School of Medicine
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Hua Xu, Ph.D., Assistant Dean for Biomedical Informatics

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 May 1, 2024.

A Message from the Dean

Since its founding in 1810 as the Medical Institution of Yale College, Yale School of Medicine has conferred 9,702 medical degrees. We educate physician-scientists and leaders, with a focus on our innovative biomedical research and the advanced care that our Yale Medicine physicians provide.

Basic translational research is helping us identify drivers of the growth and spread of cancer and resistance to drugs that new therapies can target. We are at the forefront of learning how to harness the immune system to kill cancer cells and understanding how the immune system contributes to inflammation in acute infections and chronic diseases. In the neurosciences, we are making progress in understanding the intricacies of the brain and the biological basis of behavior and abnormal brain function, and gaining insight about the underpinnings of such neurodegenerative brain diseases as Alzheimer's, Parkinson's, and amyotrophic lateral sclerosis. We are devoting extensive resources to developing and obtaining new technologies to study cells, genes, and other essential structures of life in atomic detail. At the same time, we are mining and modeling in novel ways the vast amounts of biomedical data now available to study molecular, cellular, and organismic systems.

Our researchers and clinicians also collaborate to advance personalized medicine and to promote health equity. Translational researchers have developed novel therapies to treat obesity and to prevent diabetes. The ability to link whole-genome sequencing to a patient's health record is creating possibilities for predicting diseases and targeting therapies. The use of data science and artificial intelligence enables the identification of individuals and populations at greatest risk for a disease and enables us to tailor preventive strategies. We engage our community in prioritizing clinical research. In this way, every patient can benefit from discovery.

Our education program fosters curiosity and critical thinking. The courses described in this bulletin represent a curriculum continually refined through self-evaluation and by incorporating best educational practices from peer institutions and other disciplines. Our program combines personal interaction with distinguished faculty with effective technology tools that promote interactive learning and innovative teaching.

Welcome to Yale School of Medicine.

Nancy J. Brown, M.D.
Jean and David W. Wallace Dean of Medicine
C.N.H. Long Professor of Internal Medicine

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 completed 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.

Over the last several years, YSM and YNHHS have been engaged in strategic planning with a shared aspiration to achieve extraordinary gains in individual, community, and global health as one of the nation's premier academic health systems.

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

MISSION

Yale School of Medicine educates and nurtures creative leaders in medicine and science, promoting curiosity and critical inquiry in an inclusive environment enriched by diversity. We advance discovery and innovation fostered by partnerships across the university, our local community, and the world. We care for patients with compassion and commit to improving the health of all people.

FACILITIES

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

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

The Harvey Cushing/John Hay Whitney Medical Library, located in Sterling Hall of Medicine, houses approximately 366,500 print volumes and subscribes to more than 23,000 electronic journals, 39,500 electronic books, and 96 databases. It offers comfortable seating, small-group study spaces, computers, and services to help with research.

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

Yale New Haven Hospital (YNHH) is a nationally recognized, 1,541-bed, not-for-profit hospital serving as the primary teaching hospital for the Yale School of Medicine. Founded as the fourth voluntary hospital in the United States in 1826, YNHH today has two New Haven-based campuses and also includes Yale New Haven Children's Hospital, Yale New Haven Psychiatric Hospital, and Smilow Cancer Hospital. YNHH has received Magnet designation from the American Nurses Credentialing Center, the nation's highest honor for nursing excellence. YNHH has a combined medical staff of about 4,500 university, hospital, and community physicians and advanced care providers practicing in more than one hundred specialties. YNHH (http://www.ynhh.org) is the flagship hospital of Yale New Haven Health, an integrated delivery system that includes Bridgeport, Greenwich, Lawrence + Memorial, and Westerly hospitals and their affiliated organizations, as well as Northeast Medical Group.

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 at 135 College Street and 350 George 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, Neurosurgery, Pathology, Urology, Comparative Medicine, and Anesthesiology. The Boardman Building houses offices for the departments of Surgery and Internal Medicine. Farnam Memorial Building (FMB) and the Laboratory of Surgery, Obstetrics and Gynecology (LSOG) provide facilities for the departments of Surgery; Orthopaedics and Rehabilitation; Obstetrics, Gynecology, and Reproductive Sciences; Neurosurgery; Neuroscience; Internal Medicine; Pediatrics; and Comparative Medicine.

The YNHH Clinic Building connects Farnam with the Laboratory for Medicine and Pediatrics (LMP). Adjacent to the Clinic Building are Tompkins Memorial Pavilion (TMP) and Fitkin Memorial Pavilion (FMP), facilities shared by the hospital and the school. They contain the departments of Anesthesiology, Laboratory Medicine, Neurology, Neurosurgery, Orthopaedics and Rehabilitation, Pathology, Radiology and Biomedical Imaging, and Urology; the Cardiology section; the Endocrinology 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), which houses offices for Neurology, Neurosurgery, and the Pulmonary section, and research labs for the departments of Dermatology, Pediatrics, and Therapeutic Radiology.

Laboratories of the departments of Ophthalmology and Visual Science and Neurology, the Cardiology section, the Cancer Center, the Keck Foundation Biotechnology Resource Laboratories, and the Human and Translational Immunology Program; offices for the Geriatric section, the Department of Pathology, the Child Study Center, Yale Center for Medical Informatics, and the School of Public Health; 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. 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 Radiology and Biomedical Imaging, maintains three MR imaging systems for clinical examination. A new Positron Emission Tomography (PET) Center, also operated by the Department of Radiology and Biomedical Imaging, 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 classrooms and a number of administrative offices for the School of Public Health as well as academic and administrative offices for the departments of Surgery and Orthopaedics and Rehabilitation; and the Cancer Center.

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.

350 George Street, a three-story structure at the corner of George and York streets, houses clinical services for the Child Study Center, offices for Yale School of Public Health, and a laboratory facility for the Department of Neuroscience.

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, Neurosurgery, and Radiology and Biomedical Imaging.

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, global health education, and student research are located on the second floor. The offices of the deputy dean for education, curriculum, the M.D.-Ph.D. Program, and Diversity, Inclusion, Community Engagement, and Equity 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

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Holly Grossetta Nardini, M.L.S., Associate Director
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MISSION

The Harvey Cushing/John Hay Whitney Medical Library provides access to an extensive array of information resources and tools, offers research assistance and expertise, and delivers meaningful services to our users to support innovation and excellence in biomedical research, patient care, and the development of scholars and future leaders in health care.

HISTORY

Elihu Yale himself donated Yale College's first two medical volumes. A century later, in 1813, the Medical Institution of Yale College opened, but it was not until 1917 that the medical school began a separate library on the medical campus.

The current medical library was founded thanks to the efforts of Dr. Harvey Cushing (1869–1939), considered one of the founders of modern neurosurgery, and two other renowned medical specialists, Dr. Arnold C. Klebs and Dr. John F. Fulton. Calling themselves "The Trinitarians," these three physicians gave their extensive library collections to Yale to form the nucleus of one of the great medical historical libraries in the world.

Completed in 1940, the medical library is located on the main floor of the Sterling Hall of Medicine and features two main wings and stacks below for books and journals. The central rotunda honors Harvey Cushing, who graduated from Yale College in 1891 and returned in 1933 as Sterling Professor of Neurology.

In the late 1980s, Betsey Cushing Whitney, daughter of Harvey Cushing and widow of John Hay Whitney, donated $8 million to enlarge and refurbish the medical library. The medical library was renamed the Harvey Cushing/John Hay Whitney Medical Library, honoring Cushing and John Hay Whitney (1904–1982; Yale 1926), editor of the *Herald Tribune* and patron of the arts.

A renovation in 2019 introduced a large team-based learning classroom, eight rooms for small-group learning and independent study, an expanded studio for video production of learning materials, and the Information Commons with workstations, comfortable seating, and an information help desk. These spaces are designed for flexible use and incorporate technologies to support the YSM curriculum and accommodate individual study preferences.

SERVICES

During orientation week, medical students are introduced to their personal librarian, who will act as a contact for research and library-related questions throughout their education at Yale.

The medical library houses a substantial print collection, but most of its resources can also be accessed remotely. In the event the library doesn't own something, it can acquire it for free through the interlibrary loan service.

Library guides and video tutorials provide 24/7 help on a wide range of library topics, from getting started with a research project, to using resources like EndNote. Most library-related questions can be answered on the medical library website, but students are encouraged to contact their personal librarian for assistance.

SPACES TO COLLABORATE AND STUDY

Students will find group and individual study spaces throughout the medical library. Individual study carrels, standing desks, and tables are located on all levels of the library. The Morse Reading Room and Historical Library Reading Room are designated as quiet study spaces. More details can be found at https://library.medicine.yale.edu/about/places.

LIBRARY TECHNOLOGY

Windows and Mac computers are available in the Information Commons, with software such as Microsoft Office, EndNote, Adobe Creative Suite, and statistics and GIS programs (SAS, SPSS, ArcGIS, etc.).

Yale researchers have access to black-and-white and color printers and copiers, as well as two scanning stations (Windows and Mac) in the 24/7 space. A high-performance workstation with a suite of licensed and open-source tools, such as BRB-Array Tools, Cytoscape, and Qlucore, is also available to process, manage, analyze, and visualize data in a variety of formats. Access to this workstation can be reserved by any Yale researcher.

Laptops are available for loan to Medical Center students needing a computer for short-term use. Digital cameras, camcorders, and cell phone chargers are also available at the Circulation Desk. This equipment may be borrowed by anyone with a valid Yale ID.

For more information about available library technology, visit https://library.medicine.yale.edu/services/library-technology.

LIBRARY COLLECTIONS

The Cushing/Whitney Medical Library provides a comprehensive collection of clinical reference tools, databases, evidence-based practice resources, image collections, educational software, and books and journals in support of programs in medicine, nursing, public health, physician associates, bioinformatics, and the basic sciences. The library provides access to more than 50,000 electronic books, 23,000 electronic journals, and 110 databases, in addition to more than 400,000 print volumes. Its holdings also include all Yale medical student theses, many of which are available online. Yale affiliates have access to the library's electronic collections from any device wherever they are, as well as to the holdings of the entire Yale University Library system.

The Medical Historical Library contains one of the world's finest collections of rare medical books, journals, prints, posters, drawings, 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 catalogs, yearbooks, photographs, and other publications and ephemera related to the Yale School of Medicine, and a growing archives program focused on the School of Medicine community. Special strengths in the collection are the works of Hippocrates, Galen, Vesalius, Boyle, Harvey, Culpeper, Haller, Priestley, and S. Weir Mitchell, and works on anatomy, anesthesia, and smallpox inoculation and vaccination. The library also owns an extensive smoking and tobacco advertising collection and the Robert Bogdan collection of disability photographs and postcards. In addition, an outstanding selection of photographs, posters, and other images is available online.

The Cushing Center, located in the lower level of the Cushing/Whitney Medical Library, houses a unique archive of materials collected by Dr. Harvey Cushing. The center is the home of the Harvey Cushing Brain Tumor Registry, which consists of approximately 600 brain specimens, glass-plate negatives, and accompanying patient files from the early twentieth century.

MEDICAL LIBRARY ASSOCIATES

The Associates of the Cushing/Whitney Medical Library are friends of the library who, through membership and other contributions, assist the medical library in its mission of serving the information needs of Yale students, faculty, and staff. Funds raised by associates represent unallocated money that can be used at the librarian's discretion to support various projects.

The associates host an annual lecture in the spring. Past lecturers include Nobel laureates, writers, professors, and surgeons general who have spoken on a wide variety of topics relating to medicine. A gratis membership for Yale medical students continues through their years of residency. More information is available online at https://library.medicine.yale.edu/associates.

Degree Programs

DOCTOR OF MEDICINE

Admissions

Yale School of Medicine seeks to assemble a diverse community of outstanding students who show great promise for becoming creative leaders in medicine and science. With their broad range of experiences, backgrounds, knowledge, and humanity, these students commit to improving the health and well-being of all people. The Committee on Admissions, in general, aims to admit students who are optimally suited to contribute to and benefit from the educational programs and mission of the school. In particular, the committee looks for intelligent, mature, and intrinsically motivated students who show great promise to contribute to the advancement of medicine through scientific discovery. The Committee on Admissions also carefully considers personal qualities necessary for the successful study and practice of medicine. These include maturity, integrity, compassion, leadership potential, and dedication to service.

Graduates of the School of Medicine must have the knowledge and skills to function in a broad variety of clinical situations and to provide a wide spectrum of patient care. In addition to scholastic accomplishments and potential, applicants must have the physical and emotional capacities to meet the full requirements of the school's curriculum and to graduate as skilled and effective practitioners of medicine.

All applications to Yale School of Medicine are given careful consideration without regard to sex, race, color, national or ethnic origins, age, religion, gender identity or expression, sexual orientation, or financial status. For a complete statement of the Yale University policy on nondiscrimination, refer to https://oiea.yale.edu/discrimination-and-harassment.

The School of Medicine admissions process is holistic and contextual, with no minimum test score or GPA requirements. In evaluating candidates, the Committee on Admissions performs a balanced review of each applicant's lived experiences and background, opportunities and obstacles, academic performance, leadership, initiative, accomplishments, service, letters of recommendation, and personal interviews (when offered). Interviews are selective and invitations to interview are extended only after a complete review of application materials.

It is recommended that students enter medical school after four years of undergraduate study. The minimum requirements for admission to the first-year class are:

1. Attendance for three academic years, or the equivalent, at an accredited college, university, or institute of technology.
2. Satisfactory completion of the following courses including laboratory work:
   General Biology or Zoology (two semesters)
   General Chemistry (two semesters)
   Organic Chemistry (one semester)
   Biochemistry (one semester—laboratory recommended, but not required)
   General Physics (two semesters)

Acceptable courses in these subjects are usually given three to four term hours credit per semester. These courses must be completed in a U.S., Canadian, or U.K. college or university. Advanced courses may be substituted for introductory-level courses in each of these subjects. U.S. advanced-placement credits from high school do not themselves satisfy premedical requirements, but advanced courses (for which students are made eligible by AP credits) may be substituted for introductory-level courses in each of these subjects. Most online courses are acceptable, but all laboratory course work must be done in person. The only exception are laboratory courses taken online during the 2019–20, 2020–21, and 2021–22 academic years due to the COVID-19 pandemic, which will be accepted.

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. 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. 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.

Application Process

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 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, reachable by telephone at 202.828.0600 or by email at amcas@aamc.org. Extensive information can also be obtained at the AMCAS website, http://www.aamc.org.

Inquiries to Yale School of Medicine regarding the degree of Doctor of Medicine should be addressed to the Office of Admissions, medical.admissions@yale.edu. Information about the Yale Supplemental Application can also be obtained online at https://medicine.yale.edu/md-program/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. The number of students admitted each year for studies leading to the M.D. degree and/or M.D.-Ph.D. degrees is 104.

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.
4. An evaluation from the applicant's Premedical Advisory Committee or individual letters from at least three of the applicant's instructors. These letters should come

from individuals who are in a position to comment knowledgeably on the applicant's accomplishments, abilities, experience, and/or personal qualifications. They may come from those who have taught or worked with the applicant in undergraduate or graduate school classes, in research settings, clinical settings, extracurricular or community service activities, professional settings, or other contexts. For M.D. applicants, it is helpful to have at least one of the letters from someone in the sciences, but this is not mandatory. For M.D./Ph.D. applicants, letters of recommendation should be written by individuals who can evaluate your research potential as a physician-scientist. One letter should be from the research mentor with whom you have been most recently associated. These evaluations must be sent to the Office of Admissions via AMCAS Letter Service. Detailed instructions regarding electronic transmission of evaluation letters will be found at https://medicine.yale.edu/md-program/admissions/how-to-apply.

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, reachable by telephone at 202.828.0600. Information on the MCAT can also be obtained online at http://www.aamc.org. Only MCAT scores from tests administered during the current calendar year and the three prior calendar years will be considered for the current application cycle.
6. A fee of $110 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.

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 minor 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 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 large a degree of freedom as is consistent with the fulfillment of requirements for the degree of Doctor of Medicine. Memorization of facts should be far less important than a well-rounded education in fundamental principles, training in methods of investigation, and the acquisition of the scientific habit of mind.

During the pre-clerkship years, the students acquire knowledge and develop clinical skills. In the integrated basic and clinical science courses, lectures are held to a minimum, and there is a focus on interactive learning in small-group workshops and conferences. Students are evaluated through examinations that they take anonymously.

Performance is assessed by the faculty based upon participation in small-group sessions, by anonymous qualifying examinations at the end of each course, and by passing of the United States Medical Licensing Examinations. Competency in performing a complete history and physical examination is assessed at the end of the pre-clerkship period using standardized patients in an observed structured clinical examination (P-OSCE). Student attendance is expected in all skill-building sessions and sessions in which interactive learning, clinical reasoning, or collaboration are necessary for optimal learning.

In the pre-clerkship period (first eighteen months), there are no grades and there is no class ranking throughout medical school. While grades are not given and rank order not established, evaluation of students is an important part of the educational process. The faculty considers small-group teaching with formative feedback interchanges between faculty and students to be the most effective means of teaching and evaluation. Students should expect direct questioning in workshops and labs as an important adjunct to the evaluation process. The final decision of acceptable performance for a given course or clerkship is determined by the course/clerkship director based upon the successful completion of the assessments described above.

Freed from the usual anxieties provoked by high-stakes summative examinations, students tend to learn for their future rather than for tests. Competition for grades is eliminated and students are eager to help one another. Class spirit is remarkably high year after year. Upon completing a course, all students are expected to submit a programmatic evaluation so that course/clerkship directors can make changes based on student feedback.

Students are encouraged to allocate their time to further their own interests, within the framework of the Yale curriculum. Some students pursue elective courses or a joint-degree program in another school at Yale University, such as management, public health, divinity, or law.

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

Educational Program Objectives

The Yale School of Medicine has nine competencies which frame our goals for the knowledge, skills, and attributes that we aim for YSM students to attain prior to graduation. The associated educational program objectives (EPOs) describe the skills and behaviors that are required to achieve each competency.

1. **Health Promotion and Disease Prevention** Students apply scientific knowledge and use clinical skills to promote health and prevent disease in individuals and communities.

   HPI.1 Apply principles of epidemiology and social-behavioral sciences to health promotion and disease prevention for patients and communities.

   HPI.2 Provide health care services to patients, families, and communities aimed at preventing health problems or maintaining health, including screening, counseling, immunizations, and chemoprophylaxis.

2. **Mechanisms and Treatment of Disease** Students acquire knowledge at the molecular, cellular, organ-system, psychosocial, and whole-body levels and integrate this knowledge with clinical science and skills to diagnose and treat disease.

   MTD2.1 Apply established and emerging bio-physical, clinical, epidemiologic, and psychosocial scientific principles to the provision of health care for patients, including identification of disease, diagnosis, disease frequency, risk factors, prognosis, and treatment strategies.

3. **Clinical Reasoning** Students apply established and emerging principles of clinical sciences to diagnostic and therapeutic decision-making and clinical problem-solving based on a thorough understanding of the patient's history, physical exam, and diagnostic studies.

   CR3.1 Apply established and emerging principles of clinical sciences to diagnostic and therapeutic decision-making and clinical problem-solving, based on patient information and preferences and up-to-date scientific evidence while minimizing the impact of cognitive errors. Recognize that uncertainty is part of clinical health care and respond by utilizing appropriate resources.

4. **Patient Care** Students achieve competency in the care of patients at a level required to excel in residency.

   PC4.1 Gather and interpret essential and accurate information about patients and their conditions through history-taking, physical examination, and paraclinical data (lab studies, imaging, and other tests).

   PC4.2 Communicate patient information in an organized and concise manner in both oral and written forms.

   PC4.3 Develop and carry out patient management plans in an organized and prioritized manner to promote patient care that is safe, effective, and efficient. Follow up on patient progress.

   PC 4.4 Coordinate care with physicians, other health professionals, and health agencies to support the health maintenance and treatment of disease in patients. Make timely, appropriate, and informative referrals or handoffs, ensuring continuity of care through transitions between providers or settings.

   PC4.5 Perform all medical, diagnostic, and surgical procedures considered essential to enter residency in the area of chosen practice.

5. **Professional Identity Formation** Students conduct themselves in accordance with professional standards in interactions with patients, families, peers, and colleagues. They learn to prioritize patients' needs and interests, avoid conflicts of interest, keep current with evolving science and practice standards, defer to ethical principles in difficult decision-making, and engage in self-awareness and self-care.

   PR5.1 Engages in practices that benefit mental and physical wellness. Cultivates self-awareness to guide appropriate self-care. Recognizes stressful situations and explores coping mechanisms best suited for them. Aware of range of support services and reaches out for help when needed. Recognizes distress in others and offers assistance.

   PR5.2 Maintain commitment to lifelong learning. Identify and perform learning activities that address strengths, deficiencies, and limits in knowledge and expertise. Set learning and improvement goals and incorporate feedback into daily practice.

PR5.3 Work effectively as an accountable team member to enhance team functioning, the learning environment and/or the health care setting. Contribute to a culture of psychological safety rooted in mutual respect and trust.

PR5.4 Demonstrate responsiveness, integrity, and respect to patients, society, and the profession. Manage conflict between personal and professional responsibilities. Practice flexibility and maturity in adjusting to change with the capacity to alter one's behavior.

PR5.5 Demonstrate a commitment to ethical principles pertaining to provision or withholding of care, confidentiality, informed consent, and business practices, including committing to uphold relevant laws, policies, and regulations which promote patient privacy and autonomy.

6. **Communication** Students communicate effectively, respectfully, and compassionately in all of their professional interactions.

   CM 6.1 Communicate effectively using patient-centered techniques, with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds. Demonstrate sensitivity, honesty, and compassion in serious conversations, including those about death, end of life, adverse events, bad news, disclosure of errors, and other sensitive topics.

   CM 6.2 Counsel and educate patients and their families to empower them to participate in their care and enable shared decision making.

   CM 6.3 Communicate effectively and respectfully with peers, staff, interprofessional colleagues, and faculty in classroom, clinical, and administrative domains.

7. **Responsibility to Society** Students recognize barriers to achieving health equity and envision ways to reduce barriers with a commitment to improving the quality of care and health of all people.

   RS7.1 Identify the social and structural determinants of health that impact patients and communities and utilize these in improving care, including assessment of the impact of psychosocial, structural, or cultural influences on health, disease, care-seeking, care adherence, and barriers to and attitudes toward care.

   RS7.2 Demonstrate sensitivity and responsiveness to diverse patient populations, including but not limited to gender, age, culture, race, religion, disabilities, and sexual orientation and leverage their role and the roles of other health professionals to appropriately assess and address the health care needs of the patients and populations served.

   RS7.3 Appreciate the factors that contribute to patient safety and the methods used to approach quality improvement. Participate in identifying system errors and implementing potential solutions. Advocate for quality and equity in patient care and optimal patient care systems.

   RS7.4 Incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care.

8. **Creation and Dissemination of Knowledge** Students appreciate that unexplained clinical observations can inspire research that advances the practice of medicine. They perform mentored scholarly research culminating in a formal thesis. This project promotes critical thinking, understanding of the scientific method, and contributes to new medical knowledge and practices.

CDK 8.1 Critically evaluate and use literature, databases and primary sources to develop a strong scientific premise for a research question. Apply the scientific method to ensure robust, reproducible and unbiased study design.

CDK 8.2 Rigorously analyze and interpret data using appropriate scientific and statistical methods. Convey research findings in a clear and organized manner and disseminate to communities of interest.

CDK 8.3 Apply principles of responsible conduct of research to preserve the integrity of the research process and to protect the privacy and rights of research subjects.

9. **Physician as Scientist** Students apply existing and evolving scientific literature to inform their care of patients and promote the health of individuals and populations.

PS9.1 Acquire, appraise, assimilate, and apply evidence from scientific studies related to patients' health problems. Demonstrate an investigatory and analytic approach to clinical situations. Evaluate the credibility and usability of the spectrum of medical information resources.

M.D. Program Curriculum

PRE-CLERKSHIP PHASE

The first eighteen months of the curriculum focus on providing students with a foundation in the basic and clinical sciences and the art of medical practice. The integrated course curriculum includes eight master courses (Introduction to the Profession, Scientific Foundations, Genes and Development, Attacks and Defenses, Homeostasis, Energy and Metabolism, Connection to the World, and Across the Lifespan); four longitudinal courses (Professional and Ethical Responsibility, Populations & Methods, Human Anatomy, and Scientific Inquiry); and three skills based courses (the Clinical Skills course, the Interprofessional Longitudinal Clinical Experience and the Medical Clinical Experience).

The Clinical Skills course (CS) introduces students to the principles and skills of medical interviewing and physical examination. CS course sessions meet weekly and provide an opportunity for students to observe and develop clinical skills.

In addition to didactic sessions, students will also participate in the Interprofessional Longitudinal Clinical Experience (ILCE) in the first year, where students will work in interprofessional teams with students from Yale School of Nursing and the Physician Associate Program. Students meet in a consistent clinical setting once a week and engage in simulation in interprofessional teams. At the end of the first year, students are assessed on their acquired clinical skills utilizing a two-case Observed Structured Clinical Exam (P-OSCE).

At the conclusion of the ILCE and into the fall of the second year, students participate in the Medical Clinical Experience (MCE) to learn advanced clinical skills and prepare them for the clerkship year. For pre-clerkship course descriptions, please see course listings under Medical Education.

Requirements for Advancement in the Pre-Clerkship Phase

The Progress Committee will review all medical students prior to enrollment in the second year of the pre-clerkship curriculum. Criteria for advancement to the second-year pre-clerkship phase include:

1. Satisfactory completion of all first-year pre-clerkship courses as measured by passing the course or successfully completing remediation for each course. Students may repeat each course one time. Total time in the pre-clerkship phase cannot exceed 2.5 years, not including time for approved leaves of absence.
2. Continued satisfactory fulfillment of the YSM Professionalism Standards.
3. Continuing to meet YSM Technical, Non-Academic Standards.

Requirements for Advancement to the Clerkship Phase

The Progress Committee will review all medical students prior to beginning clinical clerkships. Criteria for advancement to the clerkship phase include:

1. Satisfactory progress in reaching the milestones for the pre-clerkship period in all nine YSM Competencies.
2. Satisfactory completion of all required pre-clerkship courses as measured by passing each course or successfully completing remediation for each course. Students may repeat each course one time. Total time in the pre-clerkship phase cannot exceed two-and-a-half years, not including time for approved leaves of absence.
3. Satisfactory performance on the P-OSCE or successfully completing remediation for those who do not pass.
4. Continued satisfactory fulfillment of the YSM Professionalism Standards.
5. Continuing to meet YSM Technical, Non-Academic Standards.

CLERKSHIP PHASE

The clerkship curriculum consists of four twelve-week integrated clerkship blocks:

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

Clerkship scheduling will be arranged through the registrar in the Office of Student Affairs. There is no required order for taking clerkships, and there is no advantage to any particular order. Students are required to complete and pass all clerkships before proceeding to the Advanced Training Period. For clerkship descriptions, please see course listings under Medical Education.

Requirements for Advancement to the Advanced Training Phase

The Progress Committee will review all medical students after completion of the Clinical Clerkships. Criteria for advancement to the advanced training period phase include:

1. Satisfactory progress in reaching the milestones for the clerkship period in all nine YSM Competencies.
2. Satisfactory completion of all required clinical clerkships as measured by passing the clerkships. Students may take a clerkship up to two times to fulfill the requirement. Total time in the clerkship phase cannot exceed two years, not including time for approved leaves of absence.
3. Passing the C-OSCE.
4. Continued satisfactory fulfillment of the YSM Professionalism Standards.
5. Continuing to meet YSM Technical, Non-Academic Standards.

ADVANCED TRAINING PHASE

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

The Office of Student Affairs holds an informational meeting in the fall of the third year (last six months of the clerkship period), and students meet with their advisers to discuss scheduling and requirements during the advanced clinical training and research period.

Graduating students are required to submit a thesis plan to the Office of Student Research in the fall of their final year. Students must provide a tentative thesis title and the name of the thesis adviser as part of the thesis plan.

Students are required to schedule one four-week subinternship, thirty-three weeks of scheduled clinical electives or research time, and the capstone course in the spring of the fourth year. Students will also schedule time to study for and take the USMLE Step 1 and Step 2 CK board examinations. Time is also provided to schedule interviewing and residency preparation. For elective and subinternship listings and descriptions, please see course listings under Medical Education and individual departments.

Required Thesis

Yale has a long tradition of 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 full-time faculty who are distinguished scientists, clinicians, and scholars. The investigation may have its origins in basic, translational, or clinical science, including bench, outcomes, health services, community-engaged, health equity, and medicine and the humanities (medical ethics, history of medicine, etc.) research. A hypothesis must be defined, experimental methods developed, and data gathered to prove or disprove the hypothesis. Qualitative research designed to generate hypotheses is also encouraged. 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 (National Institutes of Health, Sarnoff Foundation, American Heart Association) and Yale-sponsored one-year research fellowships available. Conduct of the research is begun in the summer following the first year and is continued during free periods in the third and fourth years, often over vacations. A large number of 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 osr.med@yale.edu or at https://medicine.yale.edu/md-program/research.

Eligibility for the M.D. Degree

In April of the anticipated year of graduation, the Progress Committee will review students' progress to determine their eligibility for the M.D. degree. If the student meets all criteria, a student will be included on the list to be transmitted to the dean and registrar of the university for conferral of the M.D. degree. Criteria for graduation are:

- Successful completion of all required pre-clerkship courses and clinical experiences
- Successful completion of all required clinical clerkships
- Satisfactory performance on the P-OSCE and C-OSCE
- Satisfactorily meet all nine YSM competencies.
- Taken and passed USMLE (United States Medical Licensing Exam) Step 1 and Step 2 CK.
- Satisfactory completion of a subinternship. Students may take a given subinternship up to two times to fulfill the graduation requirement.
- Satisfactory completion of the Capstone course and any required assessments.
- Satisfactory completion of forty weeks of study in the final year, including one required subinternship and the Capstone course. The remaining weeks may be devoted to electives, additional subinternships, approved dual degree coursework, and supervised research.
- Satisfactory completion of the Medical Student Thesis Requirement.
- Continued satisfactory fulfillment of the YSM Professionalism Standards.
- Continuing to meet YSM Technical, Non-Academic Standards.
- No unresolved concerns regarding academic performance.

If a student does not meet criteria for advancement, the Progress Committee will determine whether the student is determined to be making satisfactory academic progress (SAP) toward meeting the criteria (e.g., participation in a prescribed remediation plan). Total time in the M.D. program cannot exceed five years in total, not including time for approved leaves of absence. Under extraordinary circumstances, the Progress Committee may approve up to one additional year of study.

United States Medical Licensing Examination (USMLE)

The United States Medical Licensing Examination (USMLE) is a three-step examination for medical licensure in the United States. It is sponsored by the Federation of State Medical Boards and the National Board of Medical Examiners (NBME).

- USMLE Step 1 assesses a student's ability to apply basic sciences to the practice of medicine. The eight-hour test consists of 350 multiple-choice questions.
- USMLE Step 2 CK (Clinical Knowledge) assesses a student's ability to apply medical knowledge, skills, and understanding of clinical science for patient care.
- USMLE Step 3, a two-day exam, assesses whether a medical school graduate can apply medical knowledge and understanding of biomedical and clinical science for the unsupervised practice of medicine. This exam is taken only after obtaining an M.D. degree.

Passing Step 1 and Step 2 CK is required for graduation from Yale School of Medicine. Students apply for the USMLE online at the NBME website at https://apps.nbme.org/nlesweb. Additional information on USMLE scheduling and guidelines is available

online on the medical education website at https://medicine.yale.edu/education/academicprogress/registrar/scheduling/usmle.

USMLE Step 1 and USMLE Step 2 CK are computer-administered at Prometric Testing Centers. This system has given students considerable flexibility over the choice of test time and place. The Office of Student Affairs holds a USMLE information session for students preparing to take the exams after completion of their clerkships.

REQUIREMENTS

1. Yale School of Medicine students are required to take USMLE Step 1 and USMLE Step 2 CK by December 31 of the year before graduation.
2. Joint- and dual-degree students (excluding M.D.-Ph.D. students) are required to schedule one of the exams to be taken prior to the start of the joint or dual degree and to work with their adviser to schedule the second exam in a timely fashion, but not necessarily prior to starting the dual- or joint-degree program. After working out a schedule with their adviser, students must notify the chair of the Progress Committee, Deborah Proctor, of the plan.
3. M.D.-Ph.D. students are required to take USMLE Step 1 by December 31 of the year in which they complete their first six months of clerkships.
4. Any failure of Step 1 or Step 2 CK will be brought to the attention of the Progress Committee and the student's academic adviser. In general, a student in good standing will be allowed three attempts to take and pass each of these examinations.
5. If a student fails an exam three times, the Progress Committee will review the student's overall academic progress. Under extraordinary circumstances the Progress Committee may permit a fourth attempt, but barring that permission, the student will be dismissed from the medical school.
6. If a student who fails one of these exams is also experiencing other academic difficulties, including issues related to unprofessional behavior or failure to progress through the clinical clerkships, or is already on academic probation, the Progress Committee will review the student's overall academic progress. The Progress Committee will then determine how many times and under what circumstances that individual may be permitted to repeat these exams, which may be fewer than three times.

ADDITIONAL GUIDELINES

1. It is strongly suggested that students complete USMLE Step 1 and USMLE Step 2 CK by June 30 in the first year of the Advanced Training Period (ATP).
2. Students may schedule up to eight weeks of study for USMLE Step 1 and up to four weeks of study for USMLE Step 2 CK. Any study time over these limits must be approved by the associate dean for student affairs.
3. It is strongly suggested that M.D.-Ph.D. students take USMLE Step 1 by August 31 of the year in which they complete their six months of clerkships in order to fully engage with their Ph.D. work.

Certificate in Global Medicine

The Certificate in Global Medicine is awarded upon graduation to Yale School of Medicine students who demonstrate competence in global health and provides recognition

that a student has completed required didactic course work, scholarly work, global health clinical experience, and language, culture, and leadership activities relevant to global health. This certificate allows students to develop expertise and prepares students for leadership in global health by providing the knowledge, skills, and attitude essential for success in this field. Requirements for earning the certificate can be completed over four (or five) years, while maintaining flexibility in terms of both the timing and content of these opportunities. It is expected that students pursuing the certificate will engage with the community of practitioners and scholars working on global health at Yale and around the world. International field experience in global health is an integral part of the program.

Additional information is available at https://medicine.yale.edu/md-program/gho/certificate.

Calendar

The following dates are subject to change as the university makes decisions regarding the 2024–2025 academic year. Changes will be posted online on the School of Medicine's website.

FALL 2024

June 10	M	Matriculation for first-year students in the START@Yale Program
July 22	M	Fall term begins for third-year students
Aug. 5	M	Matriculation for first-year students Fall term begins for first-year students
Aug. 12	M	Fall term begins for fourth- and fifth-year students
Aug. 27	T	First term begins for second-year students
Sept. 2	M	Labor Day. No classes for first- and second-year students
Nov. 25–29	M–F	Fall recess for first- and second-year students
Nov. 23–24	TH–F	Thanksgiving break for clerkship students
Dec. 14	SA	Winter recess begins for third-year students
Dec. 19	TH	Winter recess begins for first-year students
Dec. 21	SA	Winter recess begins for second-year students
Dec. 30	M	Fall term ends for fourth- and fifth-year students

SPRING 2025

Jan. 2	TH	Spring term begins for all students
Jan. 20	M	Martin Luther King, Jr. Day. No classes for first-year students
Mar. 10–14	M–F	Spring recess for first-year students
Mar. 21	F	Match Day
May 6	T	Student Research Day. No afternoon classes for first-year students
May 16	F	Spring term ends for second- through fifth-year students
May 19	M	University Commencement
June 6	F	Spring term ends for first-year students

Enrollment Dates

FALL 2024

First Year Students (Class of 2028):	08/05/2024 – 12/18/2024
Second Year Students (Class of 2027):	08/27/2024 – 12/20/2024
Third Year Students (Class of 2026) :	07/22/2024 – 12/13/2024
Fourth Year Students (Class of 2025):	08/12/2024 – 12/30/2024
Fifth Year Students (Extended Study):	08/12/2024 – 12/30/2024

SPRING 2025

First Year Students (Class of 2028):	01/02/2025 – 06/06/2025
Second Year Students (Class of 2027):	01/02/2025 – 05/16/2025
Third Year Students (Class of 2026):	01/02/2025 – 05/16/2025
Fourth Year Students (Class of 2025):	01/02/2025 – 05/16/2025
Fifth Year Students (Extended Study):	01/02/2025 – 05/16/2025

SUMMER 2025

First Year Students (Class of 2028):	no summer term
Second Year Students (Class of 2027):	05/19/2025 – 07/18/2025
Third Year Students (Class of 2026):	05/19/2025 – 08/15/2025
Fourth Year Students (Class of 2025):	no summer term
Fifth Year Students (Extended Study):	05/19/2025 – 08/15/2025

Tuition and Special Fees

Tuition for candidates for the M.D. degree (per academic year)	$72,290
Yale Health Hospitalization coverage and miscellaneous medical expenses	$3,268

Examination fees for candidates for the M.D. degree:	
United States Medical Licensing*	*2024–2025*
2024 Fees for Step 1 ($670) and Step 2 CK ($670)	$1,340

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.

Students who are asked to repeat one or more years of course work because of academic failure in curriculum requirements will pay 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 $111,257, 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 $600 Activity Fee. All students are required to pay an annual $600 Technology Fee. All students are required to pay a $5 Background Check 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.

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 each term on leave. They pay full tuition for the four years they are in residence.

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 May 2024, the Yale Physician Associate Program has graduated 1,466 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; order and interpret diagnostic tests; 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.

Admission to the Yale Physician Associate Program

The admissions process is highly selective and competitive. Selection is based on a multitude of factors including academic history, community or leadership involvement, patient care experience, and interpersonal effectiveness. For additional information regarding admissions, please visit the PA Program website at http://paprogram.yale.edu/admissions.

ACADEMIC CONSIDERATIONS

Students must have a baccalaureate degree prior to matriculation. 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 complete the following prerequisites: one semester of statistics or calculus, one semester of organic or biochemistry, one semester of anatomy with or without lab, one semester of animal or human physiology, and one semester of microbiology. Please visit https://medicine.yale.edu/pa/admissions/prerequisites-experience-skill/#academic-prerequisites for further details. 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 an applicant's past records.

EXPERIENTIAL CONSIDERATIONS

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, medical scribe, phlebotomist, or emergency medical technician. Experience need not be in a hospital setting. At least one thousand hours of direct, hands-on patient care experience is highly recommended to be competitive for admission.

INTERPERSONAL CONSIDERATIONS

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 at https://medicine.yale.edu/pa/admissions/prerequisites-experience-skill.

APPLICATION FOR ADMISSION

The application deadline for the class entering in August 2025 is September 1, 2024. Program information is available on the PA Program website, http://paprogram.yale.edu/admissions/apply.aspx. Online applications for admission are processed through

the Centralized Application Service for Physician Assistants (CASPA) at https://caspa.liaisoncas.com/applicant-ux/#/login. The program also requires a supplemental application, available at https://www.applyweb.com/yalepa.

This publication is true and correct in content and policy at the time of its printing. The PA Program and the university reserve the right to revise its policies throughout the year and to reflect any such modifications in the online version of this bulletin.

Curriculum Structure and Goals of the Yale Physician Associate Academic Program

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

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

THE DIDACTIC PHASE

The first calendar year is devoted to course work in basic and clinical sciences. Courses include:
Anatomy I, II, III
Basic Science I, II, III
Clinical Medicine I, II, III
Diagnostic Studies I, II, III
Patient Assessment I, II, III
Pharmacology I, II, III
Practice, Policy, and Ethics I, II, III
Prevention, Population Health and Patient Centered Care I, II, III
Research I, II, III

THE CLINICAL PHASE

Each student completes thirteen 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. Nine rotations are mandatory: Internal Medicine I, Internal Medicine II, General Surgery, Primary Care I, Primary Care II, Psychiatry, Pediatrics, Women's Health, and Emergency Medicine. The remaining four rotations are reserved for subspecialty electives (please see departmental listings for available clinical elective rotations). Students also complete a longitudinal Practice Enhancement Course which includes hands-on technical training, and simulation experiences.

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 one rotation outside of New Haven or Connecticut. Students should expect to provide their own transportation and housing for all rotations away from New Haven. Students may also choose to broaden their experience by applying for an elective global health clinical rotation with the Quileute Tribe in La Push, Washington or at Mulago Hospital in Kampala, Uganda.

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

Graduation Requirements

In order to graduate from the Physician Associate Program, a student must successfully complete their didactic year (60 credits), all clinical rotations (52 credits), the practice enhancement course (4 credits) and the thesis project (4 credits). Additionally, they must attend all mandatory professionalism, practice-related, and skills-building sessions held during all phases of the program and achieve 75 percent or greater on the thesis project, 75 percent or greater on summative exams, and 75 percent or greater on Clinical Practice and Clinical Thinking Assessments.

Calendar

The academic calendar for the Physician Associate Program can be found at https://medicine.yale.edu/pa/curriculum/pa-academic-calendar.

Tuition and Fees

Tuition for the Physician Associate program for the 2024–2025 academic year is $50,544 for first- and second-year students, and $16,848 for third-year students. Fees and other expenses—including books, supplies, and equipment; room and board; personal expenses and transportation; Yale Health Hospitalization coverage; and travel to rotations—are estimated at an additional $43,014 for first-year students, $44,729 for second-year students, and $15,215 for third-year students. For more information, visit https://medicine.yale.edu/pa/tuition-financial-aid/student-budget/#pa-budget-2024-2025.

YALE PHYSICIAN ASSISTANT ONLINE PROGRAM

The novel twenty-eight-month YSM Physician Assistant (PA) Online Program is committed to educating students for primary care medical practice while allowing them to remain connected with their home communities and train in health care settings close to where they live.

In September 2017 the Yale School of Medicine Physician Assistant Online Program was granted Accreditation—Provisional status from the Accreditation Review

Commission on Education for the Physician Assistant (ARC-PA). In February 2020 the program completed the second scheduled ARC-PA site visit and was again granted Accreditation—Provisional status in June 2020. In February 2022, the Program completed the third ARC-PA site visit and at its June 2022 meeting, the Accreditation Review Commission on Education for the Physician Assistant, Inc. (ARC-PA) placed the Yale Physician Assistant Online Program on Accreditation-Probation status until its next review in June 2024. Probation accreditation is a temporary accreditation status initially of not less than two years. However, that period may be extended by the ARC-PA for up to an additional two years if the ARC-PA finds that the program is making substantial progress toward meeting all applicable standards but requires additional time to come into full compliance. Probation accreditation status is granted, at the sole discretion of the ARC-PA, when a program holding an accreditation status of Accreditation–Provisional or Accreditation–Continued does not, in the judgment of the ARC-PA, meet the standards or when the capability of the program to provide an acceptable educational experience for its students is threatened.

Mission of the Yale Physician Assistant Online Program

The mission of the Yale Physician Assistant (PA) Online Program is to improve the health of all people by transforming medical education through innovation.

Values of the Yale Physician Assistant Online Program

The PA Online Program values higher-order learning; critical thinking; bioethical principles; and diversity, inclusion, justice, and equity.

Admission to the Yale Physician Assistant Online Program

The Yale PA Online Program will graduate its final class in 2026. The program will continue to offer high-quality, innovative education and support to our current and matriculating students but will not admit future students. Learn more information about this change by visiting https://medicine.yale.edu/education/paonline/about-us/program-update.

ACADEMIC CONSIDERATIONS

Matriculants must have a baccalaureate degree from a regionally accredited U.S. institution prior to matriculation. 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 complete the following prerequisites with a minimum of 3 semester credits each: statistics, organic chemistry or biochemistry, human anatomy, physiology, and microbiology. Please visit https://paonline.yale.edu/admissions/prerequisites for detailed descriptions of the courses required. An undergraduate science grade point average of 3.0 is required. A cumulative undergraduate GPA of 3.0 is also required. Academic rigor and performance in science courses are some of the indicators of academic success examined by the Admissions Committee.

EXPERIENTIAL CONSIDERATIONS

Matriculants must have some awareness of the intricacies of health care delivery and demonstrate their commitment to the PA profession. The Yale PA Online Program requires more than five hundred paid patient-care experience hours. Additional hands-on health care experience does make an applicant more competitive and will reconfirm the applicant's commitment to the field. Some examples of experience include working as an emergency medical technician, phlebotomist, or medical scribe. Experience can be in a variety of health care settings.

INTERPERSONAL CONSIDERATIONS

The program values the ability to work competently, maturely, conscientiously, and with empathy within a team setting. The Admissions Committee reviews letters of recommendation and screens applicants to determine their career commitment, interpersonal skills, and willingness to work with the supervision of a physician. All admissions interviews are conducted online.

In addition to scholastic potential and interpersonal skills, matriculants 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 at https://paonline.yale.edu/admissions/technical-standards.

This publication is true and correct in content and policy at the time of its printing. The PA Online Program and the university reserve the right to revise its policies throughout the year and to reflect any such modifications in the online version of this bulletin.

Curriculum Structure of the Yale Physician Assistant Online Academic Program

The program is divided into a didactic phase of twelve months (including two mandatory on-campus immersions, both one week in length) and a clinical phase of sixteen months (including a capstone month and one mandatory on-campus immersion, one week in length). A research component, in the form of a capstone, is incorporated into the clinical phase of the curriculum over a four-week rotation period. The program provides a rich combination of medical courses and clinical experiences to ensure that PA students are prepared for their careers as professionals in interprofessional medical teams. Students begin their Clinical Experience in Early Didactic (CEED) in the second term of the didactic year. Through problem-based learning, case studies, hands-on patient care, and the capstone, the Yale PA Online students are well prepared to join health care teams across the country to meet the ever-increasing demand for primary care providers.

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

THE DIDACTIC PHASE

The didactic year consists of two mandatory on-campus immersions and a series of courses that are spread out over the course of the twelve months. The organ system approach is used, with pediatrics, emergency medicine, and geriatrics being included across each system. The following is a summary of the courses and credit hours:

Course number	*Course name*	*Credits*
OLPA 5010	Human Anatomy I	3
OLPA 5110	Human Anatomy II	3
OLPA 5210	Human Anatomy III	3
OLPA 5020	Basic Science I	2
OLPA 5120	Basic Science II	2
OLPA 5220	Basic Science III	2
OLPA 5030	Patient Assessment I	3
OLPA 5130	Patient Assessment II	3
OLPA 5230	Patient Assessment III	3
OLPA 5040	Diagnostic Studies I	1
OLPA 5140	Diagnostic Studies II	1
OLPA 5240	Diagnostic Studies III	1
OLPA 5050	Clinical Medicine I	5
OLPA 5150	Clinical Medicine II	5
OLPA 5250	Clinical Medicine III	5
OLPA 5060	Pharmacology I	3
OLPA 5160	Pharmacology II	3
OLPA 5260	Pharmacology III	3
OLPA 5070	Behavioral and Preventive Medicine I	1
OLPA 5170	Behavioral and Preventive Medicine II	1
OLPA 5270	Behavioral and Preventive Medicine III	1
OLPA 5080	Preparing Future PAs I: PA Practice	1
OLPA 5180	Preparing Future PAs II: Evidence-Based Medicine	1
OLPA 5280	Preparing Future PAs III: Bioethics	1

Total credits, 57

THE CLINICAL PHASE

Each student completes fifteen four-week rotations, with an emphasis on internal medicine and primary care. One additional four-week block during the clinical phase is reserved as the capstone month. There are three four-week elective rotations and one final mandatory on-campus immersion.

The majority of the rotations will be in the student's local geographic area, although there may be some opportunities for elective rotations in other geographic areas. Students are expected to provide their own transportation to and from CEED sites, all clinical rotations, and for all on-campus immersions. These expenses are calculated into the student budget.

CLINICAL ROTATIONS AND CAPSTONE

Internal Medicine I, II, and III (12 weeks; 12 credits)
Primary Care I, II, and III (12 weeks; 12 credits)
Behavioral Medicine (4 weeks; 4 credits)
Pediatrics I and II (8 weeks; 8 credits)
General Surgery (4 weeks; 4 credits)
Women's Health (4 weeks; 4 credits)
Emergency Medicine (4 weeks; 4 credits)
Electives (12 weeks; 12 credits)
Master's Capstone (4 weeks; 1 credit)

Total credits, 61

Graduation Requirements

In order to graduate from the PA Online Program, a student must successfully complete their didactic year (57 credits), all clinical rotations and the Master's Capstone (61 credits), a virtual interprofessional education (VIPE) session, summative evaluation using standardized patients, and a written final cumulative examination.

Calendar

The academic calendar for the Physician Associate Online Program can be found at https://medicine.yale.edu/education/paonline/current-students/registrar/academic-calendar.

Tuition and Fees

Tuition for the PA Online Program for the 2024–2025 academic year is $17,095 per term. For first-year students, the tuition is $34,190 for two terms of tuition. Second-year students can expect to remit approximately $51,285 for three terms of tuition, and third-year students remit $34,190 for two terms of tuition. Activity fees, technology fees, and other expenses—including books and supplies; equipment; room and board; immersions; personal and transportation expenses; hospitalization coverage and miscellaneous medical expenses; and travel to rotations—are estimated at an additional $30,819 for first-year students, $47,881 for second-year students, and $28,446 for third-year students. For more information see https://paonline.yale.edu/admissions/tuition-and-financial-aid.

Veterans Affairs (VA) recipients: The PA Online Program participates in Yellow Ribbon and allows VA recipients with pending VA remittance to attend or participate in the PA course of study, provided that the individual submits a Chapter 33 Certificate of Eligibility (or equivalent form from e-Benefits) or a Chapter 31 contract with the institution for this student on VA Form 28-1905.

MASTER OF HEALTH SCIENCE

The School of Medicine administers a two-year Master of Health Science (M.H.S.) degree program for applicants with a doctorate from across the Yale community and outside partners. The two-year stand-alone degree program is often referred to as the

"Professional" M.H.S. to distinguish it from the combined five-year M.D./M.H.S. designed for medical students.

The goal of the Yale Master of Health Science Degree Program is to provide rigorous training for future independent investigators and future educational leaders at Yale School of Medicine. There is a critical need to develop outstanding clinician-scientists whose educational experiences and career goals position them to work in interdisciplinary teams and translate scientific discoveries into practical applications for public good. The M.H.S. is designed to address this need through a two-year program that sets intensive standards of coursework, research experiences, and mentorship.

Mission

The mission of the M.H.S. program is to prepare clinicians and scientists for academic research careers in clinical, translational, education, and informatics research and to foster the next generation of clinician-scientists through rigorous training, experiential learning, and mentorship.

Admissions

Admissions to the M.H.S. program are overseen by the Office of Postgraduate Research Training and the M.H.S. track directors, composed of senior-level physician-scientist and clinician-educator faculty. Applicants must be able to commit a minimum of thirty-five percent FTE effort (Medical Education track) or fifty percent FTE effort (all other tracks) for the two years to participate in the M.H.S. program.

Application Process

Applications for the next academic year open in September and are closed to further submission in December. The application is completed online and includes identification of the track being applied to; submission of a project title and research project plan; personal statement; and letters of support from the proposed mentored research thesis adviser and the applicant's departmental chair, chief, or other supervisor with authority to confirm protected time and tuition support. Proposed thesis committee members must be named, and at least one M.H.S. thesis committee member must be from a department external to the applicant. Applications are reviewed for acceptance into the M.H.S. program by M.H.S. program and track leadership. More information about the application process for the M.H.S. program can be found at https://medicine.yale.edu/edu/mhs-degree/how-to-apply. Inquiries should be directed to mhs@yale.edu.

Curriculum

The M.H.S. program is administered along four tracks: clinical investigation, clinical informatics and data science, advanced health sciences research, and medical education.All tracks are overseen by Yale's Office of Postgraduate Research Training and administered with support from M.H.S. track directors. For the clinical and laboratory/translational pathways, M.H.S. track directors.

The M.H.S. program follows a shared curriculum structure, with track requirements (e.g., required courses, electives, presentations) tailored to fit the unique training needs of students during the two-year program.

RESEARCH

M.H.S. students are expected to undertake an intensive mentored research training experience that constitutes a major portion of their effort in the program. Required components of this research experience include:

- Development of a mentored research project to be conducted during the two-year program. The thesis project must be approved by the primary adviser, two additional thesis committee members, and the M.H.S. track leader.
- The thesis research culminates in a written thesis or at least one manuscript for publication in a peer-reviewed journal (specific requirements vary by track).
- Presentation of their research at one or more Grand Rounds or similar open-forum seminar each year.
- Completion of (at minimum) two meetings per year with the thesis committee to evaluate progress on the research project.

Graduation Requirements

- Biostatistics course
- Research Methods
- Ethics course
- Mentored research project
- Thesis requirement
- Track-specific requirements

Courses should equal thirty work credits, including all mandatory courses, electives, and mentored research.

JOINT ACADEMIC PROGRAMS

Students in the M.D. program at the School of Medicine who are 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 (other than an M.D.-Ph.D. student in the MSTP program) must complete three years in the School of Medicine and take Step 1 and Step 2 CK of the USMLE by June 30th of the year that they start the joint/dual degree.

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,

prior research experiences of a high caliber, and a strong motivation toward careers that will significantly impact the health of individuals and populations.

The goal of the M.D.-Ph.D. Program at Yale School of Medicine is to train excellent physician-scientists. Integrated medical and graduate research training equips students with technical, operational, and professional skills to carry out clinically relevant research. M.D.-Ph.D. Program graduates are expected to develop impactful research programs, informed by their understanding of human health and disease, and become leaders in their chosen fields.

The M.D.-Ph.D. Program, sponsored jointly by the School of Medicine and the Graduate School of Arts and Sciences, 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 Graduate School departments/programs of Anthropology; Applied Mathematics; Biomedical Engineering; Cell Biology; Cellular and Molecular Physiology; Computational Biology and Biomedical Informatics; Economics; Experimental Pathology; Genetics; History of Science and Medicine; Immunobiology; Interdepartmental Neuroscience Program; Microbiology; Molecular Biophysics and Biochemistry; Molecular, Cellular, and Developmental Biology; Pharmacology; Public Health (Biostatistics, Chronic Disease Epidemiology, Environmental Health Sciences, Epidemiology of Microbial Diseases, Health Policy and Management, and Social and Behavioral Sciences); and Religious Studies. Students interested in taking the joint degree in another department may be able to do so, provided they can work out, in advance of acceptance, a program that is approved by the department concerned and the director of the M.D.-Ph.D. Program. Students who anticipate programs in the humanities and social sciences for their Ph.D. studies must be admitted to the programs concurrently with their admission to the M.D.-Ph.D. Program.

Applications to the M.D.-Ph.D. Program are accepted from U.S. citizens or permanent residents and foreign nationals. All applicants selected for admission currently receive support from the program for stipend, tuition, and health fees. Substantial funding is provided by the Medical Scientist Training Program (MSTP) training grant provided by the National Institute of General Medical Sciences. Continuation in the program is contingent on satisfactory progress in both the School of Medicine and the Graduate School. Students spend an average of seven to eight years completing the requirements for the M.D.-Ph.D. Program.

Students matriculated in the Yale School of Medicine who are interested in joining the M.D.-Ph.D. Program should meet with the director or deputy director to discuss the internal application process. Internal applicants must apply by the fall of their second year of medical school. An important consideration for admission to the M.D.-Ph.D. Program is adequate research experience and identification of a supportive thesis adviser in the intended program of graduate study. Applications 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 the same committee that evaluates external applicants to the M.D.-PhD. Program.

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

M.D. and Ph.D. training is highly integrated throughout a student's time at Yale. M.D.-Ph.D. students begin their Ph.D. dissertation research after completing the first eighteen months of the pre-clinical School of Medicine curriculum. Students will complete two twelve-week clinical rotations at the end of the second year of medical school and participate in longitudinal clinical experiences during their Ph.D. years. Students are expected to take their Step 1 board exams in the summer following the second year of medical school and affiliate with a graduate program by the beginning of the third year of the program. Only under unusual circumstances will students be allowed to complete more or less than six months of clerkships prior to beginning Ph.D. work; this requires prior approval of the director.

During the first and second years of medical school, the majority of M.D.-Ph.D. students complete graduate-level courses co-listed in the medical and graduate schools. In addition, there are M.D.-Ph.D.-specific courses that complement the core medical school curriculum, and course credit can be applied toward the requirements of the student's chosen Ph.D. program. Lab rotations (up to two approximately five-week rotations) in the summer between the first and second years allow students to explore potential thesis mentors and research projects. Students request affiliation with a particular department in the Graduate School by the beginning of their third year of study in the program. Any exceptions must be approved by the director of the M.D.-Ph.D. Program and the director of graduate studies (DGS) of the proposed Ph.D. department.

Students admitted to the joint-degree program must satisfy the Graduate School Honors requirement and complete all predissertation requirements within four terms of affiliation with the Ph.D. department. To be admitted to candidacy, students in the M.D.-Ph.D. Program must fulfill the Ph.D. program course requirements, teaching requirements if applicable, a departmental qualifying examination, and the submission of an approved prospectus. An average of three to four years is spent completing the Ph.D. requirements.

To develop skills in our trainees that are associated with success in a broad range of physician-scientist research careers through experiential learning, the Certificate in Leadership and Research Management for Physician-Scientists was developed to provide formal training in the skills necessary for effective leadership and management of research and clinical teams. Workshops are organized into eight modules taken by students during their M.D. and Ph.D. training periods; Modules 1–4 (Mentoring, Proposal Development, Teaching, Anti-Racism) are required of all M.D.-Ph.D. students. Students are also required to complete at least one of four optional modules (Communication, Leadership and Teamwork, Self-Management, Nuts and Bolts of Research Management) during the course of their training.

After the student's thesis defense, the student returns to the medical wards to complete six months of integrated clinical clerkships and remaining clinical course work, including mandatory and/or elective subinternships, clinical electives, and the M.D. Capstone Course. Students must also pass Step 2 CK and C-OSCE exams by December 31 of the academic year in which they plan to graduate from the joint-degree program.

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 March 15 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.

M.D./M.H.S. Program

Yale School of Medicine has established a joint degree program, 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.H.S. degree for medical students: a clinical research pathway and a laboratory/translational research pathway. The 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.

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 (OSR) and the M.D.-Master of Health Science Advisory Committee.
2. Additional course work is required. Please refer to the OSR website (https://medicine.yale.edu/md-program/research) as course requirements may change.
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 at https://medicine.yale.edu/education/md-program/research.

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

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

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

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

M.D./M.Div. Program

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

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

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

M.D./J.D. Program

The Yale School of Medicine has a formal relationship with the Law School to allow students to seek degrees from both schools. This can be done in six years instead of seven, as would be the case if these disciplines were studied separately. Students pay three and one-half years' tuition to the School of Medicine and two and one-half years' tuition to the Law School. Students interested in this program must confer early with the appropriate deans at each school to plan curriculum and find out if they qualify for the special tuition arrangement. Students at the Law School must petition for approval of a joint-degree program, and they may only petition after they have matriculated in Law School and completed their first term.

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 the student 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.

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

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

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

Tuition and fees are billed to the student by the corresponding school during matriculation. Satisfactory academic progress is required for continued matriculation in both schools. The Master of Medical Science (M.M.Sc.) and Master of Public Health (M.P.H.) degrees are conferred upon completion of both programs.

Tuition Arrangements for Joint-Degree Students

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 and pay full 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. Any students who are in the program after six years will pay a minimal registration fee to the school they are attending. (Students are responsible for their 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.

Student Accounts, Billing, and Financial Aid

STUDENT ACCOUNTS AND BILLING

Student accounts, billing, and related services are administered through the Office of Student Accounts, located at 246 Church Street. The office's website is https://student-accounts.yale.edu.

The Student Account is a record of all the direct charges for a student's Yale education such as tuition, room, board, fees, and other academically related items assessed by offices throughout the university. It is also a record of all payments, financial aid, and other credits applied toward these charges.

Students and student-designated proxies can view all activity posted to their Student Account in real time through the university's online billing and payment system, YalePay (https://student-accounts.yale.edu/yalepay). At the beginning of each month, email reminders to log in to YalePay to review the Student Account activity are sent to all students at their official Yale email address and to all student-designated YalePay proxies. Payment is due by 4 p.m. Eastern Time on the last day of the month.

Yale does not mail paper bills or generate monthly statements. Students and their authorized proxies can generate their own account statements in YalePay in pdf form to print or save. The statements can be generated by term or for a date range and can be submitted to employers, 401K plans, 529/College Savings Plans, scholarship agencies, or other organizations for documentation of the charges.

Students can grant others proxy access to YalePay to view student account activity, set up payment plans, and make online payments. For more information, see Proxy Access and Authorization (https://student-accounts.yale.edu/understanding-your-bill/your-student-account).

The Office of Student Accounts 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. Students who have not paid their student account term charges by the due date will also be placed on Financial Hold. The hold will remain until the term charges have been paid in full. While on Financial Hold, the university will not provide diplomas and reserves the right to withhold registration or withdraw the student for financial reasons.

Payment Options

There are a variety of options offered for making payments toward a student's Student Account. Please note:

- All bills must be paid in U.S. currency.
- Yale does not accept credit or debit cards for Student Account payments.
- Payments made to a Student Account in excess of the balance due (net of pending financial aid credits) are not allowed on the Student Account. Yale reserves the right to return any overpayments.

ONLINE PAYMENTS THROUGH YALEPAY

Yale's recommended method of payment is online through YalePay (https://student-accounts.yale.edu/yalepay). Online payments are easy and convenient and can be made

by anyone with a U.S. checking or savings account. There is no charge to use this service. Bank information is password-protected and secure, and there is a printable confirmation receipt. Payments are immediately posted to the Student Account, which allows students to make payments at any time up to 4 p.m. Eastern Time on the due date of the bill, from any location, and avoid late fees.

For those who choose to pay by check, a remittance advice and mailing instructions are available on YalePay. Checks should be made payable to Yale University, in U.S. dollars, and drawn on a U.S. bank. To avoid late fees, please allow for adequate mailing time to ensure that payment is received by 4 p.m. Eastern Time on the due date.

Cash and check payments are also accepted at the Office of Student Accounts, located at 246 Church Street and open Monday through Friday from 8:30 a.m. to 4:30 p.m.

Yale University partners with Flywire, a leading provider of international payment solutions, to provide a fast and secure way to make international payments to a Student Account within YalePay. Students and authorized proxies can initiate international payments from the Make Payment tab in YalePay by selecting "International Payment via Flywire" as the payment method, and then selecting the country from which payment will be made to see available payment methods. International payment via Flywire allows students and authorized proxies to save on bank fees and exchange rates, track the payment online from start to finish, and have access to 24/7 multilingual customer support. For more information on making international payments via Flywire, see International Payments Made Easy at https://student-accounts.yale.edu/paying-your-bill/payment-options.

A processing charge of $25 will be assessed for payments rejected for any reason by the bank on which they were drawn. In addition, for every returned ACH payment due to insufficient funds made through YalePay, Flywire will charge a penalty fee of $30 per occurrence. Furthermore, the following penalties may apply if a payment is rejected:

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

Yale Payment Plan

A Yale Payment Plan provides parents and students with the option to pay education expenses monthly. It is designed to relieve the pressure of lump-sum payments by allowing families to spread payments over a period of months without incurring any interest charges. Participation is optional and elected on a term basis. The cost to sign up is $50 per term.

Depending on the date of enrollment, students may be eligible for up to five installments for the fall and spring terms. Payment Plan installments will be automatically deducted on the 5th of each month from the bank account specified when enrolling in the plan. For enrollment deadlines and additional details concerning the Yale Payment Plan, see https://student-accounts.yale.edu/ypp.

Bill Payment and Pending Military Benefits

Yale will not impose any penalty, including the assessment of late fees, the denial of access to classes, libraries, or other facilities, or the requirement that a student borrow additional funds, on any student because of the student's inability to meet their financial obligations to the institution, when the delay is due to the delayed disbursement of funding from VA under chapter 31 or 33.

Yale will permit a student to attend or participate in their course of education during the period beginning on the date on which the student provides to Yale a certificate of eligibility for entitlement to educational assistance under chapter 31 or 33 and ending on the earlier of the following dates: (1) the date on which payment from VA is made to Yale; (2) ninety days after the date Yale certifies tuition and fees following the receipt of the certificate of eligibility.

INTERRUPTION OR TEMPORARY SUSPENSION OF UNIVERSITY SERVICES OR PROGRAMS

Certain events that are beyond the university's control may cause or require the interruption or temporary suspension of some or all services and programs customarily furnished by the university. These events include, but are not limited to, epidemics or other public health emergencies; storms, floods, earthquakes, or other natural disasters; war, terrorism, rioting, or other acts of violence; loss of power, water, or other utility services; and protest disruptions, strikes, work stoppages, or job actions. In the face of such events, the university may, at its sole discretion, provide substitute services and programs, suspend services and programs, or issue appropriate refunds. Such decisions shall be made at the sole discretion of the university.

FINANCIAL AID

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

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

The amount of the budget considered the student's responsibility is determined using the Free Application for Federal Student Aid (FAFSA) and/or the CSS Profile, and includes money from the student's own resources (assets, salaries, etc.) and from the spouse and/or fiancé's income, when applicable. For M.D. students below age thirty, a parent contribution is also calculated. 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 bulletin is a full-time student. For the M.D. program, this includes the required pre-clerkship courses and the required clinical clerkships in the first, second, and third years. In addition, during the third and fourth years, the student works on and completes a required thesis and completes an adviser-approved schedule of electives, a subinternship, and the Capstone course. Medical students must be enrolled in and complete 12 or more credits in each of the fall and spring terms and 6 or more credits in the summer terms to be considered a full-time student. First- and final-year medical students do not take classes in the summer terms. The student is charged full tuition, and financial aid is available if the student completes all the necessary forms, need for aid has been determined, and the student is enrolled as a full-time student. PA Program students must maintain twelve credits each term to be considered full-time.

(b) Leaves of Absence. No financial aid is available to students not attending classes or working toward the requirements of the 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 the student is attending. Financial aid must be arranged through the other school.

(c) Extended Study. A student who is not taking a full course load but doing research toward the thesis requirement is charged a registration fee and is eligible for financial aid only in the form of loans. Students on leaves 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. For details regarding the definition of satisfactory academic program, please consult each degree program's policy on satisfactory academic progress for Title IV funds. At appropriate evaluation intervals, the student must be approved for continued enrollment by the progress committee of their program at 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 M.D. program at the School of Medicine, a student may remain up to six years.

When a student is no longer in residence and has failed to complete required coursework needed to receive the degree, the student's enrollment status is in absentia to submit. In the M.D. program, failure to complete requirements includes not completing the dissertation, not passing the USMLE Step 1 or Step 2 CK, or not satisfactorily completing a required course, clerkship, or subinternship. 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, the student's name is presented to the Board of Permanent Officers and to the Yale Corporation for the awarding of their respective degree.

Consistent with student status, satisfactory academic progress, and available funds for each program, 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. This includes scholarship money supplied directly to the student from non-Yale sources. The maximum scholarship offered 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/or CSS Profile 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 office and may result in a proportionate reduction of School support. If a student does not report changes, the student's 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' tax returns, including all schedules and W-2 forms or a statement of earnings for the previous fiscal year are required for all M.D. students under the age of thirty applying for Yale loans and scholarships. No parental information is required for students in the PA or PA Online programs. Copies of Social Security benefits, unemployment compensation, and retirement benefits of both student and parents are also required. All information is verified in accordance with federal regulations. If the parents are divorced, the student must provide information on the custodial parent. The custodial parent will remain the same for all subsequent years; a student cannot change custodial parents unless the original custodial parent dies. If the custodial parent is remarried, the stepparent's information is also required. Beginning in the 2024–2025 academic year, parental information is waived for students aged thirty and over.

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 2024–2025 all students who have a calculated loan eligibility 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. International students may borrow the Yale Graduate and Professional Loan for International Students. 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 Office of Financial Aid, Room 202, Edward S. Harkness Memorial Hall, 367 Cedar Street, or from our website at https://medicine.yale.edu/md-program/financialaid.

M.D. AND PA PROGRAM STUDENT FAMILY SUPPORT AND HEALTH CARE

Yale School of Medicine provides health insurance for the families of medical and PA Program students who have children under twenty-six years of age. This includes full health care coverage at Yale Health for all medical and PA Program students and their children (basic as well as hospitalization/specialty care). A full description of the coverage can be found on the Yale Health website at https://yalehealth.yale.edu and in this bulletin under Health Services in the chapter Yale University Resources and Services.

Medical and PA Progam students with a child of any age will receive an annual subsidy of $7,500. If a student has family coverage through Yale Health that includes spousal coverage, the $7,500 will automatically be applied toward spousal coverage. Otherwise, parents can best decide how to use this funding—for child care, spousal coverage elsewhere, or any other family expense.

Additionally, medical and PA Progam students will receive an annual subsidy of $2,500 for each additional child under the age of six.

The subsidy is one per family, not one per enrolled student. The School of Medicine will prorate the family support subsidy with a birth or adoption event.

For information on the possible effects of the subsidy on financial aid offers, contact the Office of Financial Aid at ysmfinaid@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 Title IV 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 which 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 2024–2025, the last days for refunding Title IV funds will be October 20, 2024 (Year 1), October 29, 2024 (Year 2), October 17, 2024 (Year 3), and November 4, 2024 (Years 4 and 5) in the fall term and March 30, 2025 (Year 1), March 24, 2025 (Years 2, 3, 4, and 5), and March 24, 2024 (Year 4) in the spring term. And June 24, 2025 (Year 2), July 11, 2025 (Years 3 and 5) in the summer 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 which occur on or before the end of the first 10 percent of the term: August 18, 2024 (Year 1), September 4, 2024 (Year 2), August 6, 2024 (Year 3), and August 26, 2024 (Years 4 and 5) in the fall term and January 17, 2025 (Year 1), January 16, 2025 (Years 2, 3, 4 and 5) in the spring term, and May 25, 2025 (Year 2), May 28, 2025 (Years 3 and 5) in the summer term.

   b. A rebate of one-half (50 percent) of tuition will be granted for withdrawals which occur after the first 10 percent but on or before the last day of the first quarter of the term: September 6, 2024 (Year 1), September 21, 2024 (Year 2), August 27, 2024 (Year 3), and September 16, 2024 (Years 4 and 5) in the fall term and February 7, 2025 (Year 1), February 5, 2025 (Years 2, 3, 4 and 5) in the spring term, and June 3, 2025 (Year 2), June 10, 2025 (Years 3 and 5) in the summer.
   c. A rebate of one-quarter (25 percent) of tuition will be granted for withdrawals which occur after the first quarter of a term but on or before the day of Midterm: October 7, 2024 (Year 1), October 18, 2024 (Year 2), October 2, 2024 (Year 3) and October 21, 2024 (Years 4 and 5) in the fall term and March 15, 2025 (Year 1), March 10, 2025 (Years 2, 3, 4 and 5) in the spring term, and June 18, 2025(Year 2), July 2, 2025 (Years 3 and 5) in the summer.
   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 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 described in (2)a-c applies only to the M.D. Program. Contact the Physician Associate Program and the Physician Assistant Online Program for their schedules and policies.

SCHOLARSHIPS

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

The Robert Campbell Adams (1899) and Claire Adams Scholarship Fund Established in 1981 by a 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 for students who plan to practice medicine in a rural area.

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

The Arthur N. Alling Scholarship Fund Established in 1986 by a bequest from Helen F. Alling in memory of her father for scholarships for female medical students.

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

The Drs. Carol J. '59 and Robert M. '59 Amick Scholarship Fund Established in 2020 by a gift from an anonymous donor to provide financial aid to students within the Yale School of Medicine.

The Arons Memorial Scholarship Fund Established in 2015 by a bequest from Daniel L. Arons, B.A. 1963, M.D. 1967.

The John Kenly Bacon Fund Established in 1994 by a bequest from the estate of Elsie L. Bacon in memory of her husband (Yale College Class of 1925) to provide scholarship assistance for worthy students attending the Yale School of Medicine.

The Muriel Frances Hanley Bagshaw, M.D. Scholarship Fund Established in 2000 by a gift from Malcolm A. Bagshaw, M.D. 1950, in memory of his wife to assist female students enrolled in the Yale School of Medicine.

The Donald S. Baim, M.D. 1975 Scholarship Fund Established in 2011 by a gift from Boston Scientific Corporation in memory of Donald S. Baim, M.D., to provide scholarship assistance for Yale School of Medicine students.

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

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

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

The Francis Gilman Blake (M.A. Hon. 1921) Memorial Fund Established in 1952 by gifts from an anonymous donor and Dorothy D. (Mrs. Francis) Blake in memory of her husband for scholarships.

The M. Grant Blakeslee (Ph.B. 1912) Memorial Scholarship Fund Established in 1966 by a bequest from Catherine Woodruff Blakeslee in memory of her husband for scholarships for worthy students in the School of Medicine.

The Sanfurd G. Bluestein, M.D. 1946 Scholarship Fund Established in 1996 by a gift from Sanfurd Bluestein, M.D., on his fiftieth reunion to support medical students with a need for financial aid.

The Bohmfalk Scholarship Fund The John Frederick Bohmfalk Scholarship Fund and the Alice Bohmfalk Scholarship Fund support students planning careers in general medical practice.

The Dr. and Mrs. Harold D. Bornstein, Jr., M.D. '53 Scholarship Fund Established in 2011 by a gift from Harold D. Bornstein, Jr., M.D., to provide scholarships for Yale School of Medicine students in good academic standing with need for financial aid.

The John E. Borowy, M.D. (1950) and Ruth Borowy Scholarship Fund Established in 2006 by a bequest from John E. Borowy, M.D., to support students in the M.D. program with demonstrated need.

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

The David L. Brook (B.S. 1945S, M.D. 1947) Memorial Scholarship Fund Established in 1995 by a gift from David Brook, M.D.'s family upon his death to be used to assist worthy medical students in need of financial assistance.

The Danuta I. Bujak Scholarship Fund Established in 2018 by a gift from Danuta I. Bujak, M.S.N., 1981, to provide scholarship assistance for students who are enrolled in a Ph.D. program at the School of Medicine or School of Nursing and are from Poland or whose families are from Poland.

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

The Edward Thomas Calhoun, M.D. Scholarship Fund Established in 1928 by a gift from Lida T. Calhoun in memory of her son for scholarships to students working in pathology.

The Robert E. Carroll, M.D. Yale School of Medicine Scholarship Fund Established in 2007 by a gift from Robert E. Carroll, B.A. 1938, M.D. 1942, to provide scholarship assistance to students. Preference for graduates of Yale University.

The Ettore Ciampolini, M.D. (Ph.D. 1923) Scholarship Fund Established in 1968 by a bequest from the estate of Helen A. Ciampolini in memory of her husband to be awarded to male students in need of funds to help pay tuition.

The Ruth G. Clammer Scholarship Fund Established in 2011 by a bequest from Ruth G. Clammer for scholarships in the School of Medicine.

The Class of 1944 Medical School Scholarship Fund Established in 1994 by gifts from the Class of 1944 in celebration of their fiftieth reunion to provide scholarship assistance for medical students.

The Class of 1948 Endowed Scholarship Fund Established in 2002 by gifts from the Class of 1948 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 gifts from the Class of 1950 to provide scholarships to medical students.

The Class of 1954 Memorial Scholarship Fund Established in 2004 by gifts from the Class of 1954 in honor of their fiftieth reunion to provide support for medical students.

The Class of 1955 Scholarship Fund Established in 2011 by a gift from 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 Fund Established in 2006 by gifts from the Class of 1956 in honor of their fiftieth reunion for students with demonstrated need for financial aid in the M.D. program.

The Class of 1957 Scholarship Fund Established in 2007 by gifts from the Class of 1957 in honor of their fiftieth reunion to provide financial aid to outstanding medical students who demonstrate need for support.

The Class of 1958 Medical School Scholarship Fund Established in 2014 by gifts from the Class of 1958 to provide scholarship support for students in the M.D. program with need for financial aid.

The Class of 1959 Medical School Scholarship Fund Established in 1994 by gifts from the Class of 1959 to provide financial aid to medical students who demonstrate need for support.

The Class of 1961 Memorial Scholarship Fund Established in 2002 by gifts from the Class of 1961 to support medical students.

The Class of 1963 Scholarship Fund Established in 2008 by gifts from the Class of 1963 in celebration of their thirty-ninth reunion for students in the M.D. program with need for financial aid.

The Class of 1967 Memorial Scholarship Fund Established in 2002 by gifts from the Class of 1967 in memory of their classmates.

The Class of 1971 Scholarship Fund Established in 2021 by gifts from members of the Class of 1971 to provide scholarship support for students in the M.D. program with need for financial aid.

The Class of 1972 Scholarship Fund Established in 1998 by gifts from the Class of 1972 in honor of their twenty-fifth reunion to provide scholarship support for students in the M.D. program with need for financial aid.

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

The Jack W. Cole Scholarship Fund Established in 2011 by gifts from Mrs. Jack Cole and family in memory of Dr. Jack W. Cole, founder of the Physician Associate Program at Yale, to provide scholarships for School of Medicine students enrolled in the Physician Associate Program.

The Thomas J. Coleman III, M.D. and Bebette Gualano Coleman Scholarship Fund Established in 2000 by a gift from Dr. and Mrs. Thomas J. Coleman III for scholarships for Yale medical students who will not perform abortions or euthanasia in their medical practice.

The Fred C. Collier, M.D. Memorial Fund Established in 2008 by a bequest from Rosalie F. Collier, M.N. 1950, in memory of her husband (M.D. 1946) for scholarships for needy medical students.

The Berthold R. Comeau Medical '28 Scholarship Fund Established in 1999 by a bequest from Elizabeth G. Comeau in memory of her husband for scholarships.

The Julian Czamanski Scholarship Fund Established in 2002 by a bequest from Julian Czamanski for scholarships to students with financial need.

The Lycurgus M. Davey (B.A. 1939, M.D. 1943) Fellowship Fund Established in 1986 by a gift from Lycurgus M. Davey, M.D., for financial aid to needy medical students.

The Edwin P. and Eleanor H. Dawson Scholarship Fund Established in 1971 by a gift from Eleanor Dawson for medical students in need of financial assistance.

The Franklin M. Doolittle (Ph.B. 1915) and Frances C. Doolittle Scholarship Fund Established in 1959 by a gift from Franklin M. Doolittle to provide financial assistance to needy and deserving students in the School of Medicine.

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

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

The Richard N. and Catherine Foster M.D.-Ph.D. Scholarship Fund Established in 2012 by a gift from anonymous donors to provide stipend support for medical students who are jointly pursuing M.D.-Ph.D. degrees at Yale. Preference for students planning to pursue careers as physician-scientists, making use of both their clinical and scientific training.

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

The L. Damon Gadd Endowed Scholarship Fund Established in 2018 by a gift from Sara R. Gadd in honor of her late husband (1949 B.S.) to provide scholarships for students with need for financial aid who have expressed an interest in international humanitarian medical work.

The Carl Gade (M.D. 1910) Scholarship Fund Established in 1955 by a bequest from Carl Gade, M.D., to provide assistance for needy and deserving students at the Yale School of Medicine.

The J. Roswell Gallagher Scholarship Fund Established in 1998 by a gift from J. Roswell Gallagher (Yale College Class of 1925 and School of Medicine Class of 1930) to provide scholarship assistance to medical students in need.

The John Currier Gallagher Memorial Scholarship Fund Established in 1998 by gifts from the parents and friends of John C. Gallagher (Yale College Class of 1954 and School of Medicine Class of 1958) in his memory to provide scholarship assistance to medical students in need.

The Anne G.K. Garland Memorial Fellowship Fund Established in 1930 by a gift from William J. Garland in memory of his wife to provide assistance to students in the graduate and professional schools.

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

The Maurice H. Givens (Ph.B. 1909, Ph.D. 1917) Scholarship Fund Established in 1974 by a bequest from the estate of Maurice H. Givens to provide scholarships for financially needy second-year medical students who have excelled in biochemistry.

The Gladys Godfried Scholarship Fund Established in 2006 by a bequest from Milton S. Godfried, B.A. 1934, M.D. 1936, in memory of his wife to provide financial assistance to medical students in good standing entering their third or fourth year.

The Gold Family Yale Medical Scholarship Fund Established in 2011 by a gift from 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 Fund Established in 1923 by a gift from Charles Stillman, B.A. 1882, in memory of his uncle (B.A. 1853) to provide scholarships in the School of Medicine.

The Dr. Jack Peter Green and Arlyne F. Green M.D.-Ph.D. Scholarship Fund Established in 2007 by a bequest from the estate of Jack Peter Green, M.D. 1957, Ph.D. 1952, and his wife to support promising M.D.-Ph.D. students at the Yale School of Medicine.

The Maurice R. Greenberg Scholarship Fund Established in 2014 by a gift from the C.V. Starr Foundation in honor of Maurice R. Greenberg to support students with demonstrated financial need at the Yale School of Medicine.

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

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

The GTE Foundation Fund Established in 1988 by a gift from the GTE Corporation for scholarships for minority medical students.

The Dixon Hall (M.D. 1850) Scholarship Fund Established in 1965 by a bequest from John Dixon Hall, B.A. 1881, in memory of his father for assistance to students or in the investigation of diseases.

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

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

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

The Muriel Hirshfield Memorial Scholarship Fund Established in 1964 by a gift from Jack Hirshfield in memory of his wife to assist needy medical students who are residents of Connecticut. Preference for residents of the greater New Haven area.

The John A. Hoober (LL.B. 1891) Memorial Fellowship Fund Established in 1952 by a bequest from Sarah A.K. Hoober for scholarships for students from York County, Pennsylvania, or nearby counties.

The Howey Scholarship Fund Established in 1945 by a bequest from Ennes G. Howey to support needy and deserving students of good standing.

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

The Oliver Kingsley Isham, M.D. Memorial Scholarship Fund Established in 1981 by bequests from Julia L. Isham and Charlotte T. Isham in memory of their brother for scholarships.

The James D. Jamieson and Family M.D.-Ph.D. Scholarship Fund Established in 2009 by a gift from James D. Jamieson, M.D., 1975 M.A.H., to provide stipend support for medical students who are jointly pursuing M.D.-Ph.D. degrees at Yale and conducting research in the life sciences.

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

The Michael Kashgarian, M.D. '58 and Jean Caldwell Kashgarian Scholarship Fund Established in 2019 by a gift from Michael Kashgarian, M.D., to provide financial aid to students within the Yale School of Medicine. Preference for students pursuing a career in academic medicine with an interest in the study of the kidney.

The Dr. Lynda Kauls and Dr. Geoffrey Emerson Scholarship Fund Established in 2020 by a gift from Linda Kauls, M.D. 1988 and Geoffrey Emerson, M.D. 1999, Ph.D. 2000 to provide financial aid to students within the Yale School of Medicine.

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

The Alfred E. (1937 M.D.) and Louise B. King Scholarship Fund Established in 2003 by a gift from Dr. Alfred and Louise King to provide financial aid for students at the School of Medicine.

The Hans A. and Elizabeth R. Klagsbrunn Scholarship and Loan Fund Established in 1993 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 Fund Established in 2011 by 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. Preference for students who are parents.

The Benjamin (M.D. 1926) and Fortuna Iseman Klotz Memorial Scholarship Fund Established in 1990 by a bequest from Benjamin Klotz, M.D., for scholarships at the medical school.

The William H. Konigsberg, Ph.D. Scholarship Fund Established in 2020 by a gift from Wilhelmina C. Korevaar, M.D. 1977, to provide scholarships for students within the Yale School of Medicine.

The Elizabeth S. Lamb Scholarship Fund Established in 2021 by a bequest from Elizabeth S. Lamb, M.D. 1955, M.P.H. 1958 to assist one or more students in the Yale School of Medicine's M.D. and/or M.D.-Ph.D. programs with financial need. Preference first for Native American students who are members of a tribe recognized by the U.S. Department of the Interior's Bureau of Indian Affairs and second for any Native American with financial need who has demonstrated a cultural connection to the tribe of their heritage.

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

The Marguerite Rush Lerner Award Fund Established in 1981 by a gift from Dr. Aaron B. Lerner in memory of his wife to support financial aid for deserving students in the School of Medicine.

The Frank E. Lucente Scholarship Fund Established in 2016 by a gift from Frank E. Lucente, M.D. 1968, to provide scholarships for students within the Yale School of Medicine.

The John C. Marsh, M.D. '59 Scholarship Fund Established in 2015 by a gift from John Marsh, M.D., to provide financial assistance for first-year students.

The Professor Lafayette B. Mendel (B.A. 1891, Ph.D. 1893) Scholarship Fund Established in 1974 by a bequest from the estate of Maurice H. Givens, Ph.D. 1909, in memory of Professor Mendel to provide scholarships for financially needy first-year medical students who have demonstrated a proficiency and interest in biochemistry or physiological chemistry.

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

The Anoush Miridjanian, M.D. Scholarship Fund Established in 2011 by a gift from Anoush Miridjanian, M.D. 1961, to provide scholarships for Yale School of Medicine students. Preference for students of Armenian descent.

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

The Professor Ernst Mylon and Hildegard D. Mylon Scholarship Fund Established in 1984 by a bequest from Peter Mylon in honor of his parents for scholarships for medical students.

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

The Julian J. Obermann Medicine Fellowship Fund Established in 1959 by a bequest from Julian J. Obermann, honorary M.A. 1935, to defray the costs of tuition and expenses of needy and deserving students in the School of Medicine.

The John and Jessie Ogilvie Memorial Scholarship Fund Established in 1968 by a gift from John B. Ogilvie, B.S. 1931, M.D. 1934, in memory of his parents to provide assistance to medical students in the third- or fourth-year class interested in surgery.

The Ogilvie Family Scholarship Fund Established in 1989 by a gift from John B. Ogilvie, B.S. 1931, M.D. 1934, to assist worthy students who are in need of financial help.

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

The David V. Pecora, M.D. 1941 and Dorothy E. Pecora, R.N. Scholarship Fund Established in 2007 by a gift from Dr. David and Dorothy Pecora to support students at the Yale School of Medicine.

The Frank Elmer Phillips (M.D. 1901) Scholarship Fund Established in 1992 by a bequest from Anne P. Whistler in honor of her father to benefit medical students in need of financial assistance.

The Carrie T.B. Purinton Fund Established in 1965 by a bequest from Carrie T.B. Purinton for scholarships in the School of Medicine.

The Puzak-Kurtz Scholarship Fund Established in 1962 by a gift from Michael Puzak, M.D. 1942, and his wife, Elizabeth Kurtz, M.N. 1941.

The Mila Rainof, M.D. Memorial Fund Established in 2010 by gifts from family and friends in memory of Mila Rainof, M.D. (Class of 2008), to provide financial aid for medical students with demonstrated financial need.

The Otto G. Ramsay Memorial Scholarship Fund Established in 1915 by gifts from women in New Haven in memory of Dr. Otto G. Ramsay (M.A.H. 1901) for scholarships to third-year medical students.

The D. Bradford Reich, M.D. Scholarship Fund Established in 2020 by a gift from D. Bradford Reich, M.D. 1986, to provide financial aid to students within the Yale School of Medicine.

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

The Richard S. Robbins, M.D. '72 and Helen G. Robbins Scholarship Fund Established in 2023 by a gift from Richard S. Robbins, M.D. 1972, and Helen G. Robbins to provide scholarships for Yale School of Medicine students.

The John Macklin Roberts, M.D. Scholarship Fund Established in 2022 by a bequest from the estate of John Macklin Roberts (B.S. 1949, M.D. 1952), to provide scholarships for students within the Yale School of Medicine.

The Dr. Irwin K. and Dr. Barbara F. Rosenberg Medical Student Scholarship Fund Established in 2017 by a bequest from Dr. Irwin K. Rosenberg to support students in the M.D. program with demonstrated need for financial aid.

The Nathan E. ('28) and Hilda M. Ross Scholarship Fund Established in 2002 by a gift from the trust of Nathan E. Ross, B.S. 1925, M.D. 1928, and his wife to benefit needy medical students.

The Salvatore and Lee (M.D. 1940) Sannella Scholarship Fund Established in 1991 by gifts from members of the Sannella family in memory of Dr. Salvatore Sannella and in honor of his son, Dr. Lee Sannella, to benefit needy medical students. Preference for students 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 Fund Established in 2011 by a gift from 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. Sheridan Scholarship Fund Established in 1986 by a bequest from Kathryn Whitelam Wynn in memory of her husband for scholarships for needy medical students.

The Jeffrey N. Siegel, M.D. Scholarship Fund Established in 2020 by a gift from Jeffrey N. Siegel, M.D. 1980, to provide financial aid to students within the Yale School of Medicine.

The Anson Frederick Smolowe (B.A. 1964) Memorial Fund Established in 1969 by a gift from Mr. and Mrs. Philip Smolowe in memory of their son for medical students in need of financial aid while attending the Yale School of Medicine.

The Domenick and Gertrude Spinelli Fund Established in 2019 by a bequest from Viola J. Spinelli to provide financial aid to students within the Yale School of Medicine.

The Nicholas P.R. Spinelli Scholarship Fund Established in 2011 by a bequest from Nicholas P.R. Spinelli, 1941 B.S., 1944 M.D., for scholarship aid to deserving medical students.

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

The Ruth and Milton (Ph.B. 1924) Steinbach Fund Established in 1991 by a gift from the trust of Milton Steinbach to be used to benefit needy men and women in the Epidemiology and Public Health, Medicine, and Physician Associate programs.

The Alan W. Stone '65 Scholarship Fund Established in 2019 by a gift from Judith R. Hope to provide financial aid to students within the Yale School of Medicine.

The John R. Stratton, M.D. and Carolyn Webster-Stratton, Ph.D. Scholarship Fund Established in 2023 by a gift from John R. Stratton, M.D. 1973, and Carolyn Webster-Stratton, M.S.N. M.P.H. 1972, Ph.D. to provide scholarships for Yale School of Medicine students.

The Nathan B. and Masha K. Tager Scholarship Fund Established in 1987 by a gift from Morris Tager, Ph.D. 1931, M.D. 1936, for financial aid for students.

The James and Dana Tananbaum Family Scholarship Fund Established in 2020 by James Tananbaum. M.D. and Dana B. Tananbaum to provide financial aid to students within the Yale School of Medicine. Preference for students who are focused on interdisciplinary, systems-oriented research.

The John Seymour Thacher (B.A. 1877) Memorial Fund Established in 1964 by a bequest from Frances Lake (Mrs. John) Thacher in honor of her son for scholarships.

The Reuben E. Thalberg Scholarship Fund Established by the university in 1977 in memory of Dr. Reuben E. Thalberg for medical students in need of financial aid while attending the Yale School of Medicine.

The Charles Henry Thomas Fund Established in 1940 by a bequest from Georgine H. Thomas in memory of her husband (M.D. 1873).

The Lois E. and Franklin H. Top, Jr., M.D. 1961 Scholarship Fund Established in 2001 by a gift from Dr. and Mrs. Franklin Top for medical students.

The Dr. Joseph Hendley Townsend Scholarship Fund Established in 1928 by a bequest from Emily Allison Townsend in memory of her brother (B.A. 1885, M.D. 1887) for scholarship aid for New Haven residents.

The Tremonti Family Scholarship Fund Established in 2010 by a gift from Lawrence Tremonti, M.D. 1963, to provide scholarships for Yale School of Medicine students pursuing an M.D. degree. Preference for students from small liberal arts schools.

The Myra Tyler Student Financial Aid Fund Established in 1998 by a bequest from Myra D. Tyler (Class of 1950) for scholarships for Yale School of Medicine students.

The Flora Adler Ullman Memorial Fund Established in 1927 by gifts from Joseph C. Johnson and other friends of Flora Adler Ullman for scholarship aid.

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

The Robert R. and Mary B. Wagner Scholarship Fund Established in 2014 by a gift from Robert R. Wagner for scholarships to School of Medicine students.

The Alfred Eastman Walker (B.A. 1864, M.D. 1867) Fund Established in 1951 by a bequest from Frances E. Walker in memory of her brother for a student in the second year who has made the most satisfactory progress during the first year.

The Bernice L. Walker Memorial Scholarship Fund Established in 2005 by a bequest from the estate of Bernice L. Walker to provide support for medical students.

The Joseph F. Walter, M.D. 1967 Scholarship Fund Established in 2022 by a gift from Joseph F. Walter, M.D., to provide scholarships for students within the Yale School of Medicine. Preference for students who have served in the U.S. Armed Services or National Guard, as a first responder (firefighter, paramedic, EMT, police officer), or are children of parents with this experience.

The Arthur K. Watson (B.A. 1942) Scholarship Fund Established in 1984 by a bequest from Arthur Watson for scholarships for medical students.

The Andrew Judson White Scholarship Fund Established in 1951 by a gift from Margaret White (Mrs. Chauncey S.) Truax in memory of her grandfather (M.D. 1846, honorary M.A. 1894) to provide aid for students who otherwise would be unable to acquire a medical education.

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

The Amy Hunter-Wilson (M.D. 1930, D.P.H. 1934) Fund Established in 1990 by a gift from Dr. Amy Hunter-Wilson and Frederick C. Wilson to provide financial assistance to needy medical and public health students.

The Louise Farnam Wilson (Ph.D. 1916, M.D. 1920) Memorial Scholarship Fund Established in 1955 by a gift from Mrs. Samuel Clark Harvey in memory of her sister to provide scholarship aid for financially needy female students.

The Donald D. Wright, 1930 B.A., 1933 Ph.D. (Chemistry) Scholarship Fund Established in 1998 by a gift from M. Felix Freshwater, M.D. 1972, in honor of Donald D. Wright, the chemistry major adviser at Brooklyn College who encouraged students to apply to Yale School of Medicine, to provide financial aid to medical students. Preference for graduates of Brooklyn College or any college in the City University of New York system.

Armed Forces scholarships are available upon application.

LOAN FUNDS

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

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

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

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

The Harry J. Bardwell Loan Fund Established in 1928 by a 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, Ph.D. 1931, M.D. 1934.

The David Challinor Student Loan Fund Established in 1973 by a gift from 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.

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

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

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

The C.S.M.S. Memorial Student Loan Fund Established in 1972 to provide supplementary loans up to $500.

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

The Howard Heinz Students' Educational Fund Established in 1927 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 by 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 gifts from the 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 W.K. Kellogg Foundation for loans to students in medicine and public health.

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

The Eli Lilly Loan Fund Established in 1980 as a revolving loan fund for the benefit of 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 by gifts from the friends and colleagues of Dr. Harry G. Moss in his memory 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 a gift from Mrs. Ordway in memory of her husband (M.D. 1912).

The Primary Care Loan Program Fund 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 a 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 education.

The Anson Frederick Smolowe Memorial Student Loan Fund Established in 1976 by a gift from Mr. and Mrs. Philip Smolowe in memory of their son (B.A. 1964) for medical students in need of financial aid while attending the Yale School of Medicine.

The Wayne O. Southwick 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 a gift from Dale S. Tate, B.A. 1897, in memory of his wife.

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

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

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

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

FELLOWSHIPS

The Arons-Millard Student Research Fund for Surgery Established in 2014 by a gift from M. Felix Freshwater, M.D., for medical student summer thesis research fellowships with a priority first in the history of surgery, then in clinical aspects of plastic surgery.

The James Hudson Brown Memorial Fund Established in 1944 by a bequest from Marie B.C. Brown in memory of her husband for research fellowships to promising investigators for pursuit of research in the medical sciences, including clinical medicine and public health.

The Dr. George A. Carden, Jr. Fellowship Fund in Infectious Diseases Established in 2018 by a gift from G. Alexander Carden III, M.D., to enhance the fellowship program within the Section of Infectious Diseases by providing stipend and/or research support for undergraduate, graduate, or medical school students or current fellows to work in a biological science or clinical research area of investigation.

The Carpue/Pollock Medical Student Fellowship Fund Established in 2021 by a bequest from an anonymous donor to provide research fellowships for students traveling to the United Kingdom to conduct clinical research within the surgical disciplines for their thesis.

The Alexander Brown Coxe (B.A. 1887) Memorial Fellowship Fund Established in 1927 by a gift from the family of Alexander Brown Coxe to be awarded to investigators of promise in the comprehensive field of the biological sciences.

The William Harvey Cushing Fellowship Fund Established in 1928 by a gift from Dr. Harvey Cushing, B.A. 1891, in memory of his son (Yale College Class of 1927) for research in surgery.

The Digestive Disease Endowment Fund Established in 2006 by a gift from Dr. Srinivas Seela and Dr. Harinath Sheela to support the education and academic advancement of postdoctoral fellows.

The Mitchell Edson, M.D. Fund for International Clinical Rotation Established in 2007 by a gift from Mitchell Edson, M.D. 1956, in honor of his fiftieth reunion to support the travel for an international clinical rotation of medical students in an underdeveloped country or a country where there is a pressing health care need.

The Joseph W. Eichenbaum, M.D. 1973 Endowment Fund for Student Research Established in 2005 by a gift from Joseph W. Eichenbaum, M.D., to support the summer research of M.D. students with an interest in the basic sciences under the direction of a

faculty member who has a history of providing an extraordinary mentoring and research experience for M.D. students.

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

The William U. Gardner (M.A. Hon. 1943) Memorial Student Research Fellowship Fund Established in 1989 by a gift from Katherine H. Gardner in memory of her husband to support student research projects related to endocrinological aspects of cancer.

The Richard K. Gershon, M.D. Student Research Fellowship Fund Established in 1985 by gifts from faculty and friends in honor of Richard K. Gershon, M.D. 1959, to support medical students for a fifth year of medical school to carry out research in immunology or a related discipline.

The Samuel Jordan Graham Fellowship Fund Established in 1961 by a bequest from the estate of E. Norma P. (Mrs. S.J.) Graham in memory of Judge and Mrs. Samuel Jordan Graham to assist students pursuing postgraduate study or research in the School of Medicine. Preference for students specializing in surgery.

The Norman Herzig Fellowship Fund Established in 2003 by a gift from the Albert Schweitzer Institute to provide support for medical students to experience clinical rotations in developing countries.

The James G. Hirsch, M.D. Endowed Medical Student Research Fellowship Fund Established in 1988 by a gift from 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 from four to five years to pursue research projects.

The Richard Alan Hirshfield Memorial Fellowship Fund Established in 1961 by a gift from Mr. and Mrs. Jack Hirshfield in memory of their son for students 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 gifts from the colleagues and friends of Gueh Djen Edith Hsiung, Ph.D., professor emeritus of laboratory medicine, to provide medical students with research fellowships in clinical virology and related projects in viral pathogenesis.

The Charles Linnaeus Ives Fellowship Fund Established in 1924 by a bequest from the widow of Charles Linnaeus Ives, B.A. 1852, for students doing research in pathology.

The Eric P. Kindwall, M.D. 1960 International Clinical Rotation Fund Established in 2006 by a gift from Eric Kindwall, M.D., to support the travel for an international clinical rotation of medical students in an underdeveloped country or a country where there is a pressing health care need.

The Francis G. Kingsley Memorial Fund Established in 1986 by gifts from the friends and family of Francis G. Kingsley to be awarded to young faculty investigators whose research shows great promise.

The Geraldine Lambert Fellowship Fund Established in 2014 by a gift from Caren S. Lambert, 1989 B.A., to create and support a fellowship program to train the next generation of physicians and physician-scientists who will devote their energies to the clinical and scientific understanding of dyslexia (especially dyslexia in children) and its treatment.

The Paul H. Lavietes, M.D. Summer Research Fellowship Fund Established in 1991 by gifts from the family and friends 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, to provide support for summer research fellowships for promising medical students.

The Lewis Levy, M.D. Student Thesis Research Fund Established in 2022 by a gift from J. McLeod Griffiss, M.D. 1966, in memory of professor of neurology Lewis Levy, M.D. for medical student thesis research fellowships and faculty mentor compensation.

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

The Lo Family Graduate Fellowship Fund Established in 2011 by a gift from Dr. Ka Shui Lo and Dr. Feili Lo for the benefit of senior graduate students (Ph.D. or M.D.-Ph.D. candidates) pursuing stem cell research at the Yale School of Medicine.

The Madden Fellowship Fund Established in 2015 by a gift from Edward E. Madden, B.A. 1962, to support fellows at Yale Cancer Center.

The Robert Malison, M.D. '87 Student Research Fellowship Fund Established in 2022 by a gift from Elliott Levy (B.S. 1980, M.D. 1987) and Barry Weinstock, M.D. 1987, in memory of professor of psychiatry Robert Malison, M.D. for medical student summer thesis research fellowships. Preference for students with an interest in psychiatry, neuroscience, or addiction.

The Robert L. McNeil, Jr. Fellowship Fund in Clinical Pharmacology Established in 2001 by a gift from the Philadelphia Foundation to support postdoctoral fellows.

The Medical Student Research Fund Established in 1986 by a gift from an anonymous donor to support students who choose to take a fifth year to pursue in-depth research.

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

The Peter R. Muehrer Scholarship Fund Established in 2017 by a gift from Peter R. Muehrer, M.D. (B.A. 1982), to provide support for postdoctoral fellows within the National Clinician Scholars Program. Preference for fellows who have demonstrated an interest in integrating research or clinical care for mental disorders into their studies.

The Dr. Deepak Narayan Travel Fund Established in 2020 by a gift from Reza Momeni, M.D., and friends of the late Dr. Deepak Narayan to help residents and junior faculty specializing in skin cancer advance surgical techniques, pursue research opportunities, and establish multidisciplinary collaborations.

The Office of International Medical Student Education Fellowship Fund Established in 2015 by a gift from Simeon A. Schwartz, M.D. 1977, to support international elective travel fellowships for medical students.

The Howard A. Pearson Fellowship Fund in Pediatric Hematology/Oncology Established in 1999 by a gift from Paul Newman to support faculty fellows in pediatrics.

The Gustavus and Louise Pfeiffer Research Foundation Fellowship Fund Established in 2015 by a gift from the Gustavus and Louise Pfeiffer Research Foundation to support M.D.-Ph.D. students. Preference for students who are pursuing Ph.D. research in neuroscience or a closely related field.

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

The George G. and Leah E. Posener Memorial Fellowship Fund in Hematology and Stem Cell Research Established in 1995 by a gift from George G. Posener in memory of his wife and his brother (Yale Class of 1938), who received care at Yale New Haven Hospital, to assist physician-scientists whose research focuses on polycythemia vera and related blood diseases and support stem cell research.

The Bertram H. Roberts Memorial Fund Established in 1955 by gifts from the family, friends, and colleagues of Bertram Roberts for lectures and summer stipends to medical students interested in field study or other projects in the field of social psychiatry.

The Leon Rosenberg Medical Student Research Fund in Genetics Established in 2004 by a gift from Leon E. Rosenberg, M.D., former dean of Yale School of Medicine, for medical students who elect to spend a fifth year engaged in full-time research in the Department of Genetics.

The G.D. Searle Fellowship Fund in Pharmacology Established in 1985 by a gift from G.D. Searle and Company for fellowships in the Department of Pharmacology.

The Robert Shapiro, M.D. Memorial Fellowship Fund in Diagnostic Radiology Established in 2000 by a gift from Dr. and Mrs. Marc D. Shapiro in honor of his father to provide research support in diagnostic interventional procedures for postdoctoral fellows in diagnostic radiology.

The Daniel B. Stryer, M.D., Class of 1990 International Clinical Rotation Fund Established in 2005 by a gift from Professor and Mrs. Lubert Stryer in memory of their son to support the travel for an international clinical rotation of medical students in an underdeveloped country or a country where there is a pressing health care need.

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

The Thudichum Post-Doctoral Research Fellowship Fund in Neuro-oncology Established in 2005 by a gift from Irene M. Voynick in honor of German medical practitioner and surgeon Johann Ludwig Wilhelm Thudichum, who characterized the chemical composition of the brain and is regarded as the pioneer of neurochemistry, to support Ph.D. or M.D.-Ph.D. students in the study of brain tumors utilizing cell biology, neurochemistry, and adult stem cell research.

The Translational Neuroscience Fellowship Fund Established in 2019 by gifts from various donors to support a fellow in the Department of Neurology whose research is aimed at advancing the understanding or treatment of disorders of the spinal cord or brain.

The Maria Turner, M.D. and Raymond W. Turner, M.D. 1958 International Fellowship Fund Established in 2008 by a gift from Raymond Turner, M.D., to support the travel, living, and relevant preparatory expenses for an international health-related experience of medical students or M.D.-Ph.D. students.

The Michael S. Voynick Fellowship Fund in Neuro-oncology Established in 1997 by a gift from Irene M. Voynick for faculty awards 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 Fund in Neuro-oncology Established in 2001 by a gift from Irene M. Voynick to support visiting faculty fellows who will engage in such investigative areas as tumor excisions and innovative therapies based on tumor cell biology and genetics.

The Jean McLean Wallace International Fellowship Fund Established in 2020 by a gift from Anne Wallace Juge and Mary Wallace Strizek in memory of their late mother to provide support for students, residents, or faculty members in ophthalmology to pursue an international health-related experience.

The Jane Danowski Weiss Family Foundation Fund Established in 2000 by a gift from the Jane D. Weiss Family Foundation in memory of Dr. Thaddeus S. Danowski ’36, Edwin F. Danowski, and Pelagia V. Danowski Sellers to support medical students in a fifth year of research in the areas of diabetes, stroke, and heart disease.

The Susan Wolf, M.D. (1997) and William Greene, M.D. Fund for International Clinical Rotation Established in 2006 by a gift from Drs. Susan Wolf and William Greene to support the travel for an international clinical rotation of medical students in an underdeveloped country or a country where there is a pressing health care need.

The Yale-Uganda Endocrine Surgery Fellowship Program Fund Established in 2017 by a gift from Laticrete International, Inc., to support surgeons from Uganda who will spend three to four months in training with the endocrine surgery team at Yale School of Medicine and Yale surgeons who will travel to Uganda to provide training, mentoring, and patient care.

The Herman H. and Sarah Zusman Student Research Fellowship Fund Established in 2009 by a gift from the Zusman family to support the summer research of M.D. students with an interest in the basic and/or clinical sciences with a focus on cardiovascular medicine/surgery/physiology.

General Information

STATEMENT OF FREE EXPRESSION AND NON-DISCRIMINATION POLICY

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

It must be ensured that our school is free from discrimination and acts of intolerance based on race, gender, sexual orientation, religion, national origin, ancestry, age, or physical handicap. This commitment remains consonant with the obligation to protect open and wide-ranging public discourse.

The principle of freedom of expression that might otherwise protect even the most offensive public speech does not protect, nor does it even encompass, a right to threaten the dignity and privacy of an individual. Such personally directed behavior will not be tolerated because it is antithetical to academic values, debilitates its victims, compromises the offenders. and undermines the university's fundamental commitment to individual freedom and respect for all its members. Furthermore, acts of intolerance may destroy the very atmosphere wherein freedom of expression is otherwise tolerated and cherished.

GRIEVANCE PROCEDURES

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

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

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

Sexual Misconduct, Including Sexual Harassment and Sexual Assault

http://titleix.yale.edu

The School of Medicine and Yale University have established procedures and resources to prevent and address sexual misconduct, including sexual harassment and sexual assault. In this bulletin, the section on Resources on Sexual Misconduct in the chapter Yale University Resources and Services provides extensive information and guidance. Faculty, medical students, and postdoctoral fellows may opt to bring an informal or a formal complaint to the University-Wide Committee on Sexual Misconduct or to the Title IX Coordinator of the School of Medicine.

Racial and Ethnic Harassment

The Office of Diversity, Equity & Inclusion (DEI) will work in conjunction with the Office of Institutional Equity and Access 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 that individual's own situation, is encouraged to contact the Office of Institutional Equity and Access (https://oiea.yale.edu). Students who believe that they have been harassed on the basis of race, religion, or ethnic origin by any member of the Yale community can file a complaint with one of the university's human relations counselors, who will investigate the complaint. For more information, visit https://dhr.yale.edu/complaint-resolution.

Office of Academic & Professional Development (OAPD)

Students should reach out to the OAPD with concerns about professionalism. Students are regularly reminded of the link to the OAPD website (https://medicine.yale.edu/oapd/professionalism/addressingconcerns) where they can report concerns and learn about OAPD's review, remediation, and follow-up process.

Students also have access to University resources/initiatives including the University-Wide Committee on Sexual Misconduct, Title IX coordinators, SHARE, Office of Institutional Equity and Accessibility (OIEA), and discrimination and harassment resource coordinators. If a student reaches out to OAPD about an issue involving sexual discrimination, harassment, or assault, OAPD is required under Title IX to report this to the university Office of Institutional Equity and Accessibility (OIEA). For incidents that involve bias or discrimination, OAPD consults the YSM deputy dean for DEI and/or OIEA.

Yale University Procedures for Student Complaints

For information on Yale University complaint procedures, see https://dhr.yale.edu/complaint-resolution.

STUDENT PROGRESS

The Progress Committee reviews the progress of each medical student to determine if the student meets the requirements for satisfactory academic progress, advancement to the next phase in the M.D. curriculum, and for graduation. All students must also meet ongoing academic, technical, and professional standards.

In its review of students, the Progress Committee makes one of the following two determinations:

- Meeting the requirements for Advancement, including the Professional and Technical Standards, or
- Not meeting the requirements for Advancement, including the Professional and Technical Standards, whereby actions may include one of the following adverse actions: supervised remediation, academic probation, suspension, or dismissal

The dean and the YSM Board of Permanent Officers have delegated decision making capacity for these matters to the Progress Committee. A student may appeal an adverse action decision delivered by the Progress Committee as outlined in this policy.

The Progress Committee uses a single and uniform standard for the advancement and graduation of students as outlined in the *YSM MD Program Advancement and Graduation Requirements*.

Standard Review

Under the standard review of students for satisfactory academic progress and suitability for advancement, and graduation, each student's suitability for advancement in the M.D. curriculum is reviewed at four designated time points: (1) at the completion of the first-year pre-clerkship curriculum, (2) at the completion of the second-year pre-clerkship curriculum, (3) at the completion of the clerkship curriculum, and (4) in April of the graduation year.

Student Affairs provides data on each student's academic, technical, and professional progress, identifies those who appear to be meeting criteria for advancement, and presents this list to the Progress Committee for review and approval at each designated timepoint.

Students who are identified by the Progress Committee as possibly not meeting the criteria for advancement in the M.D. curriculum, who are therefore at risk for an adverse action decision, are notified in writing and invited to appear for review with the Progress Committee (as outlined below).

Review for Reasons Other Than Standard Review

Students may be referred to the Progress Committee due to concerns including but not limited to those regarding academic performance, potential violations of professionalism standards, or the inability to fulfill the technical standards. Referral should occur consistent with the standards outlined in the *Procedure for Flow of Information for Suboptimal Student Behavior or Performance*. Students referred to the Progress Committee who are at risk for an adverse action decision are notified in writing and invited to appear for review.

Guidelines for Potential Adverse Action by the Committee

The student is provided with a disclosure of relevant data under consideration and has the opportunity to present in writing or in person any other relevant data, evidence, or information that the student would like to be considered in the deliberation. Any student appearing in person may be accompanied by their academic adviser or a faculty member of their choice.

According to the Progress Committee Conflict of Interest Policy, committee members who have a conflict of interest must disclose this to the chair and will be recused from deliberations and decisions about the student being reviewed. The Progress Committee will consider relevant submitted data, including but not limited to letters and reports regarding the issue being considered, student testimony, and special circumstances that may interfere with or limit the student's ability to meet the program's academic, professional, or technical standards. Deliberations will occur as outlined by the Progress Committee bylaws. After considering the relevant data and circumstances, the Progress Committee makes one of the following determinations:

A. **Supervised Remediation** This is designed to engage the student in a structured, supervised improvement plan to address any deficits in academic performance or professionalism with the goal of helping the student improve their performance to a satisfactory level. When supervised remediation is required, the student will be notified in writing by the Progress Committee, including a clear rationale or basis for the decision, and the consequences of not successfully completing the supervised remediation according to a specified timeline.

B. **Academic Probation** If there is a pattern of unsatisfactory performance or violation of the YSM M.D. Program Code of Conduct or Professionalism Standards, the student may be placed on academic probation. The student will be notified in writing of the terms of the academic probation by the Progress Committee, including a clear rationale or basis for the decision, the requirements for having the academic probation removed, and the consequences of not meeting these requirements according to a specified timeline. Students on academic probation may engage in the curriculum and should continue recommended remediation. The performance of students on probation is reviewed regularly by the Progress Committee until requirements are met.

C. **Suspension** If there is serious violation of the YSM M.D. Program Code of Conduct or Professionalism Standards, the student may be placed on suspension. The student will be notified in writing of the duration and terms of the disciplinary leave by the Progress Committee, including a clear rationale or basis for the decision, the requirements for returning, and the consequences of not meeting these requirements according to a specified timeline. Students who are suspended are not permitted to engage in the curriculum and will not have the privileges of an enrolled student in good standing. Students who are suspended may not work or study at Yale University during this time period.

D. **Dismissal** If a student is unable to meet the academic requirements of YSM despite remediation efforts or a student does not fulfill the terms outlined for removal of academic probation or suspension, the student may be dismissed. Additionally, if at any time a student behaves in a manner that is considered incompatible with being a physician, they may be dismissed. If dismissal occurs, the student will be notified in writing of the decision by the Progress Committee with a copy to the deputy dean for education and the dean of the School of Medicine. A dismissed student will be disenrolled from YSM without the option of return.

If a student is placed on academic probation or is suspended at any point during their medical school education, such information will be included in the MSPE. The Progress Committee will review any professionalism-related matter and decide on a case-by-case basis whether such information merits inclusion in the MSPE. The student will be notified of this in writing when such actions are to appear in their MSPE. Refer to YSM policy for Inclusion of Information in the MSPE.

Appeal Process

A student may appeal an adverse action decision by the Progress Committee. An appeal is a formal request for reconsideration of an adverse action decision and must be pursued according to the procedure outlined below:

1. To begin the appeal process, the student must write to the deputy dean for education within ten calendar days from the written decision. If the student believes that the deputy dean has a conflict of interest in considering the appeal, the student must provide an explanation in their written appeal and submit the appeal to the dean of the School of Medicine who will consider the matter and appoint a dean's designee, if warranted.
2. The student's appeal must include the specific grounds for appeal and documentation specifically relevant to and in support of the stated grounds for appeal.
3. The only grounds for appeal are: (a) the discovery of information that was not available at the time of the decision, and/or (b) evidence of material errors in procedure that impacted the decision; material errors may include a failure to follow policy or procedures or consider relevant evidence.
4. The "decisionmaker", the deputy dean or the dean's designee, shall evaluate the appeal by reviewing the information provided and, at the decisionmaker's discretion, request additional information from relevant entities and/or from the student.
5. If it is determined that there are grounds for appeal, the decisionmaker will forward the appeal to an ad hoc committee assembled ("Appeal Committee") by the decisionmaker, for reconsideration. In the case of reconsideration, the decisionmaker may give the Appeal Committee instructions regarding the nature and extent of the reconsideration.
6. The Appeal Committee will issue a reconsidered decision within four weeks of receipt of the request for appeal. The decisionmaker will review the new decision and will either approve it or revise it.
7. The student will be notified in writing of the final decision by the decisionmaker. No further appeals will be allowed.

ADVISING AT YALE SCHOOL OF MEDICINE

Yale School of Medicine recognizes the special importance of academic advising and career counseling for medical students. The academic advising program provides academic and career guidance to medical students while contributing to their professional development. Academic advisers are knowledgeable about the Yale system of medical education, as well as curriculum and graduation requirements. They are informed and up-to-date about student assessment, board examinations, residency application processes, extracurricular opportunities at Yale, fifth-year options, joint-degree programs, and the thesis requirement. Advisers are a valuable resource who will follow students' academic and professional performance, offering guidance and feedback throughout their advisees' time at Yale.

Every Yale School of Medicine student is randomly assigned a faculty academic adviser. The six advisers are highly regarded faculty members who have demonstrated dedication to and interest in students and their undergraduate medical education. Twenty percent of each adviser's effort is supported by the dean for this role. The advisers meet periodically with their advisees one-on-one and in groups to offer advice on navigating the journey through medical school and beyond and to help students having academic difficulties or questions. They are responsible for writing their advisees' MSPEs and other letters of support. Students may "opt out" of having their MSPE written by the assigned academic adviser, in which case it will be written by the associate dean for curriculum.

In addition, the associate dean for student affairs is available to all students to assist with problems of any nature, especially personal issues that students may wish to keep separate from their academic progress. The associate dean meets one-on-one with every first-year student and any student requesting a meeting throughout medical school. The associate dean meets weekly with the academic advisers to discuss themes that may emerge regarding students' academic problems in order to bring broader attention to these themes and issues.

Furthermore, starting with the M.D. Class of 2027, a longitudinal coach is assigned to each student. The coach works with the student throughout their undergraduate medical education training, supporting the student's professional development and reviewing individual progress in meeting the milestones toward attaining YSM's nine M.D. Program competencies.

These competencies are the knowledge, skills, and attributes that all M.D. students should achieve to be prepared for the next phase of medical training. Each competency is further defined by the school's educational program objectives (EPOs), with measurable or observable milestones for each of the three phases of the M.D. curriculum: pre-clerkship, clerkship, and advanced training period. (See https://medicine.yale.edu/md-program/curriculum/competencies-requirements/competencies for the competencies, EPOs, and milestones.)

Longitudinal coaches help students monitor their progress in meeting these milestones by, together with the student, reviewing the student's formative and summative assessments, self-reflections, narrative feedback, and other relevant data. They assist their students in identifying progress and achievement, as well as areas for improvement or potential concern across the four-year curriculum. Coaches work with each of their

students to develop goals and action plans that are customized to the student's needs and learning style. The coaches, as part of a larger team, also help students overcome learning challenges.

EMERGENCY SUSPENSION

The dean of the School of Medicine, or a delegate of the dean, may place a student on an emergency suspension from residence or academic status when (1) the student has been arrested for or charged with serious criminal behavior by law enforcement authorities; or (2) the student allegedly violated a disciplinary rule of the School of Medicine and the student's presence on campus poses a significant risk to the safety or security of members of the community.

Following an individualized risk and safety analysis, the student will be notified in writing of the emergency suspension. A student who is notified of an emergency suspension will have twenty-four hours to respond to the notice. The emergency suspension will not be imposed prior to an opportunity for the student to respond unless circumstances warrant immediate action for the safety and security of members of the community. In such cases, the student will have an opportunity to respond after the emergency suspension has been imposed.

When a student in the School of Medicine is placed on an emergency suspension, the matter will be referred for disciplinary action in accordance with school policy. Such a suspension may remain in effect until disciplinary action has been taken with regard to the student; however, it may be lifted earlier by action of the dean or dean's delegate, or by the disciplinary committee after a preliminary review.

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 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 extensions have been granted. The student 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 the registrar was notified of the leave. 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 the intention to return at least eight weeks prior to the end of the approved leave. In addition, a returning student who wishes to be considered for financial aid 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 mandatory medical leave of absence when, on recommendation of the director of Yale Health or the chief of the Mental Health and Counseling department, the dean of the School determines that, because of a medical condition, the student is a danger to self or others, the student has seriously disrupted others in the student's residential or academic communities, or the student has refused to cooperate with efforts deemed necessary by Yale Health and the dean to make such determinations. Each case will be assessed individually based

on all relevant factors, including, but not limited to, the level of risk presented and the availability of reasonable modifications. Reasonable modifications do not include fundamental alterations to the student's academic, residential, or other relevant communities or programs; in addition, reasonable modifications do not include those that unduly burden university resources.

An appeal of such a leave must be made in writing to the dean of the school no later than seven days from the effective date of the leave.

An incident that gives rise to voluntary or mandatory leave of absence may also result in subsequent disciplinary action.

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

Leave of Absence for Parental Responsibilities

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

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

U.S. Military Leave Readmissions Policy

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

1. The student must have served in the U.S. Armed Forces for a period of more than thirty consecutive days;
2. The student must give advance written or oral notice of such service to the associate dean for student affairs. In providing the advance notice the student does not need to indicate an intent 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 the 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 the 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 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 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 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, as well as Café Med and other student common spaces, occupy the first through third floors of the building. The great advantages of living in Harkness

Hall are its close proximity to classes and the opportunity it provides in bringing together students from the various medical-related fields in a relaxed social setting. For additional information visit https://housing.yale.edu.

DISABILITY INSURANCE

Yale 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 CAMPUS SECURITY

Yale Public Safety includes Yale Security, a dedicated team committed to providing safety and security services on a 24/7 basis across the entire campus, including the medical school community. Uniformed security officers provide vehicle, foot, and bicycle patrols, fixed posts in buildings and parking facilities, and monitors electronic security systems, including video cameras, blue emergency phones, intercom systems, and intrusion alarm systems.

Yale Security officers are available to provide walking escorts (https://your.yale.edu/community/public-safety/stay-safe-campus/walking-escort-service) anywhere within the campus footprint and can assist with lockouts. Yale Security can be reached at 203.785.5555 or directly by downloading the Yale LiveSafe app (https://your.yale.edu/community/public-safety/stay-safe-campus/livesafe-app).

Yale Security partners with the Yale Police Department, the New Haven Police Department, and the New Haven Parking Authority to patrol parking facilities, pedestrian areas, and buildings where Yale operates near campus. For more information or to request security services for special events, please visit the Yale Public Safety website at https://your.yale.edu/community/public-safety.

YSM's Safety & Security Committee includes representatives from the medical school, Yale Police Department, Yale Public Safety, Yale Parking & Transit, and Yale New Haven Health System. The committee meets bi-monthly, hosts quarterly YSM Community Safety town halls, and distributes safety and security newsletters. To view updates and frequently asked questions, visit the YSM Safety & Security Resources web page at https://medicine.yale.edu/myysm/personal-resources/safety-security-resources.

STUDENT MENTAL HEALTH AND WELLNESS PROGRAM

The YSM Student Mental Health and Wellness Program plays an important role in supporting the mental health of YSM students. The program provides short-term mental

health consultation and intervention to address mild-to-moderate severity symptoms (e.g., depressed mood or anxiety) or acute adjustment issues (e.g., role stress, grief, relationship changes). These sessions can be virtual or in-person. If longer-term mental health concerns and need for treatment are identified, the program team will facilitate the transition to Yale Health Mental Health & Counseling or Magellan through Mental Health & Counseling and support students in getting connected to those ongoing services.

In addition to the mental health services provided by a social worker and psychologist, a wellness counselor works with students to address needs related to time and stress management, well-being, and self-care. The staff also facilitates groups and wellness seminars around topics of interest to YSM students.

SPECIAL SUPPORT SERVICES

Office of Diversity, Inclusion, Community Engagement, and Equity

The Office of Diversity, Inclusion, Community Engagement, and Equity (DICE) strives to create an inclusive community for the diverse student body of Yale School of Medicine (YSM) by supporting and celebrating our differences. Through outreach, education, and advocacy, DICE aims to promote the creation of an interdisciplinary health care workforce—including innovative physicians, researchers, and scientists—who reflect and serve diverse communities.

The office actively identifies, recruits, and supports talented individuals from diverse background. Through robust outreach efforts, we aim to strengthen the pathway of talented individuals from diverse backgrounds towards achieving successful careers in health care and biomedical research.

DICE supports several health and science pathway programs, including the Youth Science Enrichment Program, the Health Professions Recruitment Exposure Program, Yale Summer Enrichment Medical Academy, Program to Advance Training in Health and Sciences, and the Minority Association of Pre-Med Students Mentorship Program. Supporting and celebrating informative discourse around diversity and inclusion, DICE actively seeks and responds to student and trainee feedback. The office of DICE supports medical student affinity groups such as the Asian Pacific American Medical Association; the Committee on Diversity, Inclusion, and Social Justice; Outpatient; South Asian Medically-oriented Students Association; the Student National Medical Association/ Latino Medical Student Association; Women in Medicine; Yale BBS Diversity and Inclusion Collective; Yale First Generation/Low Income; Yale Native American Health Professions; and Yale SACNAS.

The office also hosts a monthly social for underrepresented medical, Ph.D., PA, and BBS students; sponsors a mentorship program for students and trainees; and maintains relationships with house staff and faculty organizations that work toward inclusion. DICE partners with local schools and organizations to host community events and supports ongoing community service projects throughout the year, advocating on behalf of vulnerable populations in New Haven. The office also supports student advocacy for social justice within and beyond the campus community, partnering with Yale and local organizations to provide informative and actionable dialogue on key issues of social justice. Deputy Dean and Chief Diversity Officer Darin A. Latimore, M.D., along with

Marietta Vázquez, M.D., associate dean for medical student diversity, heads the office. The contact person is Director Linda V. Jackson, M.S. The office is located at 367 Cedar Street, Suite 320, New Haven CT 06511; telephone, 203.785.7545. For additional information please visit https://medicine.yale.edu/dice.

Computing at the School of Medicine

Computing assistance is available at all times for Yale students, faculty, and staff by contacting the ITS Help Desk (203.432.9000, or helpdesk@yale.edu). Assistance is also available at the Sterling Hall of Medicine Technology Support Service Center (SHM L E20A), Monday through Friday from 9 a.m. to 4:30 p.m., located on the lower level of the Medical Library. For information on the extensive computer facilities in the Medical Library, see the chapter Harvey Cushing/John Hay Whitney Medical Library.

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.

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

Yale University Resources and Services

A GLOBAL UNIVERSITY

Global engagement is core to Yale's mission as one of the world's great universities. Yale aspires to:

- Be the university that best prepares students for global citizenship and leadership
- Be a worldwide research leader on matters of global import
- Be the university with the most effective global networks

Yale's engagement beyond the United States dates from its earliest years. The university remains committed to attracting the best and brightest from around the world by offering generous international financial aid packages, conducting programs that introduce and acclimate international students to Yale, and fostering a vibrant campus community.

Yale's globalization is guided by the vice provost for global strategy, who is responsible for ensuring that Yale's broader global initiatives serve its academic goals and priorities, and for enhancing Yale's international presence as a leader in liberal arts education and as a world-class research institution. The vice provost works closely with academic colleagues in all of the university's schools and provides support and strategic guidance to the many international programs and activities undertaken by Yale faculty, students, and staff.

Teaching and research at Yale benefit from the many collaborations underway with the university's international partners and the global networks forged by Yale across the globe. International activities across all Yale schools include curricular initiatives that enrich classroom experiences from in-depth study of a particular country to broader comparative studies; faculty research and practice on matters of international importance; the development of online courses and expansion of distance learning; and the many fellowships, internships, and opportunities for international collaborative research projects on campus and abroad. Together these efforts serve to enhance Yale's global educational impact and are encompassed in the university's global strategy.

The Office of International Affairs (https://world.yale.edu/oia) provides administrative support for the international activities of all schools, departments, 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. OIA also coordinates Yale's program for hosting scholars at risk.

The Office of International Students and Scholars (https://oiss.yale.edu) hosts orientation programs and social activities for the university's international community and is a resource for international students and scholars on immigration matters and other aspects of acclimating to life at Yale.

The Yale Alumni Association (https://alumni.yale.edu) provides a channel for communication between the alumni and the university and supports alumni organizations and programs around the world.

Additional information may be found on the Yale and the World website (https://world.yale.edu), including resources for those conducting international activities abroad and links to international initiatives across the university.

CULTURAL, SOCIAL, AND ATHLETIC RESOURCES

Keep up to date about university news and events by subscribing to the Yale Today e-newsletter (https://news.yale.edu/subscribe-enewsletter), YaleNews (http://news.yale.edu), the Yale Calendar of Events (http://calendar.yale.edu), and the university's Facebook, Twitter, Instagram, LinkedIn, and YouTube channels.

The Yale Peabody Museum (https://peabody.yale.edu), founded in 1866, houses more than fourteen million specimens and objects in ten curatorial divisions. The Museum's galleries, newly renovated in 2024, display thousands of objects, including the first *Brontosaurus, Stegosaurus,* and *Triceratops* specimens ever discovered.

The Yale University Art Gallery (https://artgallery.yale.edu) is one of the largest museums in the country, holding nearly 300,000 objects and welcoming visitors from around the world. Galleries showcase artworks from ancient times to the present, including vessels from Tang-dynasty China, early Italian paintings, textiles from Borneo, treasures of American art, masks from Western Africa, modern and contemporary art, ancient sculptures, masterworks by Degas, van Gogh, and Picasso, and more.

The Yale Center for British Art (https://britishart.yale.edu) is a museum that houses the largest collection of British art outside the United Kingdom, encompassing works in a range of media from the fifteenth century to the present.

More than five hundred musical events take place at the university during the academic year, presented by the School of Music (https://music.yale.edu/concerts), the Morris Steinert Collection of Musical Instruments (https://music.yale.edu/concerts-events-collection), and the Institute of Sacred Music (https://ism.yale.edu/events/upcoming-events), among others.

For theatergoers, Yale offers a wide range of dramatic productions at such venues as the Yale Repertory Theatre (https://yalerep.org); the University Theater and Iseman Theater (https://drama.yale.edu/productions); and Yale Cabaret (https://www.yalecabaret.org).

The religious and spiritual resources of the university serve all students, faculty, and staff of all faiths. Additional information is available at http://chaplain.yale.edu.

The Payne Whitney Gymnasium, one of the most elaborate and extensive indoor athletic facilities in the world, is open to Yale undergraduates and graduate and professional school students at no charge throughout the year. Memberships at reasonable fees are available for faculty, employees, postdocs, visiting associates, alumni, and members of the New Haven community. Additional information is available at https://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 Tennis Complex, and the Yale Golf Course. All members of the Yale community and their guests may participate at each of these venues for a modest fee. Information is available at https://myrec.yale.edu.

The Yale Outdoor Education Center (OEC) in East Lyme Yale is open to students, faculty, staff, and alumni. The OEC, which consists of 1,500 acres surrounding a mile-long lake in East Lyme, Connecticut. The facility includes overnight cabins and campsites, a pavilion and dining hall available for group rental, and a waterfront area with

supervised swimming, rowboats, canoes, stand-up paddleboards, and kayaks. For more information, visit https://sportsandrecreation.yale.edu/outdoor-education-center-0.

Approximately fifty club sports are offered at Yale, organized by the Office of Club Sports and Outdoor Education (https://sportsandrecreation.yale.edu/club-sports-intramural-sports/club-sports). Most of the teams are for undergraduates, but a few are available to graduate and professional school students.

Throughout the year, Yale graduate and professional school students have the opportunity to participate in numerous intramural sports activities, including 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 at https://myrec.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 health, gynecology, mental health, pediatrics, pharmacy, blood draw, radiology, a fifteen-bed inpatient care unit, and an acute care clinic with extended hours and telephone triage/guidance from a registered nurse twenty-four hours a day. Additional specialty services such as allergy, dermatology, orthopedics, a travel clinic, and more are available through Yale Health Hospitalization Specialty Coverage. 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 https://yalehealth.yale.edu/coverage/student-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 Student Health Services, which is offered at no charge and includes preventive health and medical services in the departments of Student Health, Gynecology, Student Wellness, and Mental Health & Counseling. In addition, treatment or triage for urgent medical problems can be obtained twenty-four hours a day through Acute Care.

Students on leave of absence, on extended study and paying less than half tuition, or enrolled per course credit are not eligible for Yale Health Basic Student Health Services 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 Student Health Services 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 Student Health Services 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.

Students on leave of absence, on extended study and paying less than half tuition, or enrolled per course per credit, and students enrolled in the PA Online program (see below), are not eligible for Yale Health Basic Student Health Services 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 Student Health Services 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.

Health Coverage Enrollment

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

YALE HEALTH HOSPITALIZATION/SPECIALTY COVERAGE

For a detailed explanation of this plan, which includes coverage for prescriptions, see the *Yale Health Student Handbook,* available online at https://yalehealth.yale.edu/student-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 first day required to be on campus for program orientation. A student who is enrolled for the fall term only is covered for services through January 31; a student enrolled for the spring term only is covered for services through July 31.

Waiving Yale Health Hospitalization/Specialty Coverage Students are permitted to waive Yale Health Hospitalization/Specialty Coverage by completing an online waiver form at https://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 within thirty days. 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 DEPENDENT PLANS

A student may enroll the student's lawfully married spouse or civil union partner and/or legally dependent child(ren) under the age of twenty-six in one of three student dependent plans: Student + Spouse, Student + Child/Children, or Student Family Plan. These plans include services described in both Yale Health Basic Student Health Services and Yale Health Hospitalization/Specialty Coverage. Coverage is not automatic, and enrollment is by application. Applications are available from the Member Services Department or can be downloaded from the website (https://yalehealth.yale.edu/forms-and-guidelines) 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, on extended study, or enrolled per course per credit; students paying less than half tuition; students enrolled in the EMBA program; students enrolled in the Broad Center M.M.S. program; students enrolled in the PA Online program; and students enrolled in the EMPH program may enroll in Yale Health Student Affiliate Coverage, which includes services described in both Yale Health Basic Student Health Services and Yale Health Hospitalization/Specialty Coverage. Applications are available from the Member Services Department or can be downloaded from the website (https://yalehealth.yale.edu/forms-and-guidelines) and must be received by September 15 for full-year or fall-term coverage, or by January 31 for spring-term coverage only. For PA Online candidates, applications are available directly from the PA Online program, and special enrollment deadlines apply (July 15 for full-year or fall-term coverage; January 15 for spring-term coverage only).

Eligibility Changes

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

Yale Health Basic Student Health Services (including Student Health, Athletic Medicine, Mental Health & Counseling, and Care Management) during these thirty days to the extent necessary for a coordinated transition of care.

Leaves of absence Students who are granted a leave of absence are eligible to purchase Yale Health Student Affiliate Coverage for the term(s) of the leave. If the leave occurs on or *before* the first day of classes, Yale Health Hospitalization/Specialty Coverage will end retroactive to the start of the coverage period for the term. If the leave occurs anytime after the first day of classes, Yale Health Hospitalization/Specialty Coverage will end on the day the registrar is notified of the leave. In either case, students may enroll in Yale Health Student Affiliate Coverage. Students must enroll in Affiliate Coverage prior to the beginning of the term unless the registrar is notified after the first day of classes, in which case, the coverage must be purchased within thirty days of the date the registrar was notified. 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 website (https://yalehealth.yale.edu/forms-and-guidelines). Fees will not be prorated or refunded.

Extended study or reduced tuition Students who are granted extended study status or pay less than half tuition are not eligible for Yale Health Hospitalization/Specialty Coverage. They may purchase Yale Health Student Affiliate Coverage during the term(s) of extended study. This plan includes services described in both Yale Health Basic Student Health Services 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 website (https://yalehealth.yale.edu/forms-and-guidelines). 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.

Per course per credit Students who are enrolled per course per credit are not eligible for Yale Health Hospitalization/Specialty Coverage. They may purchase Yale Health Student Affiliate Coverage during the term(s) of per course per credit enrollment. This plan includes services described in both Yale Health Basic Student Health Services 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 website (https://yalehealth.yale.edu/forms-and-guidelines). 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 online at https://yalehealth.yale.edu/resource/student-handbook and from the Member Services Department, 203.432.0246, 55 Lock Street, PO Box 208237, New Haven CT 06520-8237.

Required Immunizations

Proof of vaccination is a pre-entrance requirement determined by the Connecticut State Department of Public Health. Students who are not compliant with this state regulation

will not be permitted to register for classes or move into the dormitories for the fall term, 2024. Please access the Incoming Student Vaccination Record form for graduate and professional students at https://yalehealth.yale.edu/new-student-health-requirements. Connecticut state regulation requires that this form be completed and signed, for each student, by a physician, nurse practitioner, or physician's assistant. The form must be completed, independent of any and all health insurance elections or coverage chosen. Once the form has been completed, the information must be entered into the Yale Vaccine Portal and all supporting documents must be uploaded to https://campushealth.yale.edu/welcome-to-health-on-track. The final deadline is August 1.

COVID-19 As per recommendations from the Centers for Disease Control and Prevention, vaccination against COVID-19 is strongly encouraged, but not required, for incoming (matriculating) students. Students are asked to submit documentation of prior any primary series vaccinations or bivalent boosters that they have received through the Yale Health website, http://yalehealth.yale.edu. Vaccination requirements remain in place for healthcare workers and trainees, including students who work in settings where patient care is provided, or those who work with human research subjects in clinical settings. Those individuals must submit documentation of vaccination with a primary series and one booster (or, for those who have not yet received a primary series, one bivalent dose of vaccine) to the university or seek approval for a medical or religious exemption. Yale will accept any combination of COVID-19 vaccines that have received full approval or Emergency Use Authorization (EUA) by the U.S. Food and Drug Administration (FDA) or have been issued Emergency Use Listing (EUL) by the World Health Organization (WHO). International students who do not have access to WHO or FDA authorized or approved vaccines may be vaccinated at Yale Health on request.

Influenza All students are required to have flu vaccination in the fall when it is made available to them by Yale Health.

Measles, mumps, rubella, and varicella All students are required to provide proof of immunization against measles (rubeola), mumps, German measles (rubella), and varicella. Connecticut state regulation requires two doses MMR (combined measles, mumps, and rubella) and two doses of varicella vaccine. The first dose must have been given after the student's first birthday; the second dose must have been given at least twenty-eight days after the first dose. If dates of vaccination are not available, titer results (blood test) demonstrating immunity may be substituted for proof of vaccination. The cost for all vaccinations and/or titers rests with the student, as these vaccinations are considered to be a pre-entrance requirement by the Connecticut State Department of Public Health. Students who are not compliant with this state regulation will not be permitted to register for classes or move into the dormitories for the fall term, 2024.

Quadrivalent meningitis All students living in on-campus dormitory facilities (all undergraduate residential colleges and the following graduate dormitories: 254 Prospect Street, 272 Elm Street, 276 Prospect Street, Baker Hall, and Edward S. Harkness Memorial Hall) must be vaccinated against meningitis. The only vaccines that will be accepted in satisfaction of the meningitis vaccination requirement are ACWY Vax, Menveo, Nimenrix, Menactra, Mencevax, and Menomune. The vaccine must have been

given within five years of the first day of classes at Yale. Students who are not compliant with this state regulation will not be permitted to register for classes or move into the dormitories for the fall term, 2024. The cost for all vaccinations and/or titers rests with the student, as these vaccinations are a pre-entrance requirement by the Connecticut State Department of Public Health. Please note that the State of Connecticut does not require this vaccine for students who intend to reside on campus and are over the age of twenty-nine.

TB screening The university requires tuberculosis screening for all incoming students who have lived or traveled outside of the United States within the past year. Tuberculosis screening is required for all medical, physician assistant, and nursing students.

Hepatitis B series The university recommends that incoming students receive a series of three Hepatitis B vaccinations. Students may consult their health care provider for further information. Hepatitis B immunity is required for all medical, physician assistant, and nursing students.

IDENTIFICATION CARDS

Yale University issues identification (ID) cards to faculty, staff, and students. ID cards support the community's safety and security by allowing access to many parts of campus: dining halls and cafés, residential housing, libraries, athletic centers, workspaces, labs, and academic buildings. Cultivating an environment of public safety requires the entire community to work together to ensure appropriate use of our spaces, as well as to foster a sense of belonging for all members of our community.

University policies, regulations, and practice require all students, faculty, and staff to carry their Yale ID card on campus and to show it to university officials on request. Yale ID cards are not transferable. Community members are responsible for their own ID card and should report lost or stolen cards immediately to the Yale ID Center (https://idcenter.yale.edu).

Members of the university community may be asked to show identification at various points during their time at Yale. This may include but not be limited to situations such as: where individuals are entering areas with access restrictions, for identification in emergency situations, to record attendance at a particular building or event, or for other academic or work-related reasons related to the safe and effective operation and functioning of Yale's on-campus spaces.

For some members of our community, based on the needs and culture of their program, department, and/or characteristics of their physical spaces, being asked to show an ID card is a regular, even daily, occurrence. However, for others it may be new or infrequent. For some, being asked to produce identification can be experienced negatively, as a contradiction to a sense of belonging or as an affront to dignity. Yale University is committed to enhancing diversity, supporting equity, and promoting an environment that is welcoming, inclusive, and respectful. University officials requesting that a community member show their ID card should remain mindful that the request may raise questions and should be prepared to articulate the reasons for any specific request during the encounter. In addition, individuals requesting identification should also be prepared to present their own identification, if requested.

OFFICE OF INTERNATIONAL STUDENTS AND SCHOLARS

http://oiss.yale.edu
203.432.2305

The Office of International Students and Scholars (OISS) coordinates services and support for more than 6,300 international students, faculty, staff, and their dependents at Yale. OISS assists international students and scholars with issues related to employment, immigration, personal and cultural adjustment, and serves as a source of general information about living at Yale and in New Haven. As Yale University's representative for immigration concerns, OISS helps students and scholars obtain and maintain legal nonimmigrant status in the United States.

OISS programs, like daily English conversation groups, the Understanding America series, DEIB workshops, 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) community, which organizes a variety of programs and events.

The OISS website 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 Yale Connect, Facebook, and Instagram.

OISS is a welcoming venue for students and scholars who want to check their email, grab a cup of coffee, and meet up with a friend or colleague. The International Center is OISS's home on Yale campus and is located at 421 Temple Street. The International Center provides meeting space for student groups and a venue for events organized by both student groups and university departments. For more information about our hours, directions, and how to reserve space at OISS, please visit https://oiss.yale.edu/about/hours-directions-parking.

STUDENT ACCESSIBILITY SERVICES

https://sas.yale.edu
203.432.2324

Student Accessibility Services (SAS) engages in an interactive process with Yale students, including undergraduate, graduate, and professional-school students with permanent conditions and/or temporary injuries, to determine reasonable and appropriate accommodations on a case-by-case basis. Students may initiate this process by requesting accommodations through the online accommodation request form available at https://yale-accommodate.symplicity.com/public_accommodation.

Engagement with SAS is confidential, and faculty/staff are notified of approved accommodations on a need-to-know basis only, except when required by law for health and safety reasons. Students may upload supporting documentation regarding their condition and request for accommodations with their accommodation request form. Documentation guidelines are available on the SAS website at https://sas.yale.edu/students/documentation-guidelines.

RESOURCES TO ADDRESS DISCRIMINATION, HARASSMENT, AND SEXUAL MISCONDUCT

Yale is a community committed to fostering an environment of diversity, mutual respect, and intellectual discovery in which all members of the community can thrive. Acts of discrimination and harassment are contrary to the community standards and ideals of our university. Staff in the following offices work within the Yale community to promote respect, inclusivity, diversity, and equal opportunity, and are available to talk through situations you have witnessed or experienced, as well as to provide guidance.

When you have concerns or questions related to discrimination or harassment, you have a wide range of choices for support. You can reach out to a discrimination and harassment resource coordinator, or you can talk with others, such as a residential college dean, dean of student affairs, or the Office of Institutional Equity and Accessibility.

If you'd like to talk with someone about sexual misconduct or sex-based discrimination, you can reach out directly to the deputy Title IX coordinator of your school or the Title IX Office. The Title IX website (https://titleix.yale.edu) is a helpful resource for additional questions or concerns about sex-based discrimination or sexual misconduct. If an individual is unsure of which resource to contact and wants to explore options for addressing sexual misconduct, the SHARE Center is a good place to start.

Discrimination and Harassment Resource Coordinators

Office hours: 9 a.m.–5 p.m., M–F
https://dhr.yale.edu/discrimination-and-harassment-resource-coordinators

Discrimination and harassment resource coordinators (formerly deans' designees) have been identified by the dean of each college and school as community members with the responsibility to receive concerns and offer advice and guidance related to diversity and inclusion, discrimination and harassment, and equal opportunity. Discrimination and harassment resource coordinators may also help facilitate informal resolution. This may be an individual's best "first stop" in discussing a concern related to discrimination, harassment, or retaliation, particularly as discrimination and harassment resource coordinators will be knowledgeable about resources specific to their school or college.

Office of Institutional Equity and Accessibility

Office hours: 9 a.m.–5 p.m., M–F
203.432.0849
https://oiea.yale.edu

Any individual who would like to report a concern of discrimination, harassment, and/or retaliation may contact the Office of Institutional Equity and Accessibility (OIEA). OIEA staff are available to discuss concerns, university resources, and options for resolution, including informal resolution. Where appropriate, OIEA staff are also available to conduct investigations into complaints of discrimination, harassment, and/or retaliation. Talking with someone at OIEA about a concern or making a complaint does not automatically launch an investigation. It can, however, be an important step to alerting the university about a concern and getting assistance to resolve it.

SHARE: Information, Advocacy, and Support

55 Lock Street, Lower Level
Appointments: 9 a.m.–5 p.m., M–F
24/7 on-call service (for time-sensitive matters): 203.432.2000
https://sharecenter.yale.edu

SHARE, the Sexual Harassment and Assault Response and Education Center, has trained counselors available to members of the Yale community who wish to discuss any current or past experience of sexual misconduct involving themselves or someone they care about. SHARE services are confidential and can be anonymous if desired. SHARE can provide professional help with medical and health issues (including accompanying individuals to the hospital or the police), as well as ongoing counseling and support for students. SHARE works closely with the University-Wide Committee on Sexual Misconduct, the Title IX Office, the Yale Police Department, and other campus resources and can provide assistance with initiating a complaint.

If you wish to make use of SHARE's services, you can call the SHARE number (203.432.2000) at any time for a phone consultation or to set up an in-person appointment. Some legal and medical options are time-sensitive, so if you have experienced an assault, we encourage you to call SHARE and/or the Yale Police as soon as possible.

Title IX Coordinators

Office hours: 9 a.m.–5 p.m., M–F
203.432.6854
https://titleix.yale.edu

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

Yale College, the Graduate School of Arts and Sciences, and the professional schools have each designated one or more deputy Title IX coordinators, who work closely with the university Title IX Office and university Title IX Coordinator Elizabeth Conklin. Coordinators respond to and address concerns, provide information on available resources and options, track and monitor incidents to identify patterns or systemic issues, deliver prevention and educational programming, and address issues relating to gender-based discrimination and sexual misconduct within their respective schools. Coordinators also work with pregnant and parenting individuals to coordinate needed accommodations and to respond to instances of discrimination. Discussions with a deputy Title IX coordinator are private and information is only shared with other university officials on a need-to-know basis. In the case of imminent threat to an individual or the community, the coordinator may need to consult with other administrators or take action in the interest of safety. The coordinators also work closely with the SHARE Center, the University-Wide Committee on Sexual Misconduct, and the Yale Police Department.

University-Wide Committee on Sexual Misconduct

Office hours: 9 a.m.–5 p.m., M–F
203.432.4449
https://uwc.yale.edu

The University-Wide Committee on Sexual Misconduct (UWC) is an internal disciplinary board for complaints of sexual misconduct available to students, faculty, and staff across the university, as described in the committee's procedures. The UWC provides an accessible, representative, and trained body to fairly and expeditiously address formal complaints of sexual misconduct. UWC members can answer inquiries about procedures and the university sexual misconduct policy. The UWC is composed of faculty, senior administrators, and graduate and professional students drawn from throughout the university. UWC members are trained to observe strict confidentiality with respect to all information they receive about a case.

Yale Police Department

101 Ashmun Street
24/7 hotline: 203.432.4400
https://your.yale.edu/community/public-safety/yale-police-department

The Yale Police Department (YPD) operates 24/7 and is comprised of highly trained, professional officers. The YPD can provide information on available victims' assistance services and also has the capacity to perform full criminal investigations. If you wish to speak with the sensitive crimes and support coordinator, they can be reached at 203.432.9547. Informational sessions are available with the sensitive crimes and support coordinator to discuss safety planning, available options, etc. The YPD works closely with the New Haven State's Attorney, the SHARE Center, the Title IX Office, and various other departments within the university. Talking to the YPD does not commit you to submitting evidence or pressing charges; with few exceptions, all decisions about how to proceed are up to you.

Departments and Sections

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

Courses designated *a* meet in the fall term only. Courses designated *b* meet in the spring term only. Additional information on clinical elective and subinternship experiences is available at https://medicine.yale.edu/education/curriculum/advancedtraining/clinicalelectives.

Faculty listings reflect approved appointments effective May 1, 2024.

ANESTHESIOLOGY

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

Professors S. Akhtar, H. Benveniste, C.A. Brandt (*Biomedical Informatics and Data Science*), F. Braveman (*Emeritus*), M.M. Burg (*Medicine*), J.G. Collins (*Emeritus*), J. Ehrenwerth (*Emeritus*), R.R. Gaiser, P.M. Heerdt, R.L. Hines, L. Kitahata (*Emeritus*), C. Kopriva (*Emeritus*), V. Kurup, R. Lagasse (*Emeritus*), R.H. LaMotte (*Emeritus*), L. Leffert (*Chair*), H. Lin, L.E. Niklason (*Adjunct*), T. Oh (*Emeritus*), A.C. Perrino, W.M. Popescu, T.D. Rafferty (*Emeritus*), S.H. Rosenbaum (*Emeritus*), W. Rosenblatt, K.H. Shelley (*Emeritus*), D.G. Silverman (*Emeritus*), R.S. Sinatra (*Emeritus*), N. Vadivelu

Associate Professors A. Alian, T. Banack, L. Caramico, J. Charchaflieh, R. Deshpande, R.M. Doody, A. Gonzalez-Fiol, C.K. Gooden, J. Hyman, J. Li, L.L. Maerz (*Surgery*), G.F. McCloskey, A. Oprea, M. Ozcan, A. Rady, H. Roselinsky, R. Schonberger, J.J. Schwartz, J. Sherman, C. Szabo, H. Tantawy, D.M. Thomas, J. Zafar, Q. Zhu

Assistant Professors G. Abdulkarim, B. Abraham, M. Ancuta, S. Antony, R. Aouad, A. Bardia (*Adjunct*), D. Bercik, J. Berlin, M.E. Blessing, O. Brecher, A. Brenes Bastos, K.A. Bruno, A.M. Bustos, L. Calo, N. Chawla, R. Chow, N. Chowdhury, M. Cortes, M.R. Costin, S. Dabu-Bondoc, K.A. Daley, A. De Lima Arboleda, M. Denham, J. Dennis, S. Diaz, P. Effraim, A. Emple, K. Fardelmann, A. Farela, J. Feinleib, T. Feldheim, C. Fernandez Robles, L. Freudzon, D.J. Gaal, J.H. Garofalo, T. Ghaly, N. Ginsberg, R. Govindaswamy, F. Guzman, A. Haque, N. Haralabakis, K. Hernandez, A. Hernandez Rodriguez, A. Herrera, T. Hickey, H. Ibrahim, B. Kerner, D. Kiamanesh, A. Kilari, G. Kim, J. Kim, D. Kinney, R. Kumaraswami, J. Kurfess, M. Kutner, L.H. Kwan, H. Leahy, T. Leepuengtham, M. Leonova, H. Li, D. Lombardo, A. Longhini, A. Malik, P. Mancini, T.P. Mann, R. Marando, V. Matei, M. Mazurek, P. McGuire, P.M. Meeks, M. Montealegre Gallegos, R. Munoz-Acuna, M. Newton, N. Nguyen, A. Notarianni, D. Nussbaum, S. Nyshadham, L. Otchere-Darko, M. Ozcan, M. Pahade, J.T. Pan, B.M. Patel, M. Poole, M. Punjala, J. Quick, K. Rajput, P.H. Rana, S. Rao, A. Roberman, R.M. Romero, M. Rose, P. Rubin, O. Salianski, C. M. San Juan (*Orthopaedics and Rehabilitation*), J. Santana, D. Schafer, A.C. Schmeck, Z. Sesonsky, R. Sharma, S. So, R. Stout, A. Tanella, A. Torres, A. Vaidyanathan, O. Viktorsdottir, X. Wang, T. Wong, X. Zhang, Y. Zhao

Research Scientist H. Lee

Associate Research Scientists S. Koundal, S. Mizoguchi

Clinical Professor J.Katz

Assistant Clinical Professors A.F. Durrani, E. Jakab, J. Kim, N.A. Lone, N. Saidi, L. Wang

Elective

Anesthesiology Advanced Clinical Elective This is a full-time clinical elective. Advanced Clinical Elective is an individualized program of instruction in anesthesia subspecialties, including cardiovascular, neurosurgical, obstetrical and pediatric anesthesia.

Subinternship

Anesthesiology Subinternship This is a full-time clinical elective. Advanced Clinical Elective is an individualized program of instruction in anesthesia subspecialties, including cardiovascular, neurosurgical, obstetrical and pediatric anesthesia.

BIOMEDICAL INFORMATICS & DATA SCIENCE

100 College Street, Ninth Floor, informatics@yale.edu
https://medicine.yale.edu/biomedical-informatics-data-science

Professors C.A. Brandt, K. Cheung, J. Deng (*Therapeutic Radiology*), M.B. Gerstein (*Molecular Biophysics and Biochemistry*), A.L. Hsiao, A. Justice (*Medicine*), S.H. Kleinstein (*Pathology*), L. Ohno-Machado (*Chair*), P.L. Miller (*Emeritus*), X. Papademetris, H. Xu, K. Xu (*Psychiatry*)

Associate Professors H. Altalib (*Neurology*), A. Chou (*Medicine*), M. Davis (*Radiology and Biomedical Imaging*), K. Harris Nwanyanwu (*Ophthalmology and Visual Science*), R. Hauser (*Laboratory Medicine*), S. Jarad (*Emergency Medicine*), R. McDougal (*Public Health*), D. Meeker, E. Melnick (*Emergency Medicine*), J. Miller (*Medicine*), M. Sharifi (*Pediatrics*), R. Taylor, Z. Wang (*Public Health*), Y. Zhao (*Public Health*)

Assistant Professors S. Aneja (*Therapeutic Radiology*), K. Aneni (*Child Study Center*), I. Arhuidese (*Surgery*), G.I. Ash (*Medicine*), H. Cho, J.M. Cohen (*Dermatology*), B. Coleman (*Emergency Medicine*), T. Durant (*Laboratory Medicine*), E. Erson Omay (*Neurosurgery*), M. Hartley, M. Iscoe, R. Khera (*Medicine*), I. Leeds (*Surgery*), A. Lisi, Y. Lu (*Medicine*), T. McCall (*Public Health*), J. Montalvo-Ortiz (*Psychiatry*), C. Oliveira (*Pediatrics*), W. Roberts (*Psychiatry*), W. Schulz (*Laboratory Medicine*), D. Shung (*Medicine*), K. Wang (*Medicine*), H. Zhou (*Psychiatry*)

Instructors N. Hong, J. Kim, K. Raja

Senior Research Scientists N. Rajeevan, X. Zhu

Research Scientists H. He, H. Rajeevan, R. Wang

Associate Research Scientists Q. Chen, K. Corcoran, F.A. Kidwai (*Medicine*), V. Kuttichi Keloth, F. Lin, P. Mutalik, H. Wolfe, K. Zawack

Lecturers D. Chartash, D. Greenbaum, M. Krauthammer, D.R. Levy

BENG 406, Medical Software Design Software design and implementation for medical applications, with emphasis on how new ideas can be developed within today's healthcare regulatory environment. This is a project-based class. The lectures provide essential material to help the students successfully complete their projects. In particular, the lectures cover material in the following three broad areas: (i) Medical software design based on a clinical need. (ii) Needs identification, verification, validation, and overview of the FDA regulatory process. (iii) Introductory material in experimental design, image analysis, and machine learning as needed by the projects. We also examine the new proposed FDA regulations on the use of machine learning in medical devices and related issues related to the use of these techniques in medical software in general. Prerequisite: Some programming background in at least one programming language. Instructor permission required. Staff

BIS 550b, Topics in Biomedical Informatics and Data Science The course focuses on providing an introduction to common unifying themes that serve as the foundation for different areas of biomedical informatics, including clinical, neuro-, and genome informatics. The course is designed for students with basic computer experience and course work who plan to build databases and computational tools for use in biomedical research. Emphasis is on understanding basic principles underlying informatics approaches to interoperation among biomedical databases and software tools, standardized biomedical vocabularies and ontologies, biomedical natural language processing, modeling of biological systems, high-performance computation in biomedicine, and other related topics. S. Jarad

BIS 560a, Introduction to Health Informatics Health Informatics is a diverse and varied field. This course is designed to provide a general introduction to health informatics. Students will gain foundational knowledge in clinical information systems, health data standards, electronic health records and data security/privacy issues, among other areas. Students will survey a variety of informatics subfields including research, laboratory/precision medicine, imaging, and artificial intelligence. A particular focus for the course will be conceptual underpinnings that generalized well to all informatics disciplines Permission of the instructor required. A. Taylor

BIS 562b, Clinical Decision Support Building on BIS 560/CB&B 740, this course provides the purpose, scope, and history of decision support systems within health care. Using a weekly hands-on application of knowledge acquired in the lecture portion of the course, students identify a clinical need and prototype their own clinical decision support solution. Solutions are then presented in a "shark tank" format to iteratively refine them to yield a final product that is capable of real-world implementation. Prerequisite: BIS 560 or CB&B 740. E. Melnick

BIS 633a, Population and Public Health Informatics This is not a programming course or a mathematics course. The course provides an in-depth survey of the data standards, data analysis tools, databases, and information management systems and applications used in clinical population research, disease surveillance, emergency response information systems, and the like. It examines informatics techniques used on population-level data to improve health and the application of information and computer science and technology to public health practice, research, policy, and decision support. This scientific area focuses on the capture, management, and use of electronic public health data. While these backgrounds are prominent in the field, the purpose of this course is to provide the history and context of the field. B. Coleman

BIS 634a, Computational Methods for Informatics This course introduces the key computational methods and concepts necessary for taking an informatics project from start to finish: using APIs to query online resources, reading and writing common biomedical data formats, choosing appropriate data structures for storing and manipulating data, implementing computationally efficient and parallelizable algorithms for analyzing data, and developing appropriate visualizations for communicating health information.

The FAIR data-sharing guidelines are discussed. Current issues in big health data are discussed, including successful applications as well as privacy and bias concerns. This course has a significant programming component, and familiarity with programming is assumed. Prerequisite: CPSC 223 or equivalent, or permission of the instructor. R. McDougal

BIS 638a, Clinical Database Management Systems and Ontologies This course introduces database and ontology in the clinical/public health domain. It reviews how data and information are generated in clinical/public health settings. It introduces different approaches to representing, modeling, managing, querying, and integrating clinical/public health data. In terms of database technologies, the course describes two main approaches—SQL database and non-SQL (NoSQL) database —and shows how these technologies can be used to build electronic health records, data repositories, and data warehouses. In terms of ontologies, it discusses how ontologies are used in connecting and integrating data with machine-readable knowledge. The course reviews the major theories, methods, and tools for the design and development of databases and ontologies. It also includes clinical/public health use cases demonstrating how databases and ontologies are used to support clinical/public health research. Prerequisite: CPSC 223 or permission of the instructors. The general expectation to obtain instructor permission is that students have basic command of the Python programming language sufficient to pass CPSC 223 or the equivalent. K.H. Cheung, G. Hauser

BIS 640b, User-Centered Design of Digital Health Tools This course combines needs assessment methods, user-centered design principles, and an agile approach to designing digital health tools for consumers. The class environment is designed to model that of a health tech start-up. Students are expected to apply what they learn from the lectures and readings to identify a pain point (i.e., a problem or need faced by a prospective user) and solicit input from intended users to design a prototype of the digital health tool. Solutions are presented in class to receive feedback on the design and to iteratively refine a prototype in order to create a minimum viable product. Prerequisite: BIS 560/CB&B 740, SBS 574, or permission of the instructor. T. McCall

BIS 685a and BIS 686b, Capstone in Health Informatics Building on BIS 560/CB&B 740 and BIS 550/CB&B 750, this course provides the opportunity for master's-level integration of basic informatics theory and practice through the use of modules focusing on the workflow of major health informatics projects. Students have two major projects throughout the course, including a team project where additional reflection on coordination of responsibilities and teamwork is essential. Each student is also able to work on a term-long individual module or choose to individually continue to advance the previous team project. The final projects are meant to show how the student integrates informatics theory, skills, and stakeholder's needs into a final product or project that may be developed into a deliverable for general public use. Prerequisites: BIS 560/CB&B 740 and BIS 550/CB&B 750, or equivalents. Not open to auditors. P. Hoffman, K.H. Cheung, D. Chartash, H. Altalib

CB&B 752b, Biomedical Data Science: Mining and Modeling Biomedical data science encompasses the analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. It represents a major practical application for modern techniques in data mining and simulation. Specific topics to be covered include sequence alignment, large-scale processing, next-generation sequencing data, comparative genomics, phylogenetics, biological database design, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, normalization of microarray data, mining of functional genomics data sets, and machine-learning approaches to data integration. Prerequisites: biochemistry and calculus, or permission of the instructor. M.Gerstein, M. Simon

CELL BIOLOGY

SHM C207, 203.737.5603
https://medicine.yale.edu/cellbio

Professors J. Bewersdorf, J.S. Bogan (*Medicine*), C.G. Burd (*Chair*), D.A. Calderwood (*Pharmacology*), M.J. Caplan (*Cellular and Molecular Physiology*), D. Colón-Ramos, L. Cooley (*Genetics*), P. Cresswell (*Immunobiology*), P. De Camilli, J.E. Galan (*Microbial Pathogenesis*), F. Gorelick, V. Greco (*Genetics*), C. Hashimoto (*Emeritus*), D.S. Krause (*Laboratory Medicine*), T. Lentz (*Emeritus*), H. Lin, V. Malhotra (*Adjunct*), M. Nathanson (*Medicine*), K.M. Neugebauer (*Molecular Biophysics and Biochemistry*), K. Reinisch, J.E. Rothman, C. Schlieker (*Molecular Biophysics and Biochemistry*), M.A. Schwartz, D.K. Toomre, S.L. Wolin (*Emeritus*), Y. Zhang

Associate Professors J. Berro (*Molecular Biophysics and Biochemistry*), S. Ferguson, S. Guo, M. King, C. Lin, J. Liu (*Microbial Pathogenesis*), C. Lusk, M. Mariappan, T. Melia, P. Takizawa, K. Volynski (*Adjunct*), J. von Blume, S. Wang (*Genetics*), M. Wu

Assistant Professors D. Baddeley (*Adjunct*), K. Gupta, X. Su, S. Yogev (*Neuroscience*)

Senior Research Scientist X. Liu

Research Scientists A.R. Ferguson, K. Grushin, F. Li, M. Llaguno, H. Qi, C. Qiu, I.V. Surovtsev

Associate Research Scientists M. Bera, S. Chandra, J. Goder, R. Kalyana Sundaram, K. Karatepe, Y. Kim, Y. Li, N. Liu, P. Munoz LLancao, N. Neuenkirchen, F. Pincet, A. Radhakrishnan Pattathil Santha, K. Sato, F. Schüder, M. Su, Q. Wu, Z. Xi, Y. Xiong, L. Zeng, M. Zhong, K. Zhou

Lecturer A.C. Vignery

CBIO 501a and 502b, 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 include structure and organization of cells; regulation of the cell cycle and mitosis; protein biosynthesis and membrane targeting; cell motility and the cytoskeleton; signal transduction; cell adhesion; cell and tissue organization of organ systems. Clinical correlation sessions, which illustrate the contributions of cell biology to specific medical problems, are interspersed in the lecture schedule. Histophysiology laboratories provide practical experience with an understanding of exploring cell and tissue structure. The course is offered only to M.D. and M.D.-Ph.D. students. P.A. Takizawa

CBIO 600a and 601b, Science at the Frontiers of Medicine This full-year graduate seminar for first-year M.D.-Ph.D. students—an elective course for M.D. students—matches the progression of topics in the eighteen-month preclinical medical school curriculum and emphasizes the connections between basic and clinical science, human physiology, and disease. It is directed by M.D.-Ph.D. program faculty, and many class discussions are led by expert Yale School of Medicine faculty members who select the papers to be read. Students explore scientific topics in depth, learn about cutting-edge

research, and improve their presentation skills. The curriculum provides a framework for critically reading and analyzing papers drawn broadly from the biomedical sciences; this breadth of knowledge is also leveraged in team-based exercises that promote peer-to-peer teaching and learning. Enrollment limited to students who have taken or are currently taking CBIO 501/CBIO 502.

CBIO 602a/MB&B 602a/MCDB 602a, Molecular Cell Biology A comprehensive introduction to the molecular and mechanistic aspects of cell biology for graduate students in all programs. Emphasizes fundamental issues of cellular organization, regulation, biogenesis, and function at the molecular level. Prerequisites: none, but some knowledge of basic cell biology and biochemistry is assumed. Students who have not taken courses in these areas can prepare by reading relevant sections in basic molecular cell biology texts. We recommend Pollard et al., *Cell Biology* (3rd ed., 2016), Alberts et al., *Molecular Biology of the Cell* (6th ed., 2014), or Lodish et al., *Molecular Cell Biology* (8th edition, 2016). T. Melia

CBIO 603a/MCDB 603a, Seminar in Molecular Cell Biology A graduate-level seminar in modern cell biology. The class is devoted to the reading and critical evaluation of classical and current papers. The topics are coordinated with the CBIO 602 lecture schedule. Thus, concurrent enrollment in CBIO 602 is required. Prerequisites: Any undergraduates wishing to enroll must have already taken MCDB 205. In addition, undergraduates are strongly encouraged to reach out to the course directors prior to enrollment. M. King

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

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

CBIO 701b, Illuminating Cellular Function The focus of the course is on the technical treatment of light microscopy and its applications. The course provides biology and bioengineering students with the knowledge and skills necessary to design and undertake advanced light microscopy experiments. It covers conceptual elements of fluorescence microscopy imaging and analysis (without going too heavily into the theory and math); new advances in super-resolution modalities; biological applications; and hands-on practical work. Enrollment limited to fifteen. D.K. Toomre

CBIO 901b/GENE 901b/MCDB 901b, Research Skills and Ethics II This course consists of a weekly seminar that covers ethics, writing, and research methods in cellular and molecular biology as well as student presentations ("rotation talks") of work completed in the third laboratory rotation. C. Lin

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

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

CBIO 913b/GENE 913b/MCDB 913b, Third Laboratory Rotation Third laboratory rotation for Molecular Cell Biology, Genetics, and Development (MCGD) and Plant Molecular Biology (PMB) track students. S. Bahmanyar

CELLULAR AND MOLECULAR PHYSIOLOGY

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

Professors R.J. Alpern (*Medicine*), N.A. Ameen (*Pediatrics*), P. Aronson (*Medicine*), A. Bordey (*Neurosurgery*), E.L. Boulpaep (*Emeritus*), C. Canessa, L. Cantley (*Medicine*), M.J. Caplan (*Chair*), N. Carrasco (*Adjunct*), A. Dardik (*Surgery*), J.B. Demb (*Ophthalmology and Visual Science*), S. Diano (*Adjunct*), M.E. Egan (*Pediatrics*), B.E. Ehrlich (*Pharmacology*), A. Eichmann, T. Eid (*Laboratory Medicine*), B. Forbush (*Emeritus*), L. Kaczmarek (*Pharmacology*), G. Lister (*Pediatrics*), P. Mistry (*Medicine*), M.N. Nitabach, V. Pieribone, P. Preisig (*Medicine*), J. Santos-Sacchi (*Surgery*), G.I. Shulman (*Medicine*), F.J. Sigworth, C.L. Slayman (*Emeritus*), S. Tomita, T. Wang, C. Xu, X. Yang (*Comparative Medicine*), L. Young (*Medicine*), D. Zenisek, Z. Zhou (*Ophthalmology and Visual Science*)

Associate Professors N. Addy (*Psychiatry*), S. Bagriantsev, J. Chung, R.M. Fitzsimonds (*Adjunct*), J. Goodwin (*Pediatrics*), E. Gracheva, S. Ishibe (*Medicine*), E. Karatekin, R. Kibbey (*Medicine*), J. Rinehart, M.S. Rodeheffer (*Comparative Medicine*), S. Singh (*Adjunct*), C. Thoreen

Assistant Professors R. Chang, J. Kim (*Urology*), R. Perry, M. Schneeberger Pane, H. Shen

Senior Research Scientist E. Boulpaep (*Cellular and Molecular Physiology*)

Associate Research Scientists S. Cheppali, D. Chetrit, V. Feketa, C. Frederick, C. Gomis Perez, N. Gresko, E. Hoyos-Ramirez, A. Landajuela, M. Mastrotto, M. Oda, J. Platisa, M. Reyna, A. Rivetta, M.M. Tomita, M. Watson, Y. Yang

C&MP 506a / PATH 620a / PHAR 506a / PTB 620a, Lab Rotations Students work in laboratories of faculty of their choice. The schedule for each rotation is announced at the beginning of the fall term. Staff

C&MP 550a/ENAS 550a/MCDB 550a/PHAR 550a, Physiological Systems The course develops a foundation in human physiology by examining the homeostasis of vital parameters within the body, and the biophysical properties of cells, tissues, and organs. Basic concepts in cell and membrane physiology are synthesized through exploring the function of skeletal, smooth, and cardiac muscle. The physical basis of blood flow, mechanisms of vascular exchange, cardiac performance, and regulation of overall circulatory function are discussed. Respiratory physiology explores the mechanics of ventilation, gas diffusion, and acid-base balance. Renal physiology examines the formation and composition of urine and the regulation of electrolyte, fluid, and acid-base balance. Organs of the digestive system are discussed from the perspective of substrate metabolism and energy balance. Hormonal regulation is applied to metabolic control and to calcium, water, and electrolyte balance. The biology of nerve cells is addressed with emphasis on synaptic transmission and simple neuronal circuits within the central nervous system. The special senses are considered in the framework of sensory transduction. Weekly

discussion sections provide a forum for in-depth exploration of topics. Graduate students evaluate research findings through literature review and weekly meetings with the instructor. W.M. Saltzman, S. Campbell

C&MP 600a and C&MP 601b, 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 550 and permission of the instructor. Credit for full year only. E. Boulpaep

C&MP 610a and C&MP 611b/PTB 610a, Medical Research Scholars Program: Mentored Clinical Experience The purpose of the Mentored Clinical Experience (MCE), an MRSP-specific course, is to permit students to gain a deep understanding of and appreciation for the interface between basic biomedical research and its application to clinical practice. The MCE is intended to integrate basic and translational research with direct exposure to clinical medicine and patients afflicted with the diseases or conditions under discussion. The course provides a foundation and a critically important forum for class discussion because each module stimulates students to explore a disease process in depth over four ninety-minute sessions led by expert clinician-scientists. The structure incorporates four perspectives to introduce the students to a particular disease or condition and then encourages them to probe areas that are not understood or fully resolved so they can appreciate the value and challenge inherent in using basic science to enhance clinical medicine. Students are provided biomedical resource material for background to the sessions as well as articles or other publicly available information that offers insight to the perspective from the non-scientific world. During this course students meet with patients who have experienced the disease and/or visit and explore facilities associated with diagnosis and treatment of the disease process. Students are expected to prepare for sessions, to participate actively, and to be scrupulously respectful of patients and patient facilities. Prior to one of the sessions students receive guidance as to what they will observe and how to approach the experience; and at the end of the session, the students discuss their thoughts and impressions. All students receive HIPAA training and appropriate training in infection control and decorum relating to patient contact prior to the course. Y. Konnikova, R. Pierce

C&MP 629a and C&MP 630b/PATH 679a and PATH 680b/PHAR 501a and PHAR 502b/PTB 629a, 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). Required of and open only to Ph.D. and M.D.-Ph.D. students in the Molecular Medicine, Pharmacology, and Physiology track. Staff

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

C&MP 710b/MB&B 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. Staff

C&MP 711b/MB&B 711b, Practical cryo-EM Workshop This laboratory course provides hands-on training in the practical aspects of macromolecular structure determination by cryo-electron microscopy (cryo-EM). Topics include cryo-EM data collection, image preparation and correction, single-particle picking and 2-D classification, 3-D classification, refinement and post-processing, model building, refinement and evaluation. The course includes training in the use of computer programs used to perform these calculations. Prerequisite: C&MP 710/MB&B 710. Y. Xiong, F. Bleichert

CHILD STUDY CENTER

NIHB 208, 844.362.9272
https://medicine.yale.edu/childstudy

Professors A.T. Arnsten (*Neuroscience*), D. Barry (*Psychiatry*), M. Bloch, H. Blumberg (*Psychiatry*), M. Brackett, K. Chawarska, J. Comer, A. Danese (*Adjunct*), L.E. Fiellin (*Medicine*), V. Gallo (*Adjunct*), W.S. Gilliam (*Adjunct*), E. Grigorenko (*Adjunct*), S. Kagan (*Adjunct*), Z. Kain (*Adjunct*), R.A. King (*Emeritus*), J. Leckman, C. Lejuez (*Adjunct*), P.J. Lombroso (*Emeritus*), S. Marans, A.S. Martin, L.C. Mayes (*Chair*), E. McCrory (*Adjunct*), J.C. McPartland, K. Pelphrey (*Adjunct*), M.N. Potenza (*Psychiatry*), J.E. Schowalter (*Emeritus*), N. Sestan (*Neuroscience*), G. Shahar (*Adjunct*), W.K. Silverman, A. Slade, M. State (*Adjunct*), C. Stover, D. Stubbe, D. Sukhodolsky, J. Tebes (*Psychiatry*), F. Vaca (*Emergency Medicine*), F. Vaccarino, L.A. Vitulano, F.R. Volkmar (*Emeritus*), S.W. Woods (*Psychiatry*), J. Woolston (*Emeritus*), H. Zhang (*Public Health*)

Associate Professors L. Cardona-Wolenski, C. Cipriano, M.J. Crowley, T.V. Fernandez, M. Goslin, M. Goyette-Ewing, M. Hampson (*Radiology and Biomedical Imaging*), E. Hoffman, Y. Kim (*Adjunct*), N. Landy (*Adjunct*), E.R. Lebowitz, E. Miguel (*Adjunct*), H. Millard (*Psychiatry*), I. Park (*Genetics*), C. Pittenger (*Psychiatry*), K. Pugh (*Adjunct*), H. Rutherford, D. Scheinost (*Radiology and Biomedical Imaging*), F. Shic (*Adjunct*), T.C. VanDeusen (*Psychiatry*), P. Ventola, J.M. Wolf, S. Yip (*Psychiatry*)

Assistant Professors A. Abyzov (*Adjunct*), K. Aneni, A. Ayobello, P. Ayora, S. Baddam, C. Bailey, B. Barbot (*Adjunct*), M. Best, D. Bridgett (*Adjunct*), P. Britto (*Adjunct*), B. Brower, A. Chiapa (*Adjunct*), Y. Cho, A.L. Close, J. Coffey (*Adjunct*), E.H. Connors (*Psychiatry*), J. Cromer (*Adjunct*), C. Cukar-Capizzi, C.J. Cutter, D. David, L. Drozdowicz, J. Ebaugh, P. Fearon (*Adjunct*), R. Feldman (*Adjunct*), P. Fischman (*Adjunct*), J. Foss-Feig (*Adjunct*), C. Frometa, D. Garay, O. Gerdner, K.R. Giuseppone, I. Gordon (*Adjunct*), V. Gracco (*Adjunct*), G. Gryglewski (*Adjunct*), G.T. Han (*Adjunct*), S. Hein (*Adjunct*), P. Hoffman, M.L. Holland (*Adjunct*), K. Ibrahim, R. Kamody, C. Keifer, C. Loucas, C. Marin, A. Maupin, J. Mayo, S. Mehr (*Adjunct*), C. Moreno, C. Morgan, R. Muhle (*Adjunct*), A. Naples, K. Nelson-Coffey (*Adjunct*), K. O'Donnell, R. Oien (*Adjunct*), E. Olfson, D. Ostrey (*Adjunct*), J. Paez, K. Pattabiraman, F. Penner (*Adjunct*), E. Pluhar (*Adjunct*), Y.B. Poncin, K.K. Powell, C. Reyes, N. Salmaso (*Adjunct*), J. Shein-Szydlo (*Adjunct*), S. Smith (*Adjunct*), S. Stahl, H. Stevens (*Adjunct*), M. Stoeckel, M.S. Torres-Viso, W. Tseng, C. Turek, A. Urban (*Adjunct*), T. Vanderwal (*Adjunct*), A. Vassilopoulos, V. Weersing (*Adjunct*), D.H. Whalen (*Adjunct*), C. Wilson (*Psychiatry*), T. Yatziv (*Adjunct*), M. Yazgan (*Adjunct*), E. Yuen (*Psychiatry*)

Instructors N. Borstelmann, J.R. Gardner, J. Johnson, R. Jou, J. Lee, C. McGirr, C.S. Pierart, N. Szilagyi

Senior Research Scientists G. Anderson, R. Aslin, R.A. King, S.L. Macari, Z. Pringle, B. Ruhl

Research Scientists M. Beitel, A.M. Erard, M. Finn-Stevenson, H. Hahn, J. Hoffman, J. Mariani, A. Ponguta, A. Vernetti

Associate Research Scientists V. Avila Quintero, L. Booth, F.E. Brown, W. Chen, R. Ebling, C. Fanikos, J. Floman, A. Jourdon, D. Kleinman, K. Koenig, N. Koirala, A. Landeros, D.J. Lewkowicz, M. Nasir, Z. Ng, S.S. Nicholls, P. Oliveira, S. Sanchez-Alonso, S. Scuderi, C. Shadle, K. Thompson, E. Warnick, A. Zieher

Clinical Professors J. Adnopoz, R. Angoff (*Pediatrics*), R. Aslin, P. Fonagy, N. Laor, K. Pruett

Associate Clinical Professors M. Azeem, S. Boltax-Stern, C. Califano, J. Ferholt, A. Gerber, D. Koenigsberg, A. Lustbader, J. Marachi, M. Powers, P. Van Wattum

Assistant Clinical Professors M. Akbar, H. Allen, E. Arzubi, A. Aujla, D. Aversa, K. Babb, K.F. Bailey, D. Bober, L. Bogen, H. Bonitz Moore, S. Brooke, J. Chilton, L. Ciarleglio, R. Cifarelli, J. Collins, T. Davila, M. de Carvalho, N. de la Fontaine, L. Dennehy, D. Divecha, D.M. Dodge, J. Dwyer, P. El-Fishawy, C. Emmons, C. Epstein, G. Epstein-Wilf, C. Fernandes, K. Finch, S. Fitzpatrick, R. Franks, J. Gallalee, G.G. Gammon, J. Gereda, K. Gereda Marganski, S. Gossart-Walker, H. Grantz, F. Gregory, D. Grodberg, S. Guerrier, J. Hagen, K.E. Hanson, I. Jennings, H. Kahn, M. Kaplan, N. Kendall-Taylor, B. Keyes, E. Khondkaryan, B. Kleine, K. Kowats, J. Lang, L. Lavalley, P. Leebens, N. Libby, G. Lopez-Cohen, M. Lyons, J. Madigan, K. Maiorana, N. Malberg, K. Malensek, H. Maurizio, R. McWilliam, M.C. Mennesson, J. Meyers, C. Mills, A. Myers, R. Nikolov, W. Njoroge, M. Palmieri, C. Parrott, S. Peck, J. Poll, K. Pracitto, K. Proctor, J. Radawich, P. Rao (*Psychiatry*), B. Reddy, R.A. Ritvo, R. Salah, D. Sasso (*Psychiatry*), D. Saunders, C. Schwartz, V. Shiller, Y. Shimshoni, A. Smaller, K.K. Smith-Tavaris, K. Sondergaard, R. Sotsky, M. St. Pierre, V. Stob, E. Stone, C. Suppies, D. Szydio, L. Taylor, P. Thomas, J. Tillman, B. Torres, N. Treadwell, K. Tsatsanis, J. Tuis, J. Van Dyke, G. Van Schalkwyk, A. Van Scoyoc, K. Voccola, J. Weathers, J. Webb, S. Werblood, E. Whelan, J. Wilen, M. Wudarsky, V.J. Zecchini, L. Zimmerman

Clinical Instructors B. Aarestrup, A. Adiba, A. Adigun, K. Ahmed, O. Ayankola, D. Becker, E. Caffo, H. Chaidez Ruacho, J. Dean, S. Fitzpatrick, E. Garcia Rolland, B. Graham, R. Hasan, F. Javier, L. Keith, R. La Bril, S. Lembeck, N. Luzino, T. Martinez, H. Maurizio, F. Montazeri, Y. O'Brien, A. Orozco, C. Patsky-Pomerleau, B. Penque, S. Peshori, C. Poe, B. Rickler, C. Schaefer, K. Siegel, T. Szydlo-Shein, Y. Tyndale, M. Usmani, A. Vatner, M. Vitulano

Lecturers T.M. Anderson, M.A. Ben-Avie, L. Brotnow, N.A. Brown, K. Capotorto, A. Church, T.L. Collins, C.J. Cooper, J. Cunningham, M. Fay, M. Gunsalus, R.H. Hersh, C.M. Horwitz, B. Israel, E.J. Jimenez-Francis, L. Kabari, N. Kaufman, M.W. Lovett, A. Meehan, S. Miller, T. Miller, B. Powers, A. Price, J.J. Russell, S. Taddei, E.O. Tongul, S. Young, L. Zaretsky

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 Hospital, 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.

Electives

Child Study Center Clinical Research Elective This elective entails etiology, clinical manifestations, and treatment of adolescent psychopathology, including eating disorders, depression, suicide, psychosis, delinquency, and the impact of physical and mental disabilities on adolescent development. Reading is supplemented with live and taped clinical material.

Subinternship

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

COMPARATIVE MEDICINE

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

Professors A.M. Bennett (*Pharmacology*), B. Conti, V. Dixit (*Pathology*), C. Fernandez-Hernando, L. Garcia-Segura (*Adjunct*), M. Hajos, J. Hirsch, T.L. Horvath (*Chair*), R.O. Jacoby (*Emeritus*), I. Levy, J.D. Macy, G. Post (*Adjunct*), N. Sestan (*Neuroscience*), M. Sleeman (*Adjunct*), P.C. Smith, Y. Suarez, T. Tiganis (*Adjunct*), X. Yang, C.J. Zeiss

Associate Professors J.L. Asher, M. Dietrich, M.S. Rodeheffer

Assistant Professors D. Alagpulinsa, L. Biwer, C. Booth, M. Chioccioli, D. Ekanayake-Alper, J.A. Goodrich, M. Grubb (*Adjunct*), M. Lawrence (*Adjunct*), H. Loh, R. Perry (*Cellular and Molecular Physiology*), S.R. Wilson, X. Zhao

Senior Research Scientists S.R. Compton, X. Gao, T.P. Nottoli

Research Scientists S. Bai, Z. Liu, A.E. Prendergast, M. Stoiljkovic, B. Stutz Xavier, S. Thorne (*Medicine*)

Associate Research Scientists B. Chaube, E. Esplugues, P. Fernandez Tussy, Y. Huang, O. Iyilikci, D. Li, B. Mathew, M. Shin, M. Shrestha, Q. Xiao, Y. Yasumoto, J. Yoshinda

DERMATOLOGY

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

Professors R.J. Antaya, J.L. Bolognia, M.W. Bosenberg, I.M. Braverman (*Emeritus*), L. Chen (*Immunobiology*), K. Choate (*Chair*), S. Cowper, R.L. Edelson, R.A. Flavell (*Immunobiology*), F.M. Foss (*Medicine*), M. Girardi, E. Glusac (*Pathology*), V. Greco (*Genetics*), P. Heald (*Emeritus*), A. Iwasaki (*Immunobiology*), H. Kluger (*Medicine*), C.J. Ko, D.J. Leffell, H. Lin (*Cell Biology*), J. McNiff, R.M. Medzhitov (*Immunobiology*), L.M. Milstone (*Emeritus*), J.S. Pober (*Immunobiology*), R.E. Tigelaar (*Emeritus*), L.D. Wilson (*Therapeutic Radiology*)

Associate Professors C. Bunick, S. Christensen, B. Craiglow (*Adjunct*), A. Galan, S. Imaeda, B. King, J. Leventhal, P. Myung, S. Ramachandran, A. Sethi (*Adjunct*), K. Suozzi, M.M. Tomayko

Assistant Professors J.M. Cohen, W. Damsky, A. Eisenstein, J. Farhadian (*Adjunct*), L. Galluzzi (*Adjunct*), M. Laird, A. Little, C.A. Nelson, I. Odell, G. Panse, S. Perkins, L. Provini, J. Siegel, M. Vesely, A. Zubek

Instructors M. Elgash, M. Johnston, M. Kidacki (*Dermatology*), G. Micevic, S.F. Roy, R. Stavert

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

Research Scientists D. Hanlon, I. Lomakin

Associate Research Scientists M. Junejo, L. Laborne Sousa Pinto Kalil, A.V. Odell, K. Tatsuno, A. Vassall

Clinical Professors R. Savin, B. Strober, K. Watsky

Associate Clinical Professor M. Alexiades-Armenakas, S. Bender, A. Bronin, F. Castiglione, I. Cohen, D. Davidson, L. Donofrio, J. Dover, J. Edelglass, M. Gohara, M.E. Grossman, R. Kahan, R. Langdon, A. Lewis, E.B. Milstone, J. Moss, P. Schneiderman, P. Shapiro, A. Zalka

Assistant Clinical Professors J. Alter, A. Atton, S. Barrett, P. Bevilacqua, D. Bilinski, J. Cantatore-Francis, C. Carroll, S. Chavel, D. Correale, A. Czernik, L. Daman, K. Diette, T. Durazzo, D. Feinberg, B. Goldberg, M. Goldstein, H. Hamilton, W. Jacoby, R. Klein, J. Knispel, L. Kugelman, J. Lehrman, S. Lerner, P. Lowenstein, L. Luck, E. Markstein, E. Marsh, M.A. McFerren, D. Miller, E. Mirrer, E. Naidorf, M. Noonan, W. Notaro, M. Oestreicher, R. Oshman, M. Petrazzuoli, B. Richter, D. Robinson, J. Sansing, M. Shahriari, N. Sherline, N. Silverman, E. Smith, J. Zirn, B. Zubkov

Clinical Instructors M. Beuttler, E. de Moll, T. Futoryan, D.D. George, N. Levit, L. Madden, M. Malik, N. Ring, D. Weissman

Electives

Dermatology Inpatient Consult Elective In this rotation, students will work as an integral member of the Dermatology consult team, composed of a dermatology resident and attending. Clinical settings will include the Yale-New Haven Hospital adult and pediatric wards, intensive care units, emergency rooms and urgent care services as well as the Smilow Bone Marrow Transplant Day Hospital. Students will be exposed to dermatologic disease requiring inpatient admission, systemic disease with cutaneous manifestations, and skin complications among hospitalized patients. Students will learn how dermatologists approach these patients, including: initial evaluation, workup, and differential diagnosis building; role of biopsy and histologic evaluation; and treatment plan design. Under resident supervision, the student will evaluate a new consult patient each day and follow this patient for the hospital course. The student is expected to read intensively on relevant disease processes and will formally present this patient to the attending on rounds. Additionally, the student should research disease and management-related questions that arise on the service and informally present a summary of findings to the attending and resident. One day a week (Wednesday), students will participate in departmental Grand Rounds and educational conferences. Two evenings a week, students will participate in resident rounds of the inpatient service. During the rotation, the student will identify a patient with a chronic dermatologic condition and conduct an in-depth interview to learn about how the disease and its treatment has affected the patient's life and, conversely, how life considerations have affected disease management. Additionally, at the end of the rotation, the student will present a formal case presentation and literature review at Grand Rounds. This course is intended as introduction to inpatient dermatology for the student considering postgraduate training in dermatology.

Dermatology Outpatient Elective Students will be expected to acquire the skills needed by a primary care physician or surgeon to evaluate dermatological problems independently. Orientation location will be at the West Haven VA Medical Center. Outpatient experiences will include the West Haven VA Medical Center, the Adult and Pediatric Yale Primary Care Clinics, and possibly the Yale University Health Services. These clinics will expose the student to a variety of primary and referral dermatology services that treat inflammatory and neoplastic skin diseases. To gain an overview of the specialty, students will also have exposure to dermatologic surgery and dermatopathology. One day a week (Wednesday), students will participate in departmental Grand Rounds and educational conferences. Reading and review of assigned materials will be required in preparation for a series of case discussions led by faculty. A formal presentation on a topic of the student's choice will be required in the final week. The goal of the course is to ground students in the fundamentals of dermatologic physical examination, diagnosis and treatment.

EMERGENCY MEDICINE

464 Congress Avenue, Suite 260, 203.785.2353
https://medicine.yale.edu/emergencymed

Professors M. Auerbach (*Pediatrics*), C. Baum (*Pediatrics*), M. Bogucki (*Emeritus*), K.A. Bechtel (*Pediatrics*), C.A. Brandt (*Biomedical Informatics and Data Science*), M. Chawarski, G. D'Onofrio, D. Della-Giustina, J. Dziura, A. French, J. Goulet, U. Hwang (*Adjunct*), M. Langhan (*Pediatrics*), C. Moore, H.C. Moscovitz, S.M. Powsner (*Psychiatry*), M. Ranney (*Public Health*), B. Safdar, K. Santucci (*Pediatrics*), A. Ulrich, F. Vaca (*Adjunct*), A. Venkatesh (*Chair*)

Associate Professors F. Abujarad, P. Agrawal, L.D. Arnold (*Pediatrics*), P. Aronson (*Pediatrics*), A. Aydin, D.R. Camenga, S. Chekijian, M.X. Cicero (*Pediatrics*), J.M. Dodington (*Pediatrics*), L.V. Evans, K. Goldflam, M. Goldman (*Pediatrics*), K. Hawk, S. Jarad, K. Jubanyik, R. Liu, E. Melnick, H. Mowafi, C.M. Ngaruiya (*Adjunct*), V. Parwani, J. Sather, R. Taylor, A. Tomassoni, C. Wira

Assistant Professors C. Baloescu, B. Banz, J. Belsky, J. Bod, J.W. Bonz, A. Breyre, S. Buck, J. Cardwell, L.G. Chepenik (*Psychiatry*), B. Coleman, R.F. Coughlin, E. Coupet, K. Couturier, J.I. Daley, M. Dashevsky, D. Devlin, R. Dreyer (*Adjunct*), C.J. Gettel, R. Heckmann, M. Iscoe, E. Jaffa, A. Kamilaris, O. Kovalerchik (*Adjunct*), K. Li (*Adjunct*), J. McDonagh (*Adjunct*), A. Merritt (*Adjunct*), T. Moylan, A. Nelson, S. Pavuluri, E. Reid, C. Ryus, N. Sabounchi (*Adjunct*), R. Sangal, A. Sevlam (*Adjunct*), L. Siew (*Pediatrics*), D. Suwundo, A.F. Tarabar, A. Tsyrulnik, R. Van Tonder, S. Vora, A. Wong

Instructors S. Aly, R. Bayer, Z. Boivin, S. Bonner, R. Buckley, M. Dilip, R. Hoffman, S. Ikejiani, C. Ingram, H, Khidir, J. Kovar, J. Li, J. Pauly, C. Rambus, M. Rollins, N. Srica, W. Sun, J. Tanner, K. Tuffuor, V. Verghese, D. Vining, A. Waltman, D. Wright, D. Yang

Senior Research Scientist M. Bogucki

Associate Research Scientists G. Elhadari, B. Nath

Associate Clinical Professors M. Hommel (*Pediatrics*), J. Maisel, S.A. Walsh (*Pediatrics*), M. Werdmann

Lecturers N. Kanaparthy, A. Loza

Clerkship

Surgical Approach to the Patient Clerkship This twelve-week integrated clerkship block is composed of Surgery and Emergency Medicine rotations. As disciplines with a heavy emphasis on procedures and management of acute disease, Surgery and Emergency Medicine share didactic sessions and simulation-based training over the course of the rotation. An appreciation of the basic and clinical sciences, critical thinking, and problem-solving in a fast-paced varied environment is experienced by learners. Given the complexity of patients with acute and critical illness, a high degree of professionalism and emotional intelligence is an essential skill during these rotations.

Electives

Emergency Medicine Medical Simulation Elective During this two-week elective at the Yale Center for Medical Simulation (YCMS), students gain an immersive experience participating in medical simulation for medical education within the Yale School of Medicine. Students participate as learners in high-fidelity medical simulation cases and procedural sessions on topics related to the students' desired specialty/topic of interest. Students also participate in medical simulation as educators and facilitators by participating as actors in medical simulation cases for medical students and residents rotating through YCMS. Students have the opportunity to participate in all educational activities within YCMS including simulation cases, debriefing sessions, procedural sessions, and in-situ simulations (simulations that take place in the clinical environment). Students also create and program a medical simulation case on their topic of interest under the mentorship of YCMS faculty, using evidence-based medicine resources. Students are given one-on-one instruction on how to program their case. Students can also participate in simulation-based journal clubs, a simulation debriefing course, and simulation-based medical student precede sessions.

Emergency Medicine Point-of-Care Ultrasound Elective A two- or four-week experience that introduces the student to the use of ultrasound at the bedside. Attention is paid to image acquisition, machine optimization, and image interpretation. Students may perform cardiac, pulmonary, general abdominal, pelvic, soft-tissue, trauma, and hypotension evaluation ultrasounds. In addition, there are opportunities for the student to participate in supervised ultrasound-guided procedures (central and peripheral vascular access, abscess drainage, paracentesis, regional analgesia). The bulk of time is spent performing ultrasounds in the emergency department, with one half-day a week spent reviewing recorded examinations, their influence in clinical management, and scanning techniques. 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. Students are assigned daily scanning shifts that do not carry any clinical responsibility but offer exposure to the clinical environment. It is not the same as the combined Emergency Medicine/Ultrasound Subinternship, in which the student is primarily assigned clinical shifts to demonstrate knowledge, proficiency, and workflow, and also receives exposure to ultrasound through a few scan shifts and image review sessions.

Subinternships

Combined Emergency Medicine/Ultrasound Subinternship At Yale New Haven Hospital, combined emergency medicine/ultrasound subinterns complete a four-week rotation comprising ten clinical shifts, six scanning shifts dedicated to bedside ultrasound, and didactic activities. On clinical shifts, subinterns are expected to function as interns, evaluating patients primarily, managing multiple patients simultaneously, and presenting directly to the senior resident and attending physician. Students see a broad case mix in the emergency department and are expected to generate coherent, problem-focused, differential diagnoses. They are involved in all aspects of patient care including updating patients and families, calling consultants, and performing

procedures. They rotate with a variety of attendings and are exposed to faculty from all sections of the emergency department, but they spend a majority of their shifts with ultrasound-trained faculty to maximize their ability to incorporate bedside ultrasound into clinical evaluation. Scanning shifts are dedicated to the skills of performing and interpreting bedside ultrasounds and are typically supervised by a senior resident or ultrasound fellow. 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). Didactic activities include resident educational conference and ultrasound image review. This is an advanced elective. Applicants must have completed or plan to complete an Emergency Medicine rotation prior to starting this elective.

Emergency Medicine Subinternship At Yale New Haven Hospital, emergency medicine subinterns complete a four-week rotation comprised of clinical shifts and didactic activities. Students complete sixteen shifts of eight hours' duration. Students are expected to function as interns, evaluating patients primarily, managing multiple patients simultaneously, and presenting directly to the senior resident and attending physician. Students see a broad case mix in the emergency department and are expected to generate coherent, problem-focused, differential diagnoses. They are involved in all aspects of patient care including updating patients and families, calling consultants, and performing procedures. They rotate with a variety of attendings and are exposed to faculty from the sections of education, ultrasound, critical care, global health, administration, and EMS. Didactic activities include resident educational conference, ultrasound image review, and simulation. Prerequisites: Internal Medicine and General Surgery Clerkships.

GENETICS

SHM I308, 203.785.2649
https://medicine.yale.edu/genetics

Professors A.E. Bale, S.J. Baserga (*Molecular Biophysics and Biochemistry*), M. Brueckner (*Pediatrics*), K. Choate (*Dermatology*), L. Cooley, D.C. DiMaio, J.E. Gelernter (*Psychiatry*), A.J. Giraldez, P. Glazer (*Therapeutic Radiology*), V. Greco, K. Gregory (*Psychiatry*), D. Greif (*Medicine*), J. Gruen (*Pediatrics*), M. Gunel (*Neurosurgery*), I. Hall, M. Hammarlund, A.L. Horwich, Y. Jiang, M. Khokha (*Pediatrics*), K. Kidd (*Emeritus*), P. Li, R.P. Lifton, H. Lin (*Cell Biology*), M. Mahoney (*Emeritus*), S.M. Mane, A. Mani (*Medicine*), M.N. Nitabach (*Cellular and Molecular Physiology*), J. Noonan, V. Reinke (*Chair*), J. Rothberg, M. Seashore (*Emerita*), N. Sestan (*Neuroscience*), S. Somlo (*Medicine*), S. Weissman, T. Xu, H. Zhao (*Public Health*)

Associate Professors K. Bilguvar (*Neurosurgery; Adjunct*), S. Chen, S. Krishnaswamy, B. Lesch, J. Lim, J. Lu, M. Muzumdar, S. Nicoli, S. Nunez, I. Park, C. Scharfe, M. Spencer-Manzon, Z. Sun, S. Wang, A. Xiao, H.Z. Zhang

Assistant Professors Y. Chen (*Immunobiology*), M. Chioccioli, N. Derar, T. Jerves Serrano, M. Lek, D. Ma, D. Massilani, S. Reily, J. Sheltzer (*Surgery*), Z. Smith, T. Sorrells, B. Sozen, K. Sumigray, J. Wen, F. Wilson (*Medicine*), C. Zhao

Senior Research Scientist A. Hudson

Research Scientists B. De Kumar, W. Fenton, J. Knight, N. Lake, J. Lopez-Giraldez, T. Xin

Associate Research Scientists S.S. Agabiti, J. Choi, M. Chong, R. Christ, P.R. Clark, J. Cohen, A. Cox, E. Forrest, S. Gallini, A. Hemalatha, C. Hendry, L. Hong, C. Hsieh, S. Huang, C. Kam, K. Kim, M. Kojima, M. Kudron, H. Lee, Y. Li, X. Lu, S. Mehta, L. Miao, M. Nagy, M. Ortuno Romero, L. Peng, K. Price, S. Qiao, P. Ren, T. Roychowdhury, C. Ruiz, A. Shelar, Y. Takeo, V. Tornini, A. Tyagi, S. Wang, W. Wang, Y. Wang, L. Weiss, G. Wu, S. Youlten, J. Zhang, D. Zhao, L. Zhong, X. Zhou

GENE 555a/AMTH 553a/CB&B 555a/CPSC 553a, Unsupervised Learning for Big Data This course focuses on machine-learning methods well-suited to tackling problems associated with analyzing high-dimensional, high-throughput noisy data including: manifold learning, graph signal processing, nonlinear dimensionality reduction, clustering, and information theory. Though the class goes over some biomedical applications, such methods can be applied in any field. Prerequisites: knowledge of linear algebra and Python programming. Staff

GENE 625/MB&B 625/MCDB 625, 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. J. Lu

GENE 645b/CB&B 647b, Statistical Methods in Human Genetics Probability modeling and statistical methodology for the analysis of human genetics data are presented. Topics include population genetics, single locus and polygenic inheritance, linkage analysis, quantitative trait analysis, association analysis, haplotype analysis, population structure, whole genome genotyping platforms, copy number variation, pathway analysis, and genetic risk prediction models. Offered every other year. Prerequisites: genetics; BIS 505; S&DS 541 or equivalent; or permission of the instructor. H. Zhao

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

GENE 675a and 676b, Graduate Student Seminar: Critical Analysis and Presentation of Scientific Literature Students gain experience in preparing and delivering seminars and in discussing presentations by other students. A variety of topics in molecular, cellular, developmental, and population genetics are covered. Required of all second-year students in Genetics. Graded Satisfactory/Unsatisfactory. T. Sorrells, S. Wang

GENE 734/MB&B 734/MBIO 734, Molecular Biology of Animal Viruses Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. M. Laurent-Rolle, W. Mothes

GENE 743/MB&B 743/MCDB 743, 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. F. Bleichert, M. Hochstrasser, M. Simon

GENE 760b, Genomic Methods for Genetic Analysis Introduction to the analysis and interpretation of genomic datasets. The focus is on next-generation sequencing (NGS) applications including RNA-seq, ChIP-seq, and exome and whole genome sequencing. By the end of the course, each student will be able to process and analyze large-scale NGS datasets and interpret the results. This course is intended only for graduate students who are interested in applying genomic approaches in their thesis research. At a minimum, students must have basic familiarity with working in a UNIX/Linux computing environment. Prior experience with shell scripting or a scripting language such as Perl, Python, or Ruby is strongly recommended. Interested students must contact the instructor early in the fall term to discuss their prior experience and expectations for the course. Enrollment limited to twenty. Prerequisite: permission of the instructor. S. Reilly, B. Lesch

GENE 777b/MCDB 677b, Mechanisms of Development An advanced graduate seminar on animal development focusing on conserved mechanisms that govern germline development, embryogenesis, and somatic differentiation in molecular detail. The course runs in parallel to the Spring session of the Department of Genetics Seminar Series and is

divided into two components: six Yale faculty-led lectures on core concepts in development and six combined journal club/student-led discussions with outside developmental biology speakers on their cutting-edge research. Over the course of the term, small student groups are responsible for presenting one journal club-formatted discussion on two papers selected from the outside speaker's lab, as well as emceeing a dedicated question and answer session between the class and the speaker. This course provides a rare opportunity for students to actively engage with world leaders on their work in developmental genetics, epigenetics, and cell biology, as well as learn essential skills in experimental thinking and scientific communication. The course grade is based on forty percent take-home problems, forty percent class participation and twenty percent student-led journal club/distinguished speaker question and answer session. There are no official prerequisites. However, some familiarity with concepts and techniques of modern biology is necessary to get the most out of the course. K. Sumigray, Z. Smith

GENE 900a/CBIO 900a/MCDB 900a, Research Skills and Ethics I This course consists of a weekly seminar that covers ethics, writing, and research methods in cellular and molecular biology as well as student presentations ("rotation talks") of work completed in the first and second laboratory rotations. P. Lusk

GENE 901b/CBIO 901b/MCDB 901b, Research Skills and Ethics II This course consists of a weekly seminar that covers ethics, writing, and research methods in cellular and molecular biology as well as student presentations ("rotation talks") of work completed in the third laboratory rotation. C. Lin

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

GENE 912a/CBIO 912a/MCDB 912a, Second Laboratory Rotation Second laboratory rotation for Molecular Cell Biology, Genetics, and Development track students. P. Lusk

GENE 913b/CBIO 913b/MCDB 913b, Third Laboratory Rotation Third laboratory rotation for Molecular Cell Biology, Genetics, and Development (MCGD) and Plant Molecular Biology (PMB) track students. P. Lusk

GLOBAL HEALTH

Office of Global Health Education: ESH 214, 203.785.5937
https://medicine.yale.edu/md-program/special-programs/global-health

EPH 591, Global Health Seminar This weekly seminar exposes students in the health professions to key issues in global health research and practice. The course features faculty from across the health professional schools and other global health experts from around the world. Its collaborative nature provides a rich environment for interdisciplinary dialogue. The goal is for students to attain a good understanding of key issues upon which they may base future research, service, and clinical pursuits in the field of global health. Although no course credit is awarded, satisfactory performance is noted on the student's transcript.

HISTORY OF MEDICINE

SHM L132, 203.785.4338
https://medicine.yale.edu/histmed

Professors S. Lederer (*Adjunct*), N. Rogers, J. Warner

Associate Professors H. Cowles (*Adjunct*), M Espinoza (*Adjunct*), J. Radin, J.L. Schwartz (*Public Health*)

Assistant Professors S. Abedin (*Pediatrics*), L. Bothwell (*Public Health*), D. Doroshow (*Adjunct*), M. Ramos

Yale College and Graduate School courses open to medical students in 2024–2025 can be found on Yale Course Search (https://courses.yale.edu) or in the Graduate School Programs and Policies (https://catalog.yale.edu/gsas).

IMMUNOBIOLOGY

TAC S625, 203.785.3857
https://medicine.yale.edu/immuno

Professors J.R. Bender (*Medicine*), M.W. Bosenberg (*Dermatology*), A.M. Bothwell (*Emeritus*), H.K. Bottomly (*Emerita*), L. Chen, T. H. Chi (*Adjunct*), J. Craft (*Medicine*), P. Cresswell, V. Dixit (*Comparative Medicine*), R.A. Flavell, D. Hafler (*Neurology*), K. Herold, A. Hidalgo, A. Iwasaki, S. Kaech (*Adjunct*), P.B. Kavathas (*Laboratory Medicine*), S.H. Kleinstein (*Pathology*), J. MacMicking (*Microbial Pathogenesis*), R.M. Medzhitov, M. Müschen (*Medicine*), J. Pober, C. Rothlin, C. Roy (*Microbial Pathogenesis*), L. Sansing (*Neurology*), D. Schatz (*Chair*), B. Su (*Adjunct*), J. Tsang

Associate Professors S.C. Eisenbarth (*Laboratory Medicine*), E.F. Foxman (*Laboratory Medicine*), A.M. Haberman, D. Jane-Wit (*Medicine*), N. Joshi, M.A. Kriegel (*Adjunct*), Y. Konnikova (*Pediatrics*),C. Lucas, E.R. Meffre (*Adjunct*), K.C. O'Connor (*Neurology*), N. Palm, J. Pereira, A. Wang (*Medicine*), C. Wilen (*Laboratory Medicine*)

Assistant Professors E. Caron, Y. Chen, W. Hu, J. Ishizuka (*Medicine*), H. Li (*Adjunct*), C. Lucas, D. Martinez, A. Martens

Senior Research Scientists A.M. Bothwell, A.F. Nassar

Research Scientists E.E. Eynon, E. Kopp, T.D. Manes

Associate Research Scientists K.M. Agaronyan, N. Arshad, C. A. Baker, R. Bayarri Olmos, B. Bhattacharjee, J. Brewer, A. Chavan, X. Cheng, C. Cho, M. Coman, K. Connolly, J. He, B. Huang, S. Kapoor, V. Khetrapal, Y. Kimura, S. Leopold, O. Levy, I. Licona Limon, A. Lledo Delgado, P. Lu, E. Marsh, A. Matthews, A. Moustaki, X. Nie, M. Oh, L. Peres Diaz, S. Pope, J. Rui, E. Sefik Karatepe, D. Song, Z. Tobias, K. Wang, L. Wu, L. Yan, W. Yu, T. Zhang

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

IBIO 530a/MBIO 530a/MCDB 530a, 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. Staff

IBIO 600a, Introduction to Research: Faculty Research Presentations Introduction to the research interests of the faculty. Required of all first-year Immunology/BBS students. Pass/Fail. C.V. Rothlin

IBIO 601/MBIO 601, Fundamentals of Research: Responsible Conduct of Research A weekly seminar presented by faculty trainers on topics relating to proper conduct of research. Required of first-year Immunobiology students, first-year CB&B students, and training grant-funded postdocs. Pass/Fail. Staff

IBIO 611a, Research Rotation 1 Intensive experience in the design and execution of experiments in immunology or other areas of biology. Students design a focused research

project in consultation with a faculty mentor and execute the designed experiments in the mentor's laboratory. Students are expected to read relevant background papers from the literature, design and perform experiments, interpret the resulting data, and propose follow-up experiments. Students are also expected to attend the mentor's weekly lab meeting(s) as well as weekly Immunobiology departmental seminars and Research in Progress seminars. The course concludes with the student giving a brief presentation of the work performed at Rotation Talks, attended by other first-year immunology-track graduate students. Evaluation is by the mentor; students also evaluate the rotation experience. Students must turn in a prioritized list of four possible mentors to Barbara Cotton in the office of the director of graduate studies at least one week prior to the beginning of the course. Mentors are assigned by the DGS. Graded Pass/Fail. 1 course credit; minimum of 20 hours/week. Required of all first-year Immunology/BBS students. C.V. Rothlin

IBIO 612b, Research Rotation 2 See description under IBIO 611a.

INTERNAL MEDICINE

Boardman 110, 203.785.4119
https://medicine.yale.edu/intmed

Professors C. Abraham, A. Abu-Alfa (*Adjunct*), F. Akar, J.G. Akar, H.G. Allore, R.J. Alpern, F. Altice, J. Amatruda (*Adjunct*), N. Angoff (*Emerita*), P. Aronson, P. Askenase, H. Aslanian, L. Bastian, W.P. Batsford (*Emeritus*), W. Becker, C. Ben Mamoun, J.R. Bender, G. Berland, F.J. Bia (*Emeritus*), M. Bia (*Emerita*), H.J. Binder (*Emeritus*), L.K. Bockenstedt, J.S. Bogan, R. Bona, J. Boyer, M. Brand, J. Brennan (*Adjunct*), U. Brewster, N. Brown, R. Bucala, L.M. Buckley, M.M. Burg, B. Burtness, H. Cabin (*Emeritus*), L. Cantley, H.H. Chao, S.I. Chaudhry, L. Chen (*Immunobiology*), G. Chupp, M.W. Cleman, G.W. Cline (*Emeritus*), L. Cohen (*Emeritus*), L.E. Cohn, D. Coleman (*Emeritus*), J. Concato (*Adjunct*), L. Cooney (*Emeritus*), J. Craft, S.T. Crowley, J.P. Curtis, N. Dahl, L. Dembry (*Emerita*), G. Desir (*Chair*), V.T. DeVita, M.P. DiGiovanna, G. D'Onofrio, B. Doolittle, J. Dranoff, M. Drickamer (*Emeritus*), J. Dziura (*Emergency Medicine*), E. Edelman, J. Eder (*Adjunct*), A. Eichmann, J.A. Elias (*Emeritus*), M.S. Ellman, J.J. Farrell, D. Federman, D. Felson (*Adjunct*), D.A. Fiellin, L.E. Fiellin (*Adjunct*), E. Fikrig, R.L. Fisher (*Emeritus*), R.N. Formica, A. Fortin (*Emeritus*), F.M. Foss, L. Fraenkel (*Adjunct*), J.V. Freeman, T.R. Fried, G. Friedland (*Emeritus*), L. Friedman, C.S. Fuchs (*Adjunct*), R. Galvin (*Adjunct*), G. Garcia-Tsao, I. Genao (*Adjunct*), S. Gettinger, R. Gifford (*Emeritus*), T. Gill, V. Giri, J.A. Goffinet (*Emeritus*), M. Golshan (*Surgery*), F. Gorelick, M.L. Green, D. Greif, C.P. Gross, S. Halene, S.G. Haskell, R. Herbst, K. Herold, E. Herzog, K.K. Hirschi (*Adjunct*), E. Holmboe (*Adjunct*), R.J. Homer (*Pathology*), R.I. Horwitz (*Emeritus*), J. Hughes (*Emeritus*), S. Huot, J. Hwa, K.L. Insogna (*Emeritus*), S.E. Inzucchi, S. Ishibe, Y. Iwakiri, P. Jamidar, E.A. Jonas, A. Justice, M. Juthani-Mehta, N. Kaminski, I. Kang, C.R. Kapadia (*Emeritus*), B. Kazmierczak, W.N. Kernan (*Emeritus*), R. Kibbey, H. Kluger, A.I. Ko (*Public Health*), I. Krop, H.M. Krumholz, M. Kryger (*Emeritus*), S. Kulkarni (*Surgery*), J. Lacy, L. Laine, R.J. Lampert, M. Landry (*Laboratory Medicine*), A. Lansky, A. Lee, F. Lee (*Emeritus*), J.K. Lim, X. Llor, P. LoRusso, D.C. Madoff (*Radiology and Biomedical Imaging*), M. Mamula, A. Mani, R.A. Marottoli, K.A. Martin, R.A. Martinello, R.A. Matthay (*Emeritus*), B. Mba, R. McNamara, W. Mehal, P. Mistry, V. Mohsenin (*Emeritus*), R.R. Montgomery, S. Mukherjee, M. Müschen, M. Nathanson, P. O'Connor, S.B. Omer (*Adjunct*), C.R. Parikh (*Adjunct*), A. Peixoto, M. Perazella (*Emeritus*), K. Petersen, D. Petrylak, S.E. Pfau, M. Pisani, K. Politi (*Pathology*), P. Preisig, D. Proctor, L. Pusztai, V. Quagliarello, A. Rastegar (*Emeritus*), W. Ravitch, C. Redlich, A.B. Reisman, D. Rhodes, D.L. Rimm (*Pathology*), J. Roberts, C. Rochester, M. Rose, L.E. Rosenfeld (*Emeritus*), J. Ross, M. Russi (*Emeritus*), M.M. Sadeghi, R. Safirstein, L. Sanders, M. Schilsky, M. Schoenfeld, M.A. Schwartz, M. Serile, S. Seropian, A. Shaw, R.S. Sherwin (*Emeritus*), G.I. Shulman, M. Siegel, A. Silber, M. Simons, A.J. Sinusas, B. Smith (*Laboratory Medicine*), M. Smith, A. Sofair, S. Somlo, R. Soufer, S. Springer, R. Steinbrook (*Adjunct*), M. Strazzabosco, L. Suter, R. Sutton, M. Sznol, T. Taddei, L. Tanoue, J. Tetrault, M. Tinetti, E. Velazquez, R. Vender, M. Villanueva,J.M. Vinetz, E. Wang, L. Wen, D. Windish, E.P. Winer (*Chair*), F. Wright (*Emeritus*), B. Wu, J. Wysolmerski, H. Yaggi, L. Young

Associate Professors K. Adelson (*Adjunct*), T. Ahmad, K.M. Akgun, K. Alavian (*Adjunct*), S. Altin, D.E. Antin-Ozerkis, L. Aoun-Barakat, W. Asch, D. Assis, R. Attaran, M. Azar, L. Baldassare, R. Belfort De Aguiar (*Adjunct*), L. Bellumkonda, C. Bergwitz, S. Bernheim, P. Bernstein, A. Bhatia, A.C. Black, S. Bogardus, R. Brienza, C. Brunet, H. Cain, C. Caldwell, B. Camby, J. Chang, A. Chiang, A. Chou, V.R. Chowdhary, H. Chun (*Adjunct*), C.M. D'Ambrosio, A. Danve, J. Davis (*Public Health*), C. Dela Cruz (*Adjunct*), N. Desai, H. Deshpande, D. Desir, M. Desruisseaux, E. Donroe, J. Donroe, D. Dunne, P.J. Ellis, B. Emu, L. Fabris (*Adjunct*), M. Fikrig, C. Flannery (*Obstetrics, Gynecology, and Reproductive Sciences*), J. Forrest, J.K. Gaidos, A. Garino, D. Geller, J. Gerber, F.J. Giordano, S.B. Goldberg, M.P. Golden, J. Gomez Villalobos, M. Grant, E.M. Grubman, M. Gulati, M. Gulati (*Medicine*), C. Gunderson, S. Gupta, S.S. Hahn, S.F. Hay, J.B. Henrich, R.I. Herzog, M. Hinchcliff, Y. Ho (*Microbial Pathogenesis*), E. Hofstatter (*Adjunct*), S. Holt, S. Honiden, L. Horwitz (*Adjunct*), C.A. Howes, J. Hummel, S. Huntington, M.E. Hurwitz, A. Imaeda, I. Isufi, D. Jacoby (*Adjunct*), F. Jadbabaie, S. Jakab, D. Jane-Wit, A. Jastreboff, L. Jilaveanu, R. Johnson, M. Kang, J.M. Kapo, S.S. Kashaf, G. Ketwaroo, V. Khungar, J. Kidwai, J.W. Kim, J.D. Kirsch (*Radiology and Biomedical Imaging*), M. Knauert, J. Koff, J. Kortmansky, F. Koumpouras, J. Kravetz, N. Krishnan, C. Kumar, P. Kumar, P. Kunz, D. Latimore, R. Legare, K. Lipska, R. Luciano, M. Lustberg, S.K. Majumdar, M. Malinis, B. Malm, K. McKenzie, R. McNeil, J. Meadows (*Adjunct*), M.C. Mecca, K. Mekala, C. Mena, M. Menon, J. Meyer, E. Miller, J. Miller, J.P. Moriarty, L. Morrison, T. Muniraj, T.E. Murphy (*Adjunct*), M. Muzumdar (*Genetics*), A.B. Nagar, S. Narasimhan, N. Neparidze, D. Nguyen (*Pathology*), S. Nicoli, J. Oen-Hsiao, O. Ogbuagu, M. Orias, S. Parikh (*Public Health*), H. Parise (*Adjunct*), M.M. Pillai, N. Podoltsev, J. Possick, T. Prebet (*Adjunct*), C. Price, D.T. Price, P. Protiva, L. Puglisi, Y. Qyang, T. Rabin, C. Regan, M.S. Remetz, C. Ruser, K. Sabbath, H. Sachar, V.T. Samuel, T. Sanft, C. Sankey, M. Sauler, S. Schellhorn, J. Schwartz, J. Setaro, S. Shenoi, D. Shenson (*Public Health; Adjunct*), J.C. Shepherd, A. Shirali, M. Silveira, J. Siner, K. Smolderen, E.S. Spatz, S.M. Stein, S. Takyar, J. Talwalkar, J. Testani, D.G. Tobin, J. Turner, A. Tzouvelekis (*Adjunct*), S. Vilarinho, M.D. Virata, A. Wang, J. Weerachayaphorn (*Adjunct*), M. Weimer, F.P. Wilson, C. Won, X. Yan, A.M. Zeidan

Assistant Professors A. Achhra, S. Agampodi (*Adjunct*), F. Ahangari, Y. Ahmad, E. Akintoye, D. Alagpulinsa (*Comparative Medicine*), B. Al Bawardy (*Adjunct*), D. Alcantara-Cadillo, S. Ali (*Adjunct*), T. Ali, A.K. Anam, E. Aneni, C. Antunes, A. Arora, V. Asare, G.I. Ash, Y. Asiedu, M. Austin, E. Bader, P. Balasubramanian, S. Baldassarri, T. Bandaranayake, B. Banini, N. Bar, T. Bärnthaler (*Adjunct*), J. Batisti, L. Baum, I. Bazan, M. Beasley, W. Besse, S. Bilgrami (*Adjunct*), MBillah, J. Bilsborrow, A. Black, K. Blenman, M. Blitzer, V. Boddupalli (*Adjunct*), A. Bolden (*Adjunct*), A. Boruchov (*Adjunct*), D. Boyd, K. Bramley, D Braun, J. Brier, D. Brissette, C. Britto-Leon, S. Browning, D. Bruessow (*Adjunct*), A. Bulgaru, M. Burke (*Adjunct*), J. Butner (*Adjunct*), C. Calhoun, J. Canterino, G. Carey, M. Cecchini, S. Chabria, E. Chang, V. Chang, W. Chang, J. Chapiro (*Radiology and Biomedical Imaging*), L. Chaptini (*Adjunct*), P. Chavez, M. Chen, I. Chernova, B. Cherry, A. Chichra, M. Chioccioli (*Comparative Medicine*), M. Chiorazzi, E. Chock, A. Choi, J. Chu (*Adjunct*), H. Chung, B. Clark, K. Clark, A. Cohen, S. Cohen, M. Cohenuram, E. Collier (*Adjunct*), J. Cook,

P. Cudahy, E. Cuoco, D.J. Curran, M. Dalal (*Adjunct*), J.G. Daniel (*Adjunct*), R. Datta, C. Davila, E. DeBiasi, R.M. DeBiasi, J. Deutsch, M. Dhond, V. Dicola (*Adjunct*), A. Do (*Adjunct*), A. Donadio (*Adjunct*), M. Dong, T. Dosani, B. Drucker, J. Duah, S. Ein Alshaeba, J. Elumn, A. Enriquez, L. Escobar-Hoyos (*Therapeutic Radiology*), S. Eysmann, E.C. Fajardo, C. Falker, C. Fankhanel, S. Farhadian, K. Faridi, S. Fedeles (*Adjunct*), A. Feher, D. Felson (*Adjunct*), L. Ferrante, R. Fiorotto, N. Fischbach, F. Foley, U. Forssmann (*Adjunct*), J. Frampton, L.A. Freed, M. Furman, J. Gaddy, A. Gaffey, B. Gallagher, C. Gallegos Kattan, P.U. Gandhi, R. Garofalo (*Adjunct*), S. Gautam, A. Giaimo, G. Giannopoulos (*Adjunct*), K. Gielissen (*Adjunct*), S. Gleeson, B. Goldman-Israelow, S. Goldstein, M. Gondal, R. Gonzalez-Colaso, S. Gordon-Dole, E. Gorshein, G. Goshula, L. Gowda, M. Grant, T. Grant, S. Green, D. Guevara-Pineda, A. Gulati (*Adjunct*), D. Gunasekaran, J. Guo (*Adjunct*), V. Gupta, N. Hafez (*Adjunct*), J. Haldas, R. Hao, L. Haque, K. Harvey, S. Hassan (*Adjunct*), N.A. Haynes, E. Heiman, T. Herbert, J. Herrin (*Adjunct*), B.L. Hiatt, M. Higgins-Chen, J. Higuero-Sevilla, M. Hoffman (*Adjunct*), J. Holleck, J. Hong-Curtis, D. Hoskins (*Adjunct*), B. Howell, B. Hsiao, F. Hsu, M. Hughes, S.C. Hull, R. Humphrey (*Adjunct*), K. Hung, D.J. Hur, J. Hwang (*Adjunct*), C. Ionescu, J. Ishizuka, S.S. Jacoby (*Adjunct*), A. Jaffe, S. Jain, E. James, R. Jarrin (*Adjunct*), D. Jayaram, P. Joseph, A. Justet (*Adjunct*), B. Kadhim (*Adjunct*), A. Kahn, R. Kalyesubula (*Adjunct*), A. Kang-Giaimo, J. Kanowitz, R. Kapel (*Adjunct*), P. Karanam (*Adjunct*), B. Kay, A. Khan (*Adjunct*), R. Khera, A. Khosla, C. Kim, S. Kim, T. Kim (*Adjunct*), J. Klimovitch, F. Knauf (*Adjunct*), S. Kothari, D. Kozhevnikov, A. Kress, F. Kron (*Adjunct*), C. Krueger, N. Kruger, A. Kumar, C. Kurlander, J. Kuster, D. Kuzmin (*Adjunct*), J.H. Kwah (*Adjunct*), J. Kwan, R. Laff, S. Langermann (*Adjunct*), J. LaSala, S. Lattanzi, H. Lau (*Adjunct*), M. Laurent-Rolle, N. Lavi, G.S. Lee, J. Lee (*Adjunct*), M. Lee, B. Lerner, A. Levin, A. Levy, S. Lim, B. Linde (*Adjunct*), M. Lipcan, M. Liu, B. Lombo Lievano, T. Long (*Adjunct*), F. Lopez-Gonzalez, C.P. Loscalzo, A. Losier, Y. Lu, B. Lupsa, D. Lutchmansingh, L. M. Madden (*Adjunct*), R. Magwenya (*Adjunct*), E.P. Manning, S. Mansour, I. Maraj, M. Marczyk (*Adjunct*), M. Marenberg, E. Marhoffer, E.P. Marin (*Adjunct*), K. Martin, J. Matloff, C. Maulion, M. McConnell, J. McDougall (*Adjunct*), C. McNamara, K. Mehra (*Adjunct*), L. Mendez, E.M. Meoli, A. Mercer-Falkoff, N. Merchant, H. Miller, P. Miller, B. Miner, N. Mnatsakanyan (*Adjunct*), D. Moledina, F. Molina, A. Moll (*Adjunct*), F. Montanari, T. Montgomery, J. Moreno, K. Morford, V. Morris, J. Mortazavi (*Adjunct*), R. Munoz Xicola, S. Mulay (*Adjunct*), K. Murugiah, J. Nadelmann, S. Neary (*Adjunct*), S. Nagpal, M. Nanna, B. Newton, R. Nudel, A. Ogurick, C. Oladele, D. O'Neil, P. Oray-Schrom, G. Ouellet, J. Ouellet, X. Ouyang, T. Palvinskaya, W. Panullo, K. Parakh (*Adjunct*), L. Parikh, J. Park (*Adjunct*), T. Parker, M. Paul (*Adjunct*), M.C. Pavlis, R. Peck (*Adjunct*), E. Perry, R. Perry, J. Persico, P. Peter, C. Philip, A. Pinar, A. Pine, M. Plavec, Z. Port, S. Possick, E. Prsic, A. Puing, A. Putnam, Z. Rahman (*Adjunct*), L. Rahmat (*Adjunct*), R. Ramachandran, A. Rao, V. Rao, M. Rao Brito, A. Reed, S. Reinhardt, C. Rentsch (*Adjunct*), B. Richards (*Adjunct*), I. Richman, R. Riello (*Adjunct*), S. Roberts, M. Rodenas, B. Rodwin, E.M. Roessler, D. Rosenthal, B. Roy (*Adjunct*), M. Rozenblit, C. Ryu, J. Ryu, O.V. Sakharova, C. Sakr (*Adjunct*), I. Sakuma (*Adjunct*), M. Samsky, E. Sanchez Rangel, J. Savage, R. Scandrett, K. Schalper (*Pathology*), S. Schnittman (*Adjunct*), J. Schupp (*Adjunct*), A. Schwartz, A. Seltzer

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Clerkship

Medical Approach to the Patient Clerkship This twelve-week integrated block is composed of Internal Medicine and Neurology rotations. The course is structured to give clerkship students in-depth experience with the diagnosis and management of adult medical issues. Because of the significant clinical overlap between internal medicine and neurology, these two disciplines are combined to form the MAP experience. Students will rotate through eight weeks of internal medicine and four weeks of neurology during their MAP experience. In addition to rotation-specific didactics, students will attend the "Top Ten" series of didactics throughout their MAP block, covering common chief complaints that encompass diagnoses specific to internal medicine and neurology.

Electives

Allergy and Immunology Elective Students attend the Allergy & Immunology Clinic for adults at the Yale Allergy & Immunology Center in North Haven and the Allergy & Immunology Pediatric Clinic at Long Wharf. It is recommended that they attend the weekly Allergy and Clinical Immunology Seminar, followed by case discussions and Journal Club. They may also join in consultations with the Allergy & Immunology service at Yale New Haven Hospital. Prerequisite: Immunobiology course.

Ambulatory Elective WEC This one-year weekly outpatient elective in the Yale Adult Primary Care Clinic provides experience in the longitudinal care of adult patients. 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 attending physicians. It is open to a limited number of senior medical students who have completed at least half of their clerkships (M.D.-Ph.D.) or most of their primary care clerkships (M.D.) Students are responsible for three patient visits/session. There are weekly pre-clinic conferences which include Journal Club and primary care case-centered topics presented by students.

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.

Cardiology Elective The student will participate in the daily activities of the inpatient cardiology consult service, including rounds and new consultations under the supervision of a fellow and attending. Students will be participating in clinical case conferences and gain exposure to procedures such as cardiac catheterization, stress testing, echocardiography, nuclear imaging, and electrocardiography. The training experience will emphasize the physiologic basis for clinical manifestations and therapy of cardiovascular diseases. A collection of pertinent review articles will be provided.

Cardiovascular Imaging Clinical Elective Working directly with the attending faculty, cardiology fellows, physician assistant, nurses, and imaging technologists within the imaging laboratories, students are involved with interviewing and examining patients referred for cardiac stress testing and learn about the appropriate use of multimodality cardiovascular imaging. They participate in the performance of both exercise and pharmacological stress imaging studies, as well as other targeted molecular imaging, and gain direct training and supervision in the performance and interpretation of these studies. In addition to the clinical training and exposure, students learn related cardiovascular physiology and gain exposure to other advanced imaging technology for the evaluation of cardiac and skeletal muscle perfusion and function in patients with suspected cardiovascular and peripheral vascular disease.

Critical Care Elective Senior students participate in critical care medicine activities in the medical intensive care unit (MICU). The emphasis is on evaluation and acute management of respiratory failure, shock, and sepsis, and on the use of invasive monitoring. The physiological basis of disease and the rationale for therapeutic interventions are also emphasized.

Endocrinology Elective The student participates as an active member of the endocrine training program, making daily rounds with the endocrine fellows, residents, and attending physicians. The student works primarily on the inpatient consult service at Yale New Haven Hospital and has the opportunity to attend selected endocrine clinics. The student also participates in the regularly scheduled metabolism-endocrine conferences.

Gastroenterology Elective The student is an integral part of the inpatient GI consult service, working primarily in an inpatient setting. This is an opportunity to see a wide variety of gastrointestinal problems and patients, with discussion and review. Open to fourth-year students only.

Geriatric Medicine Elective An introduction to the continuum of care for older adults. Students gain an understanding of the various geriatric syndromes that affect functions in the aging population and learn to identify basic geriatric syndromes such as memory loss, delirium, depression, falls, and polypharmacy. In addition, they are exposed to care planning, palliative care, and end-of-life care issues in a variety of settings, including hospital, subacute long-term care and outpatient sites, and system-wide consultation services. Prerequisite: Internal Medicine clerkships.

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.

Hepatology Elective The student is an integral part of the inpatient liver service, working primarily in an inpatient setting. This is an opportunity to see a wide variety of liver problems and patients, with discussion and review. Open to fourth-year students only.

Hospital Medicine Firm (HMF) Elective This elective was started during the 2022–2023 academic year on the YNHH East Pavilion (EP) 5-5 Unit before transitioning to (and remaining on) the East Pavilion 9-7 Unit since. The EP 9-7 Unit is a busy general internal medicine service with high acuity and patient turnover. The unit includes thirty-four patient beds which are staffed equally by both the HMF and the Whitman (formerly Generalist) Firm. A capstone and unique service for senior residents, the HMF is staffed by two hospitalist attendings and (usually) two third-year residents in Internal Medicine. Given the high volume of clinical work, there are no formal rounds and no students otherwise scheduled on this service. However, through the Yale School of Medicine Performance Improvement Program (directed by Dr. Wijesekera), students can be provided the opportunity to rotate on the HMF to build their clinical skills prior to residency. Prior to the rotation, the students work closely with the director of performance improvement (also elective director) to create an individualized educational plan, which includes targeted resources to build their medical knowledge and clinical skills. During the rotation, elective students follow and provide clinical care for two to four patients at a time including, but not limited to, pre-rounding, writing notes, oral presentations, calling consultants, responding to acute events, updating families, and writing handoffs. The elective director, supervising attendings, and senior residents will meet regularly with the student to assess and provide feedback on their communication (with patients and health care team members), clinical skills (history, physical examination, clinical reasoning), and presentations (oral and written). The students will participate in all education for the residents (e.g., noon conferences, skills labs, ad hoc teaching activities).

Infectious Disease Elective This elective offers a robust learning experience in general infectious diseases, including the diagnostic evaluation and management of common community-acquired and nosocomial infections in a diverse patient population, as well as infections in the immunocompromised patient. There are opportunities for learning in subspecialty areas such as medical microbiology, transplant ID, HIV/AIDS, hospital infection control, antimicrobial stewardship, and sexually transmitted diseases. Students function as active members of the consultation and training program in infectious diseases at Yale New Haven Hospital and are expected to attend and participate in daily attending rounds, microbiology rounds four times a week, weekly clinical case conferences, and monthly journal clubs. Evaluations are based primarily on performance in clinical case presentations on the consult service.

Medical Intensive Care Elective This elective provides an opportunity to participate in the acute management of common medical emergencies. Students are on call in the medical intensive care unit (MICU) at Yale New Haven Hospital every fourth day with an intern and resident pair, assisting them in the admission of patients. Students follow patients in the MICU, assist in their care with the intern and resident, and are expected to present during rounds. Although students are exposed to a variety of ICU-based procedures, there are limited "hands-on" opportunities. Prerequisite: Internal Medicine Clerkship.

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.

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.

Oncology Outpatient or Inpatient Elective This is an advanced elective offered to students who have completed the third-year Internal Medicine Clerkship. It is designed to expose students to all aspects of clinical medical oncology by direct participation in the daily disease-specific outpatient oncology clinics at Yale Cancer Center. Working closely with the medical oncology fellows and attending physicians, students have the opportunity to work up patients with new cancer diagnoses and participate in the ongoing

care of patients with diverse cancer diagnoses. Students participate as active members of the medical oncology training program, attending the regularly scheduled daily clinical conferences as well as weekly disease-specific multidisciplinary tumor boards and medical oncology fellow education conferences. Although the emphasis of the elective is on outpatient oncology in disease-specific units, students can also opt to work with the inpatient oncology team at Yale New Haven Hospital. Rotations at the VA Cancer Center can be arranged as well.

Palliative/Hospice Medicine Elective (Branford, Connecticut) This fifty-two-bed inpatient program at the nation's first hospice provides intensive palliative care for patients with terminal illness. The medical, psychological, and spiritual needs of these patients and their families are met through the coordinated efforts of an interdisciplinary team (IDT) of physicians, nurses, social workers, pharmacists, clergy, art therapists, and volunteers. Students work one-one-one with an attending physician caring for patients approaching the end of life and their families. They participate fully in admissions, morning rounds, family conferences, and IDT conferences. This elective offers students an opportunity to acquire advanced knowledge and skills in the management of symptoms (pain, anxiety, insomnia, etc.), which will benefit them in their future care of all patients, both those approaching the end of life as well as those who are acutely or chronically ill. It is the only elective in which symptom management receives a major focus. The goal of this elective is to learn to provide optimal symptom management and, as members of the IDT, to learn to care for patients approaching the end of life and to give support to their families. A four-week rotation, which allows for optional time spent with allied services and/or home care, is recommended, although a two-week rotation is available.

Palliative Medicine Consultation Service Elective During this two-week rotation at the YNHH (York Street Campus) the medical student focuses on promoting quality of life and preventing suffering in patients with serious illness and their families and clinician providers across a broad scope of diseases by providing an extra layer of support. The experience encompasses intensive, hands-on inpatient clinical care of patients on the YNHH Adult Palliative Medicine Consultation Service. Our team creates an opportunity for focused skill building in symptom management, interdisciplinary team function, basic and advanced aspects of serious illness communication, whole person and family focused care, and reflection on practice and self-care. The student works one-on-one with a palliative care attending, joins the interdisciplinary team meeting daily, and has the option to attend additional relevant conferences and to provide a ten-minute presentation to the team on a relevant topic. All activities are based at YSC with varying elements of Zoom/virtual activity.

Pulmonary Elective This elective is designed to provide students with an in-depth knowledge of respiratory diseases through consults on the patient care floors and through didactic sessions and directed reading. Students become an integral part of the pulmonary and critical care (PCCM) section consult service, working with the attending physician and PCCM fellow(s). From two to six new consults on average are seen daily. Students work closely with faculty and staff of the pulmonary group

and participate in daily consulting and rounds. Students assist in the examination and treatment of patients with various cardiopulmonary diseases, including tuberculosis, chronic obstructive airway disease, asthma, lung cancer, bacterial and fungal lung infection, and other diagnostic problems. They receive practical instruction in chest images and pulmonary function tests and their interpretation, and in clinical and laboratory methods used for diagnosis and management, including intensive respiratory care and respiratory therapy, and they have an opportunity to observe fiberoptic bronchoscopy. Weekly didactic lectures are given in a number of areas relating to airway pharmacology, lung cell biology, and lung immunology (respiratory cells, immunologic reactions, etc.). Students are expected to learn (1) the differential diagnosis and treatment of respiratory disorders, (2) how to interpret pulmonary function tests, and (3) how to read a chest radiograph and understand the essentials of a chest CT scan.

Re-Entry to Clinical Medicine Elective The goal of this elective is to reinforce M.D.-Ph.D. students' clinical skills prior to return to formal clerkships. The emphasis is on history taking, physical examination skills, interpretation of data, morning presentations, medical terminology, patient communication, and coordination of care. Students are assigned to a team that consists of one intern, one resident, and one attending physician; or they may be assigned to a hospitalist team that consists of one attending physician and possibly a PA. Students are expected to perform at the clerkship level, performing admission history and physical exams, and following/presenting patients on daily rounds, with supervision. History, physical diagnosis, and laboratory interpretation skills are emphasized.

Rheumatology Elective Students work closely with the faculty member and fellow assigned to the inpatient consultative service at Yale New Haven Hospital and the Saint Raphael's campus. They attend rounds and evaluate patients with rheumatic conditions and other diseases with rheumatic manifestations. In addition, they may participate in outpatient clinics. Weekly conferences emphasize the pathophysiology and management of complex autoimmune conditions.

Subinternships

Ambulatory Subinternship This one-year weekly outpatient subinternship in the adult Primary Care Center provides experience in the longitudinal care of Internal Medicine patients. Students are directly responsible for care of medical problems and preventive care as well as coordination of specialty care for their own patient panel. The clinic is held every Wednesday evening, 5:15–8:30 p.m., except the day before Thanksgiving and between Christmas and New Year's. Students are responsible for three patient visits/sessions. Weekly pre-clinic conferences begin at 4:45 and include journal club and primary care case-centered topics presented by students. Prerequisite: completion of all clerkships.

Internal Medicine Subinternship The subinternship offers students the opportunity to function in the role of an intern on an Internal Medicine inpatient team at Yale New Haven Hospital or West Haven VA Medical Center. Students join a team consisting of an upper-year medical resident and an attending physician and are responsible for

admitting patients, writing admission and daily progress notes, presenting cases on rounds, communicating with consultants, ordering medications and tests, and serving as the front-line physician for patients admitted to the hospital. Students are responsible for managing approximately half the number of patients typically managed by an Internal Medicine intern. The subinternship offers an outstanding opportunity to prepare for internship, whether the student intends to pursue a career in Internal Medicine or another specialty. Prerequisites: third-year Internal Medicine clerkships.

INVESTIGATIVE MEDICINE

2 Church Street South, Suite 112, 203.785.6842
https://medicine.yale.edu/investigativemedicine

Professors K.S. Anderson (*Pharmacology*), J.E. Craft (*Medicine*), James Dzuria (*Emergency Medicine*), D.A. Fiellin (*Medicine*), T.M. Gill (*Medicine*), F. Gorelick (*Medicine*), J.R. Gruen (*Pediatrics*), H.M. Krumholz (*Medicine*), E.D. Shapiro (*Pediatrics*), G. Tellides (*Surgery*), M.E. Tinetti (*Medicine*)

IMED 625a, Principles of Clinical Research The purpose of this intensive two-week course is to provide an overview of the objectives, research strategies, and methods of conducting patient-oriented clinical research. Topics include competing objectives of clinical research, principles of observational studies, principles of clinical trials, principles of meta-analysis, interpretation of diagnostic tests, prognostic studies, causal inference, qualitative research methods, and decision analysis. Sessions generally combine a lecture on the topic with discussion of articles that are distributed in advance of the sessions. E.D. Shapiro

IMED 630a, Ethical Issues in Biomedical Research This term-long course addresses topics that are central to the conduct of biomedical research, including the ethics of clinical investigation, conflicts of interest, misconduct in research, data acquisition, and protection of research subjects. Practical sessions cover topics such as collaborations with industry, publication and peer review, responsible authorship, and mentoring relationships. Satisfactory completion of this course fulfills the NIH requirement for training in Responsible Conduct of Research. Format consists of lecture presentation followed by discussion. Consent of instructor required. L. Ferrante

IMED 635a or b, Directed Reading in Investigative Medicine An independent study course for first-year students in the Investigative Medicine program. Topics are chosen by the student, and reading lists are provided by faculty for weekly meetings to discuss articles. Four sessions are required; dates/times by arrangement. Consent of instructor required. J.E. Craft

IMED 645a, Introduction to Biostatistics in Clinical Investigation The course provides an introduction to statistical concepts and techniques commonly encountered in medical research. Previous course work in statistics or experience with statistical packages is not a requirement. Topics to be discussed include study design, probability, comparing sample means and proportions, survival analysis, and sample size/power calculations. The computer lab incorporates lecture content into practical application by introducing the statistical software package SPSS to describe and analyze data. V. Shabanova, E.D. Shapiro

IMED 661a, Methods in Clinical Research, Part II This yearlong course (with IMED 660 and 662), presented by the National Clinical Scholars Program, presents in depth the methodologies used in patient-oriented research, including methods in biostatistics, clinical epidemiology, health services research, community-based participatory research, and health policy. Permission of instructor required. E.D. Shapiro

IMED 665a, Writing Your K- or R-Type 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 initiate their own proposals for obtaining grants to do research and to develop their own careers. The course is intended for students who plan to submit grant proposals (for either a K-type career development award or an R-type investigator-initiated award). Attendance and active participation are required. There may be spaces to audit the course. E.D. Shapiro

IMED 680b/B&BS 680b, Topics in Human Investigation The course teaches students about the process through which novel therapeutics are designed, clinically tested, and approved for human use. It is divided into two main components, with the first devoted to moving a chemical agent from the bench to the clinic, and the second to outlining the objectives and methods of conducting clinical trials according to the FDA approval process. The first component describes aspects of structure-based drug design and offers insight into how the drug discovery process is conducted in the pharmaceutical industry. The format includes background lectures with discussions, labs, and computer tutorials. The background lectures include a historical perspective on drug discovery, the current paradigm, and important considerations for future success. The second component of the course provides students with knowledge of the basic tools of clinical investigation and how new drugs are tested in humans. A series of lectures and discussions provides an overview of the objectives, research strategies, and methods of conducting patient-oriented research, with a focus on design of trials to test therapeutics. Each student is required to participate (as an observer) in an HIC review, in addition to active participation in class. Consent of instructor required. K.S. Anderson, J.E. Craft

LABORATORY MEDICINE

PS 210, 203.688.2286
https://medicine.yale.edu/labmed

Professors A. Baumgarten (*Emeritus*), S. Campbell, S. Chang, R.K. Donabedian (*Emeritus*), T. Eid, J. Hendrickson (*Adjunct*), J.G. Howe (*Emeritus*), P.B. Kavathas, D.S. Krause, M. Landry, P. McPhedran (*Emeritus*), H. Rinder, B. Smith (*Chair*), E. Snyder, G. Stack (*Emeritus*), P. Tattersall (*Emeritus*), C. Tormey

Associate Professors M. Azar (*Medicine*), S.C. Eisenbarth (*Adjunct*), J.M. El-Khoury, E.F. Foxman, A.M. Haberman (*Immunobiology*), R. Hauser, M. Hodson (*Adjunct*), D. Peaper, A. Siddon, E. Stiles, R. Torres (*Adjunct*), Z. Walther (*Pathology*), C. Willen, M. Xu (*Pathology*)

Assistant Professors R. Balbuena-Merle, A. Bersenev, T. Durant, S. Garg, E. Horstman, M.N. Lee, C. Minerowicz (*Pathology*), R. Pulk (*Adjunct*), H. Sanchez (*Pathology*), V. Scanlon (*Adjunct*), W. Schulz, N.K. Sostin, K. Stendahl

Instructors T. Binns, S. Gu

S**enior Research Scientists** R. Rai, P. Tattersall, X. Zhu (*Biomedical Informatics and Data Science*)

Research Scientists L. Devine, P. Gu, F. Liang

Associate Research Scientists K. Abbott, R. Dhaher, J. Kumar, H. Young, P. Zhang

Clinical Professor R. Levine

Assistant Clinical Professors J. Breen (*Medicine*), W. Frederick, K. Smith, F. West

Clinical Instructor E. Abels

Lecturers P.E. Marone, L. Stump, C.J. Torre

Electives

Anatomic Pathology and Laboratory Medicine Combined Elective The goals for anatomic pathology are to understand the basic principles of diagnostic anatomic pathology and its role in clinical medicine. The goals for laboratory medicine are to learn appropriate usage and interpretation of laboratory tests and to gain a better understanding of the theoretical, technological, and clinical underpinnings of laboratory medicine. This elective is appropriate for students considering a career in laboratory medicine and/or pathology, and for all students who will use laboratory and pathology tests in their careers.

Laboratory Medicine Clinical Elective This elective offers rotations through the clinical laboratories, including Blood Bank, Therapeutic Apheresis, Clinical Chemistry, Toxicology, Hematology and Coagulation, Flow Cytometry, Immunology, Molecular Diagnostics, Microbiology, and Virology. Students work closely with residents, fellows, attending physicians, and laboratory staff; work up clinical cases under supervision;

and attend morning report, case conference, journal club, clinical rounds, and didactic sessions. Students 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.

MEDICAL EDUCATION

Office of Medical Education
https://medicine.yale.edu/edu

Integrated Course Curriculum

MASTER COURSES

Introduction to the Profession The first course in the Yale School of Medicine curriculum is Introduction to the Profession (iPro). The goal of iPro is to introduce first-year medical students to their professional identity in medicine. The course also aims to introduce and foster a holistic approach to the learning and practice of medicine. The course focuses on topics related to professionalism, patient-centered care, interprofessional collaboration, health equity, bias and racism, community engagement, role power, and privilege amidst others. Beyond learning in large and small group settings in the classroom, students have early exposure to clinical environment through time at Yale New Haven Hospital, participate in simulation exercises and engage with local nonprofits that serve the New Haven community. The teaching methods in iPro include interactive and participatory classroom sessions, small group experiences in the community and museum, simulation exercises, hospital experiences, and patient centered learning. Open to M.D. and M.D.-Ph.D. students only.

Scientific Foundations This course introduces the core concepts and modes of thinking from several disciplines that are pillars of biomedical science and medicine: biochemistry, cell biology/histology, pathology, physiology, and pharmacology. Each discipline continues throughout the pre-clerkship curriculum where its content is woven into every integrated course. Scientific Foundations is thus fundamental for students' subsequent education and development as physician-scientists. The course organizes content from the above disciplines into the following themes: building a body, cell communication, cell energy, fluids and gradients, gene expression, life and death of a cell, and population health. Additional organ- and systems-related content for the above disciplines is distributed across the remaining pre-clerkship courses, as appropriate. Open to M.D. and M.D.-Ph.D. students only.

Genes and Development This course begins with an introduction to foundational genetics principles. It then transitions to embryology, presenting how the program for human development is controlled and how deregulation of this program results in birth defects. Students are then introduced to the field of clinical genetics and have the opportunity to apply their genetics knowledge as they learn about common genetic disorders affecting children and adults. This is followed by an overview of the first organ system in the curriculum, the hematologic system. This introduction to benign hematology serves as a foundation for the second part of the course, which focuses on cancer, which begins with cancer biology and pathology. In this portion of the course, students are introduced to the types of genetic changes that occur in somatic cells and enable tumorigenesis. Cancer biology and principles of neoplasia are integrated with developmental genetics and embryology, with students gaining an appreciation of neoplasia as a genetically-based aberration of normal development and cellular regulation. This knowledge is further

expanded as the students learn malignant hematology before moving on to learning about solid tumors. The course incorporates cancer pharmacology and clinical aspects of drug development and concludes with a broad introduction to the clinical oncology discipline. This content is integrated and sequenced for optimal learning utilizing a variety of teaching methods including lectures, demonstrations, team-based learning, small-group workshops, clinical-pathologic correlations, patient interviews, and labs. Open to M.D. and M.D.-Ph.D. students only.

Attacks and Defenses This course introduces principles of immunity, tissue injury and repair, and medical microbiology. These principles are integrated with the clinical fields of clinical immunology and allergy, infectious diseases, dermatology, and rheumatologic diseases. Students are introduced to the diagnosis and management of patients with infectious, allergic, autoimmune and immune deficiency related diseases. Selected examples of neoplastic disease, especially melanoma, are discussed due to the major impact of cancer immunotherapy on clinical care. Medical microbiology and infectious disease are taught during the entire course. Principles of immunobiology are taught concurrently with clinical immunology, followed by rheumatology and dermatology. All topics are taught with a mix of lectures, workshops, laboratories, and patient encounter sessions. Disease in underserved and diverse populations is a critical component of the course. Open to M.D. and M.D.-Ph.D. students only. Lectures may be audited with approval of the course directors.

Homeostasis Homeostasis is one of the fundamental properties of any living organism. The heart, lungs, and kidneys work in concert to provide oxygen to and remove toxins from our cells, and they do so continuously from our first breath to our last. The goal therefore of the Homeostasis course is to elucidate the complex biological communication and feedback, mediated via mechanical, soluble and cellular mechanisms, between the heart, the lungs, and the kidneys. Although crosstalk between these organ systems is essential to maintain body homeostasis, pathological states in one or more organs can lead to functional and structural dysfunction in the other organs. This course integrates cardiology, pulmonary, and renal content in this order. Physiology and pathophysiology of organ systems are integrated in workshops and are taught by both clinical and physiology faculty. The sessions are heavily case-based and aimed at preparing the students for their clinical rotations. Open to M.D. and M.D.-Ph.D. students only.

Energy and Metabolism The overall goal of this course is to introduce first-year students to topics broadly related to digestive diseases and endocrinology. The course is designed to provide an integrative approach, with faculty drawn from Departments of Anatomy, Physiology, Cell Biology, Pathology, Epidemiology, History of Medicine, and from clinical disciplines including medicine, surgery, pediatrics, and diagnostic imaging. The objective is to provide for learning in a cohesive fashion so that students will understand how health and disease reflect the interplay of physiology, environment, nutrition, genetics, psychology, sociology, economic, and other factors. The topics that are covered are linked to the intake, absorption, and metabolism of food; the generation and storage of energy; and other topics related to gastroenterology and endocrinology. The schedule for the course maintains a thematic sequence, covering anatomy, cell biology

and physiology, then introducing disease states. Emphasis is given to how alterations in one system can have effects on others. Open to M.D. and M.D.-Ph.D. students only.

Connection to the World Connections to the World (CTW) focuses on the structure and functions of the nervous system and related disorders. CTW integrates several distinct courses taught previously in the first two years of medical student education: Fundamentals of Neuroscience, Neurophysiology and Biological Basis of Behavior, Psychiatry, Neurology, and Ophthalmology. CTW is built upon the neuraxis, beginning with a description of the anatomy and physiology of the spinal cord and ascending to the cerebral cortex, adding disease mechanisms and pathophysiology at each anatomical station. Students have a comprehensive understanding of the normal anatomy and physiology of the central and peripheral nervous system along with abnormalities in key neurological, psychiatric, and ophthalmologist disorders. The course incorporates neuropharmacology, neuropathology, and neuroimaging into specific disease models and as distinct pedagogical entities. Topics in the biological basis of behavior and psychiatry include principles and neural mechanisms of learning and memory, neural systems involved in fear and anxiety, reward and drug addiction, stress, and neural systems attention. CTW blends didactic and interactive pedagogies in large and small group settings along with labs and patient presentations. An emphasis is placed on active learning with flipped curricula and interactive sessions with labs, workshops, and live patient presentations forming the majority of the course. It provides students with ample opportunities for spaced repetition, analytical thinking, and active application of their understanding of anatomy, physiology, pathophysiology, and pharmacology in diagnosing and treating disease. Students are introduced to and encouraged in their practice of clinical reasoning. Open to M.D., M.D.-Ph.D., and Neuroscience Ph.D. students only. The course cannot be audited.

Across the Lifespan The goal of this course is for medical students to acquire knowledge of normal and abnormal human development through all four stages of life: conception, pregnancy and birth, child and adolescent growth and development, the reproductive years, and middle age and senescence. The course integrates relevant sessions from longitudinal courses (anatomy) and threads (cell biology, embryology, genetics, pathology, diagnostic methods, pharmacology and diversity, equity, and inclusion). It starts with the uro-genital anatomy lectures, embryology, and reproduction physiology sessions so that students acquire the basic knowledge necessary to understand the material presented in each of the stages. The material is taught in a variety of formats, including lectures, small-group workshops that discuss patient cases, and laboratories, in a way that fosters the acquisition of clinical reasoning skills and prepares students to enter clerkships. Open to M.D. and M.D.-Ph.D. students only.

LONGITUDINAL COURSES

Clinical Skills This course spans the first eighteen months of school for all medical students. Students begin to develop and refine their clinical skills, the essential elements of "doctoring" that physicians use during patient encounters. In Clinical Skills (CS), students learn to communicate with patients, families, and other members of the care team; examine patients; develop clinical reasoning skills; and understand the important

role of a student-doctor in a patient's care. Multiple teaching modalities are utilized in CS, but the bulk of the experiences are designed to be hands-on, offering students the opportunity to develop clinical skills with direct faculty observation and feedback, frequently with the use of standardized patients. Throughout CS, emphasis is placed on taking a patient-centered approach to care. Students pass the course by attending all class sessions (attendance is mandatory) and performing a competent history and physical exam in a standardized assessment session at UConn. Course content is practiced and supplemented in the Interprofessional Longitudinal Clinical Experience (ILCE).

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

Interprofessional Longitudinal Clinical Experience The Interprofessional Longitudinal Clinical Experience (ILCE) is designed to prepare first-year health professional students to function effectively in the clinical environment. This course groups students from Yale School of Medicine, Yale School of Nursing, and the Yale Physician Associate Program to work together at a clinical site alongside faculty mentors. Students work at their sites approximately once a week throughout the first year of school. The program goal is for students to learn with, from, and about other health care professional students early in their training. Students accomplish this by working together to develop their clinical skills, knowledge, and attitudes, in conjunction with each school's individual plan of study. Open to M.D., M.D.-Ph.D., PA, and YSN students. Attendance at ILCE sessions is mandatory.

Medical Clinical Experience (MCE) This course builds on the first-year Interprofessional Longitudinal Clinical Experience (ILCE) and Clinical Skills courses in preparing students for their clerkship. This course focuses on history, physical examination, communication, oral presentation, and clinical reasoning skills. In MCE, medical students meet in groups of four students with one to three physician coaches to focus on the further development of their clinical skills. This is done through practice with patients in the clinical setting and includes group observation, discussion, and feedback. During MCE, students are required to take the UCONN assessment which provides important formative feedback on the acquisition of clinical skills that help assess their preparation for the clerkships. One of the highlights of this course is the longitudinal mentorship with MCE physician coaches.

Populations & Methods (P&M): The Application of Epidemiology and Biostatistics to Public Health Populations & Methods introduces students to issues, evidence, and techniques of importance to the health of populations. It is a course specifically for physicians in training: each topic is selected based on its importance to both public health and medicine. The course explores the social consequences of biological disorders (cancers,

disabilities, substance use, obesity, infectious disease transmission, and mental health) and the health consequences of social challenges (environmental hazards, firearms, incarceration, migration, maternal and child health, human rights violations, and climate change). The important role of physicians in addressing social disparities in health and of assuring health equity for patients is emphasized throughout the course. There is a focus on developing analytic skills and critical thinking. Epidemiology and biostatistics topics examine screening and diagnostic testing, evaluate observational and experimental research study designs, assess absolute and relative risks for disease, quantify temporal risk using survival analysis, explore causation, model the spread of infectious diseases, and quantify the financial costs and benefits of health-related interventions. A concentration on methodology makes the public health topics more rigorous, and attention to public health makes the methodological tools more relevant. All case studies used in the workshops integrate the public health subject matter with these quantitative methods. Open to M.D. and M.D.-Ph.D. students only.

Professional and Ethical Responsibility This course runs longitudinally through the first year and features lectures, readings, and small-group case discussions. The course examines the various contexts (social, legal, financial, and organizational) in which the practice of medicine takes place, with a particular focus on principles and approaches to medical ethics. Specific ethical problems in the practice of medicine are addressed, both historical and current, and these issues are considered in the setting of individual patient encounters as well as on the societal level. In addition, practical and ethical aspects of the various components of the U.S. health care system are reviewed. Open to M.D. and M.D.-Ph.D. students only.

Responsible Conduct of Research (*taught as part of Scientific Inquiry: Research Methods and 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. Material is taught through lectures with group discussion and case studies. (Six 1.5-hour sessions.)

Scientific Inquiry: Research Methods and Responsible Conduct of Research The goal of this course 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. Open to M.D. and M.D.-Ph.D. students only. J. Rosenberg

Integrated Clerkships

Biopsychosocial Approach to Health Clerkship This twelve-week integrated clerkship comprises a six-week rotation in primary care and a six-week rotation in psychiatry. During the six-week primary care component, students spend 5–6 half-days each week working in a practice for adult primary care (i.e., general internal medicine, family medicine, or combined medicine/pediatrics) and 2–3 half-days each week working in a practice for general pediatrics. The psychiatry component of the clerkship includes three weeks of inpatient psychiatry, three weeks of consultation-liaison or emergency psychiatry, and six half-day sessions in a longitudinal outpatient psychiatry or integrated primary care–psychiatry clinic. Primary care and psychiatry each have distinct classroom exercises. However, an integrated classroom curriculum brings students together each Thursday afternoon to explore the many topics that overlap primary care and psychiatry, including mood disorders, anxiety disorders, substance abuse, somatic symptom disorder, and pain.

Medical Approach to the Patient Clerkship This twelve-week integrated clerkship includes internal medicine (eight weeks) and neurology (four weeks) clinical components. Throughout the clerkship, students participate in integrated experiences that address the themes related to hospital-based care such as management of acute disease, diagnostic skills, transitions of care, quality improvement, and organ systems.

Surgical Approach to the Patient Clerkship This twelve-week integrated clerkship includes surgery (six weeks, general; three weeks, specialties) and emergency medicine (three weeks) clinical components. Throughout the clerkship students participate in integrated experiences that address themes of the OR experience such as perioperative care, emergency/trauma management, procedures, medical error and patient safety, and anesthesiology. Students also participate in a twelve-week mentoring program during the clerkship.

Women's and Children's Health Clerkship This twelve-week integrated clerkship includes clinical components in obstetrics and gynecology and pediatrics. Students participate in six weeks of OB/Gyn and six weeks of pediatrics, with a mix of inpatient and ambulatory clinical experiences in both specialties. Throughout the clerkship students participate in integrated experiences that cover themes such as health and development, preventive care, sexual health, families and communities, health promotion and disease prevention, and perinatal care. All students attend an evening session with the gynecologic teaching associates.

Fourth-Year Course

Capstone Course The capstone course is required of fourth-year students in the spring term beginning the week of the internship match. Conceived more than ten years ago

as a capstone to four years of medical school training, the course provides a review of some of the knowledge and skills needed for internship and beyond; discipline-specific bootcamps for hands-on pre-internship training; 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.

Non-Departmental Elective Courses

(For clinical specialty electives, please see departmental listings or visit https://medicine.yale.edu/md-program)

Clinical Longitudinal Elective, Tailored The student participates as an active member of the designated inpatient and/or outpatient service, participating in appropriate clinical cases at YNHH and/or the VA. A completed proposal with specific specialty learning objectives must be submitted to the elective director. The student attends regularly scheduled specialty conferences (to be determined by the student and the clinic preceptor). Assignment may be made weekly, twice monthly, or monthly as determined by the student's laboratory responsibilities and in association with the clinic preceptor. This is the equivalent of a two-week, full-time elective, pass/fail. The specific rotation dates are determined by the elective director. Open to Yale M.D./Ph.D. students only; students must have completed six months of clerkships. Director: L. Cohn

Creating Health Care and Life Science Ventures This course gives students a broad understanding of the major "new venture" opportunities in health care and medicine—health care delivery, health care IT and the digital health landscape, biotechnology, medical devices, and health care process redesign especially in the surgical space. In each of these areas, they learn the canonical path to commercialization including how to identify "unmet clinical needs" market opportunities; who is the customer; how to build interdisciplinary teams; regulatory hurdles to commercialization; and creation of a business strategy. The course is designed for a diverse student body including students from management, natural sciences, medicine, law, nursing, and health care management programs. The course comprises lectures, raw cases, guest speakers, and in-class projects with coaching from the venture investor community. This thirteen-week class is held at Yale School of Management, Evans Hall, and is open to all medical students. For questions, contact the instructors at christopher.loose@yale.edu or ayesha.khalid@yale.edu. *Also* MGT 657. Directors: C. Loose, A. Khalid

Evidence-Based Clinical Information Skills: Cushing/Whitney Medical Library This two-week elective is designed to introduce students to three of the four As of evidence-based practice: Ask, Acquire, Assess, as a framework for effective searching of the biomedical literature (the elective will not cover the fourth A, Apply, as this process is best assessed during clinical training). Students develop proficiency in identifying and appraising the best available evidence for patient care as part of their current and future clinical practice. Students develop skills needed in order to apply existing and evolving biomedical literature to inform their care of patients and advance the health of individuals and populations. Open to second-, third-, and fourth-year students. Director: J. Spak

Evolution and Medicine Flipped curriculum: the lectures are recorded and available online. Each week the assigned lectures and corresponding assigned readings should be viewed/read before coming to class. That assignment is tested with short-answer quizzes and reading responses, which must be submitted before class. Those who have not submitted those responses are not allowed to come to class. Class consists of discussion of the points in the lectures and readings that were found to be difficult and of recent research papers relevant to the topic at hand. The course writing assignment for medical students is to substantially improve the Wikipedia page on a topic of their choice in evolutionary medicine. Enrollment limited to fifteen. Required text: Stearns and Medzhitov, *Evolutionary Medicine* (2015). Director: S. Stearns

Family and Transgender Medicine Elective (Oneonta, New York) This is a unique opportunity to experience the full spectrum of family practice in a small-town environment. In this elective, students (1) learn how to approach the practice of family medicine in a small town with limited access to specialists and how to use available resources to provide high-quality care, (2) learn about care coordination with larger health care systems in this practice setting, (3) learn about the practice of medicine in a small community and how physicians are integrated into that community, and (4) develop a family systems-based approach to providing care. The preceptor is a Yale graduate who provides primary care for a diverse population in both the hospital and clinic setting. In addition to both inpatient and outpatient family medicine, the preceptor also has a large practice in transgender medicine for both youths and adults, providing a unique practice opportunity. One student every two or four weeks. Director: P. Ellis

Family Medicine Elective (Middlesex Hospital) This elective exposes students to the wide variety of clinical situations encountered in a national model, community-based family medicine residency program. In offices in Middletown, Portland, and East Hampton, students see and examine patients, present their findings and differential diagnosis, develop a plan of investigation and management with their supervisor, and explain the plan to their patients. Students manage and document care using electronic health records. In Middlesex Hospital, students are members of the team on the family medicine inpatient service, which provides medical, pediatric, newborn, maternity, and consultative care. Formal teaching activities include both didactic and interactive sessions, daily bedside teaching rounds, several weekly conference series, and weekly three-hour hands-on seminars. All three offices are equipped with facilities for minor surgery, casting, colposcopy, spirometry, audiometry, complete vision screening, electrocardiograms, various cultures, and rapid, enzyme-based diagnostic tests. Patients are from all walks of life and all ages and seek medical care for a wide variety of acute and chronic conditions. The emphasis is on continuity in ambulatory, nursing home, and hospital care. One student every four weeks. Director: M. Cardona

Inflammation This course covers fundamentals of inflammation from a broad biological perspective. Both physiological and pathological aspects of inflammation are the focus of this course, which is primarily for pre-clerkship medical students. Director: R.M. Medzhitov

Medical Education Course This course provides health care professional students with a unique opportunity to explore their roles as teachers, a role that is deeply intertwined with their role as physicians. The course makes use of didactic lectures, observations, group exercises, and teaching activities. Diverse and talented faculty facilitate the development of the knowledge, skills, and attitudes necessary to help students develop their experience and identity as teachers as they transition to the next phase of their career. Open only to students enrolled in the Medical Education Concentration. Director: J. Hafler

Medical Education Practicum This practicum consists of twenty hours of hands-on teaching experience, both at Yale and in the greater New Haven community. Students gain first-hand experiences as teachers and skills are refined through observation and feedback, reflective writing, and mentorship by a faculty member who has previously conducted medical education research or educational scholarship. Open only to students enrolled in the Medical Education Concentration. Director: J. Hafler

Medical Education Course Supervised Research Block Students enrolled in this supervised research block will work with a designated mentor to complete a medical education scholarly project or thesis that addresses an unmet need or area of scholarship in medical education. Open only to students enrolled in the Medical Education Concentration. Director: J. Hafler

Palliative/Hospice Medicine Elective (Branford, Connecticut) This fifty-two-bed inpatient program at the nation's first hospice provides intensive palliative care for patients with terminal illness. The medical, psychological, and spiritual needs of these patients and their families are met through the coordinated efforts of an interdisciplinary team (IDT) of physicians, nurses, social workers, pharmacists, clergy, art therapists, and volunteers. Students work one-one-one with an attending physician caring for patients approaching the end of life and their families. They participate fully in admissions, morning rounds, family conferences, and IDT conferences. This elective offers students an opportunity to acquire advanced knowledge and skills in the management of symptoms (pain, anxiety, insomnia, etc.), which will benefit them in their future care of all patients, both those approaching the end of life as well as those who are acutely or chronically ill. It is the only elective in which symptom management receives a major focus. The goal of this elective is to learn to provide optimal symptom management and, as members of the IDT, to learn to care for patients approaching the end of life and to give support to their families. A four-week rotation, which allows for optional time spent with allied services and/or home care, is recommended, although a two-week rotation is available. One or two students every two or four weeks. Director: J. Sacco

Primary Care and Community Health Advanced Clinical Elective at Chinle, Arizona This advanced clinical elective in primary care and community health provides the learner with an immersion experience in primary care at a unique, underserved site: Chinle Health Center. This month-long rotation supervised by Steve Williams, M.D., and colleagues provides an opportunity to work with Navajo on the reservation in rural, northeast Arizona. Students appreciate working with traditional native American healers in a remote, beautiful landscape, addressing health needs created by poverty and

injustice, and learning about career opportunities with the Indian Health Service. This elective is offered to senior students, who are expected to assume full responsibility for their patients, under the supervision of expert attending physicians. Director: P. Ellis

Primary Care and Community Health Advanced Clinical Elective at HAVEN (Longitudinal) This advanced clinical elective in primary care and community health provides the learner with an experience in primary care at a unique, underserved site: HAVEN, the Yale student-run free clinic, which serves predominantly Hispanic, adult, uninsured persons. This is an opportunity for students to gain clinical experience and help serve an underserved population in an urban medical site where students will also help teach and supervise students earlier in their training. Students choose eight or fifteen Saturdays to work during the year, flexibly scheduled with oversight by the student leadership at HAVEN. Saturday hours are typically 8 a.m.–2 p.m., beginning with morning meeting, followed by direct patient care, ending with afternoon case presentation and didactic presentation. This elective is offered to senior students, who are expected to assume full responsibility for their patients, under the supervision of attending physicians. Director: B. Richards

Primary Care and Community Health Advanced Clinical Elective in Appalachia Six-week advanced clinical elective in primary care and community health. Director: L.C. Mayes

Primary Care and Community Health Advanced Elective at San Francisco Free Clinic This advanced clinical elective in primary care and community health provides the learner with an immersion experience in primary care at a unique, underserved site: San Francisco Free Clinic. During this month-long rotation supervised by Yale medical school alumni Patricia and Richard Gibbs and colleagues, students assume significant autonomy in seeing diverse patients. Students with interest in Orthopaedics can sometimes accompany Dr. Richard Gibbs to provide orthopaedic care to members of the San Francisco Ballet. This elective is offered to senior students, who are expected to assume full responsibility for their patients, under the supervision of expert attending physicians. Director: P. Ellis

Primary Care Wednesday Evening Clinic This one-year weekly outpatient elective 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 attending physicians. 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 students who have completed at least half of their clerkships (M.D./Ph.D.) or all of their clerkships (M.D.). Students must have completed the MAP clerkship. Director: P. Oray-Schrom; staffed by rotating attending physicians

Uncertainty in Medicine: Critical Thinking and Decision-Making The goal for this course is to recognize that while much of medical education is traditionally centered on accrual of information for rapid recall, the health care profession is riddled with

uncertainty and incomplete information. Health care providers are faced with multidimensional and multidisciplinary problems whose solutions require a combination of rigor, creativity, and collaboration. While our current approach to medical education is only reinforced by emphasis on short-answer standardized tests as metrics of aptitude, this course aims to combat that emphasis and prepare students for the complexities of the medical field by focusing on critical thinking and problem-solving skills in a case-based collaborative environment. We use case-based exercises to analyze topics that have contemporary relevance to medicine, e.g., development of screening programs for cancer or reporting and reduction of medical error. These exercises utilize a collaborative approach aimed at developing several distinct skills: defining the scope of a complex problem, reducing a problem into definable parts, examining each part from multiple angles, prioritizing the parts and their potential solutions, and committing to an actionable solution while acknowledging unaddressed complexities and unknowns. Open to all medical students. Enrollment limited to twenty. The class meets weekly at noon from mid-June to early August. Director: G. Lister

Seminar in Healer's Art This innovative discovery model course in values clarification and professionalism for first- through fourth-year medical students is offered annually at more than ninety U.S. medical schools as well as medical schools around the world. Designed in 1991 by Rachel Naomi Remen, M.D., and offered at the School of Medicine since 1999, the course offers a safe learning environment for a personal, in-depth exploration of the time-honored values of service, healing relationship, reverence for life, and compassionate care. It utilizes principles of adult education, contemplative studies, humanistic and transpersonal psychology, cognitive psychology, formation education, creative arts, and storytelling to present and explore human dimensions of medicine rarely discussed in medical training. Topics include deep listening, presence, acceptance, loss, grief, healing, relationship, encounters with awe and mystery, and self-care practices. The curriculum enables students to uncover and strengthen the altruistic values, sense of calling, and intention to serve that have led them to medicine, creating a firm foundation for meeting the challenging demands of contemporary medical training and practice. In a rigorous standardized course evaluation, the thousands of students nationwide and internationally who take the course every year report that it fills a gap in their existing curriculum and enables them to make the practice of medicine uniquely their own. Faculty are often as profoundly affected by the course as the students, reporting a renewal of their enthusiasm for teaching and their love of medicine. Students and faculty participate together in a discovery model that transcends the divisiveness of expertise to explore service as a way of life. The process-based curriculum takes a highly innovative, interactive, contemplative, and didactic approach to enabling students to uncover and recognize the personal and universal meaning in the daily work of medicine. Dates to be determined. Director: T. Sanft

Seminar in Life Worth Living What makes a life worth living in medicine? In an era when the prevalence of physician burnout is high, and there is much change in the profession, we ask ourselves, "How should I live my life? What really matters? What makes a life worth living?" We engage these questions in a small-group discussion format, modeled after the course by the same name taught at Yale College (Humanities 411) and

adapted for the School of Medicine. This is a course of "applied philosophy," in which we address questions of meaning and purpose in our profession and reflect upon our own practice. In particular, we explore the question "What makes a life worth living in medicine?" We consider original texts and seminal works from Judaism, Buddhism, Christianity, and Islam, as well as contemporary thought leaders and evidence-based research. Special attention is given to the role that money, power, justice, and social prestige play in shaping our profession. Director: B.R. Doolittle

Seminar in Biomedical Ethic Each morning and afternoon, students participate in a ninety-minute seminar, consisting of a thirty-minute talk by a faculty member, followed by a sixty-minute discussion. Subjects include history of bioethics, clinical ethics consultations, narrative ethics, the role of bioethics in policy making, ethical issues in OB/GYN, ethical issues related to the care of those with mental illness, pediatric ethics, landmark cases, and more. Director: M. Mercurio

Seminar in Poetry and Medicine In a 2007 essay, Stephanie Burt and others wondered "Does poetry have a social function?" In that essay she argues that "one of poetry's chief aims is to illumine the walls of mystery, the inscrutable, the unsayable." She goes on to say that poetry is "an opportunity to learn to live in doubt and uncertainty." Many of us pursue medicine in search of reason and precision, and some of our greatest challenges in medicine, and in life, are when things are uncertain. It is here that poetry might help us and our patients. This elective seminar explores poetry's relevance to health care including students, doctors, nurses, physician assistants, and our patients and their families. The relationship between poetry and science has a long, rich history including such greats as John Keats (1795–1821), Oliver Wendel Holmes (1809–1894) and William Carlos Williams (1883–1963). Today, the tradition of physician-poet lives on in the work of such contemporary authors as C. Dale Young, Raphael Campo, Michael Salcman, Jack Coulehan, Audrey Shafer, Molly O'Dell, Richard Berlin, and others. The false dichotomy between art and science is a modern concept. This course explores how poetry can inform our pursuits as practitioners. Six weeks, next to be offered January–March 2025, exact dates TBD. Open to fourth- and fifth-year M.D. students.

Seminar in Narrative Medicine: Close Reading and Reflective Writing This six-session seminar explores the vital connection between storytelling and the art of healing. Narrative medicine integrates the power of literature with the practice of medicine, enriching healthcare delivery, provider well-being, and the patient experience. We examine diverse works, including fiction and non-fiction in a variety of formats such as short stories, popular press, memoirs, and other illness narratives. We engage in reflective writing exercises inspired by these narratives, enabling participants to hone their voices while exploring the craft of storytelling. We learn how narrative medicine can: enhance patient care by cultivating deeper empathy, improving communication skills, and building stronger collaborative relationships; combat burnout by fostering resilience and helping participants find new meaning in their clinical practice; and encourage self-discovery by providing methods to explore personal experiences through reflective writing. Open to all medical students beyond second year and PA students. Director: A. Merritt

MICROBIAL PATHOGENESIS

BCMM 336E, 203.737.2404
https://medicine.yale.edu/micropath

Professors M. Cappello (*Pediatrics*), E. Fikrig (*Medicine*), J.E. Galan, A. Goodman (*Chair*), E. Groisman, B.I. Kazmierczak (*Medicine*), J. Liu, J. MacMicking, W.H. Mothes, C.R. Roy, R. Sutton (*Medicine*)

Associate Professors C. Ben Mamoun (*Medicine*), C.S. Dela Cruz (*Medicine*), Y. Ho, R. Johnson (*Medicine*), P. Kumar (*Medicine*), M. Lara-Tejero, E. Rego

Assistant Professors M. Laurent-Rolle (*Medicine*), H. Pi

Research Scientist P. Uchil

Associate Research Scientists K. Gupta, M. Kim, A. Krypotou, P. Kumar, D. Lee, W. Li, E. Park, Z. Qin, S. Steiner, C. Wang, D. Xu, S. Zhang

The following courses in the Graduate School of Arts and Sciences are open to medical students with permission of the DGS.

MBIO 530a/IBIO 530a/MCDB 530a, 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. Staff

MBIO 601b/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 of first-year Immunobiology students, first-year CB&B students, and training grant-funded postdocs. Staff

MBIO 670a, 671a, 672b, Laboratory Rotations Rotation in three laboratories. Required of all first-year graduate students. Y. Ho

MBIO 685b, The Biology of Bacterial Pathogens II 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. H. Rego

MBIO 686a, The Biology of Bacterial Pathogens I 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. J. Galan and M. Lara-Tejero

MBIO 700b, Seminal Papers on the Foundations of Modern Microbiology A required course for Microbiology first-year students; not for credit. 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. Kumar

MBIO 701a and 702b, 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 the student's own work before a sympathetic but critical audience and to familiarize the faculty with the research. P. Kumar

MBIO 703a and 704b, 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. Y. Ho

MBIO 734/GENE 734/MB&B 734, Molecular Biology of Animal Viruses Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. W. Mothes and M. Laurent-Rolle

MOLECULAR BIOPHYSICS AND BIOCHEMISTRY

336 Bass, 203.432.5662; SHM C106, 203.785.4935
https://mbb.yale.edu

Professors K.S. Anderson (*Pharmacology*), S.J. Baserga, S. Chang (*Laboratory Medicine*), E.M. De La Cruz, D.C. DiMaio (*Genetics*), D. Engelman, M.B. Gerstein, W.V. Gilbert, N.F. Grindley (*Emeritus*), M.W. Hochstrasser, J. Howard, M.R. Koelle, A.J. Koleske, W.H. Konigsberg (*Emeritus*), M. Lemmon (*Pharmacology*), I. Miller (*Pediatrics*), A.D. Miranker, K.M. Neugebauer, L.J. Regan (*Emeritus*), K.M. Reinisch (*Cell Biology*), D.G. Schatz (*Immunobiology*), C. Schlieker, R.G. Shulman (*Emeritus*), F.J. Sigworth (*Cellular and Molecular Physiology*), D.G. Söll (*Emeritus*), M.J. Solomon, J.A. Steitz, S.A. Strobel, K.R. Williams, Y. Xiong, C. Zimmer (*Adjunct*)

Associate Professors J. Berro, T.J. Boggon (*Pharmacology*), E. Karatekin (*Cellular and Molecular Physiology*), N. Malvankar, C. Schlieker, M. Simon, S. Takyar (*Medicine*), Y. Zhang (*Cell Biology*)

Assistant Professors F. Bleichert, A. Didychuk, L. Escobar-Hoyos (*Therapeutic Radiology*), L.C. Kabeche, W. Mi (*Pharmacology*), C. Paulsen, S. Tang, K. Zhang

Research Scientists W. Cao, E.J. Folta-Stogniew, D.A. Hiller, T.T. Lam, J. Lin, P. Podszywalow-Bartnicka, J.S. Rozowsky, C.V. Sindelar, K. Tycowski, G. Wang, J. Wang, S. Wu (*Pharmacology*), S. Yalcin

Associate Research Scientists D. Clarke, S. Devarkar, P. Emani, T. Galeev, Y. Ishchenko, S. Lou, V. Mondol, D. Ostapenko, Q. Rao, P. Subba, S. Sutradhar, S. Tausta

Lecturers N. Arshad (*Imunobiology*), A. Belperron (*Medicine*), T. Durant (*Laboratory Medicine*), A. Esterly (*Medicine*), B. Goldman-Israelow (*Medicine*), M. Laurent-Rolle (*Medicine*), C. S. Laxton (*Public Health*), S. Mousavi, K. Schilling, A. Siddon (*Laboratory Medicine*), J.M. Ueland, C. Wilen (*Laboratory Medicine*), S. Yalcin, H. Zapata (*Medicine*)

Research Professor D.G. Söll

MB&B 500a or b/MCDB 500a or b, 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. Staff

MB&B 517b/ENAS 517b/MCDB 517b/PHYS 517b, Methods and Logic in Interdisciplinary Research This half-term PEB class is intended to introduce students to integrated approaches to research. Each week, the first of two sessions is student-led, while the second session is led by faculty with complementary expertise and discusses papers that use different approaches to the same topic (for example, physical and biological or experiment and theory). Counts as 0.5 credit toward graduate course requirements. E. Carley, C. O'Hern

MB&B 520a, 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. E. Carley, C. O'Hern

MB&B 529b/PHAR 529b, Structural Biology and Drug Discovery A comprehensive introduction to the concepts and practical uses of structural biology and structural biology-related techniques in drug discovery. The first half of the course focuses on techniques used to discover and optimize small and macromolecule drugs. Students are introduced to topics such as small molecule lead discovery, X-ray crystallography, cryo-electron microscopy, and biophysical techniques. The first half of the course also includes a practical component where students conduct hands-on structural biology experiments and learn about biophysical techniques in a laboratory setting. The second half of the course focuses on drug discovery, particularly for protein kinases. It includes a field trip to the Yale Center for Drug Discovery, where the students are introduced to the in-house Yale screening facilities for small molecule drug discovery. Two half-credit courses—PHAR 530 and PHAR 531—are also offered for the two halves of PHAR 529. T. Boggon, Y. Ha

MB&B 545b, 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. J. Berro, A. Miranker

MB&B 561a/MCDB 561a/PHYS 561a, Modeling Biological Systems I Biological systems make sophisticated decisions at many levels. This course explores the molecular and computational underpinnings of how these decisions are made, with a focus on modeling static and dynamic processes in example biological systems. This course is aimed at biology students and teaches the analytic and computational methods needed to model genetic networks and protein signaling pathways. Students present and discuss original papers in class. They learn to model using MatLab in a series of in-class hackathons that illustrate the biological examples discussed in the lectures. Biological systems and processes that are modeled include: (1) gene expression, including the kinetics of RNA and protein synthesis and degradation; (2) activators and repressors; (3) the lysogeny/lysis switch of lambda phage; (4) network motifs and how they shape response dynamics; (5) cell signaling, MAP kinase networks and cell fate decisions; and (6) noise in gene expression. Prerequisites: MATH 115 or 116, BIOL 101–104, or with permission of instructors. This course also benefits students who have taken more advanced biology courses (e.g. MCDB 200, MCDB 310, MB&B 300/301). T. Emonet

MB&B 562b/AMTH 765b/CB&B 562b/ENAS 561b/INP 562b/MCDB 562b/PHYS 562b, Modeling Biological Systems II This course covers advanced topics in computational biology. How do cells compute, how do they count and tell time, how do they oscillate and generate spatial patterns? Topics include time-dependent dynamics in regulatory, signal-transduction, and neuronal networks; fluctuations, growth, and form; mechanics of cell shape and motion; spatially heterogeneous processes; diffusion. This year, the course spends roughly half its time on mechanical systems at the cellular and tissue level, and half on models of neurons and neural systems in computational neuroscience. Prerequisite: a 200-level biology course or permission of the instructor. T. Emonet

MB&B 565b, Biochemistry and Our Changing Climate Climate change is impacting how cells and organisms grow and reproduce. Imagine the ocean spiking a fever: cold-blooded organisms of all shapes, sizes, and complexities struggle to survive when water temperatures go up two–four degrees. Some organisms adapt to extremes, while others cannot. Predicted and observed changes in temperature, pH, and salt concentration do and will affect many parameters of the living world, from the kinetics of chemical reactions and cellular signaling pathways to the accumulation of unforeseen chemicals in the environment, the appearance and dispersal of new diseases, and the development of new foods. In this course, we approach climate change from the molecular point of view, identifying how cells and organisms—from microbes to plants and animals—respond to changing environmental conditions. To embrace the concept of "one health" for all life on the planet, this course leverages biochemistry, cell biology, molecular biophysics, and genetics to develop an understanding of the impact of climate change on the living world. We consider the foundational knowledge that biochemistry can bring to the table as we meet the challenge of climate change. Prerequisites: MB&B 500, MB&B 600, and MB&B 601, or permission of the instructor. K. Neugebauer

MB&B 591a/ENAS 991a/MCDB 591a/PHYS 991a, Integrated Workshop This required course for students in the PEB graduate program involves a series of modules, co-taught by faculty, in which students from different academic backgrounds and research skills collaborate on projects at the interface of physics, engineering, and biology. The modules cover a broad range of PEB research areas and skills. The course starts with an introduction to MATLAB, which is used throughout the course for analysis, simulations, and modeling. Y. Luo

MB&B 600a, Principles of Biochemistry I Discussion of the physical, structural, and functional properties of proteins, lipids, and carbohydrates, three major classes of molecules in living organisms. Energy metabolism, hormone signaling, and muscle contraction as examples of complex biological processes whose underlying mechanisms can be understood by identifying and analyzing the molecules responsible for these phenomena. M. Simon, M. Koelle, C. Paulsen

MB&B 601b, Principles of Biochemistry II A continuation of MB&B 600 that considers the chemistry and metabolism of nucleic acids, the mechanism and regulation of protein and nucleic acid synthesis, and selected topics in macromolecular biochemistry. C. Schlieker, K. Neugebauer, F. Bleichert

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. Prerequisites: none, but some knowledge of basic cell biology and biochemistry is assumed. Students who have not taken courses in these areas can prepare by reading relevant sections in basic molecular cell biology texts. We recommend Pollard et al., *Cell Biology* (3rd ed., 2016), Alberts et al., *Molecular Biology of the Cell* (6th ed., 2014), or Lodish et al., *Molecular Cell Biology* (8th edition, 2016). T. Melia

MB&B 625a/GENE 625a/MCDB 625a, 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. J. Lu

MB&B 630b/MCDB 630b, Biochemical and Biophysical Approaches in Molecular and Cellular Biology This 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 BQBS graduate students. S. Nachtergaele, J. Yan

MB&B 635a/ENAS 518a, Quantitative Approaches in Biophysics and Biochemistry The course offers an introduction to quantitative methods relevant to analysis and interpretation of biophysical and biochemical data. Topics covered include statistical testing, data presentation, and error analysis; introduction to dynamical systems; analysis of large datasets; and Fourier analysis in signal/image processing and macromolecular structural studies. The course also includes an introduction to basic programming skills and data analysis using MATLAB. Real data from research groups in MB&B are used for practice. Prerequisites: MATH 120 and MB&B 600a or equivalents, or permission of the instructors. J. Berro, N. Malvankar, Y. Xiong

MB&B 676b, Responsible Conduct of Research Designed for students who are beginning to do scientific research. The course seeks to describe some of the basic features of life in contemporary research and some of the personal and professional issues that researchers encounter in their work. Approximately six sessions, run in a seminar/discussion format. Required of all first-year BQBS graduate students. Staff

MB&B 710b/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. J. Zhang

MB&B 711b/C&MP 711b, Practical cryo-EM Workshop This laboratory course provides hands-on training in the practical aspects of macromolecular structure determination by cryo-electron microscopy (cryo-EM). Topics include cryo-EM data collection, image preparation and correction, single-particle picking and 2-D classification, 3-D classification, refinement and post-processing, model building, refinement and evaluation. The course includes training in the use of computer programs used to perform these calculations. Prerequisite: MB&B 710/C&MP 710. Y. Xiong, F. Bleichert

MB&B 720a, Macromolecular Structure and Biophysical Analysis An in-depth analysis of macromolecular structure and its elucidation using modern methods of structural biology and biochemistry. Topics include architectural arrangements of proteins, RNA, and DNA; practical methods in structural analysis; and an introduction to diffraction and NMR. Prerequisites: physical chemistry (may be taken concurrently) and biochemistry. Y. Xiong, J. Howard, S. Tang, F. Bleichert

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 BQBS. M.J. Solomon, W. Gilbert, C. Paulsen, M. Simon

MB&B 734b/GENE 734b/MBIO 734b, Molecular Biology of Animal Viruses Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. W. Mothes, M. Laurent-Rolle

MB&B 743b/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. Staff

MB&B 752b and MB&B 753b and MB&B 754b/CB&B 752b/CPSC 752b/MCDB 752b, Biomedical Data Science: Mining and Modeling Biomedical data science encompasses the analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. It represents a major practical application for modern techniques in data mining and simulation. Specific topics to be covered include sequence alignment, large-scale processing, next-generation sequencing data, comparative genomics, phylogenetics, biological database design, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, normalization of microarray data, mining of functional genomics data sets, and machine-learning approaches to data integration. Prerequisites: biochemistry and calculus, or permission of the instructor. M. Gerstein and M. Simon

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. Baserga, W. Konigsberg

NEUROLOGY

LLCI 910, 203.737.1860
https://medicine.yale.edu/neurology

Professors L.M. Airas (*Adjunct*), T. Allison (*Emeritus*), J.M. Baehring, H. Blumenfeld, J. Booss (*Emeritus*), S.D. Dib-Hajj, H. Feldman (*Adjunct*), R.K. Fulbright (*Radiology and Biomedical Imaging*), C.H. Gottschalk, J. Grutzendler, F. Hafferty (*Adjunct*), D. Hafler (*Chair*), L.J. Hirsch, B. Jabbari (*Emeritus*), J.D. Kocsis, V. K. Kuchroo (*Adjunct*), S. Lipton (*Adjunct*), R.H. Mattson (*Emeritus*), L.R. Ment (*Pediatrics*), D.S. Navaratnam, A. Omuro (*Adjunct*), H.S. Patwa, O. C. Petroff (*Emeritus*), J.W. Prichard (*Emeritus*), P. Rakic (*Neuroscience*), D. Reich (*Adjunct*), M. Sasaki (*Adjunct*), C. Scherzer, J. Schindler, J. Seibyl (*Adjunct*), B.A. Shaywitz (*Pediatrics*), K.N. Sheth, S. Spudich, S.M. Strittmatter, J. Thomas, M. Treggiari (*Adjunct*), C.H. Van Dyck (*Psychiatry*), S. Waxman, S. Zivkovic

Associate Professors H.H. Altalib, N. Bamford, T. Belliveau, C. Benjamin, T. Biederer, F.C. Brown, W. Cafferty, S.S. Chandra, A. de Havenon, K. Destefano, D. DiCapua, G. Falcone, S. Ghosh, E. Gilmore, D. Hwang (*Adjunct*), C. Ionita, S. Kadimi, B. Keung, B. Khokhar (*Adjunct*), V. Knight (*Pediatrics*), B. Koo, H. Krestel (*Adjunct*), E. Longbrake, N. Makhani (*Pediatrics*), D. Matuskey (*Radiology and Biomedical Engineering*), J. Moeller, S. Novella, R. Nowak, K.C. O'Connor, A. Patel, N.H. Petersen, D. Pitt, I.H. Quraishi, S. Rangaraju, B. Roy, V. Santini, E. Sharp, J. Sico, A. Sivaraju, S. Tinaz, H. Tokuno, B. Tolchin, T. Toothaker, S. Towns, D.C. Volpe, D.M. Zagar, H.P. Zaveri

Assistant Professors S. Atta, M. Barden, R. Beekman, T. Bilchik, N. Blondin, S. Brinker (*Adjunct*), Y. Cardenas Castillo, C.I. Carrion, V. Cooper, K.V. Desai, J. Dewey, M. Dhakar (*Adjunct*), M. Dominguez-Villar (*Adjunct*), M. Dorotan, L. Driskell, S. Elnazar, S. Epstein, S. Farhadian (*Medicine*), A. Fesharaki-Zadeh (*Psychiatry*), A.A. Fisayo, M. Fong (*Adjunct*), R. Forman, C. Fredericks, N. Gaspard (*Adjunct*), J. Giles, P. Gopal (*Pathology*), A. Grinberg, R. Gunasekara, B. Hameed, H. Hawong, A. Herlopian, S.E. Holmes (*Psychiatry*), O. Honmou (*Adjunct*), A.S. Jasne, J. Kim, S. Krishnakumar, M. Landreneau, K. Le, C. Loomis, C.B. Maciel (*Adjunct*), J. Magid-Bernstein, D. Matuskey (*Radiology and Biomedical Imaging*), M. McCauley, K. Medin, A. Meyer (*Adjunct*), G. Mills, N. Mishra, R. Narula, J.P. Ney, S. Park, B. Patedakis Litvinov, A. Perez, J. Peters, M. Prust, K. Raddassi (*Adjunct*), A. Rashid (*Psychiatry*), M. Rosen (*Orthopaedics and Rehabilitation*), L. Ruiz, A. Rusk, S. Sanamandra, S. Schaefer, E. Schindler, R. Sharma, Z.B. Sheikh (*Adjunct*), R. Shirane, T. Sumida, N. Sunmonu, C. Traner, B. Tseng, N. Tzikas, U. Usman, A. Vives-Rodriguez, L. Zhang, A. Zubair

Instructors J.M. Cedarbaum, K. Holroyd, Z. Lin, L. McAlpine, L. O'Keefe, M. Sharma

Senior Research Scientist/Scholar C.M. Viscoli (*Medicine*)

Research Scientists J. Bai, X. Cheng, M. Estacion

Associate Research Scientists C. Benson, G. Bories, Y. Cai, Y. Chan, C. Chen, V. D J, R. Duckrow, C. Espinosa-Garcia, M. Gopaul, D. Griffith, C. He, I. Kondratiuk, P. Kumar, R. Kumari, K. Lankford, S. Lee, G. Masi, M. Matos, B. Schulman, L. Simoes Braga Boisserand, M. Skarica, U. Srivastava, A.M. Szekely, L. Tong, T. Vasylyev, N. Wang, B. Weykopf, S.S. Yandamuri, Y. Yasumizu, P. Zhao

Clinical Professors R. Lesser (*Ophthalmology and Visual Science*), S. Levy (*Pediatrics*)

Associate Clinical Professors J.L. Gross, D. Rosenblum (*Orthopaedics and Rehabilitation*), N. Werdiger

Assistant Clinical Professors A. Adlakha, S. Ali, M. Bailey, J. Guarnaccia, D. Richardson, D. Russell (*Psychiatry*), K. Sena, M.J. Stransky

Lecturer L. Bandaru

Clerkship

Medical Approach to the Patient Clerkship This twelve-week integrated block is composed of Internal Medicine and Neurology rotations. The course is structured to give clerkship students in-depth experience with the diagnosis and management of adult medical issues. Because of the significant clinical overlap between internal medicine and neurology, these two disciplines are combined to form the MAP experience. Student will rotate through eight weeks of internal medicine and four weeks of neurology during their MAP experience. In addition to rotation-specific didactics, students will attend the "Top Ten" series of didactics throughout their MAP block, covering common chief complaints that encompass diagnoses specific to internal medicine and neurology.

Electives

Neurology AXONS Longitudinal Elective This year-long elective provides mentorship and exposure to careers in neurology. Students participate in monthly group meetings and periodic mentorship meetings throughout the course of the year, as well as engage in a scholarly activity on their own time. Meetings address the skills necessary for scholarly work in neurology, various aspects of applying for neurology residency, and information regarding careers in neurology. Participating students are matched with near-peer as well as faculty mentors to assist in their residency/career preparation. In addition, students have the opportunity to participate in clerkship educational activities and develop their skills as clinician educators. Credit for this elective is based on completion of activities using a points system. This elective is graded Pass/Fail.

Neurology Clinical Elective (Tailored) Students work 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 are provided, and the student also participates in departmental conferences and seminars. An assessment of history taking, neurological examining skills, and problem assessment is performed by an attending faculty member with each student. 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. Prerequisite: completion of the neurology portion of Medical Approach to the Patient.

Neurology Consult Service Elective Under the supervision of the neurology consult resident and attending physician, students evaluate patients referred for neurologic consultation from other inpatient services at Yale New Haven Hospital. Students also participate in academic activities of the department. Open to fourth- and fifth-year students only.

Neurology Ward Service Elective Under appropriate supervision, students directly examine, diagnose, and manage patients on the neurology ward service at Yale New Haven Hospital; attend daily teaching rounds; and attend a series of special didactic conferences on the most important topics in neurology. Open to fourth- and fifth-year students only.

Subinternship

Neurology Subinternship This advanced elective offers students the opportunity to work at a higher level of independence and responsibility equivalent to that of an intern on the neurology ward service at Yale New Haven Hospital. Working with attending faculty, senior and junior residents, and support staff, students directly examine, diagnose, and manage patients and attend daily teaching rounds, special didactic conferences, and seminars on the most important topics in neurology. Students hone their ability to obtain an accurate neurological history, perform and interpret a neurological examination, recognize the appropriate indications for ordering laboratory studies, and interpret the results of these studies, including EEG, EMG, nerve conduction studies, evoked potentials, lumbar puncture, and CT and MR imaging of the brain and spinal cord. The goal is for the student to recognize and understand less common neurological problems, including multiple sclerosis, Parkinson's disease and other movement disorders, neuromuscular diseases, dementia, central nervous system infections, and tumors of the nervous system. At times, other customized subinternships may be designed with the program director in areas such as epilepsy, stroke, movement disorders, neuromuscular medicine, neuroimmunology, and neurocritical care. Prerequisite: completion of the neurology portion of Medical Approach to the Patient.

NEUROSCIENCE

SHM C303, 203.785.4323
https://medicine.yale.edu/neuroscience

Professors A.T. Arnsten, H. Blumenfeld (*Neurology*), D. Colón-Ramos, K.P. Cosgrove (*Psychiatry*), M.C. Crair, P. De Camilli, J.B. Demb (*Ophthalmology and Visual Science*), R. DiLeone (*Psychiatry*), J.E. Gelernter (*Psychiatry*), C.A. Greer, J. Grutzendler (*Neurology*), M. Gunel (*Neurosurgery*), M. Hammarlund, J. Hirsch (*Psychiatry*), T.L. Horvath (*Comparative Medicine*), Y. Jiang (*Genetics*), E.A. Jonas (*Medicine*), J. Kocsis (*Neurology*), A.J. Koleske (*Molecular Biophysics and Biochemistry*), J.H. Krystal (*Psychiatry*), D. Lee, C. Li (*Psychiatry*), A. Louvi (*Neurosurgery*), D.A. McCormick (*Emeritus*), M.N. Nitabach (*Cellular and Molecular Physiology*), J. Noonan (*Genetics*), G.D. Pearlson (*Psychiatry*), M. Picciotto (*Psychiatry*), V. Pieribone (*Cellular and Molecular Physiology*), M.N. Potenza (*Psychiatry*), P. Rakic, J. Santos-Sacchi (*Surgery*), M.L. Schwartz (*Emeritus*), N. Sestan, R. Sinha (*Psychiatry*), S.M. Strittmatter, J. Taylor (*Psychiatry*), S. Tomita, F. Vaccarino (*Child Study Center*), C.H. Van Dyck (*Psychiatry*), S. Waxman (*Neurology*), D. Zenisek (*Cellular and Molecular Physiology*), Z. Zhou (*Ophthalmology and Visual Science*)

Associate Professors T. Biederer (*Neurology*), C. Bruce, W. Cafferty (*Neurology*), J.A. Cardin, S.S. Chandra, M. Dietrich (*Comparative Medicine*), G. Dragoi (*Psychiatry*), S. Ferguson (*Cell Biology*), E. Gracheva, A.R. Gupta (*Pediatrics*), M.J. Higley, E. Hoffman (*Child Study Center*), I. Kim (*Ophthalmology and Visual Science*), C. Kwan (*Psychiatry*), I. Levy (*Comparative Medicine*), J. Lim, D.S. Navaratnam (*Neurology*), H. Seo (*Psychiatry*)

Assistant Professors R. Chang, E. Damisah (*Neurosurgery*), E. Favuzzi, T. Geiller, J. Guo, M. Jadi (*Psychiatry*), J. Jeanne, L. Liang, J. Murray (*Psychiatry*), A. Nandy, K. Pattabiraman (*Child Study Center*), G. Santpere Baro (*Adjunct*), S. Yogev, L. Zhang (*Neurology*)

Senior Research Scientists N. Carnevale, M. Hines, M.L. Schwartz, J. Verhagen, M. Wang

Research Scientists J. Arellano, A. Duque, J. Greenwood, V. Luria, Y. Morozov, L. Shao, Y. Wu

Associate Research Scientists A. Alshuwaykh, C. Butan, P. Charbogne, X. Chen, C. Chiu, S. Emerson, K. Ferguson, K.T. Gobeski, R.H. Goodman, J. Gupta, M. Hanna, R. Kannan, N. Kaur, N. Khan, S. Kim, M.A. Kostylev, R. Kovner, H. Li, N. Matsumoto, N. Micali, J. Milani Scorisa Salgado, T. Morse, Q. Perrenoud, C. Qi, P.S. Shamble, M. Shibata, S. Sindhu, H. Snell, D. Spergel, Y. Sun, H. Takahashi, J. Tavares Da Silva Pereira, A. Ugar Orman, X. Wang, L. Wei, S.A. Wilson, P. Xu, S. Yang, Q. Zhao

The interdisciplinary research programs of Yale neuroscience faculty are central to Yale's Interdepartmental Neuroscience Program (INP). This unique, broad-based training

program is best described as a "department without walls," with the primary purpose of providing students with a maximum of diversity and depth in the most important areas of neuroscience research. The training program draws on the knowledge and expertise of more than 100 faculty members, representing more than twenty departments in both the Faculty of Arts and Sciences and the School of Medicine, ranging from psychiatry to pharmacology, from cell biology to computer science. Although each faculty member has strong department affiliations, the INP faculty functions as a cohesive and collaborative unit whose aim is to foster in graduate students an appreciation of and familiarity with the breadth of neuroscience and to create an environment in which students are encouraged to study problems from several perspectives.

The INP seeks to produce neuroscientists with both specialized knowledge and a broad-based understanding of the discipline. This is accomplished in part through a core curriculum which is designed to ensure a comprehensive understanding of modern neuroscience. For more information on courses and on requirements for the combined M.D.-Ph.D. degree program, see Interdepartmental Neuroscience Program in the Graduate School of Arts and Sciences bulletin (https://catalog.yale.edu/gsas).

NEUROSURGERY

TMP 4, 203.785.3275
https://medicine.yale.edu/neurosurgery

Professors J.M. Baehring (*Neurology*), R. Bindra (*Theraputic Radiology*), H. Blumenfeld (*Neurology*), A. Bordey, R. Bronen (*Radiology and Biomedical Imaging*), V. Chiang, E. Claus (*Public Health*), R. Constable (*Radiology and Biomedical Imaging*), N.C. DeLanerolle (*Emeritus*), M. DiLuna, C. Duncan (*Emeritus*), T. Eid (*Laboratory Medicine*), C.A. Greer, M. Gunel (*Chair*), J. Kveton (*Surgery*), C. LaMotte (*Emeritus*), A. Louvi, A. Malhotra (*Radiology and Biomedical Imaging*), E. Mendel, J. Piepmeier (*Emeritus*), S. Schiff, J. Schindler, N. Sestan (*Neurology*), K.N. Sheth, D. Spencer (*Emeritus*), R. Verhaak, J. Zhou

Associate Professors K. Bilguvar (*Adjunct*), S. Chen (*Genetics*), J.T. King, C. Matouk, K. Mishra, J. Moliterno Gunel, S. Omay

Assistant Professors F. Bahrassa, T. Barak, J. Bartolomei, A. Cagalayan (*Adjunct*), E. Damisah, P. Doherty, E. Erson Omay, K. Firouzi (*Adjunct*), M. Gupta, R. Hebert, K. Kahle (*Adjunct*), H. Kaymakcalan Celebiler (*Adjunct*), L. Kolb, M. Laurans, P. Shear, K. Wu, J. Yeung

Senior Research Scientists N.C. DeLanerolle, C. Duncan, D. Spencer

Research Scientists K.C. Johnson, K. Yasuno

Associate Research Scientists S. Amin, J. Antonios, M. Apuzzo, S. Coskun, J. Davis, A. Elsamadicy, A. Ercan-Sencicek, O. Henegariu, M. Javanbakht Movassagh, H. Lin, E. Martin-Lopez, Z. Meng, R. Mulondo, S. Nishimura, M. Osman, S. Robert, Y. Takeo, A. Whelan, Y. Xu, K. Yalcin

Assistant Clinical Professor P. Dickey

Associate Professor Adjunct of Research H.P. Zaveri (*Neurology*)

Subinternship

Neurosurgery Subinternship The subinternship allows senior medical students the opportunity to vastly extend their breadth of knowledge of neurological diseases and how they are managed both surgically and nonsurgically. Subinterns function essentially as a supervised intern, working closely with the cohesive group of mid-level providers, residents, and attending physicians in the inpatient, outpatient, and operating room settings. Subinterns are expected to participate in the evaluation and management of assigned patients, pre-round with writing of ICU notes, make rounds and attend clinics, assist in ICU procedures and surgeries, and attend academic conferences. Subinterns are expected to present their scholarly work at one of our academic conferences. The service is a busy one, and subinterns will have a wide range of surgical and clinical experiences. Examples of surgeries frequently encountered include, but are not limited to, aneurysm surgery with craniotomy or endovascular coiling or stenting; carotid endarterectomy; pediatric skull and spine reconstruction and repairs; brain tumor surgery, including awake craniotomy, epilepsy surgery, transnasal surgery, and deep brain stimulation; and spine surgery, including minimally invasive and deformity correction surgery.

OBSTETRICS, GYNECOLOGY, AND REPRODUCTIVE SCIENCES

FMB 307, 203.785.4212
https://medicine.yale.edu/obgyn

Professors V.M. Abrahams, A.M. Arici, M. Azodi, M.O. Bahtiyar, J.A. Copel, T. D'Hooghe (*Adjunct*), P. Dottino, A.J. Duleba (*Adjunct*), O. Harmanli, R.B. Hochberg (*Emeritus*), T.L. Horvath (*Comparative Medicine*), Y. Huang, P. Hui (*Pathology*), J.L. Illuzzi, Y. Jiang (*Genetics*), M. Khokha (*Pediatrics*), C. Leranth, H. Lin (*Cell Biology*), H. Lipkind (*Adjunct*), C.J. Lockwood (*Adjunct*), W.E. Longo (*Surgery*), T. Madden, U. Magriples, S. Munne, K. Oktay (*Adjunct*), M.J. Paidas (*Adjunct*), L. Pal, S. Pecorelli (*Adjunct*), A. Pellicer Martinez (Adjunct), C.M. Pettker, M. Polan, E. Ratner, U.M. Reddy (*Adjunct*), A.D. Santin, P.M. Sarrel (*Emeritus*), P.E. Schwartz (*Emeritus*), R. Scott (*Adjunct*), D.B. Seifer, E.U. Seli, H.S. Taylor (*Chair*), S. Thung, K. Yonkers (*Psychiatry*), H. Zhang (*Public Health*)

Associate Professors S. Abdel-Razeq, R.S. Bercik, K. Campbell, S. Cross, G.S. Daftary (*Adjunct*), V. Desai (*Adjunct*), M. Fishman, C. Flannery, F. Galerneau, J.B. Henrich (*Medicine*), G. Huang, A. Kallen (*Adjunct*), Y. Konnikova (*Pediatrics*), K. Lawrence, B. Lesch (*Genetics*), D. Li (*Adjunct*), A. Merriam, V. Parkash (*Pathology*), L. Rickey (*Urology*), D. Sakkas (*Adjunct*), S.S. Sheth, D.H. Stitelman (*Surgery*), M. Son (*Adjunct*), A. Turitz, A.V. Vash-Margita, S.D. Whirledge, J. Wong, X. Xu (*Adjunct*), Y. Yang, L. Zamore

Assistant Professors O. Adeyemo, G. Altwerger, V. Andikyan, S. Andiman, L. Bazzett-Matabele (*Adjunct*), I.K. Berrahou, S.P. Bowers, J. Chung (*Cellular and Molecular Physiology*), M.B. Clark, A. Denoble, L.L. Fan, V. Flores (*Adjunct*), D. Garg, O. Grechukhina, C. Halicigil, T. Huynh, S. Jasani, R. Kaza, K. Kohari, M. Lalioti (*Adjunct*), A.M. Larorwitz, E. Lee (*Adjunct*), W. Mak (*Adjunct*), M. McAdow, N. Miller, A. Mor (*Adjunct*), L. Moroz, K. O'Donnell, K. Papatla, S. Pathy, M. Rainford, N.E. Ringel, F. Seifi, J. Sheu, A.K. Smith, W. Soble, B. Sozen (*Genetics*), R. Tal, M. Tong, E.A. Topran

Instructors E. Dave, J. Ding, M. Greenman, H. Hosier, A. Huber, A. Igeh, C. Liao, B. McNamara, L. Mutlu, R. Seaman, C. Sinnott, B. St. Martin, S. Stammler, S.K. Stortz, L. Sweeney, M. Volovsky, V. Wesevich, L. Yang

Senior Research Scientists X. Gao (*Comparative Medicine*), S.M. Guller, R.B. Hochberg, P.E. Schwartz, N.S. Stachenfeld

Research Scientists H.J. Kliman, G. Krikun, Z. Lin, R. Mamillapalli

Associate Research Scientists A. Ayaz, M. Basar, S. Bellone, O. Chaplia, J.F. Culhane, T. Hartwich, L. Lundsberg, S. Nichols-Burns, A. Tal, E. Unsal, Y. Zhu

Clinical Professors V. Lynch, M. Minkin, H. Sauer, R. Stiller, S. Vermund (*Public Health*)

Associate Clinical Professor R. Auerbach, S. Casper, R. Cwik, S. Fleischman, T. Hanson, R. Kaump, G. Kleinman, R. Moscarelli, N. Ravski, S. Richman, M. Silvestri

Assistant Clinical Professors A. Acharya, N. Achong, A. Chelouche, R. Chosak, J. Cuteri, R. Deal, M. Dube, T. Firoz (*Medicine*), S. Flaherty, K. Fletcher, S.M. Kashani, J. Laifer, S. Laifer, D. Lima, R. O'Sullivan, L. Plisic, R. Pringle, M. Reel, B. Rigney, T. Spurrell

Clinical Instructors R.C. Abder, E. Ackley, M. Asis, K. Aversa, T. Aziz, M. Baumbusch Brooks, E. Blair, C. Boeras, R. Choudhary, C. Cookson, R. Datar, G. Dunston-Boone, A. Edusa, J.A. Ferrentino, K.M. Goins, M. Haynes, T. Hoerle, C. Huttler, J. Jaggi, S. James-Conterelli, D. Kopel, L.A. Licare, G. Lynch, B. Maloy, M. Murray, M. Nwosu, K. Rath, A. Rauktys, M. Rhee, N. Rivera, A.B. Rostkowski, J. Shih, M. Sivkin, O. Sobh, M. Speranza, S. Tandon, K. Thomas, D. Tonzola, M. Torbey, J.M. Tornatore, K. Wright

Clerkship

Women's and Children's Health Clerkship This is a twelve-week integrated clerkship block that combines Pediatrics with Obstetrics and Gynecology (OB/GYN). The combination of these two disciplines allows students to experience and appreciate the continuum in health between women and children. Students experience this interconnectedness through their clinical encounters, integrated didactics, and a combined postcede at the end of the integrated clerkship block.

Elective

Gynecologic Oncology Elective The purpose of the gynecologic oncology elective is to enhance the student's knowledge of the diagnosis and management of women with gynecologic malignancies. The course is offered to one student at a time for two weeks. 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. The student is assigned to the operating room, especially to assist the patient whom he or she has evaluated. In addition to operating room exposure, extensive experience is gained in the post- operative management of these patients. The student has the option to request a day in the ambulatory setting where the student is exposed to the outpatient management of cancer, chemotherapy, and colposcopy. On a weekly basis, students attend divisional teaching sessions as well as the multi-discipline tumor conference. There is no night call on this elective. The recommended text for this elective is *Clinical Gynecologic Oncology* (DiSaia).

Pediatric and Adolescent Gynecology Elective This two-week elective provides hands-on experience in Pediatric and Adolescent Gynecology in both inpatient and outpatient clinical settings. In the mornings, students attend rounds with supervising attending and Ob/Gyn & Pediatric and/or pediatrics residents. Students are exposed to acute common as well as rare pediatric and adolescent gynecologic disorders. The student obtains

histories and performs examinations on newly admitted patients or consult patients. Bedside discussions regarding diagnosis, work up and treatment are encouraged. The student mainly works in the Pediatric and Adolescent Gynecology consultation service and outpatient clinics. The consultation service exposes the student to various acute conditions in Pediatric and Adolescent Gynecology. The elective is generally exposed to a mixture of outpatient and inpatient clinical care in Pediatric Gynecology with exposure to pediatric surgery, urology, and endocrinology. Prerequisite: core Ob/Gyn clerkship.

Subinternships

Gynecologic Oncology Subinternship The purpose of the gynecologic oncology subinternship is to enhance the student's knowledge of the diagnosis and management of women with gynecologic malignancies. The student is exposed to all modalities of treatment for gynecologic malignancies including radical gynecological surgery, chemotherapy, and radiation therapy. The student is expected to be an integral part of the team in the management of the patients admitted to the service. The student admits patients and takes part in their care throughout the subinternship 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 multidiscipline tumor conference. There is no night call. The recommended text is *Clinical Gynecologic Oncology* (DiSaia). Prerequisite: core Ob/Gyn clerkship.

Maternal Fetal Medicine Subinternship The Maternal Fetal Medicine division offers a four-week, high-risk obstetrics subinternship 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 an evidence-based case review to members of the MFM division. Prerequisite: core Ob/Gyn clerkship. Students are expected to work two weekend days of their choice.

Pediatric and Adolescent Gynecology Subinternship This four-week subinternship provides hands-on experience in pediatric and adolescent gynecology in both inpatient and outpatient clinical settings. In the mornings, students attend rounds with the supervising attending physician and residents. Students are exposed to acute common as well as rare pediatric and adolescent gynecologic disorders and can expect to participate in the care of girls and adolescent females with vulvar conditions, abnormal pubertal development, bleeding disorders, gastrointestinal diseases, reproductive issues stemming from endocrine disorders (PCOS and others), collagen vascular disorder, developmental and physical delays, disorders/differences of sexual development, and postoperative complications. Students obtain histories and perform examinations on newly admitted patients

or consult patients. Bedside discussions regarding diagnosis, work up, and treatment are encouraged. Prerequisite: core Ob/Gyn clerkship.

Reproductive Endocrinology and Infertility Subinternship The Reproductive Endocrine and Infertility (REI) division offers a four-week subinternship for fourth- and fifth-year students. In addition to gaining knowledge of human reproductive endocrine function, students are introduced to disruptions in physiology and function, which can lead to endocrinological and infertility disorders. Common problems seen in REI practice include female and male infertility, recurrent pregnancy loss, polycystic ovarian syndrome, anovulation, amenorrhea, endometriosis, chronic pelvic pain, abnormal uterine bleeding, and uterine leiomyomas. Exposure to Advanced Reproductive Technologies (ART) is integrated into this subinternship. 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: core Ob/Gyn clerkship.

Urogynecology and Reconstructive Pelvic Surgery Service Subinternship Offered by the Section of Urogynecology and Reconstructive Pelvic Surgery. Students are taught about the normal and abnormal physiology and function of the female pelvic floor and are introduced to the diagnosis and management of female pelvic floor disorders, namely lower urinary tract disorders, pelvic organ prolapse, and defecatory disorders. Common problems encountered by urogynecologists include urinary incontinence, recurrent urinary tract infections, cystocele, rectocele, uterine prolapse, vaginal vault prolapse after hysterectomy, microscopic hematuria, dyspareunia, interstitial cystitis, anal incontinence, and constipation. Exposure to advanced pelvic floor reconstructive surgery is also integrated into this elective. In addition to clinical activities in the office and the hospital, students have the opportunity to attend section didactics. Evaluation is based on clinical performance in the office and the operating room, participation in didactics, and an evidence-based presentation on a urogynecology topic of interest. Prerequisite: core Ob/Gyn clerkship.

OPHTHALMOLOGY AND VISUAL SCIENCE

40 Temple Street, 3rd floor, 203.785.2020
https://medicine.yale.edu/eyes

Professors R. Adelman (*Emeritus*), M. Coca-Prados (*Emeritus*), M.C. Crair (*Neuroscience*), B.M. DeBroff, L.V. Del Priore (*Chair*), J.B. Demb, S.H. Forster (*Emeritus*), M.L. Sears (*Emeritus*), M. Shields (*Emeritus*), D. Silverstone, J.H. Sinard (*Pathology*), V. Vasiliou (*Public Health*), C.J. Zeiss (*Comparative Medicine*), D. Zenisek (*Cellular and Molecular Physiology*), Z. Zhou

Associate Professors J.H. Chow, M. Fields, K. Harris Nwanyanwu, J.J. Hoh (*Public Health*), M. Howard, J.E. Kempton, I. Kim, J. Liu, J.F. Martone, K.M. Stoessel, C. Teng

Assistant Professors M. Bakhoum, V. Diaz, M. DiStasio (*Pathology*), A.A. Fisayo (*Neurology*), B. Hafler, A. Hwang, P. Kang, M. Kibe, A.A. Kohli, N. Kombo, M. Maeng, A. Musto, S. Palioura (*Adjunct*), J. Rotruck, S. Sarrafpour, M. Tahvildari, E. Walsh, Y. Wang

Instructors L. Barnard, V. Rana, E. Volker

Research Scientists H. Cai, S. Lee

Associate Research Scientists Q. Chen (*Biomedical Informatics and Data Science*), Z. Chen, J. Gong, S. Miller, H. Song, X. Yin

Clinical Professors I. Abrams, R. Lesser

Elective

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 on a topic in ophthalmology 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 West Haven VA Eye Clinic, and the Cornell Scott-Hill Health Center. Prerequisite: second-year ophthalmology module or equivalent.

ORTHOPAEDICS AND REHABILITATION

47 College Place, 203.785.2579
https://medicine.yale.edu/ortho

Professors C. Allen, M.R. Baumgaertner, C.G. Carpenter (*Emeritus*), T. Carpenter (*Pediatrics*), D.R. Cooperman, G. Friedlaender, J. Fulkerson, J. Grauer, A.H. Haims (*Radiology and Biomedical Imaging*), M. Horowitz (*Emeritus*), P. Jokl (*Emeritus*), M. Lattanza (*Chair*), F.Y. Lee, C. Liu, M.J. Medvecky, M.M. Panjabi (*Emeritus*), R.R. Pelker (*Emeritus*), T.S. Renshaw (*Emeritus*), P.G. Whang

Associate Professors R. Aslam, C. Franklin, E. Gardner, D. Gibson, M.P. Leslie, D.M. Lindskog, I.C. Oh, L. Rubin, A. Socci, C.R. Swigart, D. Wiznia, B. Yoo

Assistant Professors K. Donohue, M. Dundas, A. Eslam Pour, B. Fram, D. Frumberg, A. Gianakos, A. Halim, L. Hanke, J. Hankenson, T. Hickernell, E. Holder, A. Jimenez, M. Li, X. Luo, I. Molloy, N. Morgado-Vega, C.A. Odonkor, S. Peden, R. Raju, R. Ramirez, M. Riedel, M. Rosen, D. Rubio, C. M. San Juan, S. Smith, T. Tokarz, D. Tuason, A. Varthi

Instructors A. Brzezinski, Y. Ogura, S.E. Rizzo, S. Sabzevari, S. Surucu

Senior Research Scientist M. Horowitz (*Orthopaedics and Rehabilitation*)

Research Scientist W. Fu, S. Tommasini

Associate Research Scientist D. Buono (*Psychiatry*), X. Kong, L. Moradi, X. Zhao, R. Zhou

Associate Clinical Professor D. Rosenblum

Assistant Clinical Professor R. Bernstein, S. Brown, R. Katz, K. Kramer, A. Reznik, J. Sumner

Lecturer A. Glennon

Elective

Interdisciplinary Musculoskeletal Care Elective Disorders and diseases of the musculoskeletal system are a leading cause of pain, physical disability, and doctor visits throughout the world, but physicians have historically received inadequate training during medical school on how to examine, diagnose, and manage these conditions. This four-week elective provides medical students with an experience of a multidisciplinary approach to care for patients with musculoskeletal diseases and disorders. Medical students who elect to take this course spend time on a weekly basis to learn from teams in outpatient orthopedics, physical medicine and rehabilitation (also known as physiatry), pain medicine, physical therapy, diagnostic radiology, and rheumatology. Specifically, students gain an appreciation for how each specialty examines, diagnoses, and manages patients with conditions of the musculoskeletal system to close the gap in medical education described above and cultivate foundational clinical skills beneficial for all physicians given the prevalence of musculoskeletal disorders and diseases in the United States such that all physicians, regardless of one's ultimate choice in specialty/subspecialty training, will continually encounter patients with these conditions throughout their careers.

Physical Medicine and Rehabilitation Introduction This two-week elective exposes the fourth-year student to the specialty of PM&R under the direction of attending physiatrists. Students gain clinical experience and participate in the evaluation and rehabilitation management of patients with various disabling conditions such as stroke, acquired brain injury, amputation, multiple trauma, arthroplasty, acute and chronic musculoskeletal conditions, and spinal cord injury. In addition to management of the medical care of patients with disabilities, students gain an understanding of the rehabilitation team approach, which is an integral part of the overall management of such patients. Students also have the opportunity to participate in the management of patients with acute and chronic pain. Management of a patient's care through interaction with other health professionals such as neurologists, orthopaedic surgeons, psychiatrists, social workers, occupational therapists, speech and language pathology therapists, and physical therapists is an integral part of the elective. Students participate in the interdisciplinary rehabilitation team meetings held regularly in the inpatient rehabilitation setting and are exposed to the treatment modalities and therapeutic and diagnostic interventions performed by physiatrists. These interventions can include, but are not limited to, therapeutic exercise, therapeutic modalities (heat, cold, functional electrical stimulation, biofeedback), intrathecal baclofen, and therapeutic injection procedures such as interventional spine injections, corticosteroid joint injections, and botulinum toxin injections. Students may also be exposed to diagnostic tools such as electro diagnostic testing (electromyography or EMG and nerve conductions studies) and musculoskeletal ultrasound. Learning to take a comprehensive rehabilitation history and performing complete musculoskeletal and functional examinations are emphasized. Students also have the opportunity to observe their assigned patients during the patient's course of rehabilitation therapies. Clinical settings may include inpatient consultations in Yale New Haven Hospital (both York Street and St. Raphael campuses); outpatient consultations at the Yale Spine Center (Long Wharf) and the YNHH Center for Musculoskeletal Care in Stamford, Old Saybrook, Milford, and/or North Haven; outpatient consultations with physiatrists at the West Haven VA Medical Center; and inpatient rehabilitation care of patients admitted to the YNHH inpatient rehabilitation unit (IRU) at the Rehabilitation and Wellness Center (Milford).

Subinternship

Orthopaedics and Rehabilitation Subinternship Students are active members of one of seven orthopaedic teaching teams: Adult Reconstruction and Orthopaedic Oncology, Orthopaedic Trauma and Fracture Care, Pediatric Orthopaedics, Spine Surgery, Outpatient Hand and Upper Extremity Surgery, Sports Medicine and Arthroscopic Surgery, and Foot and Ankle Surgery. Students assist in the management of orthopaedic inpatients and receive operating room experience in both the inpatient and outpatient settings. Participation in the orthopaedic outpatient clinics provides experience in the evaluation and treatment of common musculoskeletal conditions. It is recommended that students take call with the orthopaedic resident in the emergency room to gain insight into the principles of acute fracture management. Clinic and operating room experiences are supplemented by weekly subspecialty conferences and the residents' education program.

PATHOLOGY

Lauder Hall 108, 203.785.2759
https://medicine.yale.edu/pathology

Professors A. Adeniran, N. Ahuja (*Surgery*), C. Ben Mamoun (*Medicine*), R. Bindra (*Therapeutic Radiology*), M.W. Bosenberg (*Dermatology*), R. Bucala (*Medicine*), N. Buza, G. Cai, S. Chang (*Laboratory Medicine*), K. Choate (*Dermatology*), Y. Choi (*Emerita*), J. Costa (*Emeritus*), S. Cowper (*Dermatology*), S. Dacic, V. Dixit, S. Downing (*Emeritus*), C. Fernandez-Hernando (*Comparative Medicine*), G.E. Friedlaender (*Orthopaedics and Rehabilitation*), E.J. Glusac, M. Harigopal (*Adjunct*), E. Herzog (*Medicine*), R.J. Homer, S. Hudnall (*Emeritus*), P. Hui, P. Humphrey, D. Jain, M. Kashgarian (*Emeritus*), J.H. Kim (*Emeritus*), S.H. Kleinstein, Y. Kluger, C.J. Ko (*Dermatology*), D.S. Krause (*Laboratory Medicine*), U. Krishnamurti, T. Kyriakides, W. Laskin, F.Y. Lee (*Orthopaedics and Rehabilitation*), C. Liu (*Chair*), J. Madri (*Emeritus*), V.T. Marchesi (*Emeritus*), J.M. McNiff (*Dermatology*), G. Moeckel, R.R. Montgomery (*Medicine*), R. Morotti, J. Morrow, J. Pober (*Immunobiology*), M. Prasad, D.L. Rimm, M.E. Robert, J.K. Rose (*Emeritus*), J.H. Sinard, J.L. Sklar (*Emeritus*), E. Snyder (*Laboratory Medicine*), D.F. Stern, Y. Suarez (*Comparative Medicine*), F. Tavassoli (*Emeritus*), A.B. West (*Emeritus*), M. Xu, Q. Yan, X. Zhang

Associate Professors A. Barbieri, D. Braddock, P. Cohen, B. Emu (*Medicine*), K. Finberg, A. Galan (*Dermatology*), P. Gershkovich, J.A. Gibson, S. Halene (*Medicine*), A. Huttner, R. Jensen (*Therapeutic Radiology*), S.G. Katz, D. Kowalski (*Adjunct*), A. Levi, D. McGuone, P. Myung (*Dermatology*), I. Nalbantoglu, D. Nguyen, V. Parkash, M.M. Pillai (*Medicine*), Y. Qyang (*Medicine*), K. Schalper, A. Siddon (*Laboratory Medicine*), E.C. Stites (*Laboratory Medicine*), M.M. Tomayko (*Dermatology*), S. Vilarinho (*Medicine*), Z. Walther, H. Wang, H. Wu, M. Zhong (*Adjunct*)

Assistant Professors R. Abi Raad, A. Augert, M. Bakhoum (*Opthalmology and Visual Science*), R. Baldassarri, D. Braun (*Medicine*), J. Chandler, L. Colón-Cartagena, G. Coppola, W. Damsky (*Dermatology*), A. Darbinyan (*Adjunct*), M. DiStasio, H. Dong (*Adjunct*), J. Eskendri (*Adjunct*), R. Fiorotto (*Medicine*), S. Garg (*Laboratory Medicine*), P. Gopal, V. Gupta (*Medicine*), B. Hafler (*Ophthalmology and Visual Science*), T. Higgins-Chen (*Psychiatry*), W. Huh, J. Ishizuka (*Medicine*), M. Kahila, D. Kumar, M.N. Lee (*Laboratory Medicine*), M. Levine (*Adjunct*), Z. Levine (*Adjunct*), Y. Liang, S. Liberos, Y. Liu, W. Luo, C. Mandel-Brehm, C. Minerowicz, G. Panse (*Dermatology*), S. Perincheri, S. Ramakrishnan, H. Sanchez, K. Stendahl, T. Sun, S. Thomas, M. Wang, I. Yildiz, D. Yimlamai (*Pediatrics*), M. Yu, S. Yu, H. Zhan, J. Zhou

Instructors P. Chen, H. Mizra

Senior Research Scientists J. Costa, M. Kashgarian, J. Madri, J.K. Rose, J.L. Sklar, A.B. West

Research Scientists Y. Bai, S. Jiang, K. Pham, J. Wang

Associate Research Scientists A. Aguirre-Ducler, T. Aung, R. Camp, M. Carpio, L. Chan, N. Chan, S. Chande, G. Gabernet Garriga, F. Gao, Y. Jin, H. Kato, S. Lang, M.

Lu, S. Mathew, A. Porciuncula, B. Rajendran, K. Ranjan, M.C. Stankewich, B. Tao, Y. Xi, G. Yang, L. Yang, Y. Youm, H. Zhang

Clinical Professor J. Gill

Associate Clinical Professor L. Hao

Assistant Clinical Professors M. DeJoseph, W. Frederick (*Laboratory Medicine*), M.M. Pinto, S. Straub, S. Wong

School of Medicine Courses

Anatomic Pathology and Laboratory Medicine Combined Elective The goals for anatomic pathology are to understand the basic principles of diagnostic anatomic pathology and its role in clinical medicine. The goals for laboratory medicine are to learn appropriate usage and interpretation of laboratory tests and to gain a better understanding of the theoretical, technological, and clinical underpinnings of laboratory medicine. This elective is appropriate for students considering a career in laboratory medicine and/or pathology, and for all students who will use laboratory and pathology tests in their careers. One or two students every four weeks.

Anatomic Pathology Elective The department offers an elective to third- and fourth-year medical students that provides a broad experience in general diagnostic techniques. Students have opportunities to participate in autopsy pathology, cytopathology, and surgical pathology. A daily diagnostic conference is scheduled for both residents and students. In addition to direct responsibilities in autopsy and surgical pathology areas, the student has opportunities to participate in electron microscopy, immunohistochemistry, molecular diagnostics, and flow cytometry techniques.

Neuropathology Elective The major goals of this two-week elective rotation are to gain exposure to surgical and autopsy neuropathology, develop a basic understanding of common adult and pediatric CNS tumors and recognition of primary vs. metastatic tumors, develop a basic understanding of the grading of common brain tumors, recognize common non-neoplastic CNS disorders (e.g. infectious, inflammatory, vascular/infarct and neurodegenerative disorders), and gain an appreciation of molecular pathology and the use of predictive/prognostic biomarkers for neuropathologic diagnosis. Clinical settings include surgical neuropathology (EP2, NP3) at YNHH and autopsy/morgue (BML 55).

Graduate Courses

PATH 620a/C&MP 506a/PHAR 506a/PTB 620a, Lab Rotations Students work in laboratories of faculty of their choice. The schedule for each rotation is announced at the beginning of the fall term. Staff

PATH 630b/ENAS 535b, Biomaterial-Tissue Interactions Study of 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. Attention to specific areas such as biomaterials for tissue engineering and the importance of stem/progenitor cells, as well as biomaterial-mediated gene and drug delivery. T. Kyriakides

PATH 640a/B&BS 640a, Developing and Writing a Scientific Research Proposal The course covers the intricacies of scientific writing and guides students in the development of a scientific research proposal on the topic of their research. All elements of an NIH fellowship application are covered, and eligible students submit their applications for funding. Enrollment limited to twelve. Required of second-year graduate students in Experimental Pathology. Registration allowed by prior authorization from course directors only. K. Politi

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

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

PATH 679a and PATH 680b/C&MP 629a and C&MP 630b/PHAR 501a and PHAR 502b/PTB 629a and PTB 630b, 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). Required of and open only to Ph.D. and M.D.-Ph.D. students in the Molecular Medicine, Pharmacology, and Physiology track. Staff

PATH 681a, Advanced Topics in Cancer Biology This advanced course focuses on readings and discussion on three or four major topics in cancer biology, such as targeted therapy, tumor immunology, tumor metabolism, and genomic evolution of cancer. For each topic, the class starts with an interactive lecture, followed by critical analysis of primary research literature. Recent research articles are assigned, and a student leads discussions with input from faculty who are experts in the topic area. Prerequisite: PATH 650 or permission of the instructor. Open to all Ph.D., M.D.-Ph.D., and M.P.H. students and to advanced undergraduates at the discretion of the instructor. K. Schalper

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. D. Braddock, C. Fernandez-Hernando

PEDIATRICS

LMP 4085, 203.785.4638
https://medicine.yale.edu/pediatrics

Professors N. Ameen, W.A. Andiman (*Emeritus*), A.G. Asnes, M. Auerbach, C. Baum, A. Bazzy-Assad (*Emiritus*), K.A. Bechtel, M.J. Bizzarro, C.W. Bogue (*Chair*), P. Braverman (*Adjunct*), M. Brueckner, M. Cappello, S. Caprio, T. Carpenter, K. Chawarska (*Child Study Center*), L. Chen, J.A. Copel (*Obstetrics, Gynecololgy, and Reproductive Sciences*), E.R. Colson (*Emeritus*), M. Dias, B. Doolittle (*Medicine*), M.E. Egan, J. Fahey, E. Faustino, M. Flaherty-Hewitt, B.W. Forsyth (*Emeritus*), A. Friedman, P.G. Gallagher (*Emeritus*), M. Genel (*Emeritus*), I. Gross (*Emeritus*), J. Gruen, J.P. Hafler, W.E. Hellenbrand (*Emeritus*), J. Hendrickson (*Laboratory Medicine*), A.L. Horwich (*Genetics*), M.K. Hostetter (*Adjunct*), A.L. Hsiao, Y. Jiang (*Genetics*), O. Karam, M. Khokha, D.M. Komp (*Emeritus*), L. Krishnamurti, M. Langhan, J. Leckman (*Child Study Center*), J. Leventhal (*Emeritus*), G. Lister, R.A. Martinello (*Medicine*), L.C. Mayes (*Child Study Center*), P.L. McCarthy (*Emeritus*), L.R. Ment, M.R. Mercurio, G. Miller (*Emeritus*), I. Miller, T. Murray, E. Paintsil (*Adjunct*), J.M. Panisello, D.S. Pashankar, F.D. Pashnakar, J. Pérez Fontán (*Adjunct*), S.M. Peterec, M. Recht, S. Rooney (*Emeritus*), K. Santucci, E.D. Shapiro, B. Shaywitz, S.E. Shaywitz, J. Sherr, R.N. Shiffman (*Emeritus*), B. Smith (*Laboratory Medicine*), W.V. Tamborlane (*Emeritus*), S.N. Taylor, A. Tufro (*Emeritus*), M. Vazquez, S. Vermund (*Public Health*), S. Weinzimer, P.G. Weiss, C.C. Weitzman (*Emeritus*)

Associate Professors P.J. Ananth, P. Aronson, J. Asnes, N. Bamford, C.M. Beach, A. Berkwitt, S. Boulware, C. Bruno, E. Bruscia, D.R. Camenga (*Emergency Medicine*), C. Canapari, M.F. Canarie, E. Christison-Lagay (*Surgery*), M.X. Cicero, E. Deniz, C.A. Dinauer, R.W. Elder, S.I. Escalera, R.L. Fawaz, A.M. Fenick, D. Ferdman, I.D. Ferguson, J.S. Giuliano Jr., M. Goldman, C.K. Gooden (*Anesthesiology*), J. Goodwin, Y.F. Gozzo, I. Gross, M. Grossman, A.R. Gupta, S. Gupta, E. Hall, D. Hersh, D. Hochreiter, M.S. Hogan, M. Hommel, C. Ionita, A. Jastreboff (*Medicine*), L.C. Johnston, S. Kandil, V. Knight, S.A. Lakhani, O. Levit, J. Loyal, N. Makhani, A. Marks, S.A. Massaro, A. Montgomery, E. Myers, E.A. Nozetz, C.L. Olezeski (*Psychiatry*), R. Osborn, A.D. Patel, L. Pavlovic, J. Pellegrini, U. Phatak, A. Porto, A. Riera, L. Rodriguez, N. Santoro (*Adjunct*), V. Shabanova, N. Shah (*Adjunct*), M. Sharifi, B. Sheares, K. Sheares (*Adjunct*), M. Spencer-Manzon (*Genetics*), L. Sude, J. Talwalkar (*Medicine*), G.Y. Tiyyagura, A.V. Vash-Margita (*Obstetrics, Gynecology, and Reproductive Sciences*), E. Waldman (*Surgery*), S.A. Walsh, I.B. Yildirim, H.Z. Zhang (*Genetics*)

Assistant Professors S. Abedin, S. Agrawal, A. Ahmed, A. Alper, E. Aragona, R. Arbizu Alvarez, C.Y. Bakhoum, S. Bass (*Radiology and Biomedical Imaging*), J. Beiner, L. Braun, N. Brodsky, C. Buck, K. Byas, A. Cameron, K. Cardinale, L. Chen, F. Cheng, H. Collette, K. Corbin, A. Cozzo, C. Crana, E. Faherty, M. Fernandes, A. Flagg, N. Fleiss, K. Fletcher, J. Flom, Y. Fuchs, J.R. Gaither, A. Galderisi, D. Glaser, J. Greenberg, J. Gujral, L.H. Hart, K. Hieftje, P. Hu, K. Joseph, K. Kaman, R. Karnik, S. Kazmir, B. Keeshan, R. Kesman, A. Koral, K. Kosiv, S. Kwon, S. Kyc, S. Leeds, C. Lepus, M. Leslie, J. Leviter, R. Malik, M. McNamara, P. Mukherjee, L. Nally, C. Oliveira, O.

Olaloye, S. O'Malley, S. Ostfeld-Johns, S.T. Panacherry, T. Pastor, R. Pierce, E.M. Powers, S. Prozora, S. Purrier, V. Puthenpura, B. Redmond, A. Rodriguez, D.J. Rosen, J. Rosenberg, A. Rosenthal (*Adjunct*), C.A. Rowan, S. Samuels, T. Schlachter (*Radiology and Biomedical Imaging*), M. Sider, L. Siew, J. Silberg, G. Soffer, G. Soma, S. Stahl (*Child Study Center*), J. Steele, M. Van Name, J.C. Vasquez, A. Veten, J.M. Vinocur, J.K. Warejko, L. White, T.M. Whitfill (*Adjunct*), S. Woolf, D. Yimlamai

Instructors J. Ashley, S. Bhalodkar, A.S. Carey, M. Cichon, H. Davis, A. Devlin, S. Earley, S. Felek Boyvat, N. Ijaz (*Medicine*), J. Nugent, K. Skinner, M. Tarica, S. Zhao

Research Scientist W. Ji

Associate Research Scientists L. Balsamo, J. Browne, L. Jeffries, B. Lainez-Mas, E. Marsillio, H. Oez, R. Park, V. Schulz, K. Sheares, S. Siebel, A.L. Slusher, L. Tyan, V. Weser, K. Yu

Clinical Professors R. Angoff, H. Jacobs, S. Levy, C. Randolph, S. Spiesel, J. Zelson

Associate Clinical Professors A.J. Avni-Singer, C. Brown, R. Chessin, M. Ellison, B. Emerson, R. Freedman, G. Germain, J. Hen, C. Mann, S. Sudikoff, R. Young

Assistant Clinical Professors L. Ardeshirpour, J. Burger, C. Butler, J. Canarie, N. Condulis, M. Dilorenzo, C. Dorfman, A. Driggers, M. Gaeta, J. Gruskay, L.M. Marks, C. Menzies, J. Morgan, C. Patterson, A. Pittard, L. Shader, C. Summers, A. Vaezy, M. Williams

Clinical Instructors J. Ancona, R. Boyarsky, T. Brown, A. Coughlin, E. Dieckman, C. Hemenway, S. Himani, S. Khalife, F. Lin, R. Lockhart, A. Maley, C. Nicolosi, R. Rastetter, B. Roberts, L. Rudich, J.C. Samuel, D. Springer, L. Visscher, N. Wijesekera

Lecturer M.C. Hooper

Clerkship

Women's and Children's Health Clerkship This twelve-week integrated clerkship includes clinical components in obstetrics and gynecology and pediatrics. Students participate in six weeks of OB/Gyn and six weeks of pediatrics, with a mix of inpatient and ambulatory clinical experiences in both specialties. Throughout the clerkship students participate in integrated experiences that cover themes such as health and development, preventive care, sexual health, families and communities, health promotion and disease prevention, and perinatal care. All students attend an evening session with the gynecologic teaching associates.

Electives

Pediatric Cardiology Elective Students are exposed to a broad array of congenital and acquired heart disease in pediatrics, ranging from fetal to adult congenital heart patients. Over the course of the elective, students develop a basic understanding of the physiology of normal circulation, as well as the pathophysiology, diagnostic tests, and management of common forms of congenital and acquired heart disease. Students are exposed to patients over a broad range of settings, from daily inpatient rounds to outpatient

continuity clinics. Additionally, there may be opportunities to observe complex diagnostic and therapeutic management options, including advanced cardiac imaging, cardiac catheterization, and surgical repair of pediatric heart defects.

Pediatric Critical Care Medicine Elective (PICU) Senior medical students participate as members of the pediatric intensive care unit team. Students are directly responsible for the care of assigned patients under the supervision of pediatric residents, critical care fellows, and attending intensivists. A core curriculum composed of interactive talks on the major pediatric critical care topics is presented two to three times a week, as well as daily radiology rounds and a monthly morbidity and mortality conference. Open to fourth- and fifth-year students only.

Pediatric Emergency Medicine Elective Fourth- and fifth-year students have the opportunity to evaluate and manage a broad range of acute medical and surgical complaints while honing their clinical skills under direct attending physician supervision, including thirty-six clinical hours per week in the pediatric emergency department. Education during clinical shifts is augmented by pediatric emergency medicine fellow education conferences and one-on-one teaching sessions with the elective director. Participation in teaching conferences and mock codes is required. One student every four weeks; a tailored rotation is available. Prerequisites: pediatric rotation, EPIC inpatient training, and EPIC ED e-learning.

Pediatric Endocrinology and Diabetes Elective This 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.

Pediatric Hematology/Oncology Elective This elective provides broad experience in the diagnosis and management of pediatric malignancies and hematologic disorders 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 board, leukemia and lymphoma conference, section conference, and weekly pediatric hematology/oncology patient management rounds.

Pediatric Infectious Disease Elective Students participate in pediatric infectious disease rounds by presenting the case study of an inpatient whom they have examined to a group of faculty and fellows. Emphasis is placed on the correlation of the clinical problem and its practical management with principles of infectious epidemiology and clinical microbiology (bacteriology and virology). Consulting rounds are held daily. Teaching rounds in diagnostic microbiology are held four times a week. Weekly divisional rounds last approximately two hours. Students also attend the pediatric AIDS clinic. Prerequisite: Pediatric clerkship or permission of the instructor. Open to fourth- and fifth-year students only.

Pediatric Neonatal-Perinatal Medicine Elective (NNICU) 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.

Pediatric Nephrology Elective Students participate in the evaluation and management of patients on the pediatric inpatient service, pediatric ICU, neonatal ICU, and pediatric specialty center. Patient problems encompass the full range of clinical renal disorders, including fluid and electrolyte disturbances, acute and chronic renal failure, various forms of glomerulonephritis and interstitial nephritis, nephrolithiasis, hypertension, intoxications, inherited renal diseases, and urinary tract abnormalities. A pediatric nephrology faculty member serves as attending physician at all times and conducts teaching rounds daily. These teaching sessions provide supervision and training in the practical aspects of patient management, as well as instruction in the basic scientific disciplines that underlie the clinical practice of nephrology. Students also participate in outpatient renal clinics under the supervision of the faculty, gaining experience in the work-up of common renal disorders not initially requiring hospitalization (e.g., proteinuria, hematuria, mild azotemia), the assessment and treatment of childhood hypertension, and the long-term follow-up of patients after discharge from the inpatient and transplant services. Students are expected to attend weekly teaching conferences, formal pediatric renal core curriculum, and pediatric renal rounds. Open to fourth-and fifth-year students only.

Pediatric Neurology Elective This elective provides hands-on experience in pediatric neurology in both inpatient and outpatient clinical settings. Students attend rounds with supervising attending physicians as well as adult and pediatric neurology residents. Students are exposed to acute common as well as rare pediatric neurology disorders such as epilepsy, headaches, mental status changes, and weakness. The students obtain histories and perform neurological examinations on newly admitted patients or consult patients. Bedside discussions regarding diagnosis, work-up, and treatment are encouraged. Students have the opportunity to participate in the pediatric neurology consultation service or outpatient clinics. The consultation service exposes students to various emergencies in pediatric neurology such as seizures, status epilepticus, stroke, and other acute neurological issues. Both general pediatric neurology as well as subspecialty clinics (such as epilepsy, headache, movement disorders, multiple sclerosis, neuromuscular, EMG) are available. In addition, students are introduced to different procedures, including spinal tap, electroencephalogram, brain and spine imaging techniques, and electromyogram.

Pediatric Respiratory Pulmonary Elective This elective provides training and experience in the diagnosis and management of common respiratory and sleep disorders in children and adolescents. Students participate in the direct care and observation of patients on the inpatient service and in the ambulatory pulmonary clinics. They have the opportunity to go to the operating room to observe bronchoscopies. They review

pulmonary function tests. The inpatient experience consists of daily bedside rounds and consultations on the wards with the attending physician and pulmonary fellow on service. The outpatient experience occurs with faculty during their office hours and fellows during their continuity clinic. Facilities include a dedicated pulmonary function laboratory for children, a pediatric exercise laboratory, an accredited sleep laboratory, and an accredited Cystic Fibrosis (CF) Center (one of only two in Connecticut, it offers a multidisciplinary team approach to providing comprehensive state-of-the-art care for children and adolescents with CF). Students are expected to attend pulmonary conferences and seminars.

Pediatric Rheumatology Elective This elective provides hands-on experience in pediatric rheumatology. This service involves consultation service in the inpatient and outpatient setting as well as long term care for patients with autoimmune conditions. Pediatric rheumatology requires the ability to perform a comprehensive physical examination and history while interpreting laboratory and radiographic studies to develop an often-complex differential diagnosis. Pediatric rheumatology involves patients of all chronologic ages and developmental stages so learners have the opportunity to develop rapport with patients and families across pediatrics. The student is exposed to clinical setting in the hospital and outpatient setting and academic opportunity includes participation in rheumatology didactics with the internal medicine group (grand rounds and journal club) as well as with scheduled pediatric didactics (grand rounds, weekly pediatric rheumatology case conference). Where available students are able to observe arthrocentesis and learn the basics of musculoskeletal point of care ultrasound. Clinical settings include outpatient visits and hospital consultation at Yale New Haven Hospital and participation at satellite clinics is a shared decision with the student and the attending at the ultimate discretion of the course director. During this rotation, it is necessary to travel back and forth between YNHH and Pediatric Specialty Center at Longwharf (1 Longwharf Drive, New Haven); other satellite opportunities are not required but may be available at the student's and course director's discretion.

Subinternships

Pediatrics Subinternship A four-week inpatient rotation during which senior medical students are considered the equivalent of interns and are directly responsible for the care of assigned patients under the supervision of resident and attending physicians. There are four patient-care units in Yale-New Haven Children's Hospital that students may be assigned to: the Pediatric ICU, the Neonatal ICU, and two units with a mixture of general and specialty pediatric patients. Typically, up to four students can be accommodated in the rotation each block. The schedule of shifts will be as that of an intern. All subinterns, regardless of placement, take daytime and evening shifts. No overnight shifts will be assigned. Subinterns are subject to the same duty hour restrictions as the interns. This rotation is a great opportunity to develop organizational skills and experience the pace of internship in a supportive environment. An emphasis is placed on being an integrated team member, taking ownership of one's patients, and demonstrating improvement in intern skills (clinical reasoning, communicating with patients/families, organization, prioritization, presentation, and efficiency) through the incorporation of constructive feedback.

PHARMACOLOGY

SHM B208, 203.785.4393
https://medicine.yale.edu/pharm

Professors S. Akhtar (*Anesthesiology*), K.S. Anderson, A.M. Bennett, D.A. Calderwood, Y. Cheng, J.N. Contessa (*Therapeutic Radiology*), P. Dannies (*Emeritus*), M.P. DiGiovanna (*Medicine*), B.E. Ehrlich, R. Herbst (*Medicine*), L.K. Kaczmarek, N. Kaminski (*Medicine*), B. Kholodenko (*Adjunct*), I. Lax, M. Lemmon (*Chair*), E. Lolis, K.A. Martin (*Medicine*), A. Nairn (*Psychiatry*), E. Paintsil (*Pediatrics*), M. Picciotto (*Psychiatry*), C. Rothlin (*Immunobiology*), G. Rudnick (*Emeritus*), J. Schlessinger, W.C. Sessa (*Emeritus*), S. Waxman (*Neurology*), D. Wu

Associate Professors T.J. Boggon, Z. Cai (*Radiology and Biomedical Imaging*), K.M. Ferguson, S. Ghosh (*Neurology*), Y. Ha, D. Klein, Y. Liu, C. Macica (*Adjunct*), S. Nicoli (*Medicine*), B.E. Turk

Assistant Professors C. Alarcon, A. Alon, M. Bhattacharyya, J. Butterwick, S. Lee, W. Mi

Senior Research Scientist Y. Suzuki

Research Scientists C. Calderwood, A.B. Kiyatkin, J.W. Murphy, W. Tang, Y. Tsutsui, S. Wu, A. Wyler, Y. Zhang

Associate Research Scientists M. Ahmed, S.J. An, N. Bertoletti, S. Chen, C. Choi, C. Danta, F. Guan, L. Han, R. Hu, S. Krimmer, S. Kumar, W. Lam, T. Li, W. Li, Y. Luan, K. Mudumbi, S. Naik, M. Pedram, S. Perla, B. Qiu, M. Ramu, B. Salovska, S. Shu, A. Sommer, S. Staybrook, H. Wang, J. Wu, Y. Zuo

Lecturer R.F. Tilton

PHAR 501/502/C&MP 629/630/PATH 679/680, 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). Staff

PHAR 504, Molecular Mechanisms of Drug Actions This course covers the molecular mechanisms of therapeutics, which are presented in a conceptual framework to increase understanding but decrease memorization. Topics include (but are not limited to) receptor affinity, efficacy, multiple equilibria, pharmacokinetics, and toxicity; enzyme kinetics and inhibition, drug discovery and design; molecular basis of antimicrobial therapy, cardiology drugs, anticancer and antiviral therapies; and therapeutics for inflammatory disorders, asthma, and allergy. E. Lolis

PHAR 506a/C&MP 506a/PATH 620a/PTB 620a, Lab Rotations Students work in laboratories of faculty of their choice. The schedule for each rotation is announced at the beginning of the fall term. Staff

PHAR 528b, 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. Bennett

PHAR 529b/MB&B 529b, Structural Biology and Drug Discovery A comprehensive introduction to the concepts and practical uses of structural biology and structural biology-related techniques in drug discovery. The first half of the course focuses on techniques used to discover and optimize small and macromolecule drugs. Students are introduced to topics such as small molecule lead discovery, X-ray crystallography, cryo-electron microscopy, and biophysical techniques. The first half of the course also includes a practical component where students conduct hands-on structural biology experiments and learn about biophysical techniques in a laboratory setting. The second half of the course focuses on drug discovery, particularly for protein kinases. It includes a field trip to the Yale Center for Drug Discovery, where the students are introduced to the in-house Yale screening facilities for small molecule drug discovery. Two half-credit courses—PHAR 530 and PHAR 531—are also offered for the two halves of PHAR 529. T. Boggon, Y. Ha

PHAR 530b, Targeted Use of Structural Biology in Drug Discovery This 0.5-credit course, the second half of PHAR 529, begins in February. 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. T. Boggon, Y. Ha

PHAR 531b, Concepts of Structural Pharmacology This 0.5-credit course, the first half of PHAR 529, introduces students to the concepts of structural biology and provides the background for how these concepts are applied to areas of great importance in pharmacology and how they facilitate drug development. T. Boggon, Y. Ha

PHAR 537a, Systems Pharmacology and Integrated Therapeutics This course provides an in-depth, "hands-on" experience in drug design, drug discovery, high-throughput screening, state-of-the-art proteomics, and target validation. K. Ferguson

PHAR 538a, Pharmacokinetics and Pharmacodynamics in Neuropharmacology This course is designed to give a historic account of drug discovery and development for brain diseases, introduce methods to understand the pharmacological mechanisms of drugs working on neurological systems, and inspire young generations to join the endeavor of drug discovery and development for brain diseases. It is designed for advanced graduate

students, postdocs, and residents with basic knowledge in chemistry, pharmacology, and neuroscience. The lecturers and guest lecturers are leading experts in the field of PET and MR imaging, and industry leaders in pharmaceutical science. This course also introduces the applications of advanced imaging technologies (PET, MRI) in the study of pharmacokinetics and pharmacodynamics of CNS drugs in humans and its implications to our understanding of neurodegenerative and neuropsychiatric disorders. Each class constitutes a forty-five-minute didactic lecture and a thirty-minute interactive discussion section. The classroom activities are expected to prepare students for their future endeavor in the field of neuropharmacology. Open to second-year students and up. J. Cai

PHAR 540b, Developing and Writing a Scientific Research Proposal The goal of this class is to teach students to conceive, write, and defend a grant proposal. The timing of this half-term course is aligned with the pharmacology qualifying exam in the spring term, for which a written research proposal is required. This course takes students through the steps of proposal writing, guiding them in defining a problem of their own and training them in the mechanics of writing. Additional support is given as needed to students with more limited writing experience. By taking the "guesswork" out of the writing process, students can focus on the development of their research proposal without the added anxiety associated with an unfamiliar process. Students learn about the structure and components of fellowship and grant proposals. They engage in "mock study sections", providing written critiques and participating in discussion of sample proposals assigned by the instructors. Students give oral presentations of their specific aims followed by classroom discussion. At the end of the course, students will have made substantial progress toward completing the written portion of their qualifying exam and gained a set of competencies central to this program. Open to graduate students only. Priority is given to pharmacology students. M. Lemmon, T. Boggon, M. Bhattacharyya

PHAR 550a/C&MP 550a/ENAS 550a/MCDB 550a/PTB 550a, Physiological Systems The course develops a foundation in human physiology by examining the homeostasis of vital parameters within the body, and the biophysical properties of cells, tissues, and organs. Basic concepts in cell and membrane physiology are synthesized through exploring the function of skeletal, smooth, and cardiac muscle. The physical basis of blood flow, mechanisms of vascular exchange, cardiac performance, and regulation of overall circulatory function are discussed. Respiratory physiology explores the mechanics of ventilation, gas diffusion, and acid-base balance. Renal physiology examines the formation and composition of urine and the regulation of electrolyte, fluid, and acid-base balance. Organs of the digestive system are discussed from the perspective of substrate metabolism and energy balance. Hormonal regulation is applied to metabolic control and to calcium, water, and electrolyte balance. The biology of nerve cells is addressed with emphasis on synaptic transmission and simple neuronal circuits within the central nervous system. The special senses are considered in the framework of sensory transduction. Weekly discussion sections provide a forum for in-depth exploration of topics. Graduate students evaluate research findings through literature review and weekly meetings with the instructor. M. Saltzman, S. Campbell

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

PSYCHIATRY

300 George Street, Suite 901, 203.785.2117
https://medicine.yale.edu/psychiatry

Professors G.K. Aghajanian (*Emeritus*), A.T. Arnsten (*Neuroscience*), S.A. Ball, M. Baranoski, D. Barry, M. Bell (*Emeritus*), C.D. Bellamy, R. Berman (*Adjunct*), H. Blumberg, A. Buchanan, B.S. Bunney (*Emeritus*), J.M. Cedarbaum (*Neurology*), M. Chawarski, J.M. Cook, Z. Cooper (*Adjunct*), K.P. Cosgrove, C. Crusto, D. D'Souza, L. Davidson, E. Diaz, C.C. Dike, R.J. DiLeone, M.H. Ebert (*Emeritus*), J.A. Encandela, D.C. Fehon, J.E. Gelernter, D.C. Glahn (*Adjunct*), L.S. Godleski (*Adjunct*), M. Gonzalez Ibanez (*Adjunct*), K. Gregory, E.H. Griffith (*Emeritus*), C.M. Grilo, I. Harpaz-Rotem, K.A. Hawkins, G. Heninger (*Emeritus*), J. Hirsch, R.A. Hoff, M.A. Hoge, S. Jacobs (*Emeritus*), J. Katzman (*Adjunct*), J.S. Kaufman, R.D. Kerns (*Emeritus*), T. Kirk (*Adjunct*), P.D. Kirwin (*Adjunct*), T. Kosten (*Adjunct*), S. Krishnan-Sarin, J.H. Krystal (*Chair*), M. Laruelle (*Adjunct*), C. Li, A.S. Martin (*Child Study Center*), S. Martino, R. Masheb, G.F. Mason (*Radiology and Biomedical Imaging*), C. Mazure, T.H. McGlashan (*Emeritus*), S. McKee, T.J. McMahon (*Emeritus*), P. Morgan, E. Morris (*Radiology and Biomedical Imaging*), A. Nairn, M. Norko, S. O'Malley, J. Pachankis (*Public Health*), G.D. Pearlson, I.L. Petrakis, M. Picciotto, R.H. Pietrzak, C. Pittenger, A.N. Ponce, M.N. Potenza, S.M. Powsner, S.G. Resnick, R.M. Rohrbaugh, M.I. Rosen, R. Rosenheck, M. Rowe (*Emeritus*), G. Sanacora, M.J. Sernyak, N. Sestan (*Neuroscience*), R. Sinha, D. Small (*Adjunct*), D.L. Snow (*Emeritus*), M. Sofuoglu, V.H. Srihari, J.L. Steiner, J.S. Strauss (*Emeritus*), M. Stevens (*Adjunct*), D. Stubbe (*Child Study Center*), T.P. Sullivan, R. Tampi (*Adjunct*), J. Taylor, J.K. Tebes, C. Tek, D. Tolin (*Adjunct*), B. Toll (*Adjunct*), C.H. Van Dyck, B.E. Wexler (*Emeritus*), K. Wilkins, S.W. Woods, K. Xu, K. Yonkers (*Adjunct*), H.V. Zonana (*Emeritus*)

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Lecturers C.M. Barber, D. Berv, G. Blycker, E. Brett, E. Brett, F.D. Buono, J. Cooke, G.H. Davis, J. De Figueiredo, A.R. Demac, P. Dillon, J. Elsworth, S. Feuerstein, D. Foster, K.E. Gersick, J.B. Gordon, G. Greenberg, B. Izquierdo, J.P. Kimmel, L. Lager, F. Lu, R.B. Makover, N. Maletta, D. Mender, J. Meyer, M. O'Malley, A. Papsun, K. Ponte, K. Ramirez, W. Reich, J. Reynolds-Kaye, E.B. Rubin, S.L. Satel, R. Scherman, A. Solomon, S.I. Tarbox-Berry, P.F. Thomas, B. Viereck, L. Yawn, Z. Zhai, R. Zhong

Clerkship

Biopsychosocial Approach to the Patient (BAH) Clerkship This twelve-week integrated clerkship block composed of Psychology and Primary Care. Integration of training in Primary Care and Psychiatry occurs in two areas. First, in didactics, all students assemble together to complete "Top Ten" workshops on topics spanning both disciplines, e.g., assessment of competency, treatment of chronic pain, motivational interviewing, diagnosis and treatment of somatic symptoms, addressing social determinants of health. Additionally, students participate in three individual workshops: (1) introduction and rationale for the biopsychosocial approach with readings (e.g., George Engel, Barbara Starfield), (2) clinical approach to the biopsychosocial model, and (3) how patients access community health and psychiatric resources. In the clinical realm, many sites have embedded psychiatric services, e.g., West Haven VA Medical Center, the New Haven Health Consortium, Cornell Scott Hill Federally Qualified Health Center, and Yale Internal Medicine Associates. Course Directors (CDs) communicate with preceptors at all sites before students arrive, emphasizing the clerkship's goal to teach a holistic approach to patient care. Additionally, to promote exchange of ideas across primary care and psychiatry faculty, CDs prepare and host regular evening faculty-development events focusing on topics of interest to both primary care and psychiatry faculty.

Electives

Adolescent Psychiatry Elective The purpose of this elective is to provide fourth-year medical students interested in child and adolescent psychiatry and/or adolescent medicine an experience in working with adolescents presenting with acute psychiatric illness. The elective is based on the adolescent inpatient unit at Yale New Haven Psychiatric Hospital, a short-term fifteen-bed unit serving patients aged 12–18. Students gain

exposure to a diverse patient population with severe mood, psychotic, behavioral, and/or substance use disorders, as well as begin to understand the intricacies of working with families and systems providing care for adolescents with significant emotional and/or behavioral disturbances. Teaching activities include daily rounds and weekly case conferences. Prerequisite: required Psychiatry clerkship.

Child Study Center Clinical Research Elective This elective entails etiology, clinical manifestations, and treatment of adolescent psychopathology, including eating disorders, depression, suicide, psychosis, delinquency, and the impact of physical and mental disabilities on adolescent development. Reading is supplemented with live and taped clinical material.

Clinical Neuroscience Research Unit Elective This elective offers senior medical students the opportunity to work closely with a variety of patients who are hospitalized during their participation and treatment in research protocols. The Clinical Neuroscience Research Unit (CNRU) is a thirteen-bed inpatient ward with associated outpatient clinics and basic science laboratories on the third floor of the Connecticut Mental Health Center (CMHC). Supervised implementation of novel psychopharmacology, exposure to multiple aspects of clinical and basic science research, and in-depth experience with individual and group psychotherapies are educational aspects of this elective. Patients' diagnostic categories include depression, obsessive-compulsive disorder, schizophrenia, cocaine abuse, substance abuse, and psychiatric genetics. Prerequisite: required Psychiatry clerkship. Open to fourth-year students only.

Geriatric Psychiatry Elective This four-week elective provides students with exposure to caring for older adults with mental health concerns, including mood disorders, anxiety disorders, grief, and adjustment disorders, as well as neurocognitive disorders ranging from mild cognitive deficits to dementia with complex neuropsychiatric symptoms. The student works closely with geriatric psychiatry fellows and attendings in the outpatient evaluation and treatment of such disorders and participates in comprehensive psychiatric evaluations, cognitive and functional assessments, individual and family psychoeducation, and treatment. The student participates in daily team huddles which include a multidisciplinary group of physicians, nurses, social workers, and peer specialists. The student has an opportunity to participate in group therapy as well as weekly geriatric psychiatry didactics and psychiatry department Grand Rounds. It may also be possible to rotate a half day a week with neurology (movement disorders and neurocognitive clinic) or palliative care clinic experiences, if the student is interested. During this rotation, it is necessary to be on site at the VA Annex in Orange, Connecticut (200 Edison Road), where the outpatient geriatric psychiatry clinic is located.

Inpatient Elective (CMHC) This elective includes intensive work with inpatients who suffer from major psychiatric disorders with or without substance abuse. Emphasis is on assessment, acute treatment, and arrangement of continuing care in the community. The student functions as an integral member of a multidisciplinary treatment team. Clinical research participation is encouraged. Opportunities are available to explore special areas of interest (e.g., forensics, psychopharmacology, administration) with CMHC faculty. Prerequisite: required Psychiatry clerkship. Open to fourth-year students only.

Inpatient Elective (YNHH/YPH) This elective includes intensive work with patients who suffer from major psychiatric disorders and range in age from college students to middle age. Emphasis is on assessment, acute treatment, and arrangement of post-discharge follow-up care in the community. The student is an advanced clerk functioning as a member of the multidisciplinary treatment team, taking on primary clinician and psychiatric/medical responsibilities for patients under the supervision of senior clinicians. The elective is given on the inpatient service at the Yale New Haven Psychiatric Hospital; clinical research and outpatient involvement may be options. Prerequisite: required Psychiatry clerkship. Open to fourth-year students only. One student every four weeks. Director: B. Fuehrlein

Law and Psychiatry Elective This elective affords opportunities for third- and fourth-year students to observe and participate in "competency to stand trial" evaluations with a clinical team that makes these assessments at the New Haven Correctional Center. In addition, they may attend Law School classes with students who represent psychiatric patients, observe civil commitment procedures, and attend probate court hearings as well as the criminal proceedings in local New Haven Superior Courts. Students attend work seminars where case evaluations and write-ups are discussed and prepared, and read appropriate legal cases and psychiatric literature. Students may be able to participate in parts of evaluations of insanity defense, custody determination, and other forensic issues. They attend the Law and Psychiatry seminar during their rotation. Prerequisite: required Psychiatry clerkship.

Mood Disorders and Neuromodulation Elective (ECT and TMS) This elective offers senior medical students the opportunity to learn about neuromodulation techniques in the treatment of mood disorders, more specifically, by using electroconvulsive therapy (ECT) and repetitive transcranial stimulation (TMS). Students learn the theoretical basis for the use of ECT and TMS, among other neuromodulation techniques, in the treatment of mood disorders. They learn indications and contraindications to treatment, the process of evaluation of patients prior to and during treatment (including use of standardized depression rating scales), how to monitor for complications and side effects to treatment, and the latest research in the field. Students work closely with psychiatry attending physicians and residents at the VA in the evaluation of patients referred for ECT and TMS, and have the opportunity for supervised participation in the performance of these treatments. Patient population includes veterans of all ages with a variety of psychiatric conditions, including mood disorders with comorbid anxiety and substance use disorders. Prerequisite: required Psychiatry clerkship.

Psychiatric Care at Hispanic Clinic of CMHC This elective is focused on the provision of outpatient mental health services for Spanish-speaking Latino communities in the United States and covers three main themes: (1) clinical assessment and conceptualization: culturally specific and linguistically appropriate clinical skills including interviewing, diagnosis, and formulation of a recovery-oriented treatment plan that includes psychopharmacology and psychotherapy; (2) systems-based practice: understanding the impact of community-academic partnerships and the characteristics of a culturally responsive behavioral health system of care for Hispanics; and (3) recovery-oriented care: culturally sensitive approaches to recovery from mental illness. Clinical interviewing

techniques are reviewed with an emphasis on the Latino culture, and students have opportunities to practice these skills. Students initially observe crisis consultations and eventually perform supervised evaluations followed by presentations in weekly clinical rounds. Students become familiar with the Connecticut State Department of Mental Health Recovery Initiative and attend meetings of the Connecticut Latino Behavioral Health System to learn about the expansion of local culturally sensitive behavioral health services, and about progress, challenges, and outcomes. Students review and present summaries of assigned readings of mental health services, the challenges facing minority communities, and the best practices to address them. Stigma, implicit bias, health disparities, the social determinants of mental health, recovery from mental illness, and advocacy are the main subjects for review. Prerequisite: required Psychiatry clerkship.

Psychiatric Emergency Room Elective, VA Connecticut Healthcare System This four-week elective experience exposes students to the management of complex and high-risk veterans who present to the psychiatric emergency room (PER). Students learn basic skills in obtaining a thorough history, including the difficult topics of suicidality, homicidality, substance use, and homelessness. Students learn basic skills in crisis management, acute substance intoxication and withdrawal, and comprehensive risk assessments. Students function within the larger team of professionals and learn the importance of a team-based approach to patient care. Prerequisite: completion of the preclinical medical school curriculum and the core clinical clerkships.

Psychiatry/Primary Care at CMHC Elective This longitudinal elective provides senior medical students interested in psychiatry and/or primary care an experience working with patients with serious mental illness (SMI) in an integrated primary care setting. The Wellness Center provides primary health care services for individuals receiving behavioral health services at the Connecticut Mental Health Center. Patients who receive services at community mental health centers are often of low income, living in a depressed urban environment, include a significant percentage of people of color, and have limited educational opportunities and English proficiency. The goal of the Wellness Center is to improve the physical health of adults with SMI (e.g., decreased rates of obesity, hypertension, diabetes, hyperlipidemia, and tobacco and drug use) who are at increased risk for medical comorbidity and poor health outcomes. Students work directly with an attending as a clinical team member one afternoon a week for six months. Students are responsible for following patients longitudinally, building clinical alliances, leading patient encounters, and devising treatment plans and managing chronic disease (e.g. HTN, diabetes). Students learn about the unique care considerations of patients with SMI, the social determinants of health, and the use of patient-centered approaches to promote healthy lifestyles, smoking cessation, and medication adherence. Prerequisite: required Psychiatry clerkship.

Psychological Medicine Elective In this elective, post-clerkship students are exposed to a variety of patients with psychiatric symptoms who are hospitalized in the general hospital and/or present to outpatient medical clinics. The students are assigned to either the Behavioral Intervention Team (BIT), a multidisciplinary team that works proactively providing timely, appropriate, and effective patient care in the internal medicine floors, or the Psychiatric Consultation/Liaison Service, which provides psychiatric consultation

in the different specialty sites including ICU, surgery, obstetrics and gynecology, and neurology. Students also spend time in an outpatient experience in the Nathan Smith Clinic, where their clinical learning focuses on HIV psychiatry and addictive disorders. During this clinical elective, students enhance their interview skills, learn the process of consultation/liaison in the different treatment settings, and enhance their core psychiatric knowledge and skills with a focus on content at the interface of medicine and psychiatry. They participate in teaching sessions provided by the attendings and fellows and are expected to attend the service's clinical conferences and to present cases in morning rounds. Prerequisite: required Psychiatry clerkship.

Street Psychiatry Elective Street Psychiatry is the practice of providing mental health and addiction care directly where homeless individuals reside and involves both literally and philosophically meeting people "where they're at." Students join teams for street rounds/community-based drop-in clinics on a weekly basis, flexible to match with the schedules of trainees. Students participate in relationship-building with clients encountered on outreach rounds and offer services appropriate to a senior level medical student under supervision. Locations of outreach include: homeless shelters, soup kitchens, campsites in woods, public parks, and public indoor spaces (train station, library, etc.). An orientation process precedes street-based work; it includes orientation to the safety protocol, scope of practice expectations, supervision, overview of New Haven's homeless population, resources to link patients to existing mental health providers and/or CMHC, and information about various local services. Prerequisite: required Psychiatry clerkship.

Subinternships

Child Study Center Subinternship The aim of this subinternship is to provide the student with an intensive experience in infant, child, and adolescent psychiatry. The curriculum includes assessments of normal development and psychopathology in childhood, treatment methods, and research in major disorders of childhood. Students are active team members of the Children's Psychiatric Inpatient Service (CPIS, Winchester, and the consultation service to the pediatric wards of Yale-New Haven Hospital from this base and in close coordination with the Director of Medical Studies, Dr. Martin). Students are able to take advantage of the wide range of ongoing seminars, conferences, and clinical services in place at the Child Study Center. Students have direct responsibility for patient care and will aim to function at the level of an intern. Teaching methods include seminars, conferences, field observations, ward rounds, and practical's selected by the student following consultation with the Director of Medical Studies and the Child Study Center.

Clinical Neuroscience Research Unit Subinternship (CNRU) The Clinical Neuroscience Research Unit (CNRU) is a specialized service dedicated to the diagnosis, treatment, and research of neuropsychiatric disorders. The unit consists of an inpatient service, as well as outpatient specialty clinics for addictive, depressive, obsessive-compulsive, psychotic, and women's behavioral health disorders. Most patients voluntarily participate in clinical research studies designed to determine the neurobiological mechanism underlying these disorders. Pharmacotherapy, individual psychotherapy, group therapy, and behavior therapy are provided as clinically indicated and are free of charge to patients.

Students function as high-level clinical care providers and are an integral part of the treatment team. The subinternship occurs on the CNRU of the Connecticut Mental Health Center. Prerequisite: required Psychiatry clerkship. Open to fourth- and fifth-year students only.

Psychiatric Emergency Room Subintership (VACHS) Students build skills and have an increasing level of responsibility for direct patient care. Students take a primary role in caring for patients, with direct supervision from chief residents and attending physicians; and they act as role models and mentors for third-year medical students students who will be rotating simultaneously. By the end of the rotation, students should be confident with supervised but independent management of complex psychiatric patients. Prerequisite: completion of the preclinical medical school curriculum and the core clinical clerkships.

Psychiatry Inpatient Subinternship (CMHC) Intensive work with inpatients who suffer from major psychiatric disorders with or without substance abuse and who have significant social challenges often including lack of access to stable housing, work, and health care insurance. Emphasis is on assessment, acute treatment, and arrangement of continuing care in the community. The student functions as an integral member of a multidisciplinary treatment team and serves as the primary clinician for four to five patients. The subinternship occurs on the inpatient service (4th floor) of the Connecticut Mental Health Center (CMHC). Prerequisite: required Psychiatry clerkship. Open to fourth- and fifth-year students only.

Psychiatry Inpatient Subinternship (YNHH, WS-2) Intensive work with patients who suffer from major psychiatric disorders and range in age from college students to middle age. Most patients have access to health care insurance or have Medicare and/or Title XIX. Emphasis is on assessment, acute treatment, and arrangement of post-discharge follow-up care in the community. The student is an advanced clerk functioning as a member of the multidisciplinary treatment team, taking on primary clinician and psychiatric/medical responsibilities for patients under the supervision of senior clinicians. The subinternship occurs on the general adult inpatient service at the Yale New Haven Psychiatric Hospital. Prerequisite: required Psychiatry clerkship. Open to fourth- and fifth-year students only.

RADIOLOGY AND BIOMEDICAL IMAGING

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Senior Research Scientist R.A. Rosenthal

Research Scientists L. Korutla, L. Qin, A. Sharma

Associate Research Scientists H. Bai, A. Coskun, L. Julian, P. Kalakoti, Z. Li, L. Liu. E. Luna Rivera, Y. Ohashi, Z. Peng, L. Qu, P. Ren, V. Stögner, S. Thompson, D.P. Vangeli, B. Yatsula, M. Zafar, W. Zhang, B. Ziganshin

Clinical Professors S. Stein, E. Yanagisawa

Associate Clinical Professors N. Atweh, Z. Chicarilli, K. Lee

Assistant Clinical Professor D. Astrachan, B. Cha, M. Cheung, W. Cholewczynski, R. DeNatale, T. Duplinsky, S. Fusi, R. Garvey, N. Gordon, G. Horblitt, D. Karas, A. Kenler, M. O'Brien, G. Opin, L. Otake, J. Salomon, A. Savetamal, R. Schlessel, L. Skope, S. Thornton, E. Vining, S. Vyce, J.J. Willett, K. Zuckerman

Clinical Instructors J. Arons, R. Crombie, A. Czibulka, M. D'Agostino, P. Fortgang, S. Kapadia, J. Kerner, L. Prescher, T. Takoudes

Lecturers L. Acton, M. Daley Bell, S.A. Falk, B.C. Fichandler, A. Keltz, J. Mendes, H. Warner

Electives

Burn Surgery Elective (Bridgeport Hospital) This rotation provides intensive exposure to the care of the acutely burned patient: surgical and nonsurgical care, critical care, and outpatient wound care. Large burn injuries evoke the most severe critical illness known to medicine. Patients with such injuries are unstable for prolonged periods of time and require responsive and attentive critical care. The student participates in this care, including procedures performed in the burn intensive care unit. Assessment of burn depth and the prognosis for wound healing are often far from straightforward, and the student participates in this assessment process with the rest of the team, learning to gauge depth and prognosis via examination of multiple patients. Operative therapy for burns includes excisional debridement and often split-thickness skin grafting, but there are multiple choices to be made in providing optimal care to a particular patient. The student learns the rudiments of this decision-making process and is an active participant in all operations performed by the burn team.

Cardiac Surgery Elective This rotation provides students with an 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.

General Surgery Elective (YNHH/SRC) Students become an integral part of the resident team, supervised by the chief resident and attending physicians on the general surgery service. Students participate in the management of general surgical inpatients, preoperative evaluations, and outpatient clinics. Students are expected to participate in all teaching conferences, Grand Rounds, and clinics, and to attend the core curriculum conference 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. Open to fourth-year students only.

Otolaryngology Elective This clinical elective includes experience in the operating room, wards, outpatient clinics, conferences, didactics, and tumor board; the experience is similar to the Otalaryngology Subinternship but allows students more flexibility in

choosing to participate in operations and clinics of special interest to them. The rotation is divided into one-week blocks, including the head and neck service (H&N cancer/reconstructive surgery, laryngology) and the ENT specialty service (neurotology, pediatrics, sinus/skull base, facial plastics, general). Students improve their suturing skills and become comfortable performing a thorough but efficient head and neck examination and interpreting diagnostic tests and procedures that can be useful in all medical and surgical subspecialties. At the end of the rotation, students may (but are not required) to give a seven-minute presentation on a topic of their choice at the ENT grand rounds. Prerequisite: completion of third-year clerkships. Open to fourth- and fifth-year students only.

Surgical Critical Care Elective The surgical intensive care unit exposes the senior medical student to the day-to-day and minute-to-minute management of the critically ill surgical patient. The breadth of surgical disease, spanning all aspects of surgery, allows the student to understand the management of respiratory, cardiovascular, gastrointestinal, and renal failure. Advanced techniques in ventilatory management and state-of-the-art sepsis management are used. Prerequisite: completion of third-year clerkships. Open to fourth- and fifth-year students only.

Thoracic Surgery Elective Experience the rewarding and meaningful rotation that is the General Thoracic Surgery Elective! There is a lot of teaching in the operating room, on the floors, and in the clinics when you are with us. In return, the student is expected to be a valuable contributing team member during daily rounds, in the operating room, in the outpatient clinics and at conferences. The majority of the patients under the care of the thoracic surgery service include patients with lung, esophageal, and mediastinal malignancies and infections, and many present both diagnostic and therapeutic challenges. In addition to the enriching interactions with the thoracic oncology patients, 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 also be pursued while on the service.

Subinternships

Bariatric Surgery Subinternship (SRC) Students learn about the multidisciplinary approach to bariatric surgery, its indications, types of bariatric surgery, postoperative care of patients, and evaluation and management of complications. Assisting in the care of patients in the hospital ward, emergency room, operating room, and clinic, students gain familiarity with the anatomy and pathophysiology of conditions addressed by and related to bariatric surgery; are exposed to nonbariatric cases, with minimally invasive foregut surgeries and hernia repairs; and learn the principles and applications of laparoscopy. Many cases include upper endoscopy. Prerequisite: completion of third-year clerkships. Open to fourth- and fifth-year students only.

Cardiac Surgery Subinternship Intensive exposure to preoperative and postoperative management of adult and pediatric cardiac surgical patients and to intraoperative conduct of surgical procedures, with active participation in the operating room and in regular conferences. Students attend regular seminars covering major areas of cardiac surgery with members of the faculty and may be required to present a seminar on a

subject in cardiac surgery to faculty and resident staff. Prerequisite: completion of third-year clerkships.

Colorectal Surgery Subinternship Students learn about the surgical care of colon and anorectal diseases, including infectious, inflammatory, neoplastic, and mechanical pathologic processes. Students assist in the evaluation, management, and care of patients with colorectal and anorectal disease in the hospital ward, emergency room, operating room, and clinic. There is routine use of endoscopy and laparoscopy. Students may also participate in a precepted experience, with increased responsibility for patient care on the hospital ward, acting as the intern for select weekends. Prerequisite: completion of third-year clerkships. Open to fourth- and fifth-year students only.

Endocrine Surgery Subinternship This elective exposes the student to in-depth clinical and surgical aspects of endocrine surgery. Special emphasis is placed on the multidisciplinary approach to the endocrine patient, understanding the laboratory and radiologic studies, cytopathology, biochemical analysis, preoperative stabilization of patients, intraoperative decision-making, and postoperative follow-up and outpatient evaluation of patients. Technical skills are emphasized as well for students interested in improving their surgical hands. Prerequisite: completion of third-year clerkships. Open to fourth- and fifth-year students only.

Otolaryngology Subinternship This clinical experience is independent of the Otolaryngology rotation and takes place on an individual basis. It includes experience in the operating room, ward, outpatient clinics, conferences, didactics, and tumor board. The rotation is divided into two-week blocks, including the head and neck service (H&N cancer/reconstructive surgery, laryngology) and the ENT specialty service (neurotology, pediatrics, sinus/skull base, facial plastics, general). Students improve their suturing skills and become comfortable performing a thorough but efficient head and neck examination and interpreting diagnostic tests and procedures that can be useful in all medical and surgical subspecialties. At the end of the rotation, students are expected to give a seven-minute presentation on a topic of their choice at ENT grand rounds. Prerequisite: completion of third-year clerkships. Open to fourth- and fifth-year students only.

Pediatric Surgery Subinternship This subinternship provides an in-depth exposure to the broad spectrum of pediatric surgical problems. Specific attention is given to identifying the pediatric patient in crisis, a relevant skill whether or not the student pursues a career in surgery. Objectives include understanding the correction of major congenital anomalies, management of trauma, care of the critically ill child, and management of solid tumors. Experience includes in-depth exposure to the pediatric operating room, training in neonatal and pediatric critical care, and experience in the pediatric surgical outpatient clinic. The student is an integral part of the pediatric surgical team. Prerequisite: completion of third-year clerkships.

Plastic and Reconstructive Surgery Subinternship Students participate in the evaluation and reconstructive surgery of deformities of congenital, traumatic, and neoplastic origin. Students are exposed to patients in inpatient and outpatient settings as well as operating room experiences, supplemented by regular conferences. Prerequisite: completion of third-year clerkships.

Surgical Critical Care Subinternship (VAMC/SICU) Students are assigned advanced clinical duties in the field of surgical critical care. Students spend time in the surgical intensive care unit (SICU), where they participate in the management of critically ill surgical patients, including general surgical, vascular, urologic, cardiothoracic, and neurosurgical patients. Topics covered include cardiopulmonary resuscitation, airway and ventilator management, fluid management, nutritional support, and the management of sepsis. Students can participate in all invasive procedures in the SICU, including bedside tracheostomy, percutaneous gastrostomy placement, bronchoscopy, and arterial and central venous catheter placement. Under the supervision of the intensive care attending physician, students are directly responsible for one to two critical care patients. Students present on rounds each day and assist in providing family and primary service communication. Prerequisite: completion of third-year surgery and medicine clerkships. Open to fourth- and fifth-year students only.

Surgical Oncology Subinternship Intensive exposure to surgical aspects of the treatment of cancer in the clinic, hospital, and operating room. The interaction among surgery, medical oncology, and radiation therapy is experienced by following patients receiving multiple forms of therapy. Prerequisite: completion of third-year clerkships. Open to fourth- and fifth-year students only. Maximum of four students every four weeks.

Thoracic Surgery Subinternship The student is expected to be a valuable contributing team member during daily rounds, in the operating room, in the outpatient clinics, and at conferences. The majority of patients under the care of the thoracic surgery service include those with lung, esophageal, and mediastinal malignancies and infections, and many present both diagnostic and therapeutic challenges. Students have the opportunity to understand the multidisciplinary approach toward the management of these complex patients. Interested students can also pursue clinical research projects and papers. Prerequisite: completion of third-year clerkships. Open to fourth- and fifth-year students only.

Transplantation Surgery Subinternship This intensive clinical experience emphasizes the preoperative assessment, intraoperative care, and postoperative management of patients suffering end-stage organ system failure who are cared for by transplantation. Emphasis on the management of immunosuppressive medication regimens and the care of post-transplant problems. Prerequisite: completion of third-year clerkships. Open to fourth- and fifth-year students only.

Trauma and Emergency General Surgery Subintership A four-week exposure to the urgent surgical care of the critically ill and injured patient including those with penetrating and blunt injuries; surgical emergencies including mesenteric ischemia, bowel perforation, abdominal sepsis, necrotizing soft-tissue infections; and other urgent surgical conditions. Students are exposed to the evaluation and medical and surgical management of patients with traumatic and surgical emergencies in the emergency department, surgical floors, operating rooms, and outpatient clinics; and they assume supervised primary responsibility for these patients throughout their pre-, intra- and postoperative courses. Options for involvement in clinical research projects are also

available. Prerequisite: completion of third-year clerkships. Open to fourth- and fifth-year students only.

Urology Subinternship Flexible program designed to provide in-depth exposure to urology specialty areas, including uro-oncology, minimally invasive (laparoscopic) urology, endo-urology, neuro-urology, female urology, and pediatric urology. Students are part of the urologic team and participate actively in the clinic, the operating room, and on rounds. Prerequisite: at least six months of prior clinical training.

Vascular Surgery Subinternship A practical experience in the diagnosis and management of vascular disease, including pre- and postoperative care. The scope of the experience includes orientation to the noninvasive vascular diagnostic laboratory, outpatient care in the Yale Vascular Center, and inpatient management (including patients in the operating room, ICU, and the vascular surgery unit). Prerequisite: completion of third-year clerkships. Open to fourth- and fifth-year students only.

THERAPEUTIC RADIOLOGY

HRT 140, 203.785.2956
https://medicine.yale.edu/therapeuticradiology

Professors S.J. Baserga (*Molecular Biophysics and Biochemistry*), R. Bindra, D. Carlson, Z. Chen, V.L. Chiang (*Neurosurgery*), J.N. Contessa, S. Damast, J. Deng, D.C. DiMaio (*Genetics*), S. Evans, P.M. Glazer (*Chair*), B. Haffty (*Adjunct*), S.A. Higgins, M.S. Moran, R. Nath (*Emeritus*), K.B. Roberts, S. Rockwell (*Emeritus*), W. Rupp (*Emeritus*), R.J. Schulz (Emeritus), Y.H. Son (Emeritus), J.B. Sweasy (Emerita), L. Wilson

Associate Professors J.Y. Chung, K. Du, J.E. Hansen, N. Housri (*Adjunct*), R. Jensen, K. Johung, M. King (*Cell Biology*), C.A. Knowlton, B. McGibbon, H. Park, A.A. Patel, F.A. Rogers, C. Tien, M. Young

Assistant Professors Y. An, S. Aneja, A. Campbell, E. Draeger, L. Escobar-Hoyos, F. Guan, T. Hayman, S. Kamath, J. Kang, S. Kuznetsova, J. Laird, G. Maquilan, Y. Na, T. Robinson, J. Snyder, A. Van Slyke, Y. Wang, G. Welch Peters

Instructor A. Knowlton

Senior Research Scientist D.E. Brash

Associate Research Scientists M. Baro, X. Chen, Y. Lu, T. Madanayake, V. Menon, G. Moore, S. Rojas Sánchez

Clinical Professors D.E. Brash, N. Dainiak

Associate Clinical Professor P. Pathare

Assistant Clinical Professors J. Albanese, J. Bond, H. Chen, D. Han, A. Jain, N. Nguyen, C. Serago

Clinical Instructor J. Kim

Elective

Radiation Oncology Elective A flexible program designed to introduce the student to radiation oncology. Students become familiar with the biological and physical basis of radiation oncology, together with clinical practice and ongoing research. This elective offers clinical exposure to patients with malignant disease, with between seventy-five and one hundred patients treated daily in the department. The student takes part in departmental conferences, clinics, lectures, and individual training sessions. Maximum of three students every four weeks.

UROLOGY

FMP 316, 203.785.4755
https://medicine.yale.edu/urology

Professors J.W. Colberg, H.E. Foster, I. Franco (*Adjunct*), O. Harmanli (*Obstetrics, Gynecology and Reproductive Sciences*), S.C. Honig, I. Kim (*Chair*), B. Lytton (*Emeritus*), D. Petrylak (*Medicine*), R.M. Weiss

Associate Professors A. Arlen, T. Buckley, D.G. Hesse, A.B. Hittelman, M.E. Hurwitz (*Medicine*), D. Kellner, P. Kenney, M. Leapman, M. Maher, T. Martin, P. Motamedinia, M. Passarelli, J.F. Renzulli, L. Rickey, D. Singh, P. Sprenkle, T.Y. Tran

Assistant Professors R.S. Bercik (*Obstetrics, Gynecology and Reproductive Sciences*), D. Braun (*Medicine*), J. Brito, M. Casilla-Lennon, J. Cavallo, R. Devito, E. Enquist, F. Ghali, M. Karellas, H. Kennedy, J. Kim, J. Lee, D.T. Martin, J. Onofrey, K. Rotker, S. Schoenberger, J.A. Sterling, N. Stroumbakis

Instructor C. Judge

Associate Research Scientist D. Jung

Assistant Clinical Professor G. Turini

Urology electives are listed under the Department of Surgery.

Yale Cancer Center

WWW 205, 203.785.4095
http://yalecancercenter.org

Director E. Winer

Deputy Directors D. DiMaio, R. Herbst, M. Irwin

Associate Directors T. Battaglia, B. Burtness, E. Kaftan, M. King, H. Kluger, I. Krop, P. LoRusso, M. Nunez-Smith, F. Rogers, D. Stern

The center supports a $97 million research base to promote translational research through collaborations between and within seven basic, epidemiological, and clinical research programs. Basic research programs in Cancer Signaling Networks; Genomics, Genetics, and Epigenetics; Cancer Microbiology; and Developmental Therapeutics are integrated with clinical research programs in Cancer Immunology and in Radiobiology and Genome Integrity, and with one epidemiological program, Cancer Prevention and Control. The center also supports seven shared facilities that are available for oncological research: Flow Cytometry, Cesium-137 Irradiator, Rapid Case Ascertainment, Biostatistics Shared Resource, Yale Center for Genome Analysis, Yale Pathology Tissue Services, and Yale Center for Molecular Discovery.

Postgraduate Study

Graduate medical education in clinical departments is based upon the residency training programs of the Yale-New Haven Medical Center. Initial appointments are offered in Anesthesiology, Combined Child and Adult Psychiatry, Dermatology, Diagnostic Imaging, Emergency Medicine, Internal Medicine Primary Care, Internal Medicine, Internal Medicine–Pediatrics, Interventional Radiology, Neurology, Child Neurology, Neurosurgery, Obstetrics and Gynecology, Ophthalmology, Orthopaedics and Rehabilitation, Otolaryngology, Pathology, Pediatrics, Physical Medicine and Rehabilitation, Plastic Surgery, Psychiatry, Surgery, Therapeutic Radiology, Thoracic Surgery, Urology, and Vascular Surgery; appointments are made through the National Resident Matching Program or the appropriate specialty matching program (Ophthalmology and Urology). Residencies are also offered in Dentistry, Pediatric Dentistry, Oral Maxillofacial Surgery, and Podiatry. Subspecialty residency programs are offered in the following specialties:

Anesthesiology
Cardiothoracic Surgery
Child Psychiatry
Dermatology
Diagnostic Radiology
Emergency Medicine
Internal Medicine
Medical Genetics
Neurology
Neurosurgery
Obstetrics and Gynecology
Ophthalmology
Orthopaedic Surgery
Pathology and Laboratory Medicine (AP/CP)
Pediatrics
Plastic Surgery
Psychiatry
Surgery
Urology

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 are enrolled as postgraduate students in the School of Medicine in addition to their hospital appointments. In most of the clinical departments, a 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 website (https://www.ynhh.org/medical-professionals/gme) or the Yale School of Medicine site (https://medicine.yale.edu/about/departments) and visiting the appropriate department.

Center for Medical Education

The Center for Medical Education was established to foster excellence in medical education. It was founded in 2012 as the Teaching and Learning Center. In 2023, it was expanded and renamed the Center for Medical Education. The center provides a forum for YSM educators to find mentorship and educator development opportunities and has served as the medical campus hub for medical education research and scholarship.

The center's programs and resources are developed and offered to the YSM community throughout all departments and across undergraduate, graduate, and continuing medical education. A robust offering of educator development programs cultivates a vibrant community of YSM educators. These include the Medical Education Discussion Group (MEDG) series, the Yale Medical Educator Series (YES!), and Medical Education Day at Yale, an annual conference that showcases excellence and innovation in medical education.

For those interested in developing a career in the field of medical education, the center offers a Master of Health Science–Medical Education Track degree program, a fellowship for education scholars, and a longitudinal medical education concentration for students.

Center faculty and staff provide one-on-one and group consulting to members of the YSM community on issues related to medical education, including curriculum development and assessment methods. Teaching observations are also available wherein a center faculty observer watches a teaching session, records feedback, and meets with the teacher privately afterward to talk together about the feedback.

The center also houses the Assessment Hub and the Office of Continuing Medical Education, which consists of faculty and staff experts in assessment and evaluation. This group oversees program, curriculum, educator, and student assessment for Yale School of Medicine.

For more information visit https://medicine.yale.edu/center-for-medical-education.

OFFICE OF CONTINUING MEDICAL EDUCATION (CME)

The CME office is dedicated to providing the highest-quality learning opportunities for physicians and other health care professionals. Its mission is to develop and implement creative, ethical, and evidence-based educational programs that are designed to increase physician competence, enhance practice performance, promote patient safety, and, where applicable, improve patient outcomes. We strive to provide programs that not only educate but also inspire healthcare professionals to achieve excellence in their practice. For more information about these programs and services, visit https://medicine.yale.edu/cme.

Student Research Day Oral Presentations

Presented May 7, 2024

Chinye Ijeli. *Medicaid Coverage for Undocumented Children in Connecticut: A Political History*

Amanda Liberman. *Multilevel Barriers to Methadone for HIV Prevention Among People Who Inject Drugs in Kazakhstan*

Kingson Lin. *Design, Synthesis, and Characterization of Novel MGMT-Dependent, MMR-Independent Agents for the Treatment of Glioblastoma Multiforme (GBM)*

Victoria Marks. *Association between Medical Insurance, Access to Care, and Clinical Outcomes for Patients with Uveal Melanoma in the United States*

Jamieson O'Marr. *Ballistic and Explosive Orthopaedic Trauma Epidemiology and Outcomes in a Global Population*

The Work of Yale University

The work of Yale University is carried on in the following schools:

Yale College Est. 1701. Courses in humanities, social sciences, natural sciences, mathematical and computer sciences, and engineering. Bachelor of Arts (B.A.), Bachelor of Science (B.S.).

For additional information, please visit https://admissions.yale.edu, email student.questions@yale.edu, or call 203.432.9300. Postal correspondence should be directed to Office of Undergraduate Admissions, Yale University, PO Box 208234, New Haven CT 06520-8234.

Graduate School of Arts and Sciences Est. 1847. Courses for college graduates. Master of Arts (M.A.), Master of Science (M.S.), Master of Philosophy (M.Phil.), Doctor of Philosophy (Ph.D.).

For additional information, please visit https://gsas.yale.edu, email graduate.admissions@yale.edu, or call the Office of Graduate Admissions at 203.432.2771. Postal correspondence should be directed to Office of Graduate Admissions, Yale Graduate School of Arts and Sciences, PO Box 208236, New Haven CT 06520-8236.

School of Medicine Est. 1810. Courses for college graduates and students who have completed requisite training in approved institutions. Doctor of Medicine (M.D.). Postgraduate study in the basic sciences and clinical subjects. Five-year combined program leading to Doctor of Medicine and Master of Health Science (M.D./M.H.S.). Combined program with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Doctor of Philosophy (M.D.-Ph.D.). Master of Medical Science (M.M.Sc.) from the Physician Associate Program and the Physician Assistant Online Program.

For additional information, please visit https://medicine.yale.edu/edu, email medical.admissions@yale.edu, or call the Office of Admissions at 203.785.2643. Postal correspondence should be directed to Office of Admissions, Yale School of Medicine, 367 Cedar Street, New Haven CT 06510.

Divinity School Est. 1822. Courses for college graduates. Master of Divinity (M.Div.), Master of Arts in Religion (M.A.R.). Individuals with an M.Div. degree may apply for the program leading to the degree of Master of Sacred Theology (S.T.M.).

For additional information, please visit https://divinity.yale.edu, email div.admissions@yale.edu, or call the Admissions Office at 203.432.5360. Postal correspondence should be directed to Admissions Office, Yale Divinity School, 409 Prospect Street, New Haven CT 06511.

Law School Est. 1824. Courses for college graduates. Juris Doctor (J.D.). For additional information, please visit https://law.yale.edu, email admissions.law@yale.edu, or call the Admissions Office at 203.432.4995. Postal correspondence should be directed to Admissions Office, Yale Law School, PO Box 208215, New Haven CT 06520-8215.

Graduate Programs: Master of Laws (LL.M.), Doctor of the Science of Law (J.S.D.), Master of Studies in Law (M.S.L.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. For additional information, please visit https://law.yale.edu, email gradpro.law@yale.edu, or call the Graduate Programs Office at

203.432.1696. Postal correspondence should be directed to Graduate Programs, Yale Law School, PO Box 208215, New Haven CT 06520-8215.

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

For additional information, please visit https://seas.yale.edu, email grad.engineering@yale.edu, or call 203.432.4252. Postal correspondence should be directed to Office of Graduate Studies, Yale School of Engineering & Applied Science, PO Box 208292, New Haven CT 06520-8292.

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, email artschool.info@yale.edu, or call the Office of Academic Administration at 203.432.2600. Postal correspondence should be directed to Office of Academic Administration, Yale School of Art, PO Box 208339, New Haven CT 06520-8339.

School of Music Est. 1894. Graduate professional studies in performance and composition. Certificate in Performance (CERT), Master of Music (M.M.), Master of Musical Arts (M.M.A.), Artist Diploma (A.D.), Doctor of Musical Arts (D.M.A.).

For additional information, please visit https://music.yale.edu, email gradmusic.admissions@yale.edu, or call the Office of Admissions at 203.432.4155. Postal correspondence should be directed to Yale School of Music, PO Box 208246, New Haven CT 06520-8246.

School of the Environment Est. 1900. Courses for college graduates. Master of Forestry (M.F.), Master of Forest Science (M.F.S.), Master of Environmental Science (M.E.Sc.), Master of Environmental Management (M.E.M.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit https://environment.yale.edu, email admissions.yse@yale.edu, or call the Office of Admissions at 800.825.0330. Postal correspondence should be directed to Office of Admissions, Yale School of the Environment, 300 Prospect Street, New Haven CT 06511.

School of Public Health Est. 1915. Courses for college graduates. Master of Public Health (M.P.H.). Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit https://publichealth.yale.edu, email ysph.admissions@yale.edu, or call the Admissions Office at 203.785.2844.

School of Architecture Est. 1916. Courses for college graduates. Professional and post-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 https://www.architecture.yale.edu, email 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 (P.M.C.), Doctor of Nursing Practice (D.N.P.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit https://nursing.yale.edu or call 203.785.2389. Postal correspondence should be directed to Yale School of Nursing, Yale University West Campus, PO Box 27399, West Haven CT 06516-0972.

David Geffen School of Drama Est. 1925. Courses for college graduates and certificate students. Master of Fine Arts (M.F.A.), Certificate in Drama, Doctor of Fine Arts (D.F.A.).

For additional information, please visit https://drama.yale.edu, email dgsd.admissions@yale.edu, or call the Registrar/Admissions Office at 203.432.1507. Postal correspondence should be directed to David Geffen School of Drama at Yale University, PO Box 208325, New Haven CT 06520-8325.

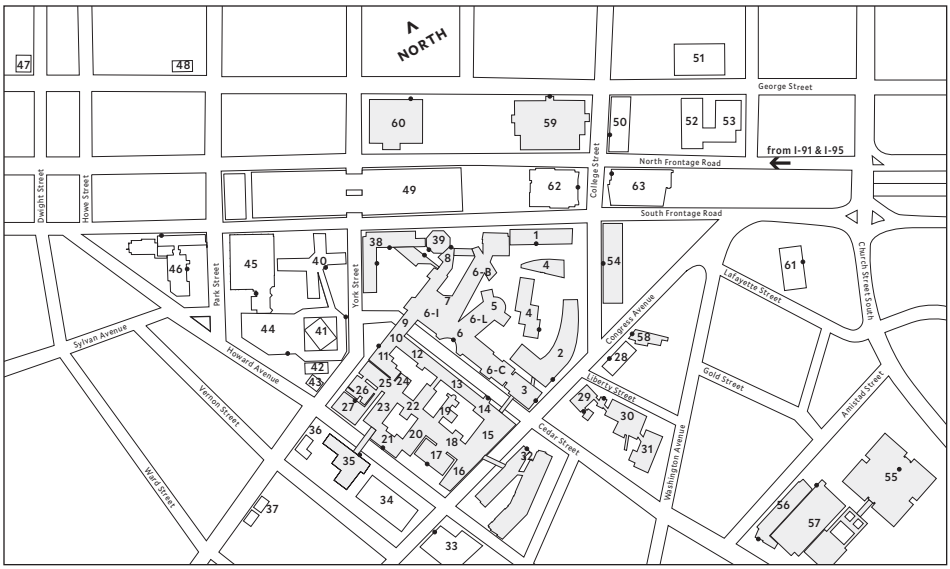
School of Management Est. 1976. Courses for college graduates. Master of Business Administration (M.B.A.), Master of Advanced Management (M.A.M.), Master of Management Studies (M.M.S.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

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

Jackson School of Global Affairs Est. 2022. Courses for college graduates. Master in Public Policy (M.P.P.) and Master of Advanced Study (M.A.S.).

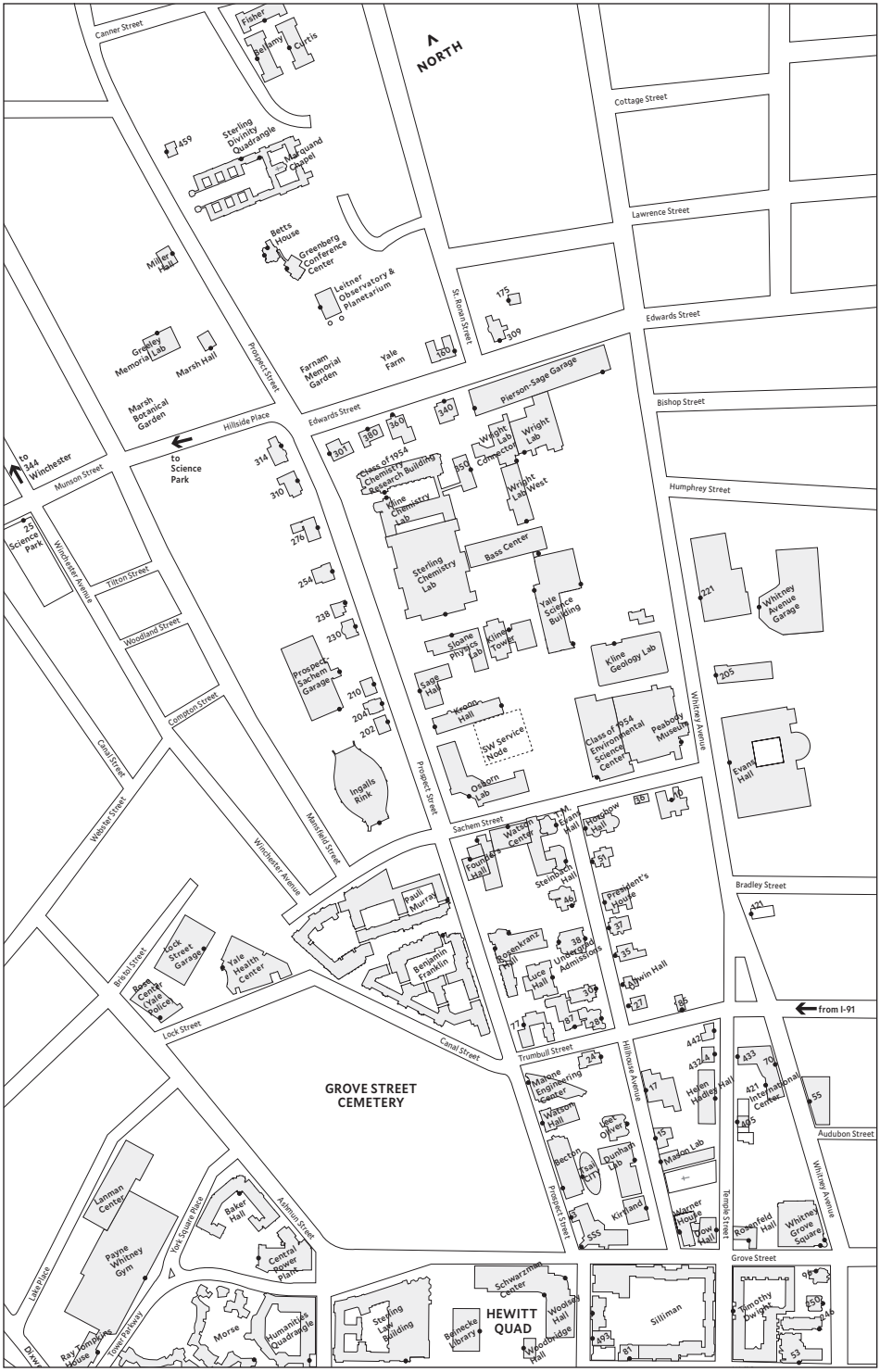
For additional information, please visit https://jackson.yale.edu, email jackson.admissions@yale.edu, or call 203.432.6253.

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.
37. 132–138 Davenport Ave.
38. Edward S. Harkness Memorial Hall A and D, 367 Cedar St.
39. Neison and Irving Harris Building, 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, 35 Park St.
46. Connecticut Mental Health Center
47. Ronald McDonald House, 501 George St.
48. 425 George St.
49. **Air Rights Parking Garage**
50. 127, 135, and 153 College St.
51. New Haven Hotel, 229 George St.
52. **Temple Garage**
53. Temple Medical Center, 40–60 Temple St.
54. College Place, 47 College St.
55. Medical Center South, 100 Church St. South
56. 10 Amistad St.
57. **Amistad Garage**
58. 270 Congress Ave.
59. 300 George St.
60. Child Study Center, 350 George St.
61. 2 Church St. South
62. 100 College St.
63. 101 College St.

YALE UNIVERSITY CAMPUS NORTH



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YALE UNIVERSITY CAMPUS SOUTH & YALE MEDICAL CENTER

Travel Directions

See also https://medicine.yale.edu/maps. 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 served by Avelo Airlines. Local taxi service, M7 taxi (203.777.7777), is available at the airport, as are car rentals. Connecticut Limousine Service (https://ctlimo.com) and Go Airport Shuttle Connecticut (www.2theairport.com) service to New Haven is available from Bradley, Kennedy, LaGuardia, Newark, and White Plains airports.

BY TRAIN

There is hourly Metro-North (800.638.7646) service to New Haven from Grand Central Station in New York every day of the week. Amtrak (800.872.7245) service is scheduled daily from Boston, Washington, D.C., or New York (Penn Station).

BY CAR

From I-95 North or South Take Exit 47 (Route 34) to Exit 1. Visitor parking is available in the Air Rights Garage, which can be entered from MLK Jr. Boulevard, South Frontage Road, or York Street.

From I-91 South Take Exit 1 (Route 34) to Exit 1. Continue to the Air Rights Garage, as above.

From Merritt Parkway (Rte. 15) North Take Exit 57 to Route 34 East into New Haven. Turn right onto Ella T. Grasso Boulevard (Rte. 10) and then left onto South Frontage Road (Legion Avenue). Follow Yale New Haven Hospital and Rte. 34 signs. Continue to the Air Rights Garage, as above.

From Wilbur Cross Parkway (Rte. 15) South Take Exit 59 immediately after the tunnel. Go right at end of ramp. Merge left onto Whalley Avenue at light. Stay on Whalley until you see signs for Yale New Haven Hospital at Park Street. Follow hospital signs, then make a left turn onto South Frontage Road. Continue to the Air Rights Garage, as above.

The university is committed to affirmative action under law in employment of women, minority group members, individuals with disabilities, and protected veterans. Additionally, in accordance with Yale's Policy Against Discrimination and Harassment (https://your.yale.edu/policies-procedures/policies/9000-yale-university-policy-against-discrimination-and-harassment), Yale does not discriminate in admissions, educational programs, or employment against any individual on account of that individual's sex; sexual orientation; gender identity or expression; race; color; national or ethnic origin; religion; age; disability; status as a special disabled veteran, veteran of the Vietnam era, or other covered veteran; or membership in any other protected classes as set forth in Connecticut and federal law.

Inquiries concerning these policies may be referred to the Office of Institutional Equity and Accessibility, 203.432.0849; equity@yale.edu. For additional information, please visit https://oiea.yale.edu.

Title IX of the Education Amendments of 1972 protects people from sex discrimination in educational programs and activities at institutions that receive federal financial assistance. Questions regarding Title IX may be referred to the university's Title IX coordinator, Elizabeth Conklin, at 203.432.6854 or at titleix@yale.edu, or to the U.S. Department of Education, Office for Civil Rights, 8th Floor, 5 Post Office Square, Boston MA 02109-3921; tel. 617.289.0111, TDD 800.877.8339, or ocr.boston@ed.gov. For additional information, including information on Yale's sexual misconduct policies and a list of resources available to Yale community members with concerns about sexual misconduct, please visit https://titleix.yale.edu.

In accordance with federal and state law, the university maintains information on security policies and procedures and prepares an annual campus security and fire safety report containing three years' worth of campus crime statistics and security policy statements, fire safety information, and a description of where students, faculty, and staff should go to report crimes. The fire safety section of the annual report contains information on current fire safety practices and any fires that occurred within on-campus student housing facilities. Upon request to the Yale Police Department at 203.432.4400, the university will provide this information to any applicant for admission, or to prospective students and employees. The report is also posted on Yale's Public Safety website; please visit http://your.yale.edu/community/public-safety.

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.

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