Britto, F.E. Brown, L. Cardona, G. Coppola, M.J. Crowley, 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, M. Kaiser, K. Koenig, P. Kotapurathu kurup, N. Landi, E.R. Lebowitz, S.L. Macari, M.G. Motlagh, S.S. Nicholls, B. Reichow, H.J. Rutherford, K.M. Smith, S.S. Stahl, K.D. Tsatsanis, B. Vander Wyk, P. Ventola, E.M. Warnick, J.M. Wolf, 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** S. Boltax-Stern, C. Canny (*Pediatrics*), P.M. Cohen, 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, L.A. Vitulano, T. Zanker

**Assistant Clinical Professors** H.A. Allen, A.J. Avni-Singer (*Pediatrics*), M.W. Azeem, E. Becker-Dunn (*Psychiatry*), M. Berkman, M. Best, D. Bober, L.A. Bogen, J.F. Chapman, P.B. Chappell, J.T. Collins, C. Epstein, G.E. Epstein-Wilf, D. Flanagan, J. Fowler, R.P. Franks, M.G. Fromm, G.D. Gammon, S. Gossart-Walker, R.M.

Greenbaum, F.X. Gregory, K.E. Hanson, A.G. Hess, W. Hill, I.R. Jennings, H.P. Kahn, M.D. Kaplan, A.T. Kravitz, 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, S.F. Nagler, F.J. Ninivaggi, B.F. Nordhaus, J.F. Poll, M.D. Powers, G.R. Racusin (*Psychiatry*), D.R. Rau (*Psychiatry*), E. Rodriguez-Keyes, D.A. Sasso, L.P. Siegel, A.G. Smaller, K.W. Sondergaard, R. Sotsky, S. Werblood, M. Wudarsky, L.D. Zimmerman

**Clinical Instructors** D. Abate, J.M. Ambrosino (*Pediatrics*), J.E. Arias, A. Aujla, J.D. Cunningham, T.S. Davila, M.B. de-Naclerio, L.N. Dennehy, D.M. Dodge, L.M. Donovan, J. Eisenberg, J.A. Gallalee, N.M. Gentili, J. Gereda, K. Gereda, J.L. Grimsley, K. Hammel, L.C. Hayden, P. Hetherington, K. Holdt, M. Infantino, B.A. Keyes, E.M. Kimball, B. Kleine, E. Kressley, S. Kuhn, M. Lyons, K. Malensek, J.P. Marachi, W. Marans, C. Martins, B.L. Mason, M. Moca, A.J. Myers, J.L. Noto, S. Peck, S.L. Peshori, H.C. Pizzanello, R. Plant, R.G. Pugliese, J. Radawich, E. Raphael-Tomkins, B. Reddy, B.N. Rickler, R.A. Ritvo, C. Schaefer, C. Schnaitmann, C. Schwartz, M.M. Silva, A.N. Smoke-Collins, M. St. Pierre, B. Taggart, E.O. Tongul, L. Urquiza, K. Voccola, J. Watson, 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, V.M. Shiller, C.B. Sicher, C.A. Talbot, 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*), L.M. Garcia-Segura (*Adjunct*), M. Hajos (*Adjunct*), T.L. Horvath (*Chair*), R.O. Jacoby (*Emeritus*), M.W. Sleeman (*Adjunct*), I. Torres Aleman (*Adjunct*), C.J. Zeiss

**Associate Professors** A.M. Bennett (*Pharmacology*), J.L. Brandsma (*Adjunct*), S. Diano (*Obstetrics, Gynecology & Reproductive Sciences*), X. Gao, J.D. Macy, P.C. Smith

**Assistant Professors** C.J. Booth, J.A. Goodrich, M.S. Lawrence (*Adjunct*), I. Levy, M.S. Rodeheffer, J.A. Scholz, A.K. Sfakianaki (*Obstetrics, Gynecology & Reproductive Sciences*), S.R. Wilson, X. Yang

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

**Associate Research Scientists** M. Koch, Z. Liu, Y. You

## DERMATOLOGY

Office: LCI 501, 203.785.4092

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

**Professors** J.L. Bolognia, D.E. Brash (*Therapeutic Radiology*), I.M. Braverman (*Emeritus*), 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** R.J. Antaya, M.W. Bosenberg, S.E. Cowper, C.J. Ko, R. Lazova, A. Subtil

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

**Instructors** J. Choi, S.R. Christensen, A.J. Cool, 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, E.B. Milstone, 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, 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, K. Mariwalla, 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. Wilder, J.R. Zirn, B. Zubkov

**Clinical Instructors** S. Chavel, M.P. Coolidge, D. Correale, J.M. Grant-Kels, J. McBean, M.I. Oestreicher, J.B. Sabetta, S.B. Sloan

**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; 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. Director: M.M. Tomayko; S. Imaeda

## DIAGNOSTIC RADIOLOGY

Office: TE-2, 203.785.6938

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

**Professors** J.J. Abrahams, J.A. Brink (*Chair*), R.A. Bronen, M.I. Burrell, R.E. Carson, R.T. Constable, E.A. Cornelius (*Emeritus*), A.M. Curtis, Y. Ding (*Adjunct*), J.S. Duncan, H.P. Forman, M.G. Glickman (*Emeritus*), R.J. Gusberg (*Surgery*), H.P. Hetherington (*Neurosurgery*), D. Hyder, G.M. Israel, L.D. Katz, E. Kier, J.P. Lawson (*Emeritus*), S.M. McCarthy, B.L. McClennan (*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, I. Tocino, J.C. Weinreb, R.I. White, B.L. Zaret (*Medicine*)

**Associate Professors** J.E. Aruny, H. Blumberg (*Psychiatry*), 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, G.F. Mason, C.R. Miller, H.R. Mojibian, E.D. Morris, J.W. Pan (*Neurosurgery*), X. Papademetris, D. Pelletier (*Neurology*), E. Reiner, A.N. Rubinowitz, R.R. Russell (*Medicine*), L.H. Staib, H.D. Tagare, C.R. Taylor, S.W. Woods (*Psychiatry*)

**Assistant Professors** L. Andrejeva, M.H. Arici, R.R. Ayyagari, K.E. Baker, R. Butler, M. Chen, M.A. Choma, K.P. Cosgrove (*Psychiatry*), M. Djekidel, I. Doddamane, G. Galiana, J. Geisel, G. Gunabushanam, R.J. Hooley, L.J. Horvath, C. Juchem, R.H. Kent, J.D. Kirsch, A.W. Lischuk, C. Liu, A. Mahajan, A. Malhotra, F.J. Minja, J.A. Obando, I.B. Oliva, J.K. Pahade, C. Poon (*Adjunct*), M. Raghu, M.V. Revzin, S. Sampath, E.M. Shapiro, C.J. Silva, H.M. Thorisson (*Adjunct*), P. Varma

**Instructors** S. Tandon (*Medicine*), W.A. Williams

**Senior Research Scientists** R.G. Shulman (*Molecular Biophysics & Biochemistry*), F.J. Wackers

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

**Associate Research Scientists** S.V. Chelikani, D. Coman, H. De Feyter, J. Gallezot, B.S. Ganganna, D. Granot, P. Herman, L. Jiang, A.A. Karpikov, D.C. Labaree, K. Lim, S. Lin, E.A. Markakis, N. Nabulsi, M. Naganawa, M. Negishi, V. Neklesa, D.C. Peters, M. Qiu, J.R. Ropchan, X. Shen, X. Zhang, 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, M.G. Tal, B.C. Zablow, I. Zubal

**Assistant Clinical Professors** W.E. Allen, R.D. Becker, S.B. Berger, M. Carino, C.C. Colton, J.K. Crowe, A.R. Daftary, H.M. Dey, 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. Knobelman, C.T. Kubiak, F.L. Lin, N. Malguria, S.A. Messina, H. Moukaddam, A.R. Niakosari, G.S. Novick, M. Obrzut, I. Onyiuke, J.R. Pannese,

A. Pathak, Z. Protopapas, R. Sadar, B.D. Simonds, S.J. Sullivan, R.R. Tash, N.W. Tishkoff, J.R. Willmann-Siegelman, J. Wruble, W.B. Zucconi

**Clinical Instructors** A. Lapas, K. Parithivel, M. Spektor, R.R. Sprague

**Lecturers** J. Arora, J. Bhawnani, G.J. Conlogue, S.M. Jonas, 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), and 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 also participate in the interventional radiology clinic and admitting service. One student every two or four 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 attendings; 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. 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 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, L.C. Degutis, J.D. Dziura, L. Jagminas, C. Moore, L.A. Post

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

**Instructors** R. Carter, E. Cobb, S. Gadiraju, K. Goldflam, V. Gupta, C.H. Lee, R. Liu, J.J. Macneal, 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** S. Battistich, J.W. Bonz, S.A. Chekijian, E. Melnick, R.A. Taylor

**Lecturers** R.D. Austin, K. Baker, M.L. Blundon, C. Bogan, J. Borsotti, E. Browne, K.J. Burns, R.E. Chen, T.E. Cohen, M. Czako, C. Dill, G.M. Faherty, D. Garland, A.L. Glick, A. Hirschman, W. Huggins, E.W. Kelleher, T. Kimberly, K. Koncewicz, M.C. Korn, L. Long, D.S. MacMillan, A. Meiman, T.A. Morris, E. Ortiz, M.C. Persinger, H. Puciata, M.T. Strong, D.E. Tichy, S. Tomlinson, 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 the simulation program. 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 four students every four weeks. Codirectors: K.J. Jubanyik, J.E. Sather

**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. K. Goldflam

**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*), D.E. Brash (*Therapeutic Radiology*), W.R. Breg (*Emeritus*), 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*), G. Roeder (*Molecular, Cellular & Developmental Biology*), M.R. Seashore, G.S. Shadel (*Pathology*), C.W. Slayman, S. Somlo (*Medicine*), M.W. State (*Child Study Center*), J.B. Sweasy (*Therapeutic Radiology*), P.J. Tattersall (*Laboratory Medicine*), S.M. Weissman, T. Xu, H. Zhao (*Public Health*)

**Associate Professors** M. Brueckner (*Pediatrics*), J.H. Cho (*Medicine*), 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.-H. Park, S.D. Weatherbee, A. Xiao, H.Z. Zhang

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

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

**Associate Research Scientists** L.M. Boyden, A. Canaan, J. Cheng, M. Choi, P.D. Drane, S. Guo, W. Ji, D. Li, J. Lian, Z. Lian, J.F. Lopez-Giraldez, J. Lu, M. Lu, Y. Lu, D.N. Nguyen, J. Overton, X. Pan, J.C. Pastor Pareja, L.M. Petti, P.M. Rabinovich, M.D. Seay, A.M. Szekely, J. Zhang, Y. 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, M.R. Koelle, and staff

[GENE 645a/BIS 645a, **Statistical Methods in Human Genetics** Offered every other year]

**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. Prerequisite: undergraduate-level cell biology, molecular biology, and genetics. I.-H. Park 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** Offered every other year]

**GENE 734a/MB&B 734a/MBIO 734a/PATH 634a, Molecular Biology of Animal Viruses** Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. R. Means, D.C. DiMaio, I.G. Miller, and staff

**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, A.J. Koleske, 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, 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, L. Cooley, S. Holley, T. Nelson, Z. Sun, S.D. Weatherbee

**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 913a/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.

## 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*), M. Espinosa

**Lecturers** R.H. Epstein, S.D. Romano

Yale College and Graduate School courses open to medical students:

**HSHM 204a/AMST 163a/EVST 120a/HIST 120a, Introduction to Environmental History** Ways in which people have shaped and been shaped by the changing environments of North America from precolonial times to the present. Migration of species and trade in commodities; contrasting uses of land; the impact of industry and markets; the rise of modern conservation and environmental movements; the development of public policy; the global search for resources by the United States. P. Sabin

**HSHM 206a/AMST 176a/EVST 206a/HIST 144a/HUMS 323a, 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 211b/G&G 211b/HIST 143b, Catastrophe and the Earth Sciences since 1850** A history of the geological, atmospheric, and environmental sciences, with a focus on predictions of global catastrophe. Topics range from headline catastrophes such as global warming, ozone depletion, and nuclear winter to historical debates about the age of the Earth, the nature of fossils, and the management of natural resources. Tensions between science and religion; the role of science in government; environmental economics; the politics of prediction, modeling, and incomplete evidence. W. Rankin

**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 413a/HIST 145Ja, Medical Imaging since 1895** The development of X rays, CT, MRI, ultrasound, and nuclear medicine. Their impact on diagnostic medicine, the legal system, and culture (high and low). Topics include the nature of invention—how new technologies appear; the economics of medicine in relation to technology; the role of warfare in invention; and the impact of these technologies on the arts. B. Kevles

**HSHM 422a/HIST 140Ja, Cartography, Territory, and Identity** Exploration of how maps shape assumptions about territory, land, sovereignty, and identity. The relationship between scientific cartography and conquest, the geography of statecraft, religious cartographies, encounters between Western and non-Western cultures, and reactions to cartographic objectivity. Students make their own maps. No previous experience in cartography or graphic design required. W. Rankin

**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 448b/HIST 151Jb/WGSS 448b, American Medicine and the Cold War** The social, cultural, and political history of American medicine from 1945 to 1960. The defeat of national health insurance; racism in health care; patient activism; the role of gender in defining medical professionalism and family health; the rise of atomic medicine; McCarthyism in medicine; and the polio vaccine trials and the making of science journalism. N. Rogers

**HSHM 455a/HIST 148Ja/HUMS 312a/WGSS 460a, History of the Body: Science, Medicine, and the Arts** The body as a site of knowledge in science, medicine, and the arts from antiquity to the present. The history of anatomy from Leonardo to the Body Worlds exhibits; the artificial body from the cyborg to cosmetic surgery; the gendering of natural knowledge. P. Bertucci, C. Thompson

**HSHM 459b/HIST 159Jb/HUMS 317b, Spies, Secrets, and Science** Relationships 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 of the state; the history of patents and copyright laws; and scientists as spies. P. Bertucci

**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. P. Bertucci

**HSHM 676a/HIST 938a/LAW 20332, 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 701a/AMST 878a/HIST 930a, Problems in the History of Medicine and Public Health** An examination of the variety of approaches to the social, cultural, and intellectual history of medicine, focusing on the United States. Reading and discussion of the recent scholarly literature on medical cultures, public health, and illness experiences from the early national period to the present. Topics include the role of gender, class, ethnicity, race, religion, and region in the experience of health care and sickness and in the construction of medical knowledge; the interplay between lay and professional understandings of the body; the role of the marketplace in shaping professional identities and patient expectations; citizenship, nationalism, and imperialism; and the visual cultures of medicine. 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. W. Rankin

**HSHM 707a/EAST 525a/EMD 588a/HIST 902a, Impact of Epidemic Disease in Context: Focus on Asia** The course brings historical, geopolitical, medical, and public health perspectives to bear on the study of specific epidemics, with a focus on Asia. Case studies include major epidemics such as cholera in the Philippines and plague in Manchuria in the early twentieth century, the story of Japan's biological warfare Unit 731 in World War II, recurrent influenza pandemics, and more recently, Nipah virus outbreaks in Malaysia, SARS in China, and pneumonic plague in Gujarat, India. W. Summers

**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 713a/HIST 899a, Geography and History** A research seminar focused on methodological questions of geography and geographic analysis in historical scholarship. We consider approaches ranging from the Annales School of the early twentieth century to contemporary research in environmental history, history of science, urban history, and more. We also explore interdisciplinary work in social theory, historical geography, and anthropology and grapple with the promise (and drawbacks) of GIS. Students may write their research papers on any time period or geographic region, and no previous experience with geography or GIS is necessary. Undergraduates are admitted with permission. W. Rankin

**HSHM 716b/HIST 900b, 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 736b/HIST 943b/WGSS 730b, Health Politics, Body Politics** A reading seminar on struggles to control, pathologize, and normalize human bodies, with a particular focus on science, medicine, and the state, both in North America and in a broader global health context. Topics include colonialism and prostitution; repression and regulation of birth control; the teaching of sex education; the public celebration and denial of sexual difference; politics of sexually transmitted diseases, including HIV/AIDS; public health and legal efforts to define and restrict abortion; the pathologizing and identity politics of transgendered people; and the development and regulation of artificial insemination and other methods of reproductive technology. N. Rogers

**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, D.R. Goldstein (*Medicine*), S. Kaech, E.R. Meffre, W.D. Shlomchik (*Medicine*), B. Su

**Assistant Professors** J.P. Pereira, C.V. Rothlin

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

**Associate Research Scientists** V. Ablamunits, T.O. Bondar, M. Ciubotaru, P.R. Clark, W. Cui, H. Huang, N. Iijima, W. Ip, H. Kanda, N.C. Kirkiles-Smith, Y. Kobayashi, E.B. Kopp, Y. Kumamoto, R.M. Leonhardt, T.D. Manes, W. O'Connor, Y. Okabe, A. Rongvaux, D. Schenten, R.B. Seth, T. Willinger, B. Yatsula, T. Yi, L. Zenewicz, G. Zhu, Y. 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. A. Iwasaki, P. Cresswell, K. Herold, S. Kaech, R.M. Medzhitov, E.R. Meffre, J.P. Pereira, C.V. Rothlin, 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 staff

**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 538a, Lymphoid Organ Development** This series of seminars covers the cellular dynamics and mechanisms controlling the development and maintenance of secondary lymphoid organs, and the interplay between immune cells and stromal niches during the course of immune responses. The course also covers key aspects of the development and function of tertiary lymphoid structures. J.P. Pereira, A.M. Haberman, N.H. Ruddle

**IBIO 539b, Inflammatory Diseases** This seminar begins with a review of the processes of mechanisms of acute and chronic inflammation and then focuses on a critical reading of the current scientific literature regarding the role of inflammatory mechanisms of tissue injury and repair in a select number of diseases such as inflammatory bowel disease, rheumatoid arthritis, atherosclerosis, vasculitis, obesity and the metabolic syndrome, asthma, and chronic obstructive pulmonary disease. Registration limited to advanced immunobiology graduate students except by permission of the instructors. J.S. Pober, J.R. Bender, C.V. Rothlin

**IBIO 600a, Introduction to Research** Introduction to the research interests of the faculty. Required for all first-year Immunology/BBS students. Pass/Fail. A.L. Bothwell and staff

**IBIO 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 and training grant-funded postdocs. Pass/Fail. A.L. Bothwell and staff

**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 Oct. 1–Dec 15. (1 course credit; minimum of 20 hours/week). Required for all first-year Immunology/BBS students. A.L. Bothwell and staff

**IBIO 612b, Research Rotation 2** See description under IBIO 611a. Course dates are Jan. 7–March 15. A.L. Bothwell and staff

**IBIO 613b, Research Rotation 3** See description under IBIO 611a. Course dates are March 16–May 31. A.L. Bothwell and staff

## INTERNAL MEDICINE

Office: Boardman 110, 203.785.4119

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

**Professors** R.J. Alpern, F. Altice, V.A. Andriole (*Emeritus*), P.S. Aronson, P.W. Askenase, W.P. Batsford, 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, G.N. Burrow (*Emeritus*), H.S. Cabin, C. Canessa (*Cellular & Molecular Physiology*), L.G. Cantley, L. Chen (*Immunobiology*), M.W. Cleman, L.S. Cohen (*Emeritus*), D.L. Coleman (*Emeritus*), J.P. Concato, H.O. Conn (*Emeritus*), 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, R.S. Galvin (*Adjunct*), 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*), H.S. Hochster, N.J. Holbrook (*Adjunct*), 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, M.J. Kozal, H.M. Krumholz, M. Kryger, 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, P.A. Preisig, D.D. Proctor, V.J. Quagliarello, A. Rastegar, C. Redlich, H.M. Rinder (*Laboratory Medicine*), S.H. Rosenbaum (*Anesthesiology*), M.B. Russi, W.C. Sessa (*Pharmacology*), R.S. Sherwin, G.I. Shulman, M. Simons, A.J. Sinusas, B.R. Smith (*Laboratory Medicine*), S. Somlo, R. Soufer, H.M. Spiro (*Emeritus*), R.L. Steinbrook (*Adjunct*), M. Strazzabosco (*Adjunct*), M. Sznol, L. Tanoue, M.E. Tinetti, E. Ullu, R.J. Vender, F.J. Wackers (*Emeritus*), 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. Angoff, H.R. Aslanian, J.M. Baehring (*Neurology*), C. Ben Mamoun, G.K. Berland, D.C. Biemesderfer, J.S. Bogan, D.M. Bravata (*Adjunct*), J. Brennan, U.C. Brewster, H. Cain, J.H. Cho, C. Chung, G.L. Chupp, G.W. Cline, H. Cohen (*Adjunct*), L.E. Cohn, S.T. Crowley, M.P. DiGiovanna, 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, L.N. Harris (*Adjunct*), S.G. Haskell, J.B. Henrich, J. Hwa, D. Jain (*Pathology*), E.A. Jonas, I. Kang, B.I. Kazmierczak, J.E. Kerstetter (*Adjunct*), H. Kluger, A.I. Ko (*Epidemiology*), 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*), R.A. Marottoli, K.A. Martin, R.L. McNamara, T.P. Meehan (*Adjunct*), E.R. Meffre (*Immunobiology*), W.Z. Mehal, J.P. Moriarty, A.B. Nagar, C.R. Parikh, A.J. Peixoto, K.F. Petersen, S.E. Pfau, M.A. Pisani, P.M. Rabinowitz, A.B. Reisman, M.S. Remetz, C. Rochester, M.G. Rose,

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, U. Siddiqui (*Adjunct*), M.D. Siegel, A.N. Sofair, L. Solomon, J. Sosa (*Surgery*), L. Sugeng, R. Sutton, O.A. Taiwo, C.A. Thompson, T.K. Trow, M.S. Villanueva, L.M. Walke, H.K. Yaggi

**Assistant Professors** A.K. Abu-Alfa (*Adjunct*), K.M. Akgun, A. Annamalai (*Psychiatry*), D.E. Antin-Ozerkis, W.S. Asch, L.A. Barakat, M.R. Basso (*Adjunct*), L. Bellumkonda, I.M. Birnbaum (*Adjunct*), A.J. Borad, G.R. Brescia, R.S. Brienza, D. Brissette, R.D. Bruce, C.M. Brunet, B.C. Cambi, S.S. Cha (*Adjunct*), H. Chao, H.H. Chao, S. Chatterjee, S.I. Chaudhry, J. Chen, A. Chiang, H.J. Chun, G.G. Chung, J.F. Clancy, S. Coca, S. Cole, G. Connors, D.J. Curran, J.P. Curtis, N.K. Dahl, C.S. Dela Cruz, H.A. Deshpande, B.R. Doolittle, L. Dugdale, D.W. Dunne, S.C. Eisenbarth (*Laboratory Medicine*), P.J. Ellis, W.H. Fares, M.K. Fikrig, R. Fogerty, C.A. Fragoso, J.S. Francis, R.L. Garcia, A. Garino, D.S. Geller, R. Gonzalez-Coloso, B.E. Gould Rothberg, D. Greif, M. Gulati, C.G. Gunderson, J. Guo, S. Halene, F. Hasan, S.F. Hay, J. Herrin (*Adjunct*), E.L. Herzog, R.I. Herzog, D.L. Hill, 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, Y. Iwakiri, D.L. Jacoby, F. Jadbabaie, S.S. Jakab, S. Jeffery (*Adjunct*), G.Y. Jenq, S. Jin, M. Juthani-Mehta, M. Kang, A.K. Karihaloo, S.S. Kashaf, R.G. Kibbey, N. Kim, J. Koff, R. Koski (*Adjunct*), N. Krishnan, C. Kumar, P. Kumar, G.J. L'Italien (*Adjunct*), R.E. Laff, A.I. Lee, J. Li, L.E. Lincoln, B.C. Lupsa, U. Makris (*Adjunct*), B.J. Malm, P.S. Marshall, R.A. Martinello, J. Mathur, R.J. McCrimmon (*Adjunct*), K.C. McKenzie, E.C. McNay (*Adjunct*), J.L. Meadows, C.I. Mena, G.C. Michaud, T.A. Molisse, D. Morgensztern, V.A. Morris, N.D. Nanda, S. Nicoli, M. Nunez-Smith, I. Oikonomou, P. Oray-Schrom, N.A. Podoltsev, K. Politi, J.D. Possick, P. Protiva, J.T. Puchalski, Y. Qyang, A.M. Reed, R.A. Rienzo, J.R. Rosenbaum, J.S. Ross, C. Ruhrberg (*Adjunct*), C.J. Sakr (*Adjunct*), M. Sanchez, L. Sanders, T. Sanft, C.B. Sankey, J.R. Satchell-Jones, R. Scandrett, S.M. Schnittman (*Adjunct*), A.R. Schwartz, S. Sheno, 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. Tetrault, T.A. Thetford, D.G. Tobin, J.N. Van Houten, L.S. Vasquez, E. Wang, Y. Wang (*Adjunct*), L.M. Whitman, D.M. Windish, C. Won, E.Y. Wong, R. Worthington (*Adjunct*)

**Instructors** A.M. Ahasic, W.C. Becker, R. Belfort-Deaguiar, S.S. Chang, B.T. Clark, J. Donroe, S. Dredar, K.N. Grieco, N. Hajizadeh, J.J. Heavner, F.I. Hsu, J.K. Jantz, A.M. Jastreboff, G. Kayingo, P. Mannam, E.P. Marin, M. Murakami, M. Panico, C. Partovian, T. Rabin, J. M. Ruszkowski, J. Schwartz, A. Seth, A.C. Shirali, S. Soares, E. Stilp, S. Tandon, D. Tirziu, L. Tobias, J. Turner, M.T. Vest, C.J. Ward, K.P. White, C. Wilson, J. Yu, X. Zhao

**Senior Research Scientists** H.G. Allore, M. Ananthanarayanan, H.J. Binder, R.J. Groszmann, P.W. Heald (*Dermatology*), R.A. Matthay, R.R. Montgomery, 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 S. Cai, A.K. Chakraborty, O. Chan, E. Drye, L. Han, L. Leng, T.E. Murphy, S. Narasimhan, E.C. Thrower, P.H. Van Ness, H. Velazquez, C.M. Viscoli, Z. Zhuang

**Associate Research Scientists** K.N. Alavian, M. Aslan, Y. Cai, W. Cho, J. Choi, R. Cong, M.D. Corral, C.J. Cutter, N. De Rekeneire, Y. Deng, K. Dong, H.A. Doyle, X. Du, M. Duggal, X. Fan, J.P. Ferguson, R. Fiorotto, C.A. Flannery, H.G. Foellmer, A. Gallagher, N.N. Gandotra, L.M. Grosso, M.T. Guerra, W.K. Gurr, M. Hao, C.H. He, M. Hedl, K. Hieftje, C. Hu, Y. Hu, Y. Huang, E.B. Jackson, I. Jankovic, Z. Jiang, L.B. Jilaveanu, R. Ju, M. J. Jurczak, H. Kim, K. Kim, F. Knaut, T.C. Kyriakides, S. Lal, A.A. Lanahan, B.B. Larrivee, S.H. Lee, R.S. Lehman, G. Li, H. Li, M. Li, K.J. Lipska, Q. Liu, B. Ma, M. Ma, C.M. Macica, R. Mamillapalli, A. Marlier, K. Mattocks, S. Mohanty, G. Neelakanta, L. Nie, M. Ouyang, X. Ouyang, S.A. Paranjape, S. Punjani, D. Qi, F. Qian, L. Qin (*Public Health*), V.S. Ramgolam, M. Razavian, J.M. Rhodes, H. Shen, M. Shin, R. Singh, M.H. Stowe, H. Sultana, B. Sun, R.K. Sundaram, S. Sutton, B. Szepietowska, N. Tai, L. Tang, J.P. Tate, T.M. Thompson, R.B. Thomson, X. Tian, D.L. Vesely, M.V. Volkova, W.E. Walker, P. Wang, Y. Wu, B. Xu, M. Yang, T. Yarovinsky, J. Zhang, P. Zhang, W. Zhang, X. Zhang, Y. Zhou

**Clinical Professors** J. Belsky, J.M. Boyce, M.H. Brand, E. Citkowitz, K.L. Cohen, N. Dainiak, J.W. Dobbins, L.R. Farber, F.O. Finkelstein, D.S. Fischer, M.H. Floch, 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.N. Bobrow, S.T. Bogardus, S.D. Brenner, G.K. Buller, M.M. Burg, J.P. Cleary, E.L. Cooney, W.B. Crede, C.A. Disabatino, K.J. Dobuler, A.B. Douglass, S.M. Epstein, E.L. Etkind, R.A. Gelfand, J. Gerber, M.P. Golden, A.V. Granata, J.M. Grant, 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, A.L. Levy, W.S. Long, W.B. Lundberg, R.W. Lyons, C.A. Manthous, 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.L. Renda, N.J. Rennert, J.H. Revkin, J.R. Sabetta, M.L. Schwartz, A.L. Silber, M.F. Simms, D.N. 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, D. Acampora, A.J. Accomando, E.D. Agin, J. Alexander, R. Alfano-Kostenka, S. Angelo, C.A. Arnold, S. Asefaw, P. Asiedu, P. Bahuguna, G.V. Bedarida, A. Bedford, A.M. Bekui, L. Berman, D.J. Berube, M.L. Blitzer, J.M. Blumberg, N.A. Bonheim, B. Boyd, T. Braverman, L. Bridger, J.A. Brier, D. Brock, A.R. Cadariu, C.A. Caldwell, E.M. Carlson, S.B. Chabria, B.J. Chan, V.A. Chang, D.M. Chess, L.M. Chou, J.J. Chuong, M.I. Chustecki, M.A. Ciampi, P.R. Cimino, P.K. Clarke, G.M. Cohen, M. Cohen, R.B. Cooper, J.A. Cosgriff, A.J. Cusano, S.B. D’Cunha, M.A. Demetrius, A.J. Dhond, 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, R.S. Folman, M.J. Franco, L.A. Freed, J.H. Fullerton, T.M. Fynan, J.E. Gage, L.S.

Galante, P.N. Geimer, S. Geller, R.S. Generoso, B.J. Gerstenhaber, A.E. Ghantous, P. Gibbs, R.D. Gibbs, H.C. Gift, P.A. Goldberg, G. Goldenberg, A.B. Gorelick, D.I. Grayer, M.S. Grogan, E.M. Grubman, M.S. Guoth, T.K. Gupta, M.S. Habboosh, 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, D. Hollister, X. Hong, L.J. Huang, K.J. Hunt, R.G. Huntley, 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, M.E. Katz, D. Kaufman, R.E. Kaufman, M.A. Kazakoff, G. Kelley, C.R. Kramer, H.M. Kramer, M.L. Kraus, S.H. Kunkes, S.P. Lagarde, S. Lam, R.A. Lanzi, 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, J.W. O'Brien, S.P. O'Mahony, G. Oliver, B.R. Olson, J.A. Orell, J.R. Ouellette, W.T. Panullo, L.A. Panzini, W.N. Pearson, B. Peck, M. Perrotti, D. Phanumas, S.E. Possick, D.T. Price, B.M. Priest, E. Prior, P.H. Pronovost, T.E. Quan, H.L. Quentzel, H.H. Reinhart, C.R. Rethy, N.I. Riegler, B. Ringstad, J. Rivera, D. Rocklin, D. Roer, P.R. Rogol, S.D. Rossner, M.C. Rubinstein, 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.C. Swirsky, G.F. Tansino, B.S. Thomas, P. Tietjen, M.K. Tighe, J. Toksoy, J. Tomanelli, J.E. Topal, P.C. Tortora, K.J. Twhigh, J.G. Uberti, H.D. Uderman, A.S. Ulku, R. Umashanker, S. Urciuoli, S. Varano, G.S. Varbaro, M.D. Virata, H. Ward, W.S. Warren, K.E. Webb, R.B. Wein, D.M. Wolfsohn, A. Wormser, J. Yu, M. Zain, C.S. Zalis, F. Zarcu-Power, J.S. Zaretsky, J.S. Zesk, F.R. Zwas

**Clinical Instructors** O.T. Akande, L. Alaparthy, S.K. Alavi, D. Alcantara-Cadillo, R. Alfano-Kostenka, O. Aliyu, S.A. Alston, L. Ameti, S.J. Angelo, S.K. Apgar, 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, K.E. Calia, L.L. Calo, A.W. Camp, H. Carey, D. Casablanca (*Nursing*), J.P. Chandler, J.J. Chang, E.H. Chanko, C. Chen, J.M. Chua-Reyes, T.M. Clarke, D.L. Copen, W.L. Cushing, L.J. Cuzzone, S.A. D'Souza, M.L. Dam, A.R. Datunashvili, A. DeLisle, J.D. Demayo, S. Dey, P. Dhawan, A.J. Dhond, D.H. Dumont, A.M. Dunn, C.M. Edelmann, C.M. Elrington, D.E. Evans, S.J. Farber, W.J. Farrell, M. Franco Vega, E.H. Francois, E. Frawley, G. Gangu, M.W. Garber, H.B. Garfinkel, V. Gassman, T. Genese, C.E. Glass, M. Gupta, W.B. Hale, I.E. Hall, C.M. Hamill, E.J. Hamilton, J. Hauser, D.G. Heacock, J.C. Hlawitschka, S.M. Hoq, J. Huang, S.C. Huen, R. Johnson, K.A. Kaplove, D.L. Katz, J.D. Kenkare, R. Khodzinsky, J. Kleinstein, F. Knauf, L. Knoll, A. Kohli-Pamnani, L. Kozicz, A.A. Kramer, E.D. Kulaga, M.E. Kulaga, J.M. Lai, F.A. Loria, L. Magras, A. Margaryan, E.P. Marin, K. McArthur, R. McLeod-Labissiere, C.J. Michos, J.D. Miller, R.L. Miller, B.P. Mobo, D. Moll, E. Montesino, R.F. Morrison, A.S. Murray, K.G. Nair, K. Nakashima,

G.J. Napolitano, E.R. Nash, S. Nawaz, S.N. Novack, C. Nwangwu, J. Oen-Hsiao, E. Ofori-Mante, R. Ohene-Adjei, K. Olson, M. Orias, J.R. Orlinick, O.I. Otolorin, W.W. Paramanathan, B. Patel, T.E. Pellechi, A.E. Petersen, J.F. Pezzimenti, K.C. Pham, L. Pham, L.J. Phillips, P.T. Porello, H.R. Pun, N.G. Ragovis, S. Raissi, R.F. Ramos, D.C. Ranani, M. Rho, N. Rizk, A.J. Rodriguez, R.R. Rohatsch, S.E. Rosener, M. Rosenthal, S.T. Rottinghaus, K.D. Sabbath, 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, S. Sharma, R.K. Shaw, J.F. Shea, L.E. Shedd, N. Sheikh, B.V. Sheynberg, G.P. Shields, B.A. Skudlarska, A. Smith, G. Spivack, D.C. Stair, R.H. Stember, R.P. Streeter, K.P. Swan, R. Tafuri, A. Taneja, A. Tarabar, J.N. Thompson, V.B. Tola, G.E. Tratt, A. Unzunpinar, J.S. Urbanetti, D.J. Van Rhijn, I. Vashist, J.S. Waldman, O.G. Weis, S.C. Widman, D.H. Witt, B. Yeboah, A. Yee, R.A. Zlotoff, J.J. Zumpano

**Lecturers** O. Abreu-Lanfranco, D. Acampora, B. Adelsberg, C. Aguilar-Lopez, A. Alfiri, M. Amuchastegui, S.K. Apgar, A. Apoltan, M. Barnes, T. Boron, J. Carroll, M. Chomiak, M.B. Courtney, P.C. Cremer, O.M. Deshpande, R. Desouza, P.B. Dieffenbach, D.L. Dobkin, P. Dogbey, C.T. Erb, M. Evans, G.E. Ferrucci, J. Gobin, J. Goetz (*Nursing*), M. Gupta, M.O. Guzman, N. Hajizadeh, R. Hao, K.T. Hartmann, R. Henry, J. Honig, P.R. Huvell, C.N. Ionescu, S. Ionescu, D. Kearney, K.G. Kett, J. Lai, J.A. Leach, M.S. Lee, R. Leventhal, P.G. Levinson, G. Lucas, P. Maher, K.T. Maloney, V. Marer, J. Marino, A.J. McCabe, S. McGarvey, D. McGowan, N. Merchant, R. Nadkarni, M. Oen-Hsiao, O.O. Olusesi, J.K. Pacini, 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, A.J. Stannard, L. Street, L. Sussman, Y. Titko, R.N. Tuktamyshov, L.Q. Vo, Y. Wang, R. Weissberger, B. Wilkinson, S. Williams, J. Yerzak, M. Yoo

**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 sees inpatient consultations and participates in the endocrine clinics and regularly scheduled metabolism–endocrine conferences. One student every two or 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 four weeks. Director: U.C. Brewster

**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, echocardiography, 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 two students 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** Students serve as subinterns on the floors of one of the following hospitals: Yale-New Haven Hospital; VA Connecticut Healthcare System, West Haven; or Waterbury Hospital, Waterbury. The students function in a role that allows for a high degree of involvement in patient care and permits autonomy in arriving at individual management plans, yet with adequate supervision at all times. Students function either as a pair in place of a first-year resident (intern) or, together with an intern in the event that no other student is available for that rotation. The subinterns admit patients to the medical service under the close supervision of an upper-level resident in charge of the service and the attending physician. In addition to daily work rounds and teaching-attending rounds, subinterns participate in Intern Morning Report once a week and at other departmental teaching conferences. The purpose of the course is to provide advanced undergraduate education in inpatient internal medicine beyond that received in the third-year clerkship. The rotation provides the opportunity for students to increase their overall knowledge of and experience with a wide variety of disease processes. In addition, the experience provides the subintern with the opportunity to build upon skills of data gathering acquired during the third-year clerkship, to develop the ability to analyze complex data in logical fashion, and ultimately, based on these analyses, to be able to arrive at clinical decisions and to set

priorities. By following a larger number of patients more closely than during third-year clerkships, students increase their clinical acumen, improve their technical skills, and develop an appropriate level of clinical confidence. The setting allows the development of an increased sense of patient care responsibility from admission to discharge of the patient. Offered throughout the year for periods of four weeks each, to students who have completed their required medical clerkships. 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 (1) to learn the differential diagnosis and treatment of respiratory disorders, (2) to learn to interpret pulmonary function tests, and (3) to learn 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 night 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. Maximum of 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 to follow patients 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. 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 a least four assessments (a self-assessment, a colleague assessment, and two patient assessments). In addition to shadowing individual chaplains, students attend departmental morning reports, staff meetings, and at least one 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 and one medical resident, performs preoperative 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 advance statistics and research methods, as

well as several sessions on health policy, social and behavioral influences on health, and community-based research. The spring term contains remaining topics in research methods and several sessions on health management. Summer sessions are held four times a week (ten hours); fall sessions are held three times a week (six and one-half hours); spring sessions are held two times a week (five hours). Permission of director required. Director: H.M. Krumholz

### *Hospital of Saint Raphael (HSR) Electives*

**Internal Medicine 203, Subinternship in Internal Medicine, HSR** 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, HSR** 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, HSR** 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, HSR** 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. Unzunpinar

**Internal Medicine 361, Internal Medicine Elective for M.D./Ph.D. Students, HSR** 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 for 2012–2013. 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: 100 Church Street South, Suite 100, 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 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 23–August 3, 2012. 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 9–20, 2012. H.J. Binder

**IMED 655b, Writing Your First 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 either a K-23 or a K-08 grant). 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*), 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.-L. 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** A.D. D'Souza, L. Devine, P. Gu, C. Keeler, A. Khalil, 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** S.R. Gray, 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.-L. 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.-L. Landry, and associates

**LMED 131, Laboratory Medicine Elective** The Department of Laboratory Medicine offers a two- or four-week elective with 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, attendings, 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.-L. Landry

**LMED 619, Laboratory Medicine and Surgical Pathology Elective** The Departments of Laboratory Medicine and Pathology offer a four-week elective that combines Laboratory Medicine and Surgical Pathology. In Laboratory Medicine, students rotate through the clinical laboratories, including Blood Bank, Therapeutic Apheresis, Clinical Chemistry, Toxicology, Hematology and Coagulation, Flow Cytometry, Immunology, Molecular Diagnostics, Microbiology, and Virology. The students work closely with residents, fellows, attendings, and laboratory staff; work up clinical cases under supervision; and attend conferences and didactic sessions. The goals 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.

In Surgical Pathology, students rotate through specialty and general anatomic surgical pathology, frozen section, hematopathology, renal and electron microscopy, molecular diagnostics, cytology, and autopsy. The students work with residents, fellows, attendings, and laboratory staff; participate in workup of clinical cases under supervision; and attend tumor boards and other clinical conferences and didactic sessions. The goals are to understand the basic principles of diagnostic anatomic pathology and its role in clinical medicine. This elective is appropriate for students considering a career in laboratory medicine and/or pathology, but also for all students who will use laboratory and pathology tests in their careers.

One or two students per four-week session. M.-L. Landry, 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.-L. 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*), J.D. MacMicking, W.H. Mothes, R. Sutton (*Medicine*)

**Assistant Professors** A. Goodman, P. Kumar (*Medicine*), B. Lindenbach

**Associate Research Scientists** I. Derre, S.S. Ivanov, B. Kim, M. D. Lara-Tejero, E. Lee, S. Lee, M.D. Lefebvre, 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 670a,b, Laboratory Rotation** 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 700a, Seminal Papers on the Foundations of Modern Microbiology** A required course for Microbiology first- and second-year students; not for credit. The course is offered every other year, alternating with MBIO 703a, so that it can be taken once during each student's tenure in the program. Students present and discuss papers describing fundamental discoveries in areas related to microbiology. The goal is to familiarize students with the process of scientific discovery, and with the history of major developments in the field. Topics include important discoveries involving major human pathogens, fundamental processes in molecular biology, and the development of technology that has a major impact on current biomedical research. P.J. Tattersall

**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 703a, Evasion of Host Defenses by Viruses, Bacteria, and Eukaryotic Parasites** Offered every other year]

**MBIO 734a/GENE 734a/MB&B 734a/PATH 634a, Molecular Biology of Animal Viruses** Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. R. Means, D.C. DiMaio, I.G. Miller, and staff

## MOLECULAR BIOPHYSICS AND BIOCHEMISTRY

Offices: JWG 304, 203.432.2077; SHM C106, 203.785.4246  
www.mbb.yale.edu

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

**Assistant Professors** R. Baxter (*Chemistry*), C. Schlieker, C.V. Sindelar, C.J. Wilson (*Engineering & Applied Science*)

**Senior Research Scientist** C.M. Joyce

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

**Associate Research Scientists** A. Alexandrov, S. Balasubramanian, I.C. Berke, C. Bruce, W. Cao, D.E. Cazalla, C. Cheng, C.M. Colangelo, J. Daley, J.H. Davis, J.I. Elliott, M. Englert, D.A. Hiller, C.A. Innis, M.N. Islam, J. Ko, Y. Kwon, T.T. Lam, Y. Li, I. Lomakin, P. O'Donoghue, D. Ostapenko, R. Park, G. Pimienta-Rosales, J.S. Rozowsky, D. Saro, K.J. Smith, G. Wang, S. Xia, X. Yan, H. Yang, K. Zhang, W. Zheng, 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, M.W. Hochstrasser, V. Horsley, A.J. Koleske, C. Schlieker, 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. E. Dufresne

**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. A.J. Koleske, M.W. Hochstrasser, 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. L.J. Regan, E. Dufresne, T. Emonet, P. Forscher, S. Mochrie

**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. T. Biederer, M.R. Koelle

**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. P. Sung, C. Schlieker

**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, E.M. De La Cruz, T.D. Pollard, and staff

[**MB&B 635a<sup>U</sup>/ENAS 518a, Mathematical Methods in Biophysics**]

**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 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. A.D. Miranker, D.M. Engelman, C.V. Sindelar, T.A. Steitz

[MB&B 722b3, **Optical Spectroscopy of Biomolecules**]

**MB&B 723a2, 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

**MB&B 734a/GENE 734a/MBIO 734a/PATH 734a, Molecular Biology of Animal Viruses** Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. R. Means, D.C. DiMaio, I.G. Miller, and staff

**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, A.J. Koleske, 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, P. Sung, and staff

**MB&B 750a2, Biological Membranes** Biological membranes and their resident proteins are essential for cellular function; yet comparatively little is known about their structure and dynamics. This class provides an introduction to the biochemistry and biophysics of lipids, lipid bilayers, and lipid-derived second messengers. In addition, structural as well as functional aspects of the different classes of membrane proteins are discussed along with an outline of experimental approaches used to achieve an understanding of membrane protein structure and function at a molecular level. Counts as 0.5 credit toward MB&B graduate course requirements. Prerequisite: biochemistry. D.M. Engelman, T. Biederer

**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 and staff

**MB&B 761b4, X-ray Crystallography Workshop** This laboratory course provides hands-on training in the practical aspects of macromolecular structure determination by X-ray crystallography. Topics include data collection, data reduction, phasing by multi-wavelength anomalous diffraction and molecular replacement, solvent flattening, non-crystallographic symmetry averaging, electron density interpretation, model building, structure refinement, and structure validation. The course includes training in the use of computer programs used to perform these calculations. Counts as 0.5 credit toward MB&B graduate course requirements. Prerequisites: MB&B 760b3 and a working exposure to the Unix operating system. Y. Xiong and staff

**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*), N. Daw (*Ophthalmology & Visual Science*), P. De Camilli (*Cell Biology*), N.C. deLanerolle (*Neurosurgery*), R.S. Duman (*Psychiatry*), J.E. Gelernter (*Psychiatry*), C.A. Greer (*Neurosurgery*), M. Gunel (*Neurosurgery*), T.L. Horvath (*Comparative Medicine*), J.D. Kocsis (*Neurology*), A.J. Koleske (*Molecular Biophysics & Biochemistry*), R.H. LaMotte (*Anesthesiology*), 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*), G.M. Shepherd, R. Sinha (*Psychiatry*), S.M. Strittmatter (*Neurology*), F.M. Vaccarino (*Child Study Center*), C.H. Van Dyck (*Psychiatry*), X.-J. Wang, S.G. Waxman (*Neurology*), Z. Zhou (*Ophthalmology & Visual Science*)

**Associate Professors** M. Alreja (*Psychiatry*), C.J. Bruce, M.C. Crair, S. Diano (*Obstetrics, Gynecology & Reproductive Sciences*), R.J. DiLeone (*Psychiatry*), J. Grutzendler (*Neurology*), E.A. Jonas (*Medicine*), M. Laubach, D. Lee, C. Li (*Psychiatry*), J.A. Mazer, D.S. Navaratnam (*Neurology*), V.A. Pieribone (*Cellular & Molecular Physiology*), M.L. Schwartz, N. Sestan, M.F. Yeckel

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

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

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

**Associate Research Scientists** J.I. Arellano, A.E. Ayoub, M. Cano-Vinas, C. Chiu, A. Duque, K. Hashimoto-Torii, Y.K. Imamura, H.J. Kang, S. Kim, X. Liu, Y. Morozov, T.M. Morse, B. Rash, R.N. Sachdev, H. Seo, M. Shibata, S. Shim, M. Torii, 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 devoted to neuroanatomy 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 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. Contact instructor for first class date and time. Offered every other year.]

**[NBIO 509b/NSCI 539b, Synaptic Organization of the Nervous System** An integrative introduction to the principles underlying the organization of neural systems. The focus is on the best-understood systems, including spinal cord, olfactory bulb, retina, cerebellum, thalamus, basal ganglia, and cerebral cortex. Students integrate experimental findings from anatomy, electrophysiology, and neuropharmacology with computational models at the cellular and circuit level to understand the neural basis of behavior. Offered every other year.]

**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 immunoperoxidase 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. C.A. Greer

**NBIO 513a/b/NSCI 513a/b, Second-Year Thesis Research** Required for all second-year Neuroscience graduate students. Both terms required.

**[NBIO 524a/NSCI 514a, Neurodevelopment and Neuropsychiatric Disorders** The course discusses basic concepts concerning the development of the central nervous system. We focus on the mechanisms that regulate progenitor cell proliferation, the acquisition of regional and cellular identity, neuronal migration, axon guidance, cell death, and activity-dependent mechanisms of neural circuit formation. Information drawn from these basic developmental mechanisms is used to discuss the newest emerging ideas about the pathogenesis of neuropsychiatric disorders such as autism, Tourette's syndrome, depression, and other affective disorders.]

**[NBIO 532b/NSCI 532b, 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. Offered every other year.]

**NBIO 535b/NSCI 535b, History of Modern Neuroscience** In this course we focus on the original breakthroughs that led to major lines of research being pursued today. Subjects include classic papers in the discoveries of DNA, action potential, synaptic transmission, growth factors, second messengers, neurotransmitters, Hebb synapse, dendrites, hippocampus and memory, cortical columns, REM sleep, neuroendocrine system, instrumental conditioning, reticular activating system, psychoactive drugs, computer modeling, and artificial intelligence. G.M. Shepherd

**[NBIO 570a, Cellular and Network Dynamics of Sensory and Motor Functions** Not offered in 2012–2013]

**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 582b/NSCI 582b/PHYS 582b/PSYC 582b, Introduction to Computational Neuroscience** The course is designed both for students in neuroscience and for those in other fields (physics, mathematics, and engineering) interested in understanding how the brain works from a systems/computational perspective. The lectures introduce basic concepts and models in the field. Topics covered include neural coding and decoding, biophysics of single neurons, kinetics and dynamics of synaptic transmission, balanced excitation and inhibition, feed-forward and feedback neural networks, central pattern generators, brain rhythms, orientation selectivity in visual cortex, selective attention, working memory, decision making and executive functions, memory and synaptic plasticity, and reinforcement learning and reward-based choice behavior. MATLAB/

Python-based homework and projects provide practical training in important computational methods. Open to undergraduates with permission of the instructor and the director of undergraduate studies.]

**NBIO 590a, Sensory Neuroethology: Bats and Owls, Electric Fish, and Beyond** In this course we review the neurophysiology of sensory processing with particular attention to animal behavior (ethology) and computation. We begin with the classic neuroethology literature and end with current work on neocortical circuits underlying sensory processing in higher vertebrates. This seminar course meets once per week to read and discuss (mostly) primary research papers selected and presented by the students. J.A. Mazer

[NBIO 595a/NSCI 595a, **Seminar in Visuomotor Neurophysiology** Not offered in 2012–2013]

[NBIO 596a/NSCI 596a, **Seminar in Neurophysiology of Decision Making** The course involves the critical reading and discussion of both historical and contemporary papers on the neurobiology of decision making. Although it covers some key papers in behavioral economics, reinforcement learning, and neuroeconomics, the major emphasis is on the studies directed at understanding the mechanisms of decision making using neurobiological methods, including single-neuron recording and functional neuroimaging.]

[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, 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. Offered every other year.]

**NBIO 602, 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. 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, D.M. Greer, 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, G. Buchanan, W.B. Cafferty, S.S. Chandra, C. Cotsapas, D.B. DiCapua, D.G. Machado, S. Novella, H.B. Nygaard, K.C. O'Connor, D. Richardson, C.S. Riley (*Adjunct*), J. Schindler, J.J. Sico, H. Tokuno, D.C. Volpe, F.S. Winstanley

**Instructors** K. Detyniecki, P. Farooque, H. Hamid, N. Rampal, J.B. Rosen, M.P. Sampat

**Senior Research Scientist** R.H. Mattson

**Research Scientists** J.A. Black, S.D. Dib-Hajj

**Associate Research Scientists** O. Abdul Samad, E.J. Arroyo, J. Bai, X. Cheng, N.R. Driesen (*Psychiatry*), M. Estacion, C.M.E. Freitas, E.C. Gunther, C. Han, J. Hyun, I. Kim, M. Kleinewietfeld, K. Lankford, K. Raddassi, M. Stagi, Y. Sun, A.M. Szekely (*Genetics*), H. Takahashi, A. Tan, D. Vasylyev, X. Wang, S.A. Wilson, H.P. Zaveri, W. Zhang, 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, 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, T.B. Toothaker

**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*), R.A. Bronen (*Diagnostic Radiology*), R.T. Constable (*Diagnostic Radiology*), N.C. deLanerolle, C.C. Duncan, C.A. Greer, M. Gunel, H.P. Hetherington, C.C. LaMotte, 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*), A. Bordey, K.R. Bulsara, V.L. Chiang, R.B. Duckrow (*Neurology*), M.H. Johnson (*Diagnostic Radiology*), J.T. King, J.W. Pan, K.P. Vives, A. Williamson (*Adjunct*)

**Assistant Professors** K.M. Abbed, I. Cavus (*Psychiatry*), M.L. DiLuna, T. Eid (*Laboratory Medicine*), D.J. Gaal (*Anesthesiology*), M.S. Laurans, A. Louvi, C.C. Matouk, J. Schindler (*Neurology*), H.B. Treloar (*Adjunct*)

**Research Scientist** K. Yasuno

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

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

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

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

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

**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, K.P. Vives

**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.A. Belfort (*Adjunct*), M.B. Bracken (*Epidemiology*), F.R. Braveman (*Anesthesiology*), G.N. Burrow (*Medicine*), J.A. Copel, T. D'Hooghe (*Adjunct*), A.J. Duleba (*Adjunct*), R.A. Ehrenkranz (*Pediatrics*), E.F. Funai (*Adjunct*), I. Gross (*Pediatrics*), J.P. Hayslett (*Medicine*), M. Hickey (*Adjunct*), R.B. Hochberg, T.L. Horvath (*Comparative Medicine*), E.I. Kohorn (*Emeritus*), C. Leranthe, 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, K.A. Yonkers (*Psychiatry*)

**Associate Professors** V.M. Abrahams, M. Azodi, M.O. Bahtiyar, V. Bhandari (*Pediatrics*), C.S. Buhimschi, I. Buhimschi, C. Bulletti (*Adjunct*), S. Diano, S.J. Fortunato (*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, N.S. Stachenfeld, N.L. Stanwood

**Assistant Professors** S. Abdel-Razeq, M.M. Abu-Khalaf (*Medicine*), R.S. Bercik, A.T. Dulay, E.A. Ereksion, A. Gariepy, M.K. Guess, C.S. Han, S.J. Huang, J. Johnson, P.H. Kodaman, M.D. Lalioti, H.S. Lipkind, W. Mak, J. Martin, R. Menon (*Adjunct*), D.A. Patel, C.M. Pettker, E. Ratner, A.K. Sfakianaki, J.A. Shaw, D. Silasi, X. Xu

**Instructors** K.L. Archabald, K.H. Campbell, M. Dick, L.F. Doherty, C.M. Duzyj, J.T. Hardy, A.N. Kallen, C.A. Laky, J. Luk, M.E. McCarthy, A.M. McPencow, U.A. Nayeri, R. Papanna, C.E. Richter, D. Roque, S. Torrealday, J. Varughese, S. Yip

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

**Research Scientists** Z. Hu, H.J. Kliman, G. Krikun

**Associate Research Scientists** A. Alvero, S. Bellone, H. Du, O.G. Kayisli, U.A. Kayisli, L. Lundsberg, M. Maduro, G. Yin

**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, 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, S.J. Fleischman, W.P. Fleming, K.C. Fletcher, D.P. Fox, M.E. Gillette, D. Gottschall, L.C. Hanlon, C.L. Kandall, B.D. Karsif, G.E. Kleinman, J.M. Knudson, 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.R. Huttler, D.R. Kopel, B.L. Maloy, C. Negron, H.J. Nusbaum, A. Ofer, E. Palluotto, A.T. Petruzzelli, C.E. Presnick, K.M. Rath, M.S. Reel, M.C. Rhee, A.M. Ross, 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, R. Wineland

**Lecturers** L. Browning (*Office of Medical Education*), F.P. Haseltine, N.R. Kellett (*Office of Medical Education*), A.E. Moss (*Office of Medical Education*), M. Reault (*Office of Medical Education*), J.A. Reinshagen (*Office of Medical Education*), J.D. Vulte (*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, Core Clerkship, 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, Core Clerkship, 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, Core Clerkship, or equivalent. One student every four weeks. Codirectors: E. Ratner, A.D. Santin

**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, Core Clerkship, 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 multiple, 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 (including continuing pregnancy, adoption, and elective abortion). 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 related topic of interest. During this rotation, it is necessary to travel back and forth between Yale-New Haven Hospital and the Summit Medical Centers at 3787 Main Street, Bridgeport, and 360 Market Street, Hartford. Directions at [www.summitcenters.com/summit-bridgeport/index.htm](http://www.summitcenters.com/summit-bridgeport/index.htm). One student every two or four weeks. Codirectors: N.L. Stanwood, A. Garipey, S.M. Richman

**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, Core Clerkship, 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** M. Coca-Prados (*Adjunct; Emeritus*), 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** R.A. Adelman, M.C. Crair (*Neurobiology*), 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, T.M. Grippo, J.E. Kempton, I. Kim, F. Levin, N. Loewen, P.C. Palmisano, D.J. Salchow, A. Shayegani

**Instructors** M. Dombrow, K. Kaplowitz, A.J. Parnes

**Associate Research Scientists** S. 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, S.B. Hersh, W.I. Larrison, E.S. Lim, J.F. Martone, A.W. Mead, A. Musto, A.D. Pearlstone, E.A. Petrelli, 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** J.D. Benevento, S.B. Castracane, T.H. Cronin, A.H. Guerrero, P.C. Guida, M.A. Howard, Y. Kostina-O'Neil, P.A. Marks, P.E. Masi, S.W. Meskin, J.J. Pasternack, R. Scartozzi, M.R. Shapiro, D.P. Shore, J.E. Silbert, A.P. Swan, S.C. Thornquist, E. 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*), W.O. Southwick (*Emeritus*)

**Associate Professors** J.N. Grauer, A.H. Haims (*Diagnostic Radiology*), M.J. Medvecky, B.G. Smith, P.G. Whang, J.J. Yue

**Assistant Professors** S.D. Dodds, V.P. Eswarakumar, P.C. Ivancic, M.P. Leslie, D.M. Lindsog, J.S. Reach, M. Sharkey, K.M. Sutton, C.R. Swigart

**Instructors** B.A. Flanagan, E.C. Gardner, A.B. Ndu, R. Ramachandran, J. Yau

**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, J.V. Lieponis, M.A. Luchini, P.P. Luchini, J.S. Marsh, 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, M.J. Kaplan, N.R. Kaplan, J.D. Kelley, J.J. Key, K.M. Kramer, 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, VA Connecticut Healthcare System, West Haven, or Hospital of St. Raphael. 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 and fourth clinical years, with prior clerkship rotation. Students are active members of one of the orthopaedic teaching teams (trauma, adult recon, spine, pediatrics, hand, and upper extremity). 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. One or two 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, N.J. Holbrook (*Medicine*), 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. West

**Associate Professors** M.W. Bosenberg (*Dermatology*), D. Braddock, S. Chang (*Laboratory Medicine*), S.E. Cowper (*Dermatology*), G.K. Haines, L. Hao, P. Hui, D. Jain, Y. Kluger, C.J. Ko (*Dermatology*), D. Kowalski, M.O. Krauthammer, T. Kyriakides, R. Lazova (*Dermatology*), R. Means, W. Min, G. Moeckel, 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, A.J. Huttner, B.C. Kenney, S. Khelifa, S.H. Kleinstein, A. Levi, K.A. Mitchell, D. Nguyen, M.M. Pinto, K. Politi (*Medicine*), Y. Qyang (*Medicine*), O. Saglam, C. Theoharis, N. Wajapeyee, M.L. Xu, Q. Yan

**Instructor** R.K. Virk

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

**Research Scientist** J. Li

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

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

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

**Assistant Clinical Professors** W. Carver, N.A. Gelfman, G.M. Golenwsky, R.N. Kranwinkel, A. Neto

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

**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 PH graduate students and MSTP students who are required to take PATH 100 for graduate credit. D.L. Rimm and staff

**PATH 616, Autopsy Pathology** Participation in the autopsy service with members of the house staff in Pathology. Participation in autopsies and the presentation and review of the clinical and anatomical findings of postmortem examinations with senior members of the department. Opportunities exist for correlation studies with previous biopsies, and clinical investigative and cell biologic techniques in relation to necropsy material. Six weeks minimum, full-time. Enrollment limited to two students. J.H. Sinar 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 surgical pathology and cytopathology. A daily diagnostic conference is scheduled for both residents and students. In addition to direct responsibilities in the handling of the cases, 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 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** Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. R. Means, D.C. DiMaio, I.G. Miller, and staff

**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

**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, W.R. Anyan (*Emeritus*), R.S. Baltimore, G.P. Beardsley, M. Cappello, S. Caprio, T.O. Carpenter, 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, 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*), M.R. Seashore (*Genetics*), E.D. Shapiro, B.A. Shaywitz, S.E. Shaywitz, R.N. Shiffman, B.R. Smith (*Laboratory Medicine*), N.S. Talner (*Emeritus*), W.V. Tamborlane, R. Touloukian (*Surgery*), F.R. Volkmar (*Child Study Center*), J. Woolston (*Child Study Center*)

**Associate Professors** N.A. Ameen, R.J. Antaya (*Dermatology*), L. Arnold, C.R. Baum, A. Bazyz-Asaad, K.A. Bechtel, V. Bhandari, M.J. Bizzarro, C.W. Bogue, C.K. Breuer (*Surgery*), M. Brueckner, L. Chen, E.R. Colson, K. Dhodapkar, B.R. Doolittle (*Medicine*), M. Egan, J.N. Grauer (*Orthopaedics & Rehabilitation*), A.L. Hsiao (*Emergency Medicine*), N. Kadan-Lottick, M.K. Khokha, J.M. McNamara, J.M. Panisello, D.S. Pashankar, F.D. Pashankar, L.E. Rosenfeld (*Medicine*), S.A. Ryan, K. Santucci, T. Shinoka (*Surgery*), B.G. Smith (*Orthopaedics & Rehabilitation*), A. Tufro, M. Vazquez, S.A. Weinzimer, C.C. Weitzman

**Assistant Professors** A.G. Asnes, J.D. Asnes, M. Auerbach, A.K. Berkwitt, E.M. Bruscia, E. Cengiz, S.D. Chirnomas, 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.S. Giuliano, Jr., J.E. Goodwin, M.R. Grossman, E.K. Hall, D.C. Hersh, A.B. Hittelman (*Surgery*), L.C. Johnston, S. Kandil, M. Langhan, O. Levit, K. Liem, M.E. McCabe, M.A. McKee (*Surgery*), E. Michaelides (*Surgery*), D. Mohtat, E. Paintsil, A.D. Patel, U.P. Phatak, E. Pinter, A.F. Porto, A. Riera, M.I. Rodriguez-Davalos (*Surgery*), D.J. Salchow (*Ophthalmology & Visual Science*), M. Sharkey (*Orthopaedics & Rehabilitation*), D.M. Steinbacher (*Surgery*), J. Talwalkar (*Medicine*), J.J. Vermeire, D.M. Walker, B.P. Weeks, C.G. Weismann, P.G. Weiss, H.Z. Zhang (*Genetics*)

**Instructors** A. Chatterjee, J.N. Flyer, A.M. Jastreboff (*Medicine*), N.E. Major, S.A. Massaro, E.A. Nozetz, L. Pavlovic, S.G. Pels, N.D. Romberg, J.L. Sherr

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

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

**Associate Research Scientists** A. Ali, J.M. Ambrosino, L. Balsamo, X. Chen, C.A. Dinauer, A.R. Gupta, R. Jakab, D.V. Kravtsov, R. Kursawe, J. Liu, K.E. Marchione,

V.T. Mihaylova, N. Niederstrasser, R. Rana, M.S. Rosenthal, N. Santoro, V. Schulz, S.S. Stahl (*Child Study Center*), D.D. Veron, K. Yu

**Clinical Professors** R. Angoff, H.D. Fink, P. Goldstein, H. Jacobs, T.L. Kennedy, 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, 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. Updegrave, P.P. Wang, C.C. Wood, R.S. Young

**Assistant Clinical Professors** R.J. Anderson, 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. Chromcha, B.V. Citarella, M. Cohen, N. Condulis, N. Czarkowski, M.E. Dilorenzo, C.L. Dorfman, D.H. Dreyfus, A. Driggers, D.P. Durante, 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, R.J. Hobbie, D.L. Idelson, M.K. Ikeda, L.R. Jayanthi, D.E. Karas (*Surgery*), S.J. Lavietes, M.A. Lee, A. Liebling, D.A. Listman, J.L. Morgan, C.L. Morrison, B.C. Natt, C.L. Patterson, H.J. Pierce, U.P. Puranik, M.F. Robert, M.A. Sanyal, M. Seli, L. Semeraro, L.B. Shader, 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, R.F. Whelan, E. Wiesner, R.D. Windom, J. Wynne

**Clinical Instructors** P.M. Alvino, C.E. Anderson, A. Antman, C.N. Asomugha, F. Beig, K.R. Burke, M.F. Canarie, R.E. Carroll, M.C. Caserta, A.M. Coughlin, C. DeSanto, M.R. Dillaway, R.G. Dorr, M. Ellison, B.G. Freeman, M. From, K.Y. Goldberg, Y.F. Gozzo, J.E. Harwin, S. Hassan, K.M. Hesse, M.S. Hogan, J.C. Jennings, L. Kappus, H. Kipperman, J.T. Lau, R. Lockhart, J.C. Long, A.J. Maley, A. Matczuk, C. Menzies, C. Nicolosi, R. Nolfo, M. Pouliot, R.F. Ramos (*Medicine*), R.C. Rastetter, C.A. Rowan, L.K. Rudich, A. Sahakian, J.C. Samuel, E.C. Schumacher, J. Seely, M. Serlin, D.J. Springer, J.H. Stein, K.R. Stephenson, S.M. Storeygard, G. Streeter, L.E. Sude, D.C. Torres, V.P. Tsuei, L. Visscher, L.M. Walby, L.A. Waldman, N.G. Wijesekera, M. Williams, J. Young, J.L. Young

**Lecturers** L. Alonso, S. Anderson, K.M. Baker, S. Baum, A. Beitel, N.B. Brown, A.J. Carlson, J. Chinchilla-Karolicki, A.V. Cohen, L.M. DeLucia, M. DiMauro, D.B. Flanagan, S. Frank, M.H. Gad, L. Glassman-Wisnewski, L.L. Gould, E. Herz, A. Hoefler, S.A. Jackson, 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, J.E. O'Connor, K. Pae, H.J. Sadinsky, Z.A. Scates, R. Seligson, M.J. Sheehan, S.J. Slattery, K. Vassell, K. Wallis, E. Wolfson, E. Zalitis

**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: M.G. Caty

**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: S.A. Weinzimer, A.D. Patel

**PEDS 152, Subinternship in Pediatrics** Subinternships are served on the School Age & Adolescent Unit, the Infant & Toddler Unit, and the ROLR Unit at the Children's Hospital of Yale-New Haven Hospital. As a subintern, students are expected to handle the same responsibilities as an intern (i.e., patient load and care, on-call schedule, and daily schedule). Prerequisite: satisfactory completion of third-year Pediatric and Internal Medicine clerkships; for those who have taken significant time away from clinical medicine, completion of at least one clinical elective prior to beginning the subinternship is strongly recommended. Note that the pediatric emergency department four-week subinternship does not take the place of a subinternship on the inpatient units for those seeking a department chair letter of recommendation. 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 Sunrise and logician training. Director: L. Arnold

**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 his or her 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 for four weeks. One student every four weeks. Director: S.N. Sudikoff; J. Zigmont

## PHARMACOLOGY

Office: SHM B204, 203.785.4372

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

**Professors** K.S. Anderson, 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. 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** A.M. Bennett, T. Boggon, D.A. Calderwood, M.P. DiGiovanna (*Medicine*), Y. Ha, S.-E. Jordt, I. Lax, 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. Bouauouina, M. Brown, A. Caceres Bustos, C.H. Calderwood, Y. Cho, G.V. Crichlow, C. Fan, V. Gazula, K.A. Grabinska, F. Guan, S. Hamill, J. Hu, R. Hu, K. Ishiguro, E.J. Kaftan, I. Kim, Y. Kim, W. Lam, Z. Lin, B. Liu, W. Liu, J.W. Murphy, P.G. Penketh, A.V. Reshetnyak, H.A. Seow, H. Shi, K. Shyam, T.J. Sullivan, W. Tang, S. Tavoulari, C. Wang, Y. Wang, W. 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** Neuroimaging methodologies including Positron Emission Tomography (PET), Single Photon Emission Computed Tomography (SPECT), Magnetic Resonance Imaging (MRI),

functional Magnetic Resonance Imaging (fMRI), Magnetic Resonance Spectroscopy (MRS), and gene array imaging (GAI) are rapidly evolving tools used to study the living human brain. Neuroimaging has unprecedented implications for routine clinical diagnosis, for assessment of drug efficacy, for determination of psychotropic drug occupancy, and for the study of pathophysiological mechanisms underlying neurologic and psychiatric disorders. The course is designed to provide an overview of the theory and current state of development of the different neuroimaging modalities. A second course, offered in the spring, focuses on applications. J. Staley, K.P. Cosgrove

**PHAR 521b/NSCI 521b, Neuroimaging in Neuropsychiatry II: Clinical Applications**

Neuroimaging methodologies including Positron Emission Tomography (PET), Single Photon Emission Computed Tomography (SPECT), structural Magnetic Resonance Imaging (sMRI), functional Magnetic Resonance Imaging (fMRI), Diffusion Tensor Imaging (DTI), and Magnetic Resonance Spectroscopy (MRS) are rapidly evolving tools used to study the living human brain. Neuroimaging has unprecedented implications 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 neuropsychiatric disorders. It is recommended for PGY I-VI, Child Psychiatry Fellows, Interdepartmental Neuroscience students, and trainees in pharmacology, neurology, neurosurgery, psychiatry, psychology, and radiology. H. Blumberg, K.P. Cosgrove, J. Staley

**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, S.J. Blatt (*Emeritus*), B.S. Bunney (*Emeritus*), 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*), 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, J.F. Leckman (*Child Study Center*), P.J. Lombroso (*Child Study Center*), R.T. Malison, A.S. Martin (*Child Study Center*), S. Martino, J.W. Mason (*Emeritus*), C. Mazure, T.H. McGlashan (*Emeritus*), A.C. Nairn, S.S. O'Malley, G.D. Pearlson, I.L. Petrakis, M. Picciotto, M.N. Potenza, S.M. Powsner, D.M. Quinlan, D.E. Redmond, Jr., R.M. Rohrbaugh, R. Rosenheck, R.H. Roth, G. Sanacora, R.S. Schottenfeld, H.I. Schwartz (*Adjunct*), M.J. Sernyak, 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, 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, H. Blumberg, A. Buchanan, V.D. Calhoun (*Adjunct*), M.C. Chawarski, C. Connell, J.M. Cook, N.L. Cooney, C.A. Crusto, R.A. Desai, E. Diaz, R.J. DiLeone, D.C. D'Souza, C.J. Easton, N.C. Epperson (*Adjunct*), J.M. Fiszdon, D.C. Glahn, L.S. Godleski, J. Gruber (*Psychology*), I. Harpaz-Rotem, J. Kaufman, J.S. Kaufman, P.D. Kirwin, S. Krishnan-Sarin, H.B. Lee, C. Li, G.F. Mason (*Diagnostic Radiology*), 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, S.N. Sathyanesan, 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*)

**Assistant Professors** N.A. Addy, K. Ahn, B.M. Anderson (*Adjunct*), A. Annamalai, E. Ansell, A. Arias, M. Assaf (*Adjunct*), R.S. Astur (*Adjunct*), 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, P.R. Corlett, K.P. Cosgrove, I.E. De Araujo, M.E. Delphin, P.H. Desan, G.J. Diefenbach (*Adjunct*), E.L. Edens, L.M. Edwards, I. Esterlis, D.C. Fehon, E.H. Flanagan, H. Fox, L. Fucito, D.M. Gordon, J.L. Goulet, J.O. Hannestad, N. Hansen, A.A. Heapy, D.M. Higgins, M.G. Hunt, J. Ikomi, J.K. Johannesen, A. Kaffman, R. Kapoor, A.S. Klee, H. Kober, S.D. Kruger, D.M. LaPaglia, R.F. Leeman, X. Luo, S. Madonick (*Adjunct*), 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, E. Ralevski, M. Ranganathan, P.H. Rosenberger, D.A. Ross, J.K.A. Sanders, C. Sanislow (*Adjunct*), C.E. Sartor, M.C. Scott, J.J. Sellinger, P. Skudlarski (*Adjunct*), M.V. Smith, H.R. Steinberg, S. Steinberg (*Adjunct*), T.P. Sullivan, B.A. Toll, 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

**Instructors** A. Forray, H. Hamid (*Neurology*), R.A. Miller, M.A. Silva

**Senior Research Scientists** G.K. Aghajanian, S.J. Blatt, 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, J. Poling, G.V. Williams

**Associate Research Scientists** D. Aikins, A. Anticevic, I.M. Balodis, M. Banasr, R.D. Barnes, A.C. Black, D.L. Boggs, F. Bois, D.A. Cavallo, A. Chen, K. Choi, G.M. Chowdhury, S. Corbera, A.D. Dager, E.E. DeVito, N.R. Driesen, C.M. D'Sa, D.C. Duffey, C.H. Duman, C.T. Dyer, H.M. Fichtenholtz, W. Gilliam, D.J. Guarnieri, S. Han, A. Herman, E.D. Jackson, J.S. Jane, W.J. Kaspro, B. Kiluk, D. Li, P.P. Licznarski, L.H. Linke, J.B. Listman, R. Liu, Y.S. Mineur, B.A. Moore, E.E. O'Brien, F. Perepletchikova, V.M. Pogorelov, T.U. Schaller, C.J. Schmidt, B. Schweinsburg, D.J. Sells, D. Seo, R.A. Sewell, P.D. Skosnik, M.J. Strambler, N.D. Thai, A. Thompson, M.M. Torregrossa, M.G. Veldhuizen, L. Wei, M. Wu, L. Zuo

**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, C. Chiles, J.J. Ciarcia, V. Coric, J. De Figueiredo, L.B. Fierman, 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, B. McKee, S. Mohamed, C.A. Morgan, M.S. Okasha, R.B. Ostroff, H.R. Pearsall, E.A. Perls (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*), P. Van Watum (*Child Study Center*), G.J. Watstein, T. Zanker (*Child Study Center*)

**Assistant Clinical Professors** L.J. Adams, A.C. Adis, A.T. Albrecht, A.M. Almai, J.A. Amatruda, P.T. Amble, M.M. Amer, B. Arnaout, S.R. Atkins, R. Aziz, C.B. Baker, J. Ballew, A.L. Balter, J.A. Barber, L.C. Barr, M.V. Barrios, G.A. Bassett, L.A. Bayer, B.R. Becker, E. Becker-Dunn, M. Beitel, C.D. Bellamy, C.C. Bemis, S. Bender, D.E. Bendor, E.H. Berger, R.L. Bergeron, T. Bergherr, S. Bers, Y.S. Blanco, H.C. Blue, D. Boltas, D.M. Brandt, D. Brockett, T.E. Brown, A. Buonopane, L.V. Calabrese, R. Casey, L.I. Chaikovsky, J. Charney, J.R. Check, A.S. Cheng, D.E. Ciancimino, T.A. Cipriano, J.C. Cleves-Bayon, J.C. Cline, S.J. Cohen, J.T. Collins (*Child Study Center*), M.L. Conroy, E.C. Cook, P.R. Correa, C.D. Couch, L.W. Cross, E. Cumberbatch, W.F. Dailey, R.S. Dealy, R.S. Denkin, J.C. Deviva, C. Dike, C. Doebrick, N. Donegan (*Psychology*), N.S. Downs, V.M. Dreisbach, S.M. Drew, L.K. Driscoll, B.A. Duncan, C.G. Edelen, J.J. Erdos, R.D. Fallot, S. Feuerstein, J.F. Fickes, P.L. Filip, S. Finkelstein, D.A. Fisk, F.G. Fortunati, P.A. Fountain, M.I. Frankel, E.R. Frazer, R. Freeman, T.A. Freeman, C.C. Frick, D. Fried, T. Glinberg, L.I. Goldstein, S.F. Gomez-Luna, T.C. Greig, A. Grier, M.C. Groner, E.G. Grottole, 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, C. Jean, 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. Kurtz, M.M. Kurtz, A. Lamba, H.M. Lankenau, K.M. Lazzarini, 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. Lizzcano, D.B. London, J. Lopez, C. Lozano, H. Lubin, M. Mandelkern, B.F. Marcus, C.A. Markle, S.L. Matlin, R.W. McCleary, B.B. McConnell, B. Meandzija, A.W. Meisler, N.C. Mellos, R.M. Meyer, S.J. Migdole, E.S. Millman, R.M. Milstein, C.R. Miner, V.R. Morrow, F.C. Mueller, P.V. Mulinski, D.S. Mundy, S. Muralee, J. Myer, E.D. Nasper, M.A. Naz, J. Nields, F.J. Ninivaggi (*Child Study Center*), 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, H.V. Phan, J.F. Poll (*Child Study Center*), D.J. Powell, M.L. Prevey, G.R. Racusin, J. Rakfeldt, I.S. Rathbone, D.R. Rau, N. Reddy, 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, R. Rubin, S. Rubin, D.S. Russell, J.A. Sabbatino, N. Sahay, D.K. Sakheim, K.M. Salisbury, C. Sanders, L.C. Sanfilippo, A.P. Sawyer, J.O. Schechter, R.R. Schreiber, J.S. Schwartz, 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, W.A. Stewart, M. Stitelman, G.E. Sturges, K. Subramanyam, D.C. Tate, E.S. Tek, A.N. Tessler, S.E. Thomas, B. Tobin, J.L. Tondora, L.A. Trevisan, K. Trueblood, M. Tupper, S.S. Unal, G.W. Valentine, J.J. Vanderploeg, D.C. Vogel, J. Walia, D.J. Wallington, J.M. Wexler, P.J. Whang, R.S. White, M.L. Whitson, A.M. Winkler, J. Wolf, P. Wupperman, C.M. Young, W. Zito, L. Zonana

**Clinical Instructors** E.G. Ahlert-Smith, O. Alpert, M. Bailey, G. Balf, N.M. Campo, V.V. Carvalho, J. Chardavoyne, V. Coggsall, R.L. Cohen, J.E. Farber, L. Fenton, D.J. Flanigan, C. Grazia, M.C. Grenough, C.M. Hunnicutt, L.C. Hyman, N. Lara, W. Levy, N.M. Lustman, D. Matuskey, M. McCarthy, B.C. Moore, S.S. Mubbashar, R. Plant (*Child Study Center*), 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, R.M. Berman, D.A. Berv, A. Brownlow, R.A. Cole, C. Conrad, H.F. Crabbe, G.H. Davis, A.R. Demac, C.E. Desmond, P.J. Dileo, P.A. Dillon, M. Emmanuel, L.K. Frisman, V.C. Girard, S.G. Goodson, J.B. Gordon, G. Greenberg, F. Grossman, M.A. Kalacznik, A. Kalafa, B.C. Klein, R.H. Klein, J. Klugman, A.S. Koleszar, K.K. Krusong, A.L. Labruzzo, L. Lager, R.B. Lenoci, L.M. Lothstein, L.M. Madden, R.B. Makover, K. Marcus, A. Massa, D.M. Mender, J.H. Meyer, M.L. Mitchell, D.C. Moore, I. Moses, R.L. Munich, M. Nicholas, A. Oberkirch, M.J. Orlosky, J.M. Palumbo, J. Pelletier, R.T. Phillips, J.M. Pisciotta, S.J. Purcell, M.D. Rego, W.N. Reich, S.D. Romano (*History of Medicine*), E.B. Rubin, S.L. Satel, M.N. Savage, J.M. Schnitt, A.J. Sholomskas, G.H. Sirkin, P.F. Thomas, R.K. Westheimer, 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, administrative) 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, R.E. Hoffman

**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, J.O. Hannestad, M. Bloch

**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. Sakska (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 (*Public Health*), K.D. Brownell (*Psychology*), R. Bucala (*Medicine*), M. Cappello (*Pediatrics*), E.B. Claus, P.D. Cleary (*Dean*), V.T. DeVita (*Medicine*), 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*), 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, H.A. Risch, R. Rosenheck (*Psychiatry*), N.H. Ruddle (*Emeritus*), M.B. Russi (*Medicine*), P. Salovey, M.J. Schlesinger, E.D. Shapiro (*Pediatrics*), J.L. Sindelar (*Public Health*), D.L. Snow (*Psychiatry*), J.T. Stitt (*Emeritus*), J.A. Stolwijk (*Emeritus*), J.K. Tebes (*Psychiatry*), G.H. Tignor (*Emeritus*), M.E. Tinetti (*Medicine*), C. Tschudi, 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, L. Dembry (*Medicine*), M.M. Desai, R.A. Desai (*Psychiatry*), R. Dubrow, J.M. Fletcher, A.P. Galvani (*Epidemiology*), E.L. Grigorenko (*Child Study Center*), J.J. Hoh (*Epidemiology*), M.L. Irwin, T. Kershaw, K. Khoshnood, A.I. Ko (*Epidemiology*), Q. Lan (*Adjunct*), B. Levy (*Epidemiology*), J.H. Lichtman, H. Lin, S. Ma, X. Ma, I. Nembhard, L.M. Niccolai, M.M. Pettigrew, J.P. Rugar (*Public Health*), A.N. Sofair (*Medicine*), N.S. Stachenfeld (*Obstetrics, Gynecology & Reproductive Sciences*), R. Stolzenberg-Solomon (*Adjunct*), Y. Zhang, Y. Zhu

**Assistant Professors** A.R. Adhvaryu (*Public Health*), R.D. Bruce (*Medicine*), A.J. Cross (*Adjunct*), A.T. Dewan, M.A. Diuk-Wasser, A.S. Ettinger, B.E. Gould Rothberg (*Medicine*), J. Gupta, B.P. Mobo (*Medicine*), J.E. Monin, F.M. Shebl, Z. Wang, B. Zhou

**Senior Research Scientists** J.E. Childs (*Epidemiology*), S.V. Kasl (*Epidemiology*), P.J. Krause (*Epidemiology*), L.E. Munstermann, N.H. Ruddle (*Epidemiology*)

**Research Scientists** N. Abdala, K. Belanger (*Epidemiology*), K.L. Bentley, B. Cartmel (*Epidemiology*), L. Curry (*Public Health*), J.F. Gent, R. Gueorguieva, B.A. Jones (*Epidemiology*), N. Sun

**Associate Research Scientists** G.M. Attardo, L. Calvocoressi, M.E. Canavan, A. Carroll-Scott, D.J. Chapman, M.M. Ciarleglio (*Public Health*), F. Dai, L.E. Grau, 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*), S.A. Reynolds, M. Rothbard, H.L. Sipsma, S. Usmani-Brown, R. Wang, B.L. Weiss, E. White, X. Yao, 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. 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*), M. Booss, M.P. Borgstrom, E.A. Bortnichak, A. Caccone, 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, M.G. Dale, A.S. Darefsky, H.G. Dove, J.D. Dunn, A.J. Durante, C. Fields, B. Fontes, G.S. Freedman, S.D. Geballe, B.D. Gifford, 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*), R.A. Lavelly, M. Lee, L.S. Levin (*Public Health*), D. Li, E.L. Linnander, L.G. Marc, J.E. McGovern, D. McKee (*Economics*), Z. McNatt, S.M. Merz, B.P. Mobo (*Medicine*), L.M. Mueller, J.M. Mullen (*Epidemiology*), E. O'Keefe, J.E. Otero, C. Petit, J.M. Rozanova, 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 (*Epidemiology and Public Health*), M.H. Stowe (*Medicine*), K.M. Talbert-Slagle, P.H. Van Ness (*Medicine*), B. Weiss, M.A. White (*Psychiatry*), 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

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**Associate Professors** J.E. Aruny (*Diagnostic Radiology*), R.L. Bell, S. Bokhari (*Diagnostic Radiology*), C.K. Breuer, C.H. Cha, A.B. Chagpar, J.W. Colberg, A. Dardik, A. Duffy, R.N. Formica (*Medicine*), S. Hashim, M.H. Johnson (*Diagnostic Radiology*), L.J. Kaplan, S. Kulkarni, B.E. Muhs, D. Narayan, L.J. Rizzolo (*Anatomy & Experimental Surgery*), S.A. Roman, M. Schilsky (*Medicine*), T. Shinoka, J. Sosa, W.B. Stewart (*Anatomy & Experimental Surgery*), J.G. Thomson

**Assistant Professors** A. Arvelakis, M.S. Bianchi, D.J. Boffa, T. Carling, R. Decker (*Therapeutic Radiology*), H.A. Deshpande (*Medicine*), K. Diefenbach, M.F. Dittilo, A. Geirsson, A.B. Hittelman, N.R. Horowitz, J. Indes, D.C. Johnson, B. Judson, B. Killelea, A.W. Kim, D. Kowalski (*Pathology*), S.L. Kwei, S.M. Luczycki (*Anesthesiology*), F.Y. Lui, L.L. Maerz, R. Manes, M. Matthew, A. Maung, M.A. McKee, E. Michaelides, C. Ochoa Char, M.F. Perkal, G.L. Piper, V. Reddy, K.E. Roberts, M.I. Rodriguez-Davalos, K. Schuster, D. Singh, D.M. Steinbacher, H.E. Tantawy (*Anesthesiology*), C.N. Walker, N. Young

**Instructors** L. Panait, L.J. Rousou, S.J. Youssef

**Senior Research Scientist** S.J. Dudrick

**Research Scientist** M.S. Kidd

**Associate Research Scientists** S. Bian, X. Guo, R. Korah, S. Peng (*Anatomy & Experimental Surgery*), T. Rampias, G. Schwach, L. Song, M. Walker, S. Yang, 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, A.J. Graham, H.L. Horton, J.P. Kelly, K. Lee, R.A. Lowlicht, J.T. Schulz, J.M. Serling, B.S. Weisbart

**Assistant Clinical Professors** D.I. Astrachan, S. Baker, P.A. Barcewicz, H. Cedarbaum, B.Y. Cha, W. Cholewczynski, R.J. Dean, R.W. DeNatale, M.L. Dewar, T.G. Duplinsky, S.I. Friedman, S. Fusi, R. Garvey, R.T. Golia, N.A. Gordon, J. Henley, R.H. Hirokawa,

G.E. Horblitt, R.B. Kaplan, D.E. Karas, D.B. Keck, A.S. Kenler, J.C. Kirchner, P.A. Kraus, S.B. Levine, D.J. Muller, S. Natkin, M.K. O'Brien, G. Opin, P.M. Opin, M.T. Pronovost, J.C. Salomon, R.F. Schlessel, J.F. Schmidt, M.J. Schpero, S. Shah, R.E. Steller, R.F. Stroup, T.F. Sweeney, J.L. Tanenbaum, D.A. Tereb, S.C. Thornton, E.M. Vining, D. Wasson, M.H. Weinstein, A.E. Wilk, J.M. Willett, K. Yanagisawa, K. Zuckerman

**Clinical Instructors** C.B. Beckman, W.R. Butler, R. Crombie, A. Czibulka, M. D'Agostino, P. Demir, K. Discepolo, S. Drukteinis, P.L. Fortgang, C. Haberland, J. Kerner, J.R. Klenoff, T.H. Lesnik, R. Radmand, H.F. Reilly, T. Takoudes, M.N. Waltzman

**Lecturers** L. Acton, L.M. Bow, H.C. Briggs (*Anatomy & Experimental Surgery*), J.P. Escandon, A. Ferruggiaro, B.C. Fichandler, S. Ghofrany (*Anatomy & Experimental Surgery*), D.D. Hendrick, N.M. Hewitt, J. Hopper, J.S. Hundal, S.E. Kapadia (*Anatomy & Experimental Surgery*), H.M. Keiser-Pedersen, L. Lattanzio, V. Lee, E.A. Likins-Graham, M.G. Maher, J. Mendes, S.B. Michaelides, C. Powell, 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. One or two 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. If the students are interested, clinical research projects and papers can be pursued. 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. Yale-New Haven Hospital, the Hospital of St. Raphael, and the VA Connecticut Healthcare System, West Haven, are available for the rotation. 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 Peripheral 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 between 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: M.G. Caty

**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, Hospital of Saint Raphael** Students become an integral part of the resident team, supervised by the chief resident and attendings 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 students 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: T. Shinoka; G.S. Kopf

**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, 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: S.A. Roman

## THERAPEUTIC RADIOLOGY

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**Professors** S.J. Baserga (*Molecular Biophysics & Biochemistry*), D.E. Brash, 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** D.J. Carlson, B.W. Chang, J.N. Contessa, S. Damast, R. Decker, S.B. Evans, F. Guo, R.B. Jensen, S. Kamath, W. Lui, S. Mani, B. McGibbon, A.A. Patel, F.A. Rogers, F. Su, J.B. Yu

**Associate Research Scientists** S. Dalal, D. Kidane, Q. Lin, D.L. Murphy, Y. Wu

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

**Assistant Clinical Professors** M. Ahmad, J. Albanese, J.E. Bond, D.D. Chamberlain, A. Chu, Y. Fan

**Lecturer** 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

# Yale Cancer Center

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## MEMBERSHIP

**Professors** K.S. Anderson (*Pharmacology*), P.W. Askenase (*Internal Medicine*), A.E. Bale (*Genetics*), L.M. Bartoshuk (*Surgery*), J.R. Bender (*Internal Medicine*), J.L. Bolognia (*Dermatology*), A.L.M. Bothwell (*Immunobiology*), D.E. Brash (*Therapeutic Radiology*), R.R. Breaker (*Molecular, Cellular & Developmental Biology*), R. Bucala (*Internal Medicine*), L. Chen (*Immunobiology*), Y.-C. Cheng (*Pharmacology*), 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. Galan (*Microbial Pathogenesis*), J. Geibel (*Surgery*), 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 (*Epidemiology & Public Health*), K.L. Insogna (*Internal Medicine*), W.L. Jorgensen (*Chemistry*), P.B. Kavathas (*Laboratory Medicine*), K.K. Kidd (*Genetics*), W.H. Konigsberg (*Molecular Biophysics & Biochemistry*), 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*), T.J. Lynch (*Cancer Center*), J.A. Madri (*Pathology*), N.J. Maihle (*Obstetrics, Gynecology & Reproductive Sciences*), S.T. Mayne (*Epidemiology & Public Health*), R. McCorkle (*School of Nursing*), J.M. McNiff (*Dermatology*), R. Medzhitov (*Immunobiology*), I.G. Miller (*Pediatrics*), S.J. Miller (*Chemistry*), J.S. Morrow (*Pathology*), R. Nath (*Therapeutic Radiology*), S. O'Malley (*Psychiatry*), R.E. Peschel (*Therapeutic Radiology*), A. Phillips (*Chemistry*), J.M. Piepmeier (*Neurosurgery*), J.S. Pober (*Pathology*), A.M. Pyle (*Molecular Biophysics & Biochemistry*), L. Regan (*Molecular Biophysics & Biochemistry; Chemistry*), H.A. Risch (*Epidemiology & Public Health*), S. Rockwell (*Therapeutic Radiology*), J.K. Rose (*Pathology*), N.H. Ruddle (*Epidemiology & 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*), Y.H. Son (*Therapeutic Radiology*), J.A. Steitz (*Molecular Biophysics & Biochemistry*), D.F. Stern (*Pathology*), P. Sung (*Molecular Biophysics & Biochemistry*), P.J. Tattersall (*Laboratory Medicine*), R.E. Tigelaar (*Dermatology*), R. Udelsman (*Surgery*), A.N. Van den Pol (*Neurosurgery*), S.M. Weissman (*Genetics*),

K.R. Williams (*Adjunct; Molecular Biophysics & Biochemistry*), D. Wu (*Pharmacology*), T. Xu (*Genetics*), H. Zhao (*Epidemiology & Public Health*)

**Associate Professors** J.M. Baehring (*Neurology; Neurosurgery*), S.J. Baserga (*Molecular Biophysics & Biochemistry*), A.M. Bennett (*Pharmacology*), M.W. Bosenberg (*Dermatology*), D. Braddock (*Pathology*), E.H. Bradley (*Epidemiology & Public Health*), J.L. Brandsma (*Comparative Medicine*), D.A. Calderwood (*Pharmacology*), L.G. Cantley (*Internal Medicine*), A.B. Chagpar (*Surgery*), S. Chang (*Laboratory Medicine*), Z. Chen (*Therapeutic Radiology*), E.B. Claus (*Epidemiology & Public Health*), C.M. Crews (*Molecular, Cellular & Developmental Biology*), J. Deng (*Therapeutic Radiology*), K. Dhodapkar (*Pediatrics*), M.P. DiGiovanna (*Cancer Center*), R. Dubrow (*Epidemiology & Public Health*), T. Fahmy (*Biomedical Engineering*), M. Girardi (*Dermatology*), C.P. Gross (*Internal Medicine*), S.A. Higgins (*Therapeutic Radiology*), M. Hodsdon (*Laboratory Medicine*), J. Hoh (*Epidemiology & Public Health; Ophthalmology*), D.F. Hyder (*Diagnostic Radiology*), M.L. Irwin (*Epidemiology & Public Health*), A. Iwasaki (*Immunobiology*), B.A. Jones (*Epidemiology & Public Health*), S.E. Jordt (*Pharmacology*), N.S. Kadan-Lottick (*Pediatrics*), S.M. Kaech (*Immunobiology*), H.M. Kluger (*Cancer Center*), Y. Kluger (*Pathology*), M.T. Knobf (*School of Nursing*), A.J. Koleske (*Molecular Biophysics & Biochemistry*), D.S. Krause (*Laboratory Medicine*), M. Krauthammer (*Pathology*), G. Kupfer (*Pediatrics*), R. Lazova (*Dermatology*), H. Lin (*Epidemiology & Public Health*), E. Lolis (*Pharmacology*), X. Ma (*Epidemiology & Public Health*), M.J. Mamula (*Internal Medicine*), E.R. Meffre (*Immunobiology*), G.G. Mor (*Obstetrics, Gynecology & Reproductive Sciences*), W. Mothes (*Microbial Pathogenesis*), D. Narayan (*Surgery*), M. Prasad (*Pathology*), D.L. Rimm (*Pathology*), M. Robek (*Pathology*), K.B. Roberts (*Therapeutic Radiology*), M.G. Rose (*Cancer Center*), T.J. Rutherford (*Obstetrics, Gynecology & Reproductive Sciences*), S. Seropian (*Internal Medicine*), W.D. Shlomchik (*Internal Medicine*), M. Sofuoglu (*Psychiatry*), M.J. Solomon (*Molecular Biophysics & Biochemistry*), J.A. Sosa (*Surgery*), R. Sutton (*Internal Medicine*), J.B. Sweasy (*Therapeutic Radiology*), M. Sznol (*Internal Medicine*), H.S. Taylor (*Obstetrics, Gynecology & Reproductive Sciences*), B. Turk (*Pharmacology*), J.B. Weidhaas (*Therapeutic Radiology*), L.D. Wilson (*Therapeutic Radiology*), S.L. Wolin (*Cell Biology*), J.J. Wysolmerski (*Internal Medicine*), H. Yu (*Epidemiology & Public Health*), Z. Yun (*Therapeutic Radiology*), T. Zheng (*Epidemiology & Public Health*), Y. Zhu (*Epidemiology & Public Health*)

**Assistant Professors** M. Abu Khalaf (*Cancer Center*), D.J. Boffa (*Surgery*), T. Boggon (*Pharmacology*), T. Carling (*Surgery*), C. Cha (*Surgery*), B. Chang (*Therapeutic Radiology*), H.H. Chao (*Internal Medicine*), G.G. Chung (*Cancer Center*), J.N. Contessa (*Therapeutic Radiology*), R.H. Decker (*Therapeutic Radiology*), H.A. Deshpande (*Cancer Center*), M. Djekidel (*Radiology*), S.B. Evans (*Therapeutic Radiology*), R. Fan (*Biomedical Engineering*), S.N. Gettinger (*Cancer Center*), A.J. Giraldez (*Genetics*), B.E. Gould-Rotherberg (*Medical Oncology*), V. Greco (*Genetics*), Y. Ha (*Pharmacology*), 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*), B. Judson (*Surgery/Otolaryngology*), A.W. Kim (*Surgery*), T.H. Kim (*Genetics*), M.C. King (*Cell Biology*),

S.H. Kleinstein (*Pathology*), P. Kumar (*Internal Medicine*), S. Kwei (*Plastic Surgery*), J. Li (*Comprehensive Cancer Center*), P. Li (*Genetics*), B. Lindenbach (*Microbial Pathogenesis*), J. Lu (*Genetics*), S. Ma (*Epidemiology & Public Health*), S. Mani (*Therapeutic Radiology*), M.A. Materin (*Ophthalmology & Visual Science*), R.E. Means (*Pathology*), A. Molinaro (*Epidemiology & Public Health*), M.S. Moran (*Therapeutic Radiology*), D. Morgenztern (*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*), K. Politi (*Pathology*), F.A. Rogers (*Therapeutic Radiology*), C.V. Rothlin (*Immunobiology*), T. Sanft (*Medical Oncology*), C. Schlieker (*Molecular Biophysics & Biochemistry*), D. Sells (*Psychiatry*), D.A. Spiegel (*Chemistry*), B. Toll (*Psychiatry*), D.K. Toomre (*Cell Biology*), N. Wajapeyee (*Pathology*), A.H. Weinberger (*Psychiatry*), A. Xiao (*Genetics*), Y. Xiong (*Molecular Biophysics & Biochemistry*), Q. Yan (*Pathology*), J.B. Yu (*Therapeutic Radiology*), Y. Zhang (*Epidemiology & Public Health*)

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

**Research Scientists** B. Cartmel (*Epidemiology & Public Health*), F. D'Errico (*Diagnostic Radiology*), A.M. Haberman (*Laboratory Medicine*), Z. Hu (*Obstetrics, Gynecology & Reproductive Sciences*), 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*)

**Clinical Professors** S. Ariyan (*Surgery*), L. Farber (*Internal Medicine/Medical Oncology*)

**Instructors** S. Halene (*Internal 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, 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, and Vascular Surgery; appointments are made through the National Resident Matching Program or the appropriate specialty matching program (Ophthalmology and Urology). Residencies are also offered in Dentistry and Pediatric Dentistry. Subspecialty residency programs are offered in the following specialties:

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

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 University 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 videos, 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 2012

Pending completion of all requirements

Kofi-Buaku Atsina, B.S., Yale University. *Nanoparticles for Delivery of Rapamycin to Glioblastoma and Glioblastoma-Derived Stem Cells*. Neurosurgery: Thomas Jefferson University Program, Philadelphia, Pa.

Kwame B. Atsina, B.S., Lehigh University. *The Role of D-Dopachrome Tautomerase in Ischemia-Reperfusion in the Heart*. Internal Medicine: Johns Hopkins Hospital, Baltimore, Md.

Joshua Kah-wor Au, B.S., Yale University. *Cirrus Spectral Domain Optical Coherence Tomography is a Clinically Effective Tool in Assessing Glaucoma Severity*. Otolaryngology: UCLA Medical Center, Los Angeles, Calif.

Danielle Barber, B.S., Massachusetts Institute of Technology; Ph.D., Yale University. *Identifying Molecular Neuroadaptations in Cocaine-Activated Rat Striatal Neuronal Ensembles Using Fluorescence-Activated Cell Sorting (FACS)*. Pediatric Neurology: The Children's Hospital of Philadelphia, Philadelphia, Pa.

Oliver Mullin Barry, B.A., Princeton University; M.H.S., Yale University. *Effectiveness and Monitoring of Antiretroviral Therapy for HIV-Infected Children in Accra, Ghana*. Pediatrics: New York Presbyterian Hospital—Columbia, New York, N.Y.

Ali Batouli, B.S., Stanford University. *Global Cancer Mortality: National Healthcare System Resources and Survival from Cancer*. Medicine—Preliminary: Hospital of Saint Raphael, New Haven, Conn. Diagnostic Radiology: Allegheny General Hospital—Western Pennsylvania Hospital, Pittsburgh, Pa.

Carl Berdahl, B.A., University of California—Los Angeles. *Emergency Department Computed Tomography Utilization in the United States and Canada*. Emergency Medicine: University of Southern California, Los Angeles, Calif.

John Christopher Binford, B.S., University of Georgia. *A Garden-Based Nutrition Intervention in the Rural Dominican Republic—Impact on Vitamin A-Rich Food Consumption and Household Food Security*. Emergency Medicine: Yale-New Haven Hospital, New Haven, Conn.

Daniel John Blizzard, B.S., University of Washington; M.H.S., Yale University. *3D-FSE Isotropic MRI of the Lumbar Spine: New Application of an Existing Technology*. Orthopaedic Surgery: Duke University Medical Center, Durham, N.C.

Benjamin Neil Blond, B.A., Amherst College. *Functional Magnetic Resonance Imaging of State and Trait Abnormalities in Bipolar Disorder*. Medicine—Preliminary: Yale-New Haven Hospital, New Haven, Conn. Neurology: Yale-New Haven Hospital, New Haven, Conn.

Ryan William Blum, A.B., Harvard University. *Features and Flaws of a Fair Hospital Policy for Allocating Expensive Charity Care to Noncitizen Patients*. Psychiatry: Yale-New Haven Hospital, New Haven, Conn.

Jessica Dara Bod, B.A., CUNY Brooklyn College. *Inpatient Preferences Regarding Code Status and Withdrawal of Life Support*. Emergency Medicine: Yale-New Haven Hospital, New Haven, Conn.

Marko Boskovski, B.A., Washington University; M.H.S., Yale University. *Galnt11 is a Novel GalNAc-Transferase that Glycosylates Notch1 Receptor to Specify between Motor and Sensory Ciliary Fates in the Vertebrate Left-Right Organizer*. General Surgery: Brigham and Women's Hospital, Boston, Mass.

Kristel Carrington, B.S., Columbia University. *Obstacles to Bariatric Surgery Provision in Adolescents in England and Scotland*. Psychiatry: New York University School of Medicine, New York, N.Y.

Jocelyn Bosco Chandler, B.S., Cornell University. *Identification of Novel Compounds that Increase Fetal Hemoglobin and Ameliorate Hemoglobinopathies*. Pathology–Anatomic and Clinical: Yale-New Haven Hospital, New Haven, Conn.

Kesi Chen, B.A., Yale University. *Surgeon Volume Trumps Speciality: Outcomes from 3,596 Pediatric Cholecystectomies*. Pediatrics: The Children's Hospital of Philadelphia, Philadelphia, Pa.

Xuejing Chen, B.S., California Institute of Technology; M.S., Carnegie Mellon University. *Effects of Music Therapy on Intravitreal Injections: A Randomized Clinical Trial*. Transitional: Memorial Sloan-Kettering Cancer Center, New York, N.Y. Ophthalmology: University of California–Los Angeles, Los Angeles, Calif.

Panos George Christakis, B.S., Yale University. *The Ahmed Versus Baerveldt Study an International, Multicenter, Randomized Glaucoma Surgical Trial*. Ophthalmology: University of Toronto, Toronto, Canada

Anne Colleen Cooper, B.A., University of Notre Dame; M.A., University of Essex. *The Rate of Placenta Accreta and Previous Exposure to Uterine Surgery*. Obstetrics and Gynecology: Oregon Health and Science University Program, Portland, Ore.

Catherine Molina Dailey, B.A., Columbia University. *Epidemiology and Innate Immune Monocyte Function of Staphylococcus Aureus Carriers and Non-Carriers in a Medical School Community: A Pilot Study*. Medicine/Pediatrics: University of Rochester/Strong Memorial Hospital, Rochester, N.Y.

Alessandro Roberto De Camilli, B.A., New York University. *The Effects of 0.5 MAC Equivalent Propofol on Functional Connectivity in Healthy Volunteers*. Medicine–Preliminary: University of California–San Diego, San Diego, Calif. Anesthesiology: University of California–San Francisco, San Francisco, Calif.

Michael Christopher Dewan, B.S., University of Notre Dame. *Neuroendoscopic Management of Dandy-Walker Complex-Associated Hydrocephalus*. Neurosurgery: Vanderbilt University Medical Center, Nashville, Tenn.

Deepali Dhar, B.S., Yale University. *Cardiovascular Lability as a Potential New Predictor of Post-Operative Patient Prognosis in the Intensive Care Unit*. Anesthesiology: Mount Sinai Hospital, New York, N.Y.

Pete Duncan, B.S., Stanford University; M.H.S., Yale University. *EMT Driven by TGF- $\beta$  is a Significant Mediator of Stenosis in Tissue Engineered Vascular Grafts*. Pediatrics: Children's Hospital Boston, Boston, Mass.

Lilangi Suhadini Ediriwickrema, B.A., M.S., University of Pennsylvania; M.H.S., Yale University. *Reconstruction of an Outer Retina Using Electrospun Polycaprolactone (PCL) and Cells Derived from Human Embryonic Stem Cells*. Transitional: Memorial Sloan-Kettering Cancer Center, New York, N.Y. Ophthalmology: University of Southern California, Los Angeles, Calif.

Leonard Ufumwen Edokpolo, B.S., University of Notre Dame. *Outcomes in the Urologic Management of Neurogenic Bladder in Spinal Cord Injured Patients*. Surgery—Preliminary: New York Presbyterian Hospital—Columbia, New York, N.Y. Urology: New York Presbyterian Hospital—Columbia, New York, N.Y.

Fayola Abebi Edwards, A.B., Harvard University. *Characterization of Mutant Pyk2 and Cocaine Sensitization in Mice*. Internal Medicine: University of California—San Francisco, San Francisco, Calif.

Mei Elansary, B.A., University of Pennsylvania; M.Phil., University of Oxford. *An Assessment of Health Care Seeking Behavior and Illness Beliefs among Clinic Patients in West Kalimantan, Indonesia*. Pediatrics/Urban Health Advocacy: Children's Hospital Boston/Boston Medical Center, Boston, Mass.

Hani M. Elwafi, B.A., Duke University. *Craving and Quitting: An Exploration of How Mindfulness Training May Help Smokers to Quit*. Psychiatry: Duke University Medical Center, Durham, N.C.

Anna Kristine Engberg Dewan, B.A., Northwestern University; M.H.S., Yale University. *Dendritic Cells as Solid Tumor Immunotherapy: Utilizing Natural Defenses to Strive to Eradicate Cancer*. Medicine—Preliminary: Vanderbilt University Medical Center, Nashville, Tenn. Dermatology: Vanderbilt University Medical Center, Nashville, Tenn.

Ogechukwu Eze, B.S., M.S., Adelphi University; M.H.S., Yale University. *Epigenetic Events Suggest a Distinct Molecular Pathogenesis in BRAF-Associated Papillary Thyroid Cancer*. Pathology—Anatomic and Clinical: New York University School of Medicine, New York, N.Y.

Olatokunbo Musili Famakinwa, B.A., Princeton University; M.P.H., Harvard University. *A Program Evaluation of Early Head Start Health Services in Family Child Care Homes*. Medicine/Pediatrics: Yale-New Haven Hospital, New Haven, Conn.

Aaron Joshua Feinstein, B.A., University of Southern California; M.H.S., Yale University. *Trends in Breast Cancer Cost and Survival and Variation in Use of Radiation Therapy in Older Women*. Otolaryngology—Head and Neck Surgery: UCLA Medical Center, Los Angeles, Calif.

Valerie A. Flores, B.S., University of Southern California. *Memory Impairment, Alzheimer's Disease, and the Role of Signal Transduction Mechanisms*. Obstetrics and Gynecology: Brown University/Women & Infants Hospital, Providence, R.I.

Corey Scott Frucht, B.S., M.S., Brandeis University; Ph.D., Yale University. *The Role of MicroRNA181a in Avian Auditory Hair Cell Regeneration*. Medicine–Preliminary: Santa Barbara Cottage Hospital, Santa Barbara, Calif. Dermatology: University of California–San Diego, San Diego, Calif.

Nupur Garg, B.S., Massachusetts Institute of Technology. *Underrepresentation of Females in Academia: A Relative Rate Index and System Dynamics Model*. Emergency Medicine: Mount Sinai Hospital, New York, N.Y.

John Webster Gilbert, B.S., Duke University. *Utility of Apparent Diffusion Coefficients in the Evaluation of Primary Central Nervous System Lymphoma*. Transitional: Hospital of Saint Raphael, New Haven, Conn. Diagnostic Radiology: Brigham and Women's Hospital, Boston, Mass.

Thomas J. Gniadek, B.S., Ph.D., Yale University. *Quantitative Analysis of the Early Secretory Pathway and Trypanosoma Brucei*. Pathology–Anatomic and Clinical: Johns Hopkins Hospital, Baltimore, Md.

Jose Luis Gonzalez, B.A., Johns Hopkins University. *Childhood Absence Epilepsy and Varied Effect on Performance on Attention and Motor Tasks, with Correlation to EEG and fMRI*. Neurology: Jackson Memorial Hospital, Miami, Fla.

Samrawit Abraham Goshu, B.S., Loyola University of Chicago. *The Use of Photoplethysmograph for Non-Invasive Assessment of Endothelial Damage*. Medicine–Preliminary: Yale–New Haven Hospital, New Haven, Conn. Anesthesiology: Yale–New Haven Hospital, New Haven, Conn.

Lauren Kathleen Graber, B.A., Wesleyan University. *Family Child Care Providers as Health Educators and Advocates: Perspectives of Parents, Health Care Providers, and Community Service Providers*. Family Medicine: Boston University Medical Center, Boston, Mass.

Marjorie-Anne Ritumban Guerra, B.S., University of California–Los Angeles. *Predictors of a Differential Neural Response to Infant Cues in Substance Using and Non-Using Mothers*. Pediatrics: UCLA Medical Center, Los Angeles, Calif.

Alisse K. Hauspurg, B.A., University of Pennsylvania. *Blood Gases and Retinopathy of Prematurity: The Extremely Low Gestational Age Newborns Study*. Obstetrics and Gynecology: Brown University/Women & Infants Hospital, Providence, R.I.

Don Hoang, B.S., Stanford University; M.H.S., Yale University. *Leptin: A Novel Hormone of the Parathyroid Gland*. Plastic Surgery: University of Southern California, Los Angeles, Calif.

Eric Alan Huebner, B.S., University of Washington; Ph.D., Yale University. *Mechanisms of Axon Regeneration Inhibition by Nogo-A*. Postdoctoral Research Fellow: Children's Hospital Boston, Boston, Mass.

Adelina Hung, B.A., Columbia University. *Carotid IMT Provides Evidence that Ascending Aortic Aneurysm Protects Against Systemic Atherosclerosis*. Internal Medicine: Beth Israel Deaconess Medical Center, Boston, Mass.

Omer Ibrahim, B.A., B.S., University of Cincinnati. *Comparing the Efficacy between Suction-Curette and Botox Injections in the Treatment of Axillary Hyperhidrosis*. Dermatology: Cleveland Clinic Foundation, Cleveland, Ohio

Aliya Zul Jiwani, A.B., Harvard University. *Effects of Caffeinated Coffee on Intraocular and Ocular Perfusion Pressure*. Transitional: Cambridge Health Alliance Program, Cambridge, Mass. Ophthalmology: Harvard Medical School/Massachusetts Eye and Ear Infirmary, Boston, Mass.

Tiffanie Jones, A.B., Harvard University; M.P.H., Yale University. *Association between Tumor Molecular Subtype and Extent of Nodal Disease in Breast Conservation Therapy*. Internal Medicine: Hospital of the University of Pennsylvania, Philadelphia, Pa.

Michelle Therssen Joy, B.S., Brown University. *"All you think about...is being high" – Phenomenology of Experiences Surrounding Heroin Detoxification*. Psychiatry: Hospital of the University of Pennsylvania, Philadelphia, Pa.

Brian Lee Ju, B.S., Yale University. *Disclosure of Conflicts of Interest in the Orthopaedic Field and in Medical Education*. Transitional: Albert Einstein Medical Center, Philadelphia, Pa. Diagnostic Radiology: Hospital of the University of Pennsylvania, Philadelphia, Pa.

Guson Kang, B.S., Stanford University. *Plasma BIN1 Correlates with Heart Failure and Predicts Arrhythmia in Patients with Arrhythmogenic Right Ventricular Cardiomyopathy*. Internal Medicine: Stanford University Programs, Stanford, Calif.

Hadiza Shu'aib Kazaure, B.S., Temple University. *Surgical Patients with Do-Not-Resuscitate (DNR) Orders: An Analysis of Characteristics and Short-Term Outcomes among 8256 Patients*. General Surgery: Stanford University Programs, Stanford, Calif.

Narae Ko, B.A., Amherst College; M.H.S., Yale University. *Epithelial Transport of Oxalate in Mouse Duodenum*. Medicine–Preliminary: Pennsylvania Hospital, Philadelphia, Pa. Ophthalmology: University of Washington Affiliated Hospitals, Seattle, Wash.

Andrew Joshua Kobets, B.A., Johns Hopkins University; M.H.S., Yale University. *Vector-Mediated Gene Delivery to Model Striatal Interneuron Loss in Severe Tourette Syndrome*. Neurosurgery: Albert Einstein College/Montefiore Medical Center, Bronx, N.Y.

Caitlin Koerber, B.A., Swarthmore College. *Family Communication Practices about Death in the Setting of Pediatric Malignancy Relapse: A Qualitative Study*. Pediatrics: University of Pittsburgh Medical Center, Pittsburgh, Pa.

Matthew Reid Kruse, B.A., Carleton College; M.B.A., Yale University. *Predicting Disengagement from Care in an Early Psychosis Patient Cohort in the United States*. Psychiatry: University of Minnesota Medical School, Minneapolis, Minn.

Esther Sunkyoung Lee, B.A., Princeton University. *Prevalence and Clinical Significance of Incidental Cardiovascular Findings on Routine Chest Computed Tomography Scans*. Medicine–Preliminary: Cedars-Sinai Medical Center, Los Angeles, Calif. Ophthalmology: University of Southern California, Los Angeles, Calif.

Matthew Scott Lidstrom, B.S., University of Washington. *Analyzing Breast Tumor Response to Neoadjuvant Therapy by PK Models of Dynamic Contrast-Enhanced MR*. Medicine–Preliminary: Providence Saint Vincent Hospital, Portland, Ore. Diagnostic Radiology: Emory University School of Medicine, Atlanta, Ga.

Michael Hong-Tak Ma, B.S., University of California–Los Angeles. *Risk Factors Associated with Biliary Pancreatitis in Children*. Pediatrics: Massachusetts General Hospital, Boston, Mass.

Cheryl Lynn Maier Jackson, B.A., B.S., University of Georgia; Ph.D., Yale University. *Human Pericytes Modulate Allogeneic CD4 T Cell Responses*. Pathology–Anatomic and Clinical: Emory University School of Medicine, Atlanta, Ga.

Tejas Chandrakant Manchandia, B.A., B.S., Rice University. *Alterations in Regional Cerebral Blood Flow with Propofol Anesthesia Compared with Sevoflurane*. Medicine–Preliminary: University of Washington Affiliated Hospitals, Seattle, Wash. Diagnostic Radiology: University of Washington Affiliated Hospitals, Seattle, Wash.

Anant Mandawat, B.A., B.S., University of Georgia. *Outcomes of Pacemaker Implantation in the Elderly*. Internal Medicine: Massachusetts General Hospital, Boston, Mass.

Badri Gunvant Modi, B.A., B.S., Emory University. *Langerhans Cells Facilitate Mutagenesis and Squamous Cell Carcinoma*. Medicine–Preliminary: Massachusetts General Hospital, Boston, Mass. Dermatology: Hospital of the University of Pennsylvania, Philadelphia, Pa.

Michelle Morales, B.S., California State University–Los Angeles. *Golgi and ERES Biogenesis in the Malaria-Causing Parasite Plasmodium Falciparum*. Internal Medicine: Scripps Mercy Hospital, San Diego, Calif.

Alexander Gharib Nazem, B.S., Yale University; M.B.A., Harvard University. *Online Communities Driving Guideline Adoption in National Health Care Initiatives: An Examination of the Door-to-Balloon Alliance Online Community*. Internal Medicine/Primary: Brigham and Women's Hospital, Boston, Mass.

Kim Nguyen, A.B., Harvard University. *Exploring Patient Perspective at End of Life: Qualitative Interviews with Terminally Ill Patients*. Internal Medicine/Primary: University of California–San Francisco, San Francisco, Calif.

Kiavash Nikkhou, B.S., University of California–Los Angeles. *Role of Active Surveillance and Volume Monitoring in Patients with Small Renal Masses*. Surgery–Preliminary: University of Southern California, Los Angeles, Calif. Urology: University of Southern California, Los Angeles, Calif.

Bolin Niu, B.S., Duke University. *Reproducibility of Exercise Testing in Patients with Pulmonary Arteriovenous Malformations*. Internal Medicine: Hospital of the University of Pennsylvania, Philadelphia, Pa.

Manish Suresh Noticewala, B.S., New York University. *Comparing Outcomes between Unicompartamental Knee Arthroplasty and Total Knee Arthroplasty*. Orthopaedic Surgery: New York Presbyterian Hospital–Columbia, New York, N.Y.

Charisse Marie Orme, B.S., University of California–Davis; Ph.D., Yale University. *TUG as a Regulator of the p97 ATPase*. Medicine–Preliminary: Yale–New Haven Hospital, New Haven, Conn. Dermatology: New York University School of Medicine, New York, N.Y.

Michael Otremba, B.A., University of Minnesota. *When Doctors Become Creditors: The Detainment of Impoverished Patients in Uganda. Essay and Documentary Film*. Postdoctoral Associate: Section of Otolaryngology in the Department of Surgery, Yale School of Medicine, New Haven, Conn.

Henry Soo-Min Park, B.A., B.S., Yale University; M.P.H., Harvard University. *Optimizing Observational Study Design in the Evaluation of Postoperative Radiotherapy*. Medicine–Preliminary: Beth Israel Deaconess Medical Center, Boston, Mass. Radiation Oncology: Yale–New Haven Hospital, New Haven, Conn.

Sascha Qian, B.S., Stanford University. *Functional MRI of Emotional Face Processing in Schizophrenia and the Social Cognition Psychometric Correlates*. Anesthesiology: New York Presbyterian Hospital–Columbia, New York, N.Y.

Odayme Quesada, B.S., University of Florida; M.H.S., Yale University. *Prenatal Hazardous Substance Use and Adverse Infant Birth Outcomes*. Internal Medicine: University of California–San Francisco, San Francisco, Calif.

Saif Shafique Rathore, B.A., Cornell University; M.P.H., University of North Carolina; Ph.D., Yale University. *Racial Differences in Cardiac Catheterization Use in Patients Hospitalized with Acute Myocardial Infarction: Classifications, Associations, and Emerging Technologies*. Internal Medicine: Massachusetts General Hospital, Boston, Mass.

Frederick William Romberg, B.S., Virginia Polytechnic Institute and State University; M.S., California Institute of Technology. *High-Resolution Time-Frequency Analysis of Neurovascular Responses to Ischemic Challenges*. Transitional: Cambridge Health Alliance Program, Cambridge, Mass. Anesthesiology: University of Utah Affiliated Hospitals, Salt Lake City, Utah

Lara Elise Rosenbaum, B.S., Massachusetts Institute of Technology; M.H.S., Yale University. *The Effect of E-Cadherin Loss on Melanoma Formation and Metastasis*. Medicine–Preliminary: Beth Israel Deaconess Medical Center, Boston, Mass. Dermatology: McGaw Medical Center of Northwestern University, Chicago, Ill.

Jill Carol Rubinstein, B.A., M.S., Ph.D., Yale University; M.S., Stockholm University. *Translational Epigenetics: Applications of High-Throughput Genomic Technologies for Melanoma Diagnosis and Treatment*. General Surgery: Yale–New Haven Hospital, New Haven, Conn.

Mona Sadehpour, B.A., University of Texas at Dallas. *Have the Gaps Closed? The Role of Gender in Academic Dermatology: Results from a National Study*. Medicine–Preliminary: Virginia Mason Medical Center, Seattle, Wash. Dermatology: University of Pittsburgh Medical Center, Pittsburgh, Pa.

Benjamin Andrew Savitch, B.S., Arizona State University; J.D., University of Washington. *Confronting Collective Violence*. Emergency Medicine: University of Chicago Medical Center, Chicago, Ill.

Marie Ann Rymut Schaefer, B.A., Ohio Wesleyan University. *Documentation of Emergency Department Discharges against Medical Advice*. Family Medicine: Ohio State University Medical Center, Columbus, Ohio

J. Hale Season, B.S., Yale University. *Acute Constipation in Children Receiving Chemotherapy for Cancer*. Emergency Medicine: Oregon Health & Science University Program, Portland, Ore.

Whitney Allison Sheen, B.S., Bates College; M.S., Johns Hopkins University. *Synthesis and Delivery of Ultra-Small Polymer Nanoparticles for Treatment of Glioblastoma Multiforme in the Rat Caudate*. Neurosurgery: University of Arizona Affiliated Hospitals, Tucson, Ariz.

Lin Shen, B.A., Stanford University. *Colorectal Cancer Profile of Native Chinese Patients in Changsha, Human Province as Compared to Chinese American Patients*. Internal Medicine: Yale-New Haven Hospital, New Haven, Conn.

Sameer Sheth, B.S., Yale University. *State-Sponsored Public Reporting of Hospital Quality*. Internal Medicine: Brigham and Women's Hospital, Boston, Mass.

David Cole Shisler, B.S., Vanderbilt University. *Impaired Interictal Network Functional Connectivity in Childhood Absence Epilepsy*. Internal Medicine: Vanderbilt University Medical Center, Nashville, Tenn.

Adam Shoffner, B.S., University of Kansas. *Tissue-Engineered Vascular Grafts Allow Neovessel Formation by Recruiting Adjacent Vascular Tissue*. General Surgery: Duke University Medical Center, Durham, N.C.

Noreen Singh, B.S., University of California—Los Angeles. *Survival of Patients with Relapsed or Refractory Acute Myeloid Leukemia: A Retrospective Comparison of Intensive Salvage Chemotherapy and Low Intensity Treatments over Ten Years at Yale-New Haven Hospital*. Family Medicine: Sutter Medical Center of Santa Rosa, Santa Rosa, Calif.

Matthew Justin Singleton, B.A., B.S., B.S., University of Maryland; M.H.S., Yale University. *Physician Knowledge of the Costs of Diagnostic Tests*. Internal Medicine: Johns Hopkins Hospital Bayview, Baltimore, Md.

Alla Vickery Lescure Smith, B.A., Bowdoin College. *High Incidence of Subsequent Pregnancy in Teens Tested for STDs in the Emergency Department*. Pediatrics/Urban Health Advocacy: Children's Hospital Boston/Boston Medical Center, Boston, Mass.

Prathap Sooriyakumaran, B.A., University of California—Berkeley. *Decision Support to Aid in the Diagnosis of Pediatric Kidney Stones without Reliance on CT Imaging*. Emergency Medicine: University of California—San Francisco, San Francisco, Calif.

Michael Carlton Soule, B.A., Brown University. *A Survey Assessing the Contributing Factors to Substance Abuse Treatment in U.S. Corrections Settings*. Psychiatry: Massachusetts General Hospital, Boston, Mass.

John Michael Thomas, B.A., B.S., University of Dayton. *Foretelling the Future of Prognostication: A Historically Inspired Domain-Based Approach for the Elderly*. Internal Medicine/Primary: Yale-New Haven Hospital, New Haven, Conn.

Sonya Thomas, B.A., Columbia University; M.H.S., Yale University. *Visual Field Asymmetry and Sleep Position in Open Angle Glaucoma*. Medicine–Preliminary: Moses H. Cone Memorial Hospital, Greensboro, N.C. Ophthalmology: Wilmer Eye Institute/Johns Hopkins University, Baltimore, Md.

Anant Vasudevan, B.S., Stanford University. *Cellular Response to Prosthetic Wear Debris Differs in Rheumatoid Versus Non-Rheumatoid Arthritis*. Internal Medicine: Brigham and Women's Hospital, Boston, Mass.

Cicely Ann Williams, B.A., University of Virginia; Ph.D., Yale University. *Three-Dimensional Modeling of the Neurovascular Niche: Neural Progenitor Cell and Endothelial Cell Interactions Modulated in Vivo Transplant Behavior*. Pediatrics: Children's National Medical Center, Washington, D.C.

Kathryn Emily Wynne, B.A., Cornell University. *Actigraphy Sleep Patterns: Relationships to Body Mass Index and Physical Activity in Minority Children*. Pediatrics: Massachusetts General Hospital, Boston, Mass.

Catherine S. Yang, B.A., Cornell University. *An Incompletely Penetrant COL7A1 Mutation Causes Dystrophic Epidermolysis Bullosa and Epidermolysis Bullosa Pruriginosa*. Pediatrics–Preliminary: Massachusetts General Hospital, Boston, Mass. Dermatology: Rhode Island Hospital/Brown University, Providence, R.I.

Rashele Patrice (Cross) Yarborough, B.S., Howard University; Ph.D., Yale University. *School-Related Exposure to Nitrogen Dioxide and Asthma Severity in Children Enrolled in the STAR*. Family Medicine: Middlesex Hospital Program, Middletown, Conn.

Igor S. Zavarine, M.S., University of New Haven; Ph.D., Purdue University. *Electron Transfer Reactions of Organometallic Compounds*. Pathology–Anatomic and Clinical: Albert Einstein College/Montefiore Medical Center, Bronx, N.Y.

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

Danielle Barber  
Corey Scott Frucht  
Thomas J. Gniadek  
Eric Alan Huebner  
Cheryl Lynn Maier Jackson  
Charisse Marie Orme  
Saif Shafique Rathore  
Jill Carol Rubinstein  
Cicely Ann Williams  
Rashele Patrice (Cross) Yarborough

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

Matthew Reid Kruse

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

Oliver Mullin Barry

Daniel John Blizzard

Marko Boskovski

Pete Duncan

Lilangi Suhadini Ediriwickrema

Anna Kristine Engberg Dewan

Ogechukwu Eze

Aaron Joshua Feinstein

Don Hoang

Narae Ko

Andrew Joshua Kobets

Odayme Quesada

Lara Elise Rosenbaum

Matthew Justin Singleton

Sonya Thomas

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

Tiffanie Jones

# Enrollment for 2011–2012

## 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	Oliver Barry
Parwiz Abrahami	Christopher Bartley
Alexandra Adler	Bryce Basques
Johannes Adomako-Mensah	Ali Batouli
Rahul Agarwal	Alexander Bazazi
Feras Akbik	Jessica Becker
Alexandra Albert	Anne Beckett
Caroline Albert	Joel Beckett
Benjamin Albright	Jonathan Belman
Andre Alcon	Gal Ben-Josef
Caroline Aldridge	Carl Berdahl
Nancy Allen	Elyssa Berg
Michael Alpert	Jessica Berger
Lisa An	Nicholas Bergfeld
Sanjay Aneja	Rohan Bhandari
Jacob Appelbaum	Dipankan Bhattacharya
Ryan Aronberg	Xiao Bi
Alexander Arzeno	Sean Bickerton
Deepak Atri	John Binford
Kofi-Buaku Atsina	Meredith Binford
Kwame B. Atsina	Vicki Zhu Jun Bing
Joshua Au	Remy Bizimungu
Chethan Bachireddy	Adriana Blakaj
Raghav Badrinath	Daniel Blizzard
Woong Hwan Bae	Benjamin Blond
Preetpaul Bagi	Ryan Blum
Harrison Bai	Jessica Bod
Aditi Balakrishna	Daniel Bohl
Daniel Balkin	Marko Boskovski
Zev Balsen	Olatunde Bosu
Jacob Baranoski	Ellen Bradley
Danielle Barber	Eric Brooks
Sabiha Barot	Cortlyn Brown

Jason Brown  
Emily Bucholz  
Rafael Buerba Siller  
Neel Butala  
Allison Campbell  
Kristel Carrington  
Siobhan Case  
Barbara Chaiyachati  
Iris Chandler  
Jocelyn Chandler  
Harry Chang  
Michael Chang  
Katherine Chau  
Jonathan Chen  
Kesi Chen  
Michelle Chen  
Ruijun Chen  
Serene Chen  
Xuejing Chen  
Connie Cheng  
David Choi  
Raj Chovatiya  
Panos Christakis  
Philip Chui  
Sakil Chundydyal  
Victoria Clark  
William Clarke  
Stephanie Cohen  
Susan Combs  
Anne Cooper  
Nika Cyrus  
Catherine Dailey  
Dylan Davey  
Katherine Davis  
Alessandro De Camilli  
Dimitri De Kouchkovsky  
Flavia De Souza  
Ethan Dean  
Uma Deshmukh  
Michael Dewan  
Deepali Dhar  
Isha Di Bartolo  
Martin Dominguez  
Stephanie Douglas  
Nicholas Downing

Jennifer Duffy  
Anna Duncan  
Daniel Duncan  
Asiri Ediriwickrema  
Lilangi Ediriwickrema  
Leonard Edokpolo  
Fayola Edwards  
Mei Elansary  
Hani Elwafi  
Anna Engberg  
Chineme Enyioha  
Nkemka Esiobu  
Harib Ezaldeen  
Ogechukwu Eze  
Devon Fagel  
Olatokunbo Famakinwa  
Louis Fazen  
Aaron Feinstein  
Hao Feng  
Kathleen Fenn  
Jennifer Fieber  
Kelly Fitzgerald  
Valerie Flores  
Dinah Foer  
Suzanne Forrest  
Amy Forrestel  
Juliet Fraser  
Marianna Freudzon  
Corey Frucht  
Jonathan Fu  
Michael Fu  
Kara Furman  
Jeffrey Futterleib  
Nupur Garg  
Matthew Garner  
Samir Gautam  
Erik Geiger  
Nyasha George  
John Gilbert  
Thomas Gilliland  
Vladimir Glinskii  
Thomas Gniadek  
Jessica Gold  
Nicholas Golinvaux  
Dan Gong

Jose Gonzalez  
Samrawit Goshu  
Sarah Goss  
Ramy Goueli  
Lauren Graber  
Conor Grady  
Simon Gray  
Caroline Greenberg  
Karl Grunseich  
Jordan Gruskay  
Marjorie-Anne Guerra  
Wei Gui  
Paul Guillod  
Abhijeet Gummadavelli  
Jennifer Na Guo  
Xiaoyue Guo  
Akash 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  
Alisse Hauspurg  
Xin He  
Joseph Heng  
Edward Herman  
Amanda Hernandez  
Lauren Hibler  
Benjamin Himes  
Hsi-En Ho  
Don Hoang  
Zhe Hou  
Chi-Joan How  
Brendan Huang  
Jing Huang  
Laura Huang  
Eric Huebner

Ken Hui  
Adelina Hung  
Joshua Hustedt  
Madison Hustedt  
Omer Ibrahim  
Dame Idossa  
Kenneth Ike  
Jacob Izenberg  
Jeremy Jacox  
Vikram Jairam  
Oliver Jawitz  
Sarah Jin  
Aliya Jiwani  
Sarah Johnson  
Tiffanie Jones  
Soledad Jorge  
Elisa Jorgensen  
Michelle Joy  
Brian Ju  
Stacey Kallem  
Guson Kang  
Maya Kasowski  
Adam Kaufman  
Hadiza Kazaure  
Haben Kefella  
Derek Kennedy  
Rabeea Khan  
Sabrina Khan  
Shihan Khan  
Ramak Khosravi  
Dhruv Khullar  
Nour Kibbi  
Changhyun Kim  
Chang-Yeon Kim  
Roger Kim  
Amanda King  
Narae Ko  
Andrew Kobets  
Srdan Kobsa  
Maria Koenigs  
Caitlin Koerber  
Derek Kong  
Kevin Koo  
Idil Kore  
Maya Kotas

Whitney Kress  
Lauren Krumeich  
Matthew Kruse  
Alexander Kula  
Vivek Kulkarni  
David Kull  
Adam Kundishora  
Eric Kuo  
Gregory Kuzmik  
Ashton Lai  
Natalie Lastra  
Samantha Lau  
Olga Laur  
Timothy Law  
Esther Lee  
Joshua Leinwand  
Felicity Lenes  
Rachel Lentz  
Benjamin Lerner  
Brian Letzen  
Jonathan Levin  
Jonathan Levinsohn  
Alice M. Li  
Alice Y. Li  
Matthew Lidstrom  
Alicia Little  
Elise Liu  
Geoffrey Liu  
Jia Liu  
Kristina Liu  
Lucinda Liu  
Rebecca Liu  
Billy Lockhart  
Kelsey Loeliger  
Songprod Lorgunpai  
Jeffrey Low  
Daniel Lu  
Julia Lubsen  
Kaysia Ludford  
Adam Lukasiewicz  
Alexander Luryi  
Michael Ma  
Benjamin Macdougall  
Abiodun Mafolasire  
Mark Mai  
Cheryl Maier

Sarah Mallik  
Tejas Manchandia  
Anant Mandawat  
Charisse Mandimika  
Benjamin Margolis  
Alexandria Marino  
Matthew Marr  
James Martenson  
Carina Martin  
Leisel Martin  
Pierre Martin  
Alexander Marzuka  
Susan Maya  
Heather McGee  
Nicole McNeer  
Bethlehem Mekonnen  
Regina Melendez  
Stephanie Meller  
David Merrick  
Goran Micevic  
Matthew Mikhail  
John Millet  
Kavita Mistry  
Badri Modi  
Michelle Morales  
Amy Moreno  
Aileen Morrison  
Joshua Motelow  
Moustafa Moustafa  
Regina Myers  
Maria Nardell  
Alexander Nazem  
Kim Nguyen  
Allen Nicholson  
Kiavash Nikkhou  
Bolin Niu  
Manish Noticewala  
Eberechi Nwogu  
Alyssa Nylander  
Julius Oatts  
Ebelechukwu Odiari  
Charles Odonkor  
Michael Oh  
Daniel Okin  
Oluwarotimi Okunade  
Caroline Ong

Oluwatosin Onibokun  
Charisse Orme  
Michael Otremba  
Eve Overton  
Micaela Owusu  
Babita Panigrahi  
Summer Paradise  
Esther Park  
Henry Park  
Aniruddh Patel  
Joseph Patterson  
Jovana Pavisic  
Michael Peluso  
Maria Perez  
Avital Perry  
Curtis Perry  
Rachel Perry  
Warren Perry  
Max Petersen  
Miles Pfaff  
Tammi-Marie Phillip  
Luke Pike  
Crystal Piper  
Nathan Pirakitikulr  
Carina Preskill  
Sascha Qian  
Odayme Quesada  
Jennifer Quon  
Kavita Radhakrishnan  
Kyle Ragins  
Jorge Ramallo Pardo  
John Ramirez  
Marco Ramos  
Vinay Rathi  
Saif Rathore  
Elizabeth Rawson  
Duncan Reid  
Adele Ricciardi  
Alexandra Ristow  
Gladys Rodriguez  
Frederick Romberg  
Lara Rosenbaum  
Brian Rosenberg  
Graeme Rosenberg  
Talia Rosenberg

Rachel Rosenstein  
Robert Ross  
Megan Rowlands  
Jill Rubinstein  
Luis Rubio  
Dionne Rudison  
Ferrin Ruiz  
Mona Sadeghpour  
Kyan Safavi  
Anton Safonov  
Michaela Samson  
Andre Samuel  
Britt Sandler  
Adam Sang  
Jonathan Santiago  
Christopher Sauer  
Ameya Save  
Benjamin Savitch  
Rollin Say  
Susan Scanlon  
Marie Schaefer  
Alexander Scherer  
Amy Schoenfeld  
Zachary Schwam  
Jonathan Season  
Sounok Sen  
Niyati Shah  
Whitney Sheen  
Lin Shen  
Sameer Sheth  
Veronica Shi  
Yushane Shih  
David Shisler  
Irina Shklyar  
Adam Shoffner  
Lydia Shook  
Bilal Siddiqui  
Noreen Singh  
Matthew Singleton  
Jordan Slosower  
Alla Smith  
Andrew Smith  
Whitney Soble  
Samuel Sondalle  
Prathap Sooriyakumaran

Michael Soule  
Gregory Stachelek  
Katherine Standish  
Justin Steinberg  
Robert Stretch  
Garth Strohbahn  
Kevin Su  
Gloria Sue  
Joome Suh  
Nataly Sumarriva  
Jared Sun  
Christine Sunu  
Alexander Svoronos  
Kai Swenson  
Victoria Tate  
Lise Tchouta  
Apoorva Tewari  
Nicholas Theodosakis  
Alexandra Thomas  
Eleanor Thomas  
Emily Thomas  
John Thomas  
Sonya Thomas  
Colin Tominey  
James Tooley  
Daniel Tran  
Gerardo Trejo  
Chung Sang Tse  
Nathan Tu  
Brooks Udelsman  
Sebastian Urday  
Katherine Uyhazi  
Ritchell Van Dams  
Tave Van Zyl  
Neil Vasan  
Aaron Vassall  
Anant Vasudevan  
Eric Venker  
Rebecca Vitale  
Ellen Vollmers  
Amanda Wallace  
Chen Wang  
Chenyang Wang  
Hanbing Wang  
Jessica Wang  
Xiao Yan Wang  
Ruth Wang'ondou  
Brian Wayda  
Judah Weathers  
Matthew Webb  
Molly Weiner  
Daniel Weisberg  
Austin Weiss  
Laura West  
Margaret Whicker  
Cicely Williams  
Theresa Williamson  
Joel Winer  
Lauren Wiznia  
Daniel Wong  
Kenneth Wong  
Risa Wong  
Rany Woo  
Kathryn Wynne  
Julie Xanthopoulos  
Wendy Xiao  
Chaoying Xu  
Catherine Yang  
Genevieve Yang  
Jenny Yang  
Qing Yang  
Rashele Yarborough  
Maryam Yeganegi  
Andrew Young  
Tiffany Yuh  
Mikell Yuhasz  
Samir Zaidi  
Igor Zavarine  
Nazlee Zebardast  
Bingnan Zhang  
Ke Zhang  
Ze Zhang  
Bixiao Zhao  
Yu Cheng Zhao  
Rocksheng Zhong  
Mojun Zhu  
Victor Zhu  
Radoslav Zinoviev  
*Total, 516*

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

Parwiz Abrahimi	Srdan Kobsa
Feras Akbik	Derek Kong
Alexandra Albert	Maya Kotas
Nancy Allen	Ashton Lai
Jacob Appelbaum	Alice M. Li
Daniel Balkin	Alicia Little
Danielle Barber	Rebecca Liu
Christopher Bartley	Kelsey Loeliger
Alexander Bazazi	Cheryl Maier
Jonathan Belman	Alexandria Marino
Dipankan Bhattacharya	James Martenson
Sean Bickerton	Heather McGee
Adriana Blakaj	Nicole McNeer
Jason Brown	David Merrick
Emily Bucholz	Goran Micevic
Allison Campbell	Kavita Mistry
Barbara Chaiyachati	Joshua Motelow
Jonathan Chen	Alyssa Nylander
Raj Chovatiya	Daniel Okin
Victoria Clark	Charisse Orme
Dylan Davey	Curtis Perry
Dimitri De Kouchkovsky	Rachel Perry
Martin Dominguez	Max Petersen
Louis Fazen	Nathan Pirakitikulr
Kelly Fitzgerald	Marco Ramos
Corey Frucht	Saif Rathore
Kara Furman	Adele Ricciardi
Samir Gautam	Brian Rosenberg
Thomas Gniadek	Rachel Rosenstein
Simon Gray	Robert Ross
Jennifer Na Guo	Jill Rubinstein
Muhamed Hadzipasic	Susan Scanlon
Adrian Haimovich	Alexander Scherer
Edward Herman	Andrew Smith
Amanda Hernandez	Samuel Sondalle
Brendan Huang	Gregory Stachelek
Eric Huebner	Nicholas Theodosakis
Ken Hui	Alexandra Thomas
Jeremy Jacox	Eleanor Thomas
Maya Kasowski	Colin Tominey
Adam Kaufman	Katherine Uyhazi
Shihan Khan	Neil Vasan
Amanda King	Ellen Vollmers

Chen Wang  
Ruth Wang'onda  
Judah Weathers  
Molly Weiner  
Laura West  
Cicely Williams  
Julie Xanthopoulos  
Wendy Xiao

Genevieve Yang  
Qing Yang  
Rashele Yarborough  
Samir Zaidi  
Ke Zhang  
Bixiao Zhao

*Total, 100*

**REGISTERED FOR THE COMBINED  
M.D./J.D. DEGREE**

Benjamin Savitch

*Total, 1*

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

Oliver Barry  
Joel Beckett  
Daniel Blizzard  
Marko Boskovski  
Jennifer Duffy  
Daniel Duncan  
Lilangi Ediriwickrema  
Anna Engberg  
Ogechukwu Eze  
Aaron Feinstein  
Jonathan Fu  
Jeffrey Futterleib  
Ramy Goueli  
Clayton Haldeman  
Benjamin Himes  
Don Hoang

Joshua Hustedt  
Narae Ko  
Andrew Kobets  
Gregory Kuzmik  
Rachel Lentz  
Kristina Liu  
Alexander Marzuka  
John Millet  
Eberechi Nwogu  
Julius Oatts  
Michael Peluso  
Odayme Quesada  
Lara Rosenbaum  
Matthew Singleton  
Sonya Thomas

*Total, 31*

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

Woong Hwan Bae  
Matthew Kruse  
Alexander Nazem  
Kyan Safavi

*Total, 4*

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

Olatokunbo Famakinwa

Tiffanie Jones

Kevin Koo

Henry Park

*Total, 4*

**REGISTERED FOR THE  
PHYSICIAN ASSOCIATE PROGRAM**

Jon-Michael Allen

Justin David Arnold

Ye Eun Bae

Ofer Barniv

Richard David Bennett

Clarence Collin Bone

Jonathon Mark Bostwick

Michael Brask

Jason Christopher Browder

Jennifer Lauren Burg

Suzanne Castner

Kelly Lauren Cederquist

Jenny Chang

Christina Chao

John Matthew Corsi

Laura Ann Cronin

Thomas Todd De Vries

Audra Veronica DiCaro

Jessica DiStefano

Colleen Elizabeth Driscoll

Caroline M. Dudley

Margot Ebling

Deanne Margot Santos Enriquez

Raina Ericson

Zena Falk

Tia Jean Ferrarotti

Jennifer Rachelle Fischer

Casandra Francis

James Frederick

Kristine Gauthier

Natalie Geisler

Hiwot Girma

Chandra Goff

Tyler Gorman

Zachary Greenier

Natalie Marie Grome

Emily Gruetzmacher

Joel David Minoru Hamaguchi

Ryan Patrick Hausfeld

Elisa Hoellerich

Justin Hogan

Eleanor Holtz-Eakin

Tamara Lynn Houston

Natalie Hutchison

Crystal Huynh

Ivan Islamaj

Jessica Jean

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 Ombrembowski  
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 write to the Office of Undergraduate Admissions, Yale University, PO Box 208234, New Haven CT 06520-8234; tel., 203.432.9300; e-mail, [student.questions@yale.edu](mailto:student.questions@yale.edu); Web site, [www.yale.edu/admit](http://www.yale.edu/admit)

**Graduate School of Arts and Sciences** Est. 1847. Courses for college graduates. Master of Arts (M.A.), Master of Engineering (M.Eng.), 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](mailto:graduate.admissions@yale.edu), or call the Office of Graduate Admissions at 203.432.2771. Postal correspondence should be directed to the 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 write to the Director of Admissions, Office of Admissions, Yale School of Medicine, 367 Cedar Street, New Haven CT 06510; tel., 203.785.2643; fax, 203.785.3234; e-mail, [medical.admissions@yale.edu](mailto:medical.admissions@yale.edu); Web site, <http://medicine.yale.edu/education/admissions>

**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 write to the Admissions Office, Yale Divinity School, 409 Prospect Street, New Haven CT 06511; tel., 203.432.5360; fax, 203.432.7475; e-mail, [divinity.admissions@yale.edu](mailto:divinity.admissions@yale.edu); Web site, <http://divinity.yale.edu>. Online application, <https://apply.divinity.yale.edu/apply>

**Law School** Est. 1824. Courses for college graduates. Juris Doctor (J.D.). For additional information, please write to the Admissions Office, Yale Law School, PO Box 208215, New Haven CT 06520-8215; tel., 203.432.4995; e-mail, [admissions.law@yale.edu](mailto:admissions.law@yale.edu); Web site, [www.law.yale.edu](http://www.law.yale.edu)

Graduate Programs: Master of Laws (LL.M.), Doctor of the Science of Law (J.S.D.), Master of Studies in Law (M.S.L.). For additional information, please write to Graduate Programs, Yale Law School, PO Box 208215, New Haven CT 06520-8215; tel., 203.432.1696; e-mail, [gradpro.law@yale.edu](mailto:gradpro.law@yale.edu); Web site, [www.law.yale.edu](http://www.law.yale.edu)

**School of Engineering & Applied Science** Est. 1852. Courses for college graduates. Master of Science (M.S.), Master of Engineering (M.Eng.), and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please write to the Office of Graduate Studies, Yale School of Engineering & Applied Science, PO Box 208267, New Haven CT 06520-8267; tel., 203.432.4250; e-mail, [grad.engineering@yale.edu](mailto:grad.engineering@yale.edu); Web site, <http://seas.yale.edu>

**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 the 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 write to the Yale School of Music, PO Box 208246, New Haven CT 06520-8246; tel., 203.432.4155; fax, 203.432.7448; e-mail, [gradmusic.admissions@yale.edu](mailto:gradmusic.admissions@yale.edu); Web site, <http://music.yale.edu>

**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 write to the Office of Admissions, Yale School of Forestry & Environmental Studies, 205 Prospect Street, New Haven CT 06511; tel., 800.825.0330; e-mail, [fesinfo@yale.edu](mailto:fesinfo@yale.edu); Web site, [www.environment.yale.edu](http://www.environment.yale.edu)

**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 write to the Director of Admissions, Yale School of Public Health, PO Box 208034, New Haven CT 06520-8034; tel., 203.785.2844; e-mail, [ysph.admissions@yale.edu](mailto:ysph.admissions@yale.edu); Web site, <http://publichealth.yale.edu>

**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 write to the Yale School of Nursing, PO Box 9740, New Haven CT 06536-0740; tel., 203.785.2389; Web site, <http://nursing.yale.edu>

**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 write to the Admissions Office, Yale School of Drama, PO Box 208325, New Haven CT 06520-8325; tel., 203.432.1507; e-mail, [ysd.admissions@yale.edu](mailto:ysd.admissions@yale.edu); Web site, [www.drama.yale.edu](http://www.drama.yale.edu)

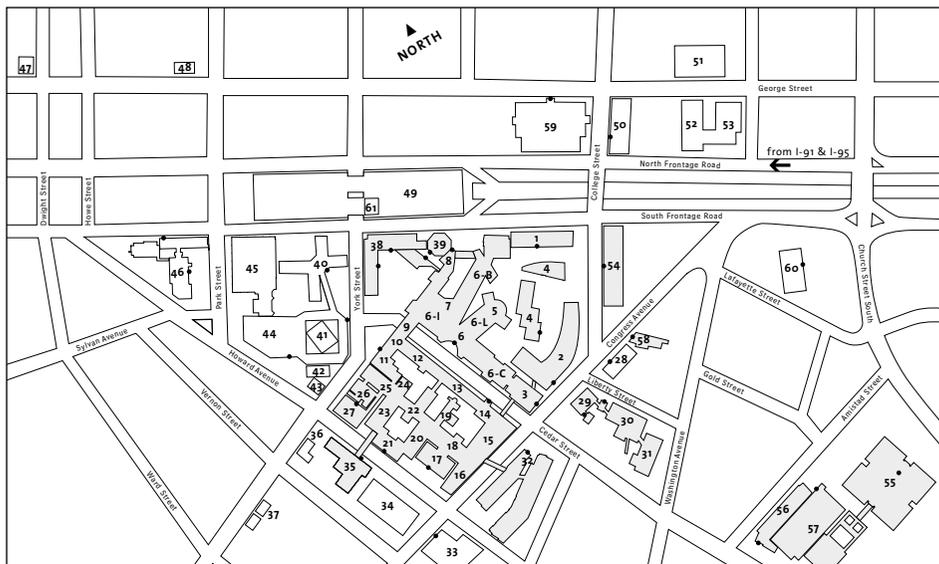
**School of Management** Est. 1976. Courses for college graduates. Master of Business Administration (M.B.A.), Master of Advanced Management (M.A.M.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please write to the Admissions Office, Yale School of Management, PO Box 208200, New Haven CT 06520-8200; tel., 203.432.5635; fax, 203.432.7004; e-mail, [mba.admissions@yale.edu](mailto:mba.admissions@yale.edu); Web site, <http://mba.yale.edu>





## YALE MEDICAL CENTER BUILDINGS AND ADDRESSES



1. Laboratory of Epidemiology and Public Health, 60 College St.
2. Boyer Center for Molecular Medicine
3. Jane Ellen Hope Building
4. Sterling Power Plant and Sterling Power Plant Co-Gen
5. Harvey Cushing/John Hay Whitney Medical Library
6. Sterling Hall of Medicine, 333 Cedar St.  
Wings: B, C, I & L
7. Mary S. Harkness Memorial Auditorium
8. Child Study Center
9. Nathan Smith Building (Bridge)
10. Yale Cancer Center
11. Hunter Building, 15 York St.
12. William Wirt Winchester Building
13. Boardman Building, 330 Cedar St.
14. Brady Memorial Laboratory, 310 Cedar St.
15. Lauder Hall
16. Laboratory for Surgery, Obstetrics and Gynecology
17. Primary Care Center
18. Farnam Memorial Building
19. Tompkins East
20. Tompkins Memorial Pavilion
21. Charles A. Dana Building, 789 Howard Ave.
22. Clinic Building
23. Fitkin Memorial Pavilion
24. Fitkin Amphitheater
25. Laboratory for Medicine and Pediatrics
26. Lippard Laboratory of Clinical Investigation
27. P.E.T. Center
28. John B. Pierce Laboratory, 290 Congress Ave.
29. Congress Place, 301 Cedar St.
30. Yale-New Haven Psychiatric Hospital 2, 184 Liberty St.
31. Yale-New Haven Psychiatric Hospital 3, 184 Liberty St.
32. Anlyan Center for Medical Research and Education, 300 Cedar St.
33. 430 and 464 Congress Ave. and 726 Howard Ave.
34. **Howard Ave. Garage**
35. Yale Physicians Building, 800 Howard Ave.
36. 110 Davenport Ave. (YNHH Day Care Center)
37. 132–138 Davenport Ave. (Lead Program)
38. Edward S. Harkness Memorial Hall A and D, 367 Cedar St.
39. Neison and Irving Harris Building, Child Study Center, 230 S. Frontage Rd.
40. East Pavilion, 20 York St.  
(Yale-New Haven Hospital Main Entrance)
41. South Pavilion, 20 York St.
42. **Emergency Services Parking**
43. **Children's Hospital Parking Garage**
44. Children's Hospital (West Pavilion)
45. Smilow Cancer Hospital, 20 York St.
46. Connecticut Mental Health Center
47. Ronald McDonald House, 501 George St.
48. 425 George St.
49. **Air Rights Parking Garage**
50. 127, 135, and 153 College St.
51. New Haven Hotel, 229 George St.
52. **Temple Garage**
53. Temple Medical Center, 40–60 Temple St.
54. College Place, 47 College St.
55. Medical Center South, 100 Church St. South  
(Yale School of Nursing)
56. 10 Amistad St.
57. **Amistad Garage**
58. 270 Congress Ave.
59. 300 George St.
60. 2 Church St. South
61. 55 York St.

# Travel Directions

See also <http://business.yale.edu/map/medicine.html>. 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 or 3. 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 or 3. 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 (voice), 203.432.9388 (TTY). For additional information, see [www.yale.edu/equalopportunity](http://www.yale.edu/equalopportunity).

In accordance with both federal and state law, the University maintains information concerning current security policies and procedures and prepares an annual crime report concerning crimes committed within the geographical limits of the University. In addition, in accordance with federal law, the University maintains information concerning current fire safety practices and prepares an annual fire safety report concerning fires occurring in 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 such information to any applicant for admission.

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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