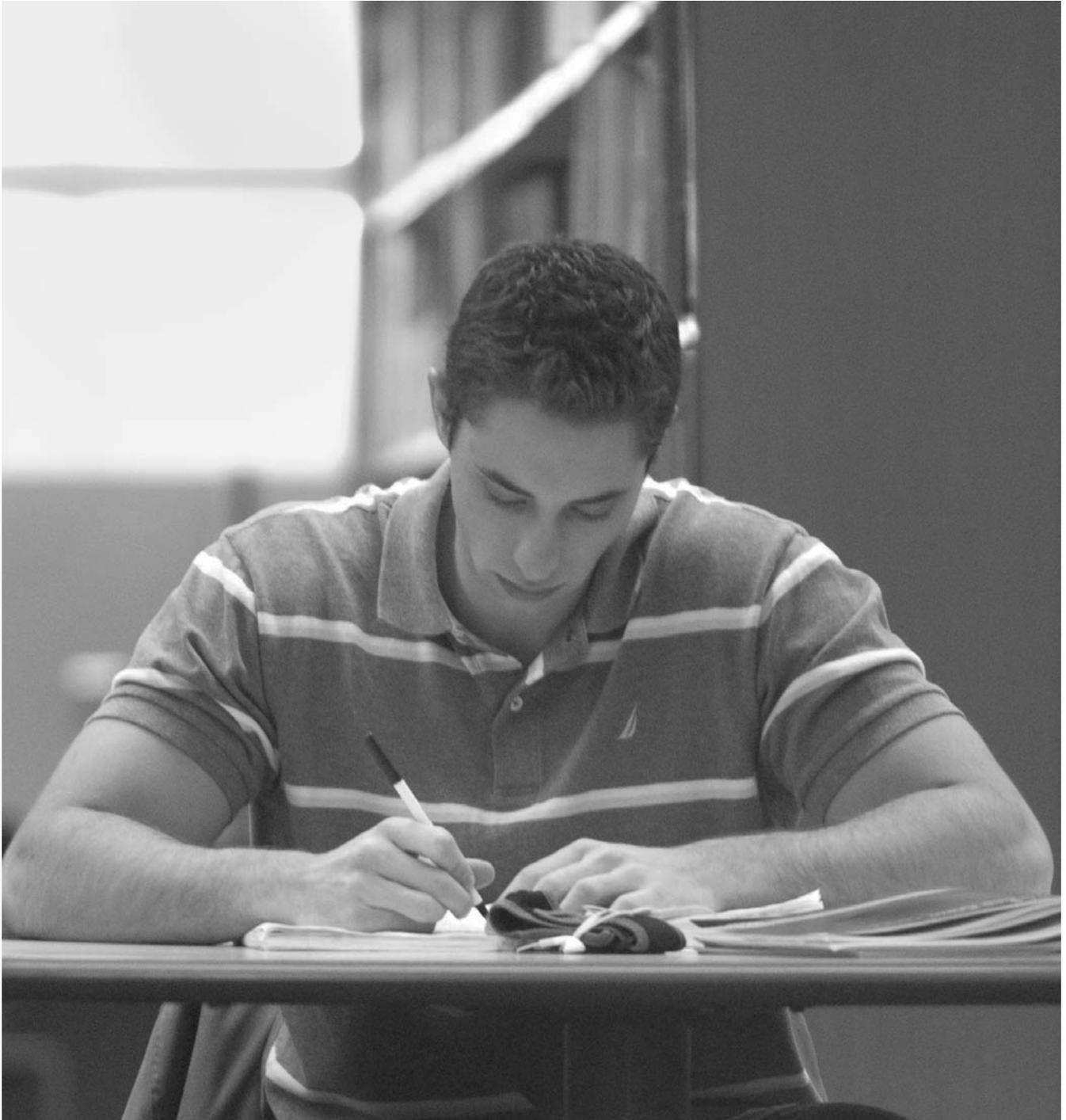




School of Medicine



School of Medicine

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VICE DEANS: Thomas Biancaniello, Clinical Affairs; Wadie Bahou, Scientific Affairs; Peter C. Williams, Academic & Faculty Affairs

ASSOCIATE DEANS: Latha Chandran, Academic & Faculty Affairs; Jack Fuhrer, Admissions; Aldustus Jordan, Student & Minority Affairs; Dorothy S. Lane, Continuing Medical Education; Elza Mylona, Educational Development & Evaluation; Michael Porembski, Administration; John H. Riley Jr., Finance and Personnel; Frederick M. Schiavone, Medical Education; George Tyson, Planning

ASSOCIATE DEANS AT CLINICAL AFFILIATIONS: John F. Aloia, Winthrop University Hospital; Edward J.C. Mack, Veterans Affairs Medical Center at Northport; Michael Mastow, Nassau University Medical Center

ASSISTANT DEANS: Grace Agnetti, Admissions; Arnold Jaffe, Graduate Medical Education; Marilyn London, Undergraduate Medical Education; David Tompkins, Undergraduate Medical Education; Karen Wilk, Faculty Personnel

EXECUTIVE ASSISTANT: Lorraine Rubino

ASSISTANT TO THE DEAN: Mary Jean Allen, Student & Minority Affairs

REGISTRAR: Burke Kincaid, Student & Minority Affairs

OFFICE: HSC Level 4, Room 147A PHONE: (631) 444-2113 WEB: www.hsc.stonybrook.edu/som

The School of Medicine consists of basic science and clinical departments that have the responsibility for pre-clinical and clinical instruction of medical students in all the schools of the Health Sciences Center, as well as university-wide responsibility to students in other schools on the campus. Basic science departments include the departments of anatomical sciences, biochemistry and cell biology, biomedical engineering, microbiology, neurobiology and behavior, pathology, pharmacological sciences, and physiology and biophysics. Clinical departments include the departments of anesthesiology, dermatology, emergency medicine, family medicine, medicine, neurological surgery, neurology, obstetrics, gynecology and reproductive medicine, ophthalmology, orthopaedics, pediatrics, physical medicine and rehabilitation, preventive medicine, psychiatry and behavioral science, radiation oncology, radiology, surgery, and urology.

In addition to instruction at the undergraduate and professional levels, these departments have major responsibility for graduate, postgraduate, and continuing education. The goal of each of these departments is to:

1. Integrate as rapidly as possible new scientific knowledge and the advances of basic research into the training of every health professional
2. Promote input from all university disciplines into education and research in the health sciences
3. Ensure that every healthcare professional trained in the school is prepared to provide the highest level of patient care. In the basic sciences, these efforts are enhanced by collaboration with colleagues at the biology and medical departments of the Brookhaven National Laboratory, the Cold Spring Harbor Laboratory, and other research institutions in the vicinity. In the clinical departments, these objectives are enhanced by Stony Brook University Medical Center as well as by the clinical affiliates of the Nassau University Medical Center, Winthrop University Hospital, the Northport Veterans Affairs Medical Center, and various community clinical facilities integrated under a variety of arrangements.

Admission to the M.D. Program

The Medical College Admission Test (MCAT) must be taken no later than the year prior to the year for which the student

seeks admission. By law, applicants must have completed a minimum of two years of college before matriculation; however, medical school admissions committees favor applicants with more complete educational preparation. Premedical course requirements include one year each of biology, physics, inorganic chemistry and organic chemistry (all with lab), and one year of English. A basic course in biochemistry is helpful in preparing students for the first year of medical school.

The school hopes to acquire a student body representative of a variety of backgrounds, experiences, and interests. The school evaluates the preparation and potential of all applicants, and asks to meet personally with those in whom it is most seriously interested. Although it is desired that many backgrounds are represented in the student body, the school does not attempt to maintain a quota to fill any one "category" of student. It does, however, want to make clear its commitment to seek a significant representation in its student body from groups who have long remained under-represented in medicine.

Grades, MCAT scores, letters of evaluation, and extracurricular and work experiences are carefully and personally examined. Motivational and personal characteristics, as indicated in an individual's application, letters of evaluation, and a personal interview, are also a major part of the admissions assessment.* Decisions will be influenced by an applicant's scholarship, aptitude, character, personal qualities, and promise of future value to society through the medical profession. Students whose history manifests an aptitude for collaboration are encouraged to apply. There is no discrimination in the admissions review and selection process on the basis of sex, race, religion, national origin, age, marital status, or disability. Although residents of New York State constitute the majority of the entrants, the School of Medicine encourages applications from out of state residents.

All questions concerning admission should be addressed to:
Office of Admissions, School of Medicine
Health Sciences Center, Room 147A, Level 4
Stony Brook University

*The submission of false or misleading information in the application materials or in connection with the application process shall be the grounds for rejection. If such submission is discovered after the rendering of an offer of admission, matriculation in the school, or award of the degree, it shall be grounds for withdrawal of the acceptance offer, for dismissal, or for revocation of degree.

Stony Brook, NY 11794-8434
Phone: (631) 444-2113

Applications are available through the American Medical Colleges Application Service (AMCAS).

Technical Standards for Admission and Retention

The M.D. degree is, and must remain, a broad undifferentiated degree attesting to the mastery of general knowledge in all fields requisite for entry into graduate medical education programs (residencies) of diverse types. It follows that graduates must possess the essential knowledge and skills to function in a broad variety of clinical situations and to render a wide spectrum of patient care in a safe and effective manner.

The School of Medicine faculty has, therefore, specified non-academic criteria, Technical Standards for Admission and Retention, which all applicants/medical students are expected to meet in order to participate in the medical education programs. These criteria include the following five categories: 1) observation; 2) communication; 3) motor skills; 4) intellectual-conceptual, integrative and quantitative abilities; and 5) behavioral and social attributes. A copy of the Technical Standards may be obtained from the Admissions Office.

M.D. Curriculum

The curriculum in the School of Medicine is a combination of a series of courses offered by individual departments or integrated units that are planned and taught in an interdisciplinary manner by faculty from many departments. Activities in the community enrich the formal curriculum. The configuration of the curriculum is under constant review and changes as evidence is found of better ways to enhance student learning and the content requirements for physicians develops. The current configuration is as follows:

The first year curriculum consists of basic science courses and introductory courses related to patient care. The five basic science courses are Molecules, Genes and Cells; The Body (anatomical sciences and embryology); Neurosciences; Medical Physiology; and Pathology. The other required course is Foundations of Medical Practice, a recent integration of five previously separate courses: Medicine in Contemporary Society (social sciences and humanities in medicine); Introduction to Preventive Medicine; Introduction to Human Behavior; Introduction to Clinical Medicine; and the first segments of Nutrition. The first year Introduction to Clinical Medicine occurs throughout the year and teaches basic skills in taking a patient history and doing a physical examination.

After a course in Microbiology, the second year emphasizes the study of pathophysiology in organ systems. The Systems Approach to Medicine consists of integrated elements of basic and clinical science related to hematology, neurology, cardiovascular, endocrine, gastrointestinal, musculoskeletal, psychiatry, renal, reproductive, and respiratory systems. Pharmacology is synchronized with the system segments. Medicine in Contemporary Society and Introduction to Clinical Medicine continue in the second year. The latter focuses on the patient interview, examination and correlative skills as the student acquires additional knowledge in physi-

ology, pathology, and the natural history of diseases in the systems course. Students take Step 1 of the United States Medical Licensing Examination (USMLE) at the end of the second year. Passage of USMLE, Step I, is a requirement for advancement into the clinical years of study as is passing a series of simulated patient exercises.

The third year curriculum is patient focused and consists of a eight-week inpatient/outpatient clerkship in medicine, surgery, pediatrics, and obstetrics-gynecology, four-week clerkships in psychiatry, ambulatory care and family medicine, and two-week rotations in emergency medicine and radiology or an elective month. Medicine in Contemporary Society is part of each of many of the clerkships. Year three culminates in a Clinical Practice Examination in the Clinical Skills Center which students must pass to advance.

The fourth-year medical student assumes greater patient care responsibilities and continues to acquire clinical and laboratory skills. The curriculum includes: a one-month sub internship (medicine, family medicine, pediatrics, or general surgery), a one-month didactic course (emergency medicine, laboratory medicine, clinical therapeutics, or surgical anatomy), a one-month neurology clerkship, a one-month experience in the surgical subspecialties, a two-week block in primary care psychiatry, and additional elective time to complete a total of 8 1/2 months. There is also a requirement that each student complete either course work or a project in Medicine in Contemporary Society.

During the four years, a student's acquisition of clinical and laboratory skills necessitates attendance and demonstration of competence at simulated and real patient-contact exercises, laboratories, and other assessment exercises. Passing USMLE Step 1 and both the knowledge and skills parts of Step 2 is required for promotion and graduation.

Graduate Studies in Basic Health Sciences

Graduate studies leading to the Ph.D. degree in basic health sciences are offered in the fields of anatomical sciences, molecular microbiology, cellular and molecular pathology, molecular and cellular pharmacology, or physiology and biophysics. The Department of Oral Biology and Pathology also offers a Master of Science degree in Basic Health Sciences.

Basic health sciences departments of the School of Medicine also collaborate with the Division of Biological Sciences and other academic units to operate graduate study programs in various areas of the biological sciences, such as molecular biology and biochemistry, cellular and developmental biology, genetics, and neurobiology and behavior. Many of these programs are part of the tri-institutional consortium that includes Cold Spring Harbor Laboratory and Brookhaven National Laboratory, and students have the opportunity to work with the faculty at these institutions in addition to the Stony Brook University faculty.

Each graduate studies program is guided by its own director and executive committee and establishes its own entrance standards and degree requirements, described in detail in the Graduate Bulletin. Inquiries regarding graduate admission to a specific department should be addressed to the director of the department's graduate program. Please see the "Admissions Section" in this Bulletin for more information.

Joint Degree Programs

M.D./Ph.D. Program (MSTP)

The M.D./Ph.D. program normally requires six to eight years to complete. The course of study integrates medical education and basic or translational science training throughout the training period. During the first two years, the M.D./Ph.D. curriculum largely follows the M.D. curriculum, with the addition of MSTP-specific small group sessions. In addition, students participate in basic science journal clubs linked to clinical presentations, dinners with translational researchers, program functions such as the annual poster session and the retreat, and three summers of laboratory research. The next two to four years are spent completing the requirements for the Ph.D. in a basic science laboratory, along with participation in clinically-related activities. To be awarded the Ph.D. degree, the student must satisfy the Graduate School and Basic Health Science Graduate Studies requirements, which are tailored to fit the MSTP. At the conclusion of the research period, M.D./Ph.D. candidates complete the medical school clerkships and selectives required for the awarding of the M.D. degree. Most students go on to undertake fast-track academic-oriented residency training positions and eventually positional positions as academic clinicians or translationally oriented basic science researchers.

Scholars for Medicine Program (B.A./M.D. or B.E./M.D.)

Scholars for Medicine will earn a B.A./M.D. degree with four years of undergraduate course work and four years of medical school. All Scholars of Medicine will be individually counseled on their careers throughout their participation in the program. Benefits include full or partial scholarship funds, help in finding laboratory placements for undergraduate research projects, regular advising from the Premedical Advisor, opportunities to meet faculty in the School of Medicine, seminar participation with invited guest speakers in the Scholars for Medicine Lecture Series, and support and encouragement in the exploration of undergraduate and career opportunities.

Scholars for Medicine positions will be available to select entering freshmen who have been accepted to the Honors College, WISE Program, or Engineering Program. Eligibility criteria are: 1350 or above on the SATs; maturity; evidence of social commitment; evidence of interest in science; high moral character; breadth of interests and strong communication skills. Potential candidates will be interviewed by members of the Committee on Admissions for the School of Medicine.

All acceptances to the Scholars for Medicine Program (B.A./M.D. or B.E./M.D. Program) are conditional. Of critical importance will be an ongoing assessment of the candidate's maturity, academic ability and his/her motivation and readiness to pursue a medical education. Scholars must continue to present exemplary academic accomplishments and those personal characteristics that exemplify a Scholar for Medicine. Students accepted into the B.A./M.D. Program must have a 3.4 overall GPA + 3.2 science GPA after the first 3 undergraduate years. Students accepted into the B.E./M.D. Program

must have a 3.2 overall and science GPA after the first 3 undergraduate years. Students will be required to take the MCAT prior to their 4th year of undergraduate work and score a minimum cumulative MCAT score of 28 with no less than 8 in any section. All scholars will be required to take the MCAT no later than spring of their junior year in college.

Scholars for Medicine accepted into the B.A./M.D. or B.E./M.D. program before matriculating at Stony Brook will have a place reserved in Stony Brook Medical School contingent upon the above criteria. Final acceptance will be placed on the ongoing evaluations by program advisors, letters of evaluation, and MCAT performance. All students in the B.A./M.D. or B.E./M.D. program must apply for early decision to Stony Brook University School of Medicine.

M.D./M.P.H. is a combined degree program, i.e. each program remains separate at this point in time, but curricular requirements are dovetailed to permit satisfaction of the requirements for in five years.

Alpha Omega Alpha

A chapter of Alpha Omega Alpha, the national honor medical society, was established at the School of Medicine in 1985. The society's purpose is to recognize and perpetuate excellence in the medical profession. Each year chapter members elect outstanding medical students, graduates, faculty and honorary members to its ranks based on academic achievements, professionalism, teaching, and service to community.

M.D. With Recognition in Research Program

Students must complete six months of research during medical school and present their results at a student research seminar in their senior year. Students work with a local scientist/researcher who serves as the mentor. Students also interact with members of the Medical Scientist Training Program in many of the academic class small group sessions and are invited to participate in the monthly journal club/clinical case presentation.

M.D. with Recognition in Humanistic Studies

This program, along with the M.D. with Recognition in Research, is designed to cultivate student scholarly capabilities. Project may focus on humanities (literature, philosophy, et al.), arts (music, visual arts, et al.), or social sciences (history, anthropology, public policy, et al.). Students must complete six months of scholarship during medical school and a creation-manuscript, score, portfolio-presenting their results during a program in their senior year. Students work with two mentors, one a physician and the other a non-physician scholar in the primary field of study.

Center for Medical Humanities and Bioethics

The Institute for Medicine in Contemporary Society was established in 1990 at the School of Medicine to develop interdisciplinary programs that explore the relationship of medicine with other dimensions of contemporary culture. Philosophy, law, the arts, social sciences, literature, and religion all have significant roles to play in our understanding of illness, pain, disability, suffering, caring, healing, therapeutic relationships and other aspects of medicine and health care practice. With its primary interest in connecting the schools of the health professions, other departments of the University, and the Long Island community, the Institute served as a catalyst for discussion, educational experiment, and research in Stony Brook's multi-cultural environment. The recently created Center for Medical Humanities and Bioethics will continue and expand the Institute's work. In particular, the Center fosters interdisciplinary collaboration, effective communication, and humanistic practice at all levels in the health care setting.

Academic Requirements for the M.D. Degree

Grading Policy

The School of Medicine does not assign credits to medical student courses; rather the curriculum is counted using hours, days and weeks. Students must complete the entire curriculum successfully to graduate. Students may receive grades of H (Honors), P (Pass), or F (Fail). Other recorded grades are I (Incomplete) for students who, with good reason, have not completed all mandatory course requirements, PO (Place Out); and W (Withdrawal). Students who complete a clerkship successfully but for a failure of the National Board of Medical Examiners clerkship subject exam receive a Z in that clerkship until the examination is retaken. At that point the student receives either a Z/P or Z/F. Although the official transcript lists only the listed above grades above, our internal records and letter to residency program directors list HP (high pass) and LP (low pass) as well.

Academic Standing

It is the intention of the School of Medicine to assure that students are adequately prepared, both for the practice of medicine and a life in medicine. Such assurance requires both an overall academic performance that goes beyond merely marginal and an unblemished record of professionalism.

Different courses have different requirements, but in all courses, grades are determined by course directors and reported to the Office of Office of Medical Education (OME) and the Committee on Academic Standing, the body charged with oversight of student progress. Students must complete all coursework in one year before proceeding to the next. Moreover, students must pass a clinical skills examination and USMLE, Step 1 before continuing in the third year, and must pass a Clinical Practice Examination and both parts of Step 2—knowledge and skills—to graduate.

The Committee on Academic Standing evaluates academic progress and responds to reports of professional misconduct and makes recommendations to the Dean regarding a student's status. The School of Medicine's policy is to ensure the integrity of its examination process, to promote ethical behavior in academic and clinical situations, and to develop in students a commitment to the integrity of the medical profession. Students have an obligation to refrain from any act that is designed to obtain for themselves or others academic credit, grades, or other recognition which is not properly earned. They also have an obligation to take an active role in ensuring that other students refrain from such acts. Each student therefore has the responsibility to prevent or report acts of academic dishonesty. There is a discussion of professionalism in the school's Policies and Procedures, and students are evaluated for professionalism in their course work using a form that specifies elements of personal responsibility, cultural sensitivity, self-improvement, integrity, and altruism.

As important, there is also a student honor code created by the students to which all medical students must adhere. Violations of the student honor code are reviewed by a student committee which reports recommendations to the Dean. In cases of academic difficulty or dishonesty, the student is offered an opportunity to appear before the Committee on Academic Standing. Decisions of this committee are reported to, and may be appealed to, the Dean of Medicine.

Students with learning or other disabilities will be evaluated by the University's Disability Support Services and, in discussion with the dean's office, appropriate accommodations made.

Financial Aid

Inquiries concerning sources of financial aid and student financial planning should be directed to the School of Medicine Student Affairs Office. First-time financial aid applicants must complete the School of Medicine Institutional Application for Financial Aid. All financial aid applicants must complete the Free Application for Federal Student Aid (FAFSA) for each academic year they are applying. Financial aid for medical students consists of loans and grants. Financial aid awards will not exceed the cost of attendance for each academic year. The cost of attendance includes tuition and fees; room and board; books and supplies; transportation expenses; and personal/miscellaneous expenses. The cost of attendance is set and published each spring prior to the beginning of the new academic year.

For a schedule of tuition and fees and payment information, please refer to the "Academic Year Fees and Charges" section at the beginning of this Bulletin.

Continuing Medical Education

The educational mission of the medical school targets medical students, post graduate trainees, and practicing physicians. This is consonant with the philosophy that education is a continuing process throughout a professional career. The purpose of Continuing Medical Education is to optimize patient care and maintain and improve physician competency by means of offering high quality learning experiences for physicians. The activities offered permit physicians to fulfill CME require-

ments for re-licensure, maintenance of certification, hospital privileges, and medical or specialty society membership.

The School of Medicine's continuing education program is fully accredited by the Accreditation Council for Continuing Medical Education. Through its Office of Continuing Medical Education the School of Medicine sponsors, co-sponsors or jointly sponsors CME activities including regularly scheduled conferences, courses, and enduring materials. The methods of instruction are varied to offer different types of learning experiences, appealing to diverse and individual learning styles and practice setting requirements. They include live conferences; interactive audio, video and electronic programs; self-study materials; and hands-on training.

Endowed Chairs

The Edmund D. Pellegrino Professorship of Medicine

In 1986, the University established a professorship in the School of Medicine to honor Edmund D. Pellegrino, M.D., founder of the Health Sciences Center. The endowment specifies that the Edmund D. Pellegrino Professorship of Medicine will be occupied by "an individual who exemplifies the breadth of interests and achievements in education, research, and the practice of medicine that have characterized Dr. Pellegrino's career." The first occupant of that chair was Dr. Pellegrino, who held it for a brief period. Following Dr. Pellegrino's tenure, the chair was occupied by Harry W. Fritts, M.D., who is now the Pellegrino Professor Emeritus and former Chair of Medicine at Stony Brook. Currently, Benjamin J. Luft, M.D., Professor of Medicine, occupies the chair.

The Evelyn Glick Chair in Experimental Medicine

In 1990, Mrs. Evelyn Grollman Glick of Baltimore, Maryland, created an endowment designed to support a Chair in the Department of Pharmacological Sciences. Income from this fund provides research or salary support for the Chair. The current occupant of the chair is Arthur P. Grollman, M.D., Distinguished Professor of Pharmacological Sciences and Professor of Medicine.

The William and Jane Knapp Endowed Chair in Pharmacological Sciences

An endowed chair in the School of Medicine, the William and Jane Knapp Endowed Chair in Pharmacological Sciences was established by the Knapps who are 1978 graduates of Stony Brook and continue to be connected to the University through a variety of activities. Bill Knapp is a member of the Stony Brook Foundation Board, and Jane Knapp is the former president of the Stony Brook Alumni Association. The endowment specifies that the "William and Jane Knapp Endowed Chair in Pharmacological Sciences will be occupied by a senior faculty member who is highly regarded, and who exemplifies the breadth of interests and achievements in education, and will advance the diagnosis and treatment of cancer, diabetes, and/or inflammatory diseases."

The Marvin Kuschner Professorship of Pathology

An endowed chair in the School of Medicine, the Marvin Kuschner Professorship of Pathology was established by the University in 1988 in honor of Marvin Kuschner, M.D., Dean Emeritus of the School of Medicine at Stony Brook. The endowment specifies that the "Marvin Kuschner Professorship of Pathology will be occupied by an individual who exemplifies the breadth of interests and achievements in education, research and the practice of pathology and environmental medicine that have characterized Dr. Kuschner's career." Kenneth Shroyer, M.D., Ph.D., Professor and Chair of the Department of Pathology, currently occupies this chair.

Grants and Awards

The Arthur Berken Fellowship

Dr. Arthur Berken, a long-time member of the clinical faculty at the School of Medicine, was concerned about the impact of technology on men and women in medical school. With the advances in diagnostics and treatment made possible through technology, he feared that young doctors might come to see their patients as little more than biochemical machines. So when Dr. Berken passed away in the late spring of 1994, his wife Roberta, his family, and a number of friends and colleagues endowed a fellowship to encourage would-be physicians to remember that, in the end, it is people who matter most. The Arthur Berken Fellowship prompted a new addition to the School of Medicine's M.D. with Recognition Awards, the M.D. with Recognition in Medical Humanism.

Sir James Black Award for Excellence in Research

An endowment has been established with a gift from Sir James Black, FRS, Nobel Laureate in Physiology or Medicine, to provide an award to the graduating undergraduate pharmacology major who has achieved the highest scholastic excellence in both course work and a senior research project.

Jean M. Devlin Achievement Award

This endowment, created by generous gifts from Richard A. Auhll and Rudi R. Schulte of Santa Barbara, California, matched by the Department of Pharmacological Sciences, honors Jean M. Devlin, founding Director of Stony Brook's undergraduate program in pharmacology. The Jean M. Devlin Award is presented at commencement to the graduating pharmacology major judged to have the greatest potential for making future contributions to the pharmacological sciences.

William G. van der Kloot Awards

An endowment has been established by Professor Robert Nathans and the Department of Pharmacological Sciences in honor of William G. van der Kloot, Ph.D., Professor of Physiology and Pharmacological Sciences, and founding Chair of the Department of Physiology. The endowment provides awards annually to two students in the Molecular and Cellular Pharmacology graduate program. The van der Kloot Award for Excellence in Teaching recognizes the most significant teaching contributions by a graduate student to the undergraduate major. The van der Kloot Award for Excellence in Research recognizes outstanding accomplishments in research evident by first author, peer-reviewed scientific publication.

David L. Williams Memorial Travel Award

Funds are provided by an established endowment to honor David L. Williams, Ph.D., Professor of Pharmacological Sciences, who was widely recognized as an excellent teacher and mentor of students and junior faculty during his many years here. The award is given to a graduate student who has been advanced to Ph.D. candidacy in the Molecular and Cellular Pharmacology Graduate Program, and who will participate in an advanced course (e.g., at Woods Hole, CSHL or an EMBO course) or present research results at either a national or international scientific meeting.

The Catacosinos Cancer Awards

Dr. and Mrs. William Catacosinos have generously donated funds for annual grants to support cancer research. The Catacosinos Cancer Award recognizes significant contributions to the illumination of the cancer problems of the past and anticipates major advances coming from these investigations. A committee of scientists, appointed by the Dean of Medicine, oversees these awards which are administered by the Stony Brook Foundation.

Radmila and Gabor Inke Anatomical Research Fund

The Department of Anatomical Sciences at University Medical Center Stony Brook is the beneficiary of a generous testamentary gift from Dr. Gabor Inke. Dr. Inke became the Department's first member in 1969 and served the Medical Center for more than 20 years. Dr. Inke, a recognized expert on the development of the human skull as well as the kidney, dedicated his life to research and teaching. Upon his death, the Radmila and Gabor Inke Anatomical Research Endowment Fund was created to support the research mission of the department that he helped to create.

Emil C. Voll Bequest

A bequest of more than \$1.7 million from Emil C. Voll was made in 1992 to fund a professorship in cancer research in the School of Medicine. Mr. Voll's wife, Geraldine, died of cancer in 1987. Awards to four faculty investigators enable them to play a major leadership role in the school of Medicine's cancer program.

Clinical Departments in the School of Medicine

Department of Anesthesiology

Chair: Peter S.A. Glass

Professors: W. Walter Backus, Helene D. Benveniste, James P. Dilger, Peter S.A. Glass, Robert I. Katz, Ira J. Rampil, Bharathi H. Scott, Stephen A. Vitkun

Associate Professors: Rishimani S.N. Adsumelli, Carole W. Agin, Chiwing Auyeung, F. Barry Florence, Christopher Gallagher, Maria R.G. Lagade, Farrokh R. Maneksha, Srinivas Pentyala, Mario Rebecchi, Kenneth Rosenfeld, Tracie A. Saunders, Joy E. Schabel, Peggy A. Seidman, Ellen S. Steinberg, Paul Willoughby

Assistant Professors: Chiwing Auyeung, Syed Azim, Nelson A. Barcelon, Tazeen Beg, Alvin Bicker, Christine Cokinos, Michelle Delemos, Congwu Du, Brian Durkin, Lauren H. Fleischer, Abdel Aziz Gaber, Xiaojun Guo, Igor Izrailtyan, Zvi Jacob, Ronald C. Jasiewicz, Ursula N. Landman, Lixin Liu, Irina Lokshina, Daryn H. Moller, Sinha Monsur, Slawomir P. Oleszak, Christopher Page, Shaji Poovathoor, Martin Redmond, Deborah Richman, Eleanor J. Romano, Mihai R. Sadean, Madhumita Saikia, Syed Y. Shah, Francis Stellaccio, Neera Tewari, Andrea K. Voutsas

The Department of Anesthesiology provides instruction in the clinical science of the specialty, and the physiology, pharmacology, and biochemistry on which it is founded. Emphasis is placed upon the integration of basic and clinical sciences, and upon an interdisciplinary approach to attain optimal care of patients. Instruction is provided to medical students during their clinical training years. All students rotate through anesthesiology for two weeks during their surgery selective month. Those students interested in more advanced training are encouraged to apply for a third-year elective or a fourth-year sub-internship, during which they will be exposed to all aspects of clinical anesthesia management of surgical, obstetrical, and chronic pain patients. They will administer anesthesia under supervision, participate in pre- and post-operative care, and become familiar with specialized aspects, such as intensive care, cardiopulmonary resuscitation, cardiac and neurosurgical anesthesia, perinatal medicine, and therapy of acute and chronic pain. Participation in ongoing clinical research projects and all teaching exercises is encouraged.

The Department of Anesthesiology also provides comprehensive instruction to dental, ER, and periodontal residents, and to orthopedic surgery, otolaryngology, and medicine interns.

In its graduate program, the department provides a three-year training program of residents specializing in anesthesiology, following completion of a basic first year of postgraduate training.

Fellowships in subspecialties and clinical research are available to physicians who have completed the requirements toward specialization.

Department of Dermatology

Chair: Evan Jones

Professors: Richard Clark, Marcia Simon

Associate Professors: Lawrence Lieblich, Ashfaq Marghoob, Marcia Tonnesen

Assistant Professors: Bernard Berger, Chih-Shan Jason Chen, Paul Chu, David Counts, Scott Flugman, Evan Jones, Tara Kaufmann, Azim Khan, Peter Klein, David Kriegel, Leonard Kristal, James Krivo, Laurie Levine, Steve McClain, Richard Miller, Gavin Moynihan, Antoinette Notaro, Lawrence Pacernick, Peter Reisfield, Lynn Silverstein, Robert Skrokov, Amy Steinberg, Diana Sun, Denise Trochesset, Shyam Verma, Marvin Winston

Adjunct Professors: Joel Gordon, Kenneth Marenus

Clinical Instructor: Deborah Deierlein

The Department of Dermatology is committed to providing quality education in cutaneous biology, cutaneous oncology, and skin disease to medical students, residents and fellows. Emphasis is placed on the integration of principles of basic pathophysiology with clinical manifestations and preventive medicine, and on the development of problem solving and diagnostic skills.

In conjunction with the Department of Orthopedics, Department of Pathology, Department of Radiology, and Department of Medicine/Divisions of Allergy, Immunology and Rheumatology, the Department of Dermatology participates in the Connective Tissue and Skin Systems Course for second year medical students. The format varies from didactic lectures to workshops and clinical pathologic correlations, including an opportunity for students to interact with patients.

A one-month clinical elective is offered during the fourth year, which provides exposure to the diagnostic and management of cutaneous disorders in both the ambulatory and inpatient settings at Stony Brook University Medical Center, Stony Brook Technology Park, and the Northport Veterans Affairs Medical Center.

A one-month research elective provides in-depth exposure to academic dermatology, and the application of laboratory science to clinical problems through participation in a laboratory or clinical research project.

A three-year dermatology residency training program provides structured education in basic cutaneous biology and pathophysiology, and extensive exposure to patients with skin disorders. The training experience comprises all aspects of ambulatory and inpatient dermatology, including dermatologic surgery, cutaneous oncology, dermatopathology, and phototherapy. Opportunity is provided for involvement in basic science and/or clinical skin research.

Postgraduate fellowships are offered in basic and/or clinical research. The Department of Dermatology is actively involved in continuing medical education for staff, community practitioners, and health care professionals, through CME accredited Grand Rounds, conferences, seminars, and through participation in local dermatologic societies.

Department of Emergency Medicine

Chair: Mark C. Henry

Vice Chair: Peter Viccellio

Vice Chair for Research: Adam Singer

Professors: Mark C. Henry, Michael McGuigan, Frederick M. Schiavone, Adam Singer, Peter Viccellio

Associate Professors: Thomas R. Caraccio, Thomas F.X. Fischer, Scott Johnson, Lester Kallus, Edward Stapleton, Henry Thode

Assistant Professors: Joshua Ardise, Afzal Butt, Christopher Carleo, Stuart Chale, Ahmed Chaudhry, David Cohen, David S. Cooling, Kerry Cronin, Charles Dalmedo, Eric Decena, Richard Dickinson, Natalie DiGioia, Jennifer Ehlers, Robert

Ehlers, Gregory P. Garra, Stephen Havasy, Michael Imperato, Paul Kaloudis, Sayed Mustafeh Khwaja, John Leavens, Christopher Lee, Robert Levy, Andrea Libutti, Melina LoGuidice-Khwaja, Cori Ann McKean, Brian McMahan, Erika Newton, Eric Niegelberg, Theodore Packy, Joseph Savasta, Lawrence Schiff, Ioanis Siderias, William Sommo, Victor Tarsia, Donna Venezia, Michael Verdirame, Andrew Wackett

The Department of Emergency Medicine offers exposure to a wide range of clinical problems and to an evolving regional emergency medical services system. The academic department provides a home for dedicated faculty and students to learn, teach, and pursue basic science, clinical, and health policy research. Stony Brook offers ample opportunity for collaboration and exchange with faculty and students from many other disciplines.

The department conducts advanced life support training for medical students at the end of the second year. During the third year, the department offers a two-week clerkship in Emergency Medicine. The course includes 84 hours of clinical time in the Emergency Department, labs, and simulation exercise.

For fourth-year medical students, the department offers four-week didactic courses in Emergency Medicine, twice a year. Those interested in pursuing a career in Emergency Medicine may take the course with incoming first-year Emergency Medicine residents in July. Lectures are offered on management of common emergency department presentations including chest pain/acute MI, trauma, burns, stroke, seizures, pediatric airway disorders, GI bleed, trauma, and toxic syndromes. Labs include airway management, wound care, advanced surgical skills, splinting, ultrasound, regional nerve block, and slit lamp. Special sessions include a Pediatric Advanced Life Support course and Advanced Trauma Life Support. This course is repeated in February as an elective for all fourth-year medical students. In addition to the clinical and didactic experiences, the department also offers a "sub-internship" in Emergency Medicine, where students take on the roles/responsibilities of a PGY-1 in Emergency Medicine. The department's goal is to offer students a path to develop the clinical competence, academic excellence and administrative acumen to assume leadership roles in the field of Emergency Medicine.

The department sponsors an accredited three-year residency training program in emergency medicine. Stony Brook University Medical Center is the primary clinical site of resident education. Comprehensive emergency medicine experience in the urban and the community settings occurs at Jacobi Medical Center and Peconic Bay Medical Center, respectively. The goal of the residency program is to train emergency physicians who are capable of providing thorough, competent, evidence-based patient care, and who are dedicated to improving and leading the field of emergency medicine into the future.

Department of Family Medicine

Chair: Jeffrey S. Trilling

Associate Professors: Robert S. Bobrow, Edward L. Feldman, Gerald Kelly, Donna Meltzer, Gwendolyn Stretch, Jeffrey S. Trilling

Assistant Professors: Marsha Alger, Josephine Connolly-Schoonen, Elisabeth Daneels, Susan DeBevoise, Richard Murdocco, Jedan Phillips, Manal Soliman, Howard Sussman, Vivica Vollmer, Katherine Wightman

Clinical Instructors: Janet Bienkowski, Lorraine Danowski, Leah Holbrook, Lauren Gargiula-Brand

Community Faculty

Associate Professors: Richard Bonanno, Clive Caplan, Maury Greenberg, Augustus Mantia, Joseph White

Clinical Assistant Professors: Carlo Annese, Jill Baron, Louis Bateman, Patrick Barrett, William Bennett, Scott Bloom, Stanley Blyskal, Frederick Caston, Joseph Calandrino, Michael Confusione, Francine Cormier, Maria Del Vessy, James Dragone, George Dunn, Raymond Ebarb, Michael Fishkin, Theodore Flaum, Melanie Frank, Jerry Reed Frank, John Gil, Louis Greenblatt, Scott Gross, Anthony Guida, Hussan Hito, Mark Jagust, Sabrina Johnson, Danelle Kenny, Scott Kirsch, Michael Ladinsky, Nicholas Livrievi, Frank Lobacz, Mian Long, Kuma Mandel, Ashfaq Margoob, Alan Nelson, Christopher Ng, Andrea Nomberg, Russell Porter, Michael Randell, Annette Rancaniello, Lesley Rechter, Anne Robbins, William Robbins, Linda Roethel, Ronald Roth, Samuel Sandoski, Deborah Schaefer, Eric Schoenfeld, John Slade, Jay Slotkin, Cindy Smith, Esther Sumitra-Albert, Farzad Tabibzadeh, Paul Tchao, Ephraim Zackson

Clinical Instructors: Alfred Belding, Alan Cooper, Laura Corsello, Christine Delguizo, Claudia Fernandes, John Franco, Genine Francis, Herbert Friedman, Francis Gleason, David Goldman, Susan Groh, Ellen Kambi, Marc Lewandoski, Joseph Liodice, Antoun Mitromaras, Lynn Marie Nitti, Steven Selter, Mark Shapiro, Sharmalee Shetty, Sam Smith, Joseph Venezia

The academic Department of Family Medicine holds as its "mission" the high quality delivery, dissemination, continual evaluation, and creation of the principles of Family Medicine.

The department emphasizes teaching, clinical practice, and research in the practice of continuing, comprehensive and family-oriented care to patients. The many educational missions of Family Medicine include management of common illnesses, health promotion and disease prevention, family practice obstetrics, behavioral medicine, sports medicine, chronic illness, and geriatric care. The department has its own division of nutrition and a certified nutrition residency.

The department's role in the medical school curriculum includes directorship of Introduction to Clinical Medicine (years 1 and 2), Introduction to Human Behavior (year 1), a

required Clerkship in Primary Care (year 3), and a sub internship and elective (year 4). In postgraduate education, the Family Medicine Residency Program provides 21 residents with comprehensive training in the discipline. It also directs a consortium of residency programs at Southside Hospital, South Nassau Community Hospital, and Community Hospital at Glen Cove.

Resident training in Family Practice occurs primarily at Stony Brook University Medical Center and includes several rotations at affiliated sites. Currently, the program accepts seven residents each year.

The excellent faculty/resident ratio and the fact that residents are involved in teaching third- and fourth-year medical students illustrate some of the advantages of conducting residency training in a major academic health center. Our affiliation with local community hospitals allows residents to experience the community-based practice of medicine. This combination of knowledge has resulted in all graduates of the program successfully passing the American Board of Family Practice certification examination, 99 percent on the first attempt.

This residency will be attractive to candidates who wish to participate in an active teaching program while they acquire clinical skills in family medicine. It is the department's goal to produce competent family practitioners who may pursue careers in full-time clinical practice or academic medicine. Over the years, graduates have migrated and now practice in all areas of the country. Many have demonstrated a continued interest in teaching, either on a voluntary basis or by holding full-time faculty positions in academic departments.

The three-year residency program in Family Medicine provides experiences in the continuing, comprehensive and personal care which characterizes Family Practice. These experiences range from providing ambulatory care in the Family Practice Center to inpatient service in family medicine, pediatrics, obstetrics/gynecology, psychiatry, medicine, and other specialties.

For residents, the goals of the program are to:

- understand comprehensive care, including the biomedical, psychological, familial and socio-economic factors that affect health and illness
- understand the importance of continuity of care and coordination of medical services to patients and their families
- fully develop cognitive abilities and clinical skills to maximize effectiveness as a family physician
- acquire competency in office- and hospital-based procedures
- develop a sense of ethics and responsibility applicable to the practice of medicine
- understand the concepts of community and social involvement that will elevate the health standards of the community, as well as the health status of patients
- understand the professional and personal needs necessary to developing an emotionally and intellectually satisfying medical practice
- gain ability to practice medicine within the framework of a team approach, using the skills of other professionals, community agencies, and support groups

- appreciate academic achievement and prepare for future learning and teaching in medicine
- prepare for success in this rapidly changing managed health care environment

In conjunction with the School of Health Technology and Management, the department offers through its residency a Masters in Primary Care Health Policy.

The Department of Family Medicine has demonstrated a commitment to the community through its outreach programs and primary care initiatives. These programs are coupled with teaching and clinical responsibilities in the ambulatory and inpatient services of Stony Brook University Medical Center as well as at community-based sites throughout Suffolk County. The Department of Family Medicine coordinates and delivers continuing medical education programs to the medical community and conducts healthcare and service research.

Department of Medicine

Interim Chair: Margaret M. Parker

Interim Vice Chair: Wadie F. Bahou

Associate Chair, Director of Student Programs: Head, Infectious Diseases Division, Assistant Dean for Undergraduate Education: David Tompkins

Associate Chair, Director of Residency Program: William Wertheim

Medical Director, LI State Veterans Home: Frank Cervo

Affiliation Chairs: Aloysius Cuijet, Nassau University Medical Center; Michael Niederman, Winthrop-University Hospital; Mark Graber, Veterans Affairs Medical Center, Northport

Professors: John F. Aloia, Reese Alsop, Wadie F. Bahou, Douglas Brand, David Brown, Harold Carlson, Steven Carsons, Wen-Tien Chen, Richard Clark (Dermatology), Ira Cohen (Physiology & Biophysics), Peter F. Cohn, Stanton Cohn, Barry Coller (Adjunct), John Coulehan (Preventive Medicine), Burke Cunha, Norman H. Edelman, Donald A. Feinfeld, Getachew Feleke, Suzanne Fields, Hussein Foda, Marianne Frieri, Harry W. Fritts Jr. (Emeritus), Theodore Gabig, Pierce Gardner, Marie Gelato, Berhane Ghebrehiwet, Irving Gomolin, Peter Gorevic (Emeritus), Mark Graber, Robert Greenwald (Adjunct), James Grendell, Arthur P. Grollman (Pharmacology), Leonard Hamilton, Mae Hultin, Adam Hurewitz, Jolyon Jesty, George J. Kaloyanides (Emeritus), John Kovach, William Lawson, Wilfred Lieberthal, Martin R. Liebowitz, Benjamin J. Luft, Stefan Madajewicz, Erich Mackow, John Maesaka, Thomas Manis, Michael Niederman, Edward Nord, Robert Olson (Emeritus), Edmund D. Pellegrino (Emeritus), Jonathan Plehn, Nathaniel Reichel, Ira Rezak, Basil Rigas, John R. Sachs (Emeritus), Sami Said, Lawrence Shapiro, Walton Shreeve, Gerald

Smaldone, Roy Steigbigel, William Van Nostrand, Michael Viola (Emeritus), Steven Vitkun (Anesthesiology), Nand Wadhwa, James Yeh, Stephen Vlay, Kenneth Zamkoff, Mohammad Zarrabi, Stanley Zucker

Associate Professors: Olakunle Akinboboye, Leonard Arbeit, Syed Asad, Leah Balsam, Eddy Barash, Richard Barnett, Jeffrey Berger, Linda Carosino, Frank Cervo, Edward Cheng, Joseph Chernilas, Gail Cohan, Jerald Cohen, Todd Cohen, Arnold Conrad, Mark J. Corapi, Ralph Della Ratta, Troy Dixon, Philip Domenico, Michael Dubin, Peter Ellis, Stephen Feffer, Getachew Feleke, Frederick Fein, Steven Fishbane, Luz Fonacier, Israel Freeman, Jack Fuhrer, Dennis Galanakis, David Goddard, Avram Gold, Beatrice Golumb (Preventive Medicine), Aasha Gopal, William H. Greene, Maritza Groth, Joanne Holland, Jonathan Howite, Junichi Iwai, Raja Jaber (Family Medicine), Victor Jiminez, Anoop Kapoor, Alan Katz, Jordan Katz, Jeffrey Kazzaz, Hossein Keyvan, Natalie Klein, Robert J. Kramer, Walter Noah Kromholz, Irwin Kurland, Tai-Ping Lee, Richard Lin, Edward Mack, George Mallis, Augustus Mantia, Kevin Marzo, Joan McInerney, Robert J. Michtom, Perry Milman (Adjunct), Sidonie A. Morrison, Sriram Naidu, Howard Novotny, Thomas O'Riordan, Sanford Pariser, Enrique Pastoriza-Munoz, Melvin Praissman, Louis Ragolia, Earnst Raeder, Romona A. Rajapakse, Linga Raju, Robert Shaw, Jay Slotkin, E. Marvin Sokol, Harry Staszewski, Lisa Strano-Paul, David Tompkins, Marcia Tonnesen (Dermatology), Steven Walerstein, Laurie Ward, Edward Weissman, Shing-Shing Yeh, Stephen Zeldis, Myron Zitt

Assistant Professors: Marc Adler, Shadab Ahmed, Mohammed Amin, Ibrahim Almasry, Michael Ammazalorso, Prachi Anand, Sonia Arunabh, Evangelia Augoustiniatos, Quaiser Bakht, Wendy Balopole, Daniel Baram, Donald J. Behr, Elise Belilos, Nicholas Berbari, Richard E. Berman, Robert Bercher, Akram Boutros, Pierre Brutus, John Bruno, Anthony Calio, Jian Cao, Stuart Chale (Emergency Medicine), Daniel Chikvashvilli, Howard Citrin, Stephen Cokinos, David Cooling (Emergency Medicine), Feroza Daroowalla, Frank J. DeMento, Oscar A. Devera, Kathleen Dickman, Freddie Diaz, Karen Dominger, Susan Donelan, Regina Druz, Albert Ferrara, Cornelius J. Foley, Kenneth Freese, Steven P. Friedling, Stephen W. Furst, Anthony Gambino, Jorge Gardyn, Michael Garrison, Shai Gavi, Liziamma George Jr., Dmitri Gnatenko, Steven Golub, Mark A. Goodman, David Goodrich, Michael N. Greenblatt, Alice Greene, Seymour Greenwald, Marwan Habeeb, Nabil Hagag, Lynn Hallarman, Bhawa Halwan, Shirley Hanna, Aaron Harrison, Janet Hearing, Donna Heinemann, Jennifer Hensley, Alexander Hindenburg, Herbert Hirsch, Robert Hirschberg, Melvin Holden, Ingolf Holm-Andersen, Rosalind Hopmeier, David Horowitz, Richard Horowitz, John Hui, Stanley Hyman, Bassiema Ibrahim, Louis J. Imbriano, Gary R. Joachim, Diane Johnson, George Juang, Ali Karakurum, Shyamala Karuvannur, Inderjit Katyal, Eugene M. Kern, Todd Kerwin, Robert Klein, Kavita Kongora, Smadar Kort, Edward Kowalski, Atul Kumar, Gamesh Kumar, Harvey Kuschner (Emeritus), Susan Lane, Alice Lee, Susan Lee, Harvey L. Lerner, Younghee Limb, David Lin, Zeena Lobo, Janice Lu, Hue Ly, David T. Lyon, Gregory Macina, Lucy Macina, Vincent V. Madonia, Robert Malacoff, Anil Mani, Noelle

Mann, Philip A. Mantia, Dwight W. Martin, Sandeep Mehrishi, Dennis Mihalatos, Mageda Mikhail, Angela Mitran-Schwartz, Nobuyuki Miyaswaki, Felix A. Monaco, Robert Mormando, Dennis Mynarcik, Harmeet Narula, Catherine Nicastri, Laurence I. Novick, Edwin Oberstein, Abuzafar Osman, Lucy Palmer, Leo G. Parmer (Emeritus), Shenyi Peng, Lester N. Ploss, Martin D. Podgainsy, Bonnie Pollack, Ronald A. Primis, Samia Qazi, Robert J. Rabinowitz, Frank Raio, Frederick Reindl (Pediatrics), Allison Reiss, Mohammed Rizvan, Heidi Roppelt, David S. Rosenthal, Ranjan Roy, Louis Saffran, Ghulam Saydain, Frederick Schiavone (Emergency Medicine), Valentina Schmidt, Jeffrey Schneider, Adrish Sen, Anuja Shah, Shahin Shaikh, Kalpana Shere, Marisa Siebel, Rubens Sievert, Anshu Singh, Rehka Sivadas, Hal Skopicki, Philip Spadafora, Peter Spiegler, Leonard Stein, Alan Steinberg, Jaishree Subramani, Heesuck Suh, Anthony Szema, Dennis Tansiongco, Shirley Tansiongco, Wen-Wei Tehou, Adrian Torres, Joseph Tripedi, Albert Tse, Gayle Vaday, Ashok Vaswani, Janice Verley, Peter Viccellio (Emergency Medicine), Isabelle von Althen, Rosalind Watman, Michael Weinstein, William Wertheim, Evelyn Wolf, Daniel Yellon, Melvin W. Young, Qamar M. Zaman, Athena Zias, Jerome Zisfein, Sheldon Zuckerman

Instructors: Charles Annunziato, Vincent Avila, Elena R. Berkowitz, Stephen Bernstein, Michael Carl, Igor Chernyasvskiy, Sheila Cheruvelil, Stephen Cusumano, Vijay K. Das, Paul Diggs, Elliott Dreznick, Yasser-El-Hennawy, Charles Famulare Theodore Flaum, John Folan, Barry Gimbel, Richard Gold, Perry Gould, Andre Haddad, Lisa Hammer (Pharmacology), Edmund Hayes (Pharmacology), Linda Honkanen, Bruce Horowitz, David M. Horowitz, Mohammed S. Hossain, Shashi B. Jhamb, Robert C. Johnson, Wei Kao, David Klein, John Lanzone, Renee Lefland, Agim Leka, Jeffrey Leonardis, Mark Davis-Lorton, Sabahat Mahmood, Deborah McBane, Harvey Mossman, John A. Ostuni, Lawrence Pacernick, Gary Rosenblum, William Ross, Francis J. Safina, Jeffrey Scavron, Paul Schulman, Gary Schwartz, Kambiz Shekib, Sheldon C. Simon, Gregory Spisak, Philip Stein, Michael Sussman, Mandar Tank, Vijai Tivakaran, Djin Y. Tjioe, Andrew Weber, Mark Williams, Ranvic Yadav

The Department of Medicine encompasses nine divisions: **Cardiology, Endocrinology & Metabolism, Gastroenterology & Hepatology, General Internal Medicine, Hospitalist and Geriatrics, Hematology/Oncology, Infectious Diseases, Nephrology & Hypertension, Pulmonary & Critical Care Medicine, and Rheumatology, Allergy & Clinical Immunology at Stony Brook**, as well as at its clinical affiliates listed above. The combined faculties of these institutions are charged with the responsibility for the following:

- 1) Directing and teaching the Introduction to Clinical Medicine program for first and second year medical students
- 2) Oversight and teaching of the Systems Approach to Medicine for second year medical students
- 3) Directing the Ambulatory Care Clerkship for third-year medical students
- 4) Directing the Clerkship and Sub-Internship in Medicine
- 5) Developing curriculum and supervising electives in the medical subspecialties
- 6) Training 99 residents and 60 fellows

- 7) Providing Continuing Education in Medicine
- 8) Providing superb clinical care for patients across Long Island who require Internal Medicine primary care and subspecialty services in both the inpatient and outpatient settings.

The Department of Medicine education program is designed to provide medical students, residents and fellows with a solid foundation in general internal medicine and its subspecialties, including quality patient care and research. This goal is exemplified in the design of the medical clerkship. Under the tutelage of full-time faculty and community preceptors, students learn the arts, skills, and modes of reasoning in making diagnoses and managing patients. In addition, students become a part of the medical staff by delivering patient care. These educational activities are supplemented by conferences, a comprehensive lecture series of topics identified as a target "Core Curriculum," the Chairman's lecture series, small group sessions with the Program Director, and multi-departmental clinical pathology conferences. The study of the patient as the keystone to learning medicine is stressed throughout the inpatient and ambulatory experience. A fourth-year sub-internship is offered for those students with an interest in careers in Internal Medicine and as a foundation for many students pursuing other disciplines. The one to two months internal medicine sub-internship provides the students with an intensive patient care experience in the inpatient setting with faculty mentoring and oversight. Additionally, many fourth-year students elect to participate in a variety of subspecialty electives that provide in-depth, focused learning experiences in the internal medicine disciplines.

The Graduate Training program's goals and objectives emphasize the department's mission to educate compassionate, life-long learner physicians who are capable of delivering the highest quality of medical care. The core program consists of 99 residents in 5 different tracks including Traditional Internal Medicine training, Primary Care Medicine, Medicine/Pediatrics, and Medicine/Neurology. A preliminary year in Internal Medicine is offered for those pursuing training in other medical disciplines, such as radiology, which require a clinical internship. In addition, the core program supports 10 fellowships, including a full range of subspecialties from Geriatrics through Gastroenterology, and from Endocrinology through Interventional Cardiology.

The post-graduate program encourages trainee participation in research, and offers training in research. Post-doctoral traineeships are available in both applied and basic research for senior house officers planning careers in academic medicine. Separate clinical research fellowships for trainees are available through the General Clinical Research Center. Senior students and residents may take electives in general medicine and the medical subspecialties.

In keeping with the goals of our education program, continuing education is provided at various hospitals through regularly scheduled rounds and conferences. These activities, aimed at not only the members of the medical staff but for all healthcare professionals, emphasize the importance of interdisciplinary approaches in analyzing problems, whether at the bedside or in the laboratory.

Advanced Certificate in Clinical Research

HMT 600 Epidemiology

This course aims: 1) to introduce basic epidemiologic concepts, methods and topics, 2) to provide skills to critically evaluate published literature, interpret data and develop an evidence-based approach to medical practice, and 3) to enable the application of basic epidemiologic principles and methods to problems encountered in clinical practice. This course is given in the summer/fall module.

3 credits

HMT 601 Biostatistics

This course is designed as an introduction to the principles and methods of biostatistics. Emphasis is on the understanding of fundamental probability and statistical concepts, and the ability to identify and apply appropriate statistical techniques to research problems. This course aims: 1) to teach fundamental probabilistic concepts and the principles of statistical reasoning; 2) to understand basic methods of data analysis, including descriptive and inferential statistics; and 3) to introduce some more advanced biostatistical methodologies. This course is given in the summer/fall module.

HMT 602 Molecular Medicine and Molecular Genetics

The aims of this course are: 1) to introduce basic methods of molecular diagnostics currently in clinical use, 2) to introduce principles of human genetic inheritance, 3) to stimulate insights into new molecular medicine approaches that will adapt the advances of the human genome to human diseases and apply these principles to focused areas of relevance to cancer, cardiovascular disease, neurological disease, and emerging pathogens, and 4) to learn the principles of genetic testing development with relevance to regulatory agencies, licensing and commercialization. This course is given in the summer/fall module.

3 credits

HMT 603 Seminar Series: Research Opportunities at Stony Brook and Affiliated Institutions

The aims of this series are to familiarize trainees with the range and breadth of clinical research at Stony Brook and its affiliated institutions, acquaint trainees with the investigators who might serve as mentors for research projects, and to teach, by example, the elements of study design, data analysis and ethical issues in clinical research. This course spans 3 modules beginning in the summer/fall module and continuing throughout the winter and spring modules.

3 credits-1 credit/module

HMT 604 Experimental Clinical Research

The aims of this course are to introduce trainees to formulation of a research question and hypothesis testing and to introduce various research methodologies and how they are used to answer clinical research questions. This course is taught in the fall/winter module.

1 credit

HMT 605 Clinical Trials

This course aims to introduce the different aspects of clinical trial design, conduct, management and analysis; and to provide a basic understanding of the key elements of clinical trial design and practice. This course is taught in the fall/winter module.

1 credit

HMT 606 Data Management and Informatics

This course presents the requisite computer and data management skills necessary to conduct clinical research. This course is taught in the spring module.

2 credits

HMT 607 Legal, Ethical and Regulatory Issues in Medical Research

This course is designed to introduce the ethical, legal and regulatory issues in the conduct of clinical investigation and presents the necessary background and skills needed to conduct clinical research. This course is taught in the winter/spring module.

2 credits

HMT 608 Putting It All Together: Development of a Research Proposal

The aim of this course is development of the skills necessary to design a research proposal including framing the specific aims, evaluation of the literature, description of preliminary data and research methods, proposed biostatistical analysis, defining eligibility criteria, development of a safety plan, issues of recruitment including under-represented ethnic and racial groups, where to find grant information, and how to construct a grant budget. This course is taught in the spring module.

1 credit

Department of Neurological Surgery

Chair: Raphael P. Davis

Vice Chair: Michael R. Egnor

Professors: Raphael P. Davis, Michael R. Egnor, William Van Nostrand

Associate Professor: Henry H. Woo

Assistant Professors: Wesley Carrion, Robert M. Galler, Jack Greenwood, Frederick B. Gutman, John Labiack, Jonathan L. Raanan, Ira Rampil, Clemente Roque, Craig Rosenberg, Arthur P. Rosiello, Robert G. Roth, Michael Sauter, Mark Stephen, Mark Wagshul

Instructors: Donna Andricopoulos, Ricardo Aranguren, Nicole Gutman, Marilyn Higgins, Mary Lane, Jacqueline Paveling, Elaine Sepe, Catherine Sheng, Nancy Strong

The Department of Neurological Surgery is a principal component of the neurosciences program at Stony Brook. The main

objective of the department is to provide quality patient care using the latest technology while integrating a commitment to teaching and research in the neurosciences. The clinical faculty members provide surgical care to both adult and pediatric patients who require surgical treatment for diseases and disorders of the spine and brain. The Cerebrovascular Center offers expertise in the surgical and endovascular management of cerebral aneurysms, carotid and intracranial atherosclerosis, arteriovenous malformations, and acute stroke. The department includes faculty with training in Physical Medicine and Rehabilitation who provide non-surgical treatment of spine disorders, varying from prescription of physical therapy programs to performance of fluoroscopically-guided injections.

Selected residents from neurology and surgery programs may rotate on the neurological surgery service for intensive exposure to the surgical management of spine and brain maladies, in particular trauma and more complex neurosurgical problems that are characteristic of an academic practice. Medical students may be instructed on processes relating to the nervous system and pre-clerkship lectures are given periodically with emphasis on pituitary tumors, craniocervical junction, cranial pressure dynamics, central nervous system tumors, management of spine pain, and cerebrovascular disease. Some of the faculty members are engaged in multidisciplinary, translational research exploring fluid dynamics in hydrocephalus and intracranial flow disorders. The Cerebrovascular Center staff is engaged in clinical trials of state-of-the-art endovascular devices. Other projects include research on devices used in spinal surgery, the development of artificial discs and artificial vision. Sponsorship may be provided to qualified graduate students.

Department of Neurology

Chair: Patricia K. Coyle (Acting)

Professors: Mary R. Andriola, Anita Belman (Emeritus), Patricia K. Coyle, Lauren B. Krupp, Rahman Pourmand

Associate Professors: Oded Gerber, Mark A. Kaufman, Joanna Smiroldo

Assistant Professors: Farruk Chaudry, Christopher Christodoulou, Michael Guido, Nurcan Gursoy, Cara Harth, Thomas Preston, Mirjana Maletic-Savatic, Candice Perkins, Gail Schuman, Rebecca Spiegel, Wenlang Xia

Instructors: Ann Marie Byers

The Department of Neurology includes Divisions of Pediatric Neurology, Clinical Neurophysiology, and Neuropsychology, as well as sections in Stroke/Vascular Neurology, Multiple Sclerosis (MS)/Neuroimmunology, Epilepsy/EEG, and Neuromuscular Diseases/EMG. It includes the Long Island Comprehensive Epilepsy Center, the Adult and Pediatric MS Comprehensive Care Centers, and the Stony Brook ALS Center.

The department's mission is to provide excellence in neurologic care for the patient, research, education, and community

service. The department provides basic and clinical training in neurological science to medical students, fellows, and residents. The intent of this training is to provide a basis for scientific neurology and practical instruction in patient care. The department carries on a broad program of research that contributes to the understanding of the structure, function and diseases of the nervous system. The clinical faculty provides tertiary, as well as basic level clinical care in neurology, carried out within the context of medical student and residency/fellowship training. The department strives to increase community awareness about neurologic disorders.

In addition to instruction of medical students the Department provides ACGME approved training programs in the following areas with subsequent Board Certification: 1) Adult Neurology, 2) Joint Internal Medicine and Neurology, 3) Child Neurology, 4) Clinical Neurophysiology, and 5) Vascular Neurology. A three-year residency program is offered to prepare post-graduate physicians for board certification in adult or child neurology. The residency training programs provide a firm background in basic neuroscience disciplines and extensive exposure to clinical neurology. The didactic and clinical curricula are emphasized. Residents complete separate rotations in neuropathology, neuroradiology, child neurology, and psychiatry, and are encouraged to become involved in clinical and/or basic neuroscience research. Graduates from all programs are eligible for certification exams upon completion of the program.

Instruction is provided at all levels of medical education. Members of the department participate in the teaching of basic neuroscience to medical students. The mandatory clinical clerkship consists of intensive inpatient (consultative services and wards) and outpatient experience in neurology. Exposure to the Child Neurology, Epilepsy/EEG/Intra-operative Monitoring, or Stroke service can be arranged during the clerkship. The intent is to provide the student with the background to perform a neurological history and examination, and to evaluate patients with neurological disease in an appropriate and logical manner. The emphasis in this experience is on improving clinical diagnostic skills and the ability to formulate a plan of care. Attention is also directed to learning the techniques and interpretation of evoked potentials, electroencephalography, electromyography, and neuroradiological procedures, including magnetic resonance imaging. Students are expected to participate in all aspects of the clinical activities of the department. Individually crafted advanced electives in neurology are available for students who have completed the clerkship.

The faculty maintains a strong commitment to clinical neurology through operation of the neurology service at Stony Brook University Medical Center and at the Northport Veterans Affairs Medical Center. Faculty research programs complement the clinical and academic functions of the department. Research in the department of neurology covers a wide spectrum of activities in basic and clinical neuroscience, ranging from basic neuroanatomical, neurochemical and neurophysiological studies to basic and clinical research in stem cell research neuroimmunology/MS, neuro-imaging, vascular neurology/stroke, epilepsy, neuro-ophthalmology, developmental neurobiology, and clinical trials. There are active ongoing research collaborations with Brookhaven National Laboratories, and Cold Spring Harbor, as well as onsite research within the department.

Department of Obstetrics, Gynecology and Reproductive Medicine

Chair: J. Gerald Quirk

Professors: David A. Baker, Richard Bronson, Eva Chalas, J. Andrew Fantl, Paul L. Ogburn Jr., Boris Pertrikovskiy, J. Gerald Quirk, Martin L. Stone (Emeritus), Siamek Tabibzadeh, Linda Tseng

Associate Professors: Frank Bonura, Reinaldo Figueroa, Mark I. Funt, Alan Garely, Magdalen Hull, Cynthia Kaplan, Jerry Ninia, Daniel Kenigsberg, Alan Monheit, Michael Pearl, Douglas Phillips, Gabriel San Roman, Genevieve Sicuranza, Ellen Steinberg, Patrick Vetere

Assistant Professors: Rishimani Adsumelli, Michael Arato, Cecilia Avila, Faina Axelrod, Genia Bekker, Melvin Berlin, Adam Buckley, Lauri Budnick, Ann Buhl, Kristen Cain, Miguel Carrasco, Kent Chan, Christine Conway, Valerie Cucco, Deborah M. Davenport, Ann Doerfler, Frank Dolisi, James N. Droesch, Kathleen E. Droesch, Mitchell Goldman, Vinette Greenland, Todd Griffin, Abraham Halfen, Robert Hock, John Hunt, Jennifer Johnson, Elana Kastner, Steven Klein, Christina Kocis, Mary Kriner, Douglas S. Lee, Gary Levine, Michael Lydic, Philip J. Makowski, Charles T. Mann, Noel O. Mohammed, Fredric Moon, Teresa Mular, Hitesh Narain, Robert O'Keefe, Jeffrey A. Porte, David Reavis, Tracie Saunders, Elsie Santana-Fox, Joy Schabel, Natalie Semenyuk, Steven Sherwin, David M. Shobin, James Stelling, Maggie Tetrokalashvili, Ian VanPraag, Jeannine Villella, Julie Welischar, Christian Westermann, Jerry Wider

Instructors: Susan Altman, Lisa Amorin, Eliot Birnbaum, Theodore Blaszczyk, Robin Bliss, Karen Coburn, Vivien Diaz-Barrios, Eleanor Dunham, Lance Edwards, Gloria Escamilla, Heather Findletar, Susan Fish, Marie Frey, Michael Gentilesco, Jennifer Griffin, Richard L. Halpert, Jessica Hilsenroth, Arlene Kaelber, Daniel Kiefer, Nicholas Kleopoulos, Laura Lesch, Megan Lochner, Karen Lohan, Paul Lograno, Kitti Loychusuk, Linda Mahler, Morisa Marin, Jennifer Marshak, Careen Mauro, Goldie McBride, Brian McKenna, Thomas Paone, Dreux Patton, John Petraco, Amy Richter, Joyce Rubin, Gerardo San Roman, Philip Schoenfeld, Mindy L. Shaffran, Keith Sommers, Vanessa Soviero, Maxine Spicer, Karen Stampf, Dennis Strittmatter, Eva Swoboda, Sylvia Tufano, Ann Visser, Doris Weisman, Joseph Xerri, Peyman Zandieh

The Department of Obstetrics, Gynecology and Reproductive Medicine is organized into the following divisions, each with its own chief: Gynecology and General Obstetrics, Gynecologic Oncology, Maternal-Fetal Medicine, Reproductive Endocrinology and Infertility, and Midwifery.

The department is responsible for instruction of medical students in each phase of their development. During the second-year curriculum, the department participates in the Introduction to Clinical Medicine course. Students are taught male and female genitourinary physical examinations in a program using prepared "professional patients." Following the study of exam techniques utilizing audiovisual aids and pelvic models, small groups of students spend one session with a

physician instructor and specially trained professional patients who assist the individual student in conducting the exam.

The objective of the program is to provide an experience for students to perform non-traumatic genital exams to minimize the initial technical and psychological difficulties of the exam, and to introduce to them the importance of communication with their patients.

Second-year medical students also have an intensive three-week course in Reproductive System Pathophysiology. Building on and expanding the students' knowledge of the basic sciences obtained in their first year, this course covers aspects of human reproduction dealing with both the normal and abnormal conditions of the male and female reproduction.

The Clinical Clerkship in Obstetrics and Gynecology is an eight-week core curriculum presentation for students to become intimately involved with the ambulatory and hospital care of female patients with pregnancy and/or diseases of the reproductive tract. Educational objectives are attained through didactic lectures, seminars, rounds, and clinical exposure—the latter essentially by integration into the service as a subintern. In addition to gaining experience with examination, diagnosis, and principles of treatment, opportunities are provided for exposure to the preventive medicine aspects of the discipline, including family planning, adolescent guidance, cancer screening, patient education and detection and prenatal health.

For students already career oriented in obstetrics and gynecology, and for those who desire greater depths than permitted by the core curriculum, fourth-year electives are offered in maternal-fetal medicine (high-risk pregnancy), reproductive endocrinology and infertility, gynecologic oncology, and gynecology and general obstetrics with participation in faculty research projects as well as in independent student research projects, utilizing the department's laboratory facilities in endocrinology, immunology, fetal physiology, and virology.

The principal goal of the department is to train physicians who will maintain and improve the highest standards in women's healthcare.

The department offers an accredited four-year residency, which includes training in all aspects of obstetrics and gynecology. The program provides a structured educational experience that is planned in continuity with undergraduate and continuing medical education. Participants are afforded structured, sequentially developed exposures using a continuity of care model in the ambulatory and inpatient setting. This includes primary medical management and a variety of surgical experiences appropriate to the level of training.

The department offers a three-year training program in Maternal-Fetal Medicine through its two Regional Perinatal Centers on Long Island, Stony Brook University Medical Center, and Winthrop University Hospital. This program is designed to include up to three fellows. The program objective is to train specialists in Maternal-Fetal Medicine who, in addition to having expertise in clinic practice, research, and public health, will have the skills needed to excel in the ever-more challenging environment of academic medicine. Specific objectives include training individuals capable of continuing a career in academic medicine with defined areas of interest and foundations in research and education that will prepare each of the trainees to obtain research grant funding or to otherwise be a productive member of the academic community.

Each graduate of the Fellowship in Maternal-Fetal Medicine will have the knowledge and skills to act as a consultant to general obstetricians as well as to participate in regionalization of perinatal services active in improving the delivery of health care to designated populations. The educational program of this fellowship is also designed to guarantee a completed, hypothesis based, research thesis by graduation. Each fellow is taught to teach and mentored to mentor with didactic lectures, structured educational experiences, 360 degree evaluations, and involvement as a research mentor to undergraduates and/or residents. Each fellow will be adequately prepared to achieve subspecialty certification by the Division of Maternal-Fetal Medicine of the American Board of Obstetrics and Gynecology and then proceed to develop successful careers in academic medicine.

Department of Ophthalmology

Chair: Patrick A. Sibony

Professors: Craig Evinger, M. Cristina Leske, Nisson Schechter, Patrick A. Sibony, Stephen Yazulla

Associate Professors: Fadi El Baba, Stuart B. Fourman, Marcelle Morcos, Elinor Schoenfeld

Assistant Professors: Timothy Chou, Tehmina Haque, Robert A. Honkanen, Richard Koty, Maury A. Marmor, Nita Mehta, Dorothy Reynolds, Eric Roberts, Gideon Schneck, Pamela Weber, Barbara Wirotzko, John Wittpenn

Instructors: James F. Collins, Kenneth Graham, Stephen Greenberg, Nancy Kwon, Jeffery Martin, John Romanelli, Scott Sheren, Eric T. Vinokur, Michael Weiner

The Department of Ophthalmology at Stony Brook University Medical Center is a fully integrated multi-specialty ophthalmic group offering a wide range of ophthalmic services, committed to providing the highest quality care for patients with all types of eye diseases and visual problems. The department strives to educate and advise patients about their specific eye problems; to communicate with the referring health care providers in order to provide timely, well coordinated care; and to treat patients with efficiency, respect and compassion.

The department is organized to provide the following clinical services:

- General ophthalmology service
- Neuro-ophthalmology service
- Vitreoretinal service
- Cornea and anterior segment service
- Glaucoma service
- Oculoplastics and reconstructive surgery service
- Pediatric ophthalmology and adult strabismus service
- Optometric service
- Uveitis

These services are directed by members of the full-time faculty, all of whom are board certified and fellowship trained.

The faculty plays an active role in the medical student education, contributing to several of the organized teaching

blocks. The department offers a two-to-four-week clinical clerkship in ophthalmology.

The department has a three-year fully accredited residency training program in ophthalmology. This training program has six residents, three of whom rotate at both Stony Brook University Medical Center and the Northport Veterans Affairs Medical Center. The faculty also participates in the training of residents from other departments in the School of Medicine including the Departments of Family Medicine, Maxillofacial Surgery, Neurology, and Emergency Medicine. The department offers a basic series of lectures in ophthalmology. Research participation within the department adds a valuable dimension to its educational programs, demonstrating the faculty's commitment to scholarly activity and the advancement of ophthalmic knowledge and patient care.

Among the research programs in which members of the faculty have been involved are: a multi-center clinical trial for supplemental oxygen treatment for retinopathy of prematurity; a preliminary trial of pirfenidone in the treatment of proliferative vitreo-retinopathy; the establishment of a human eyelid movement laboratory; HIV-related studies; an evaluation of cataract extraction in the Third World; a project involving corneal amyloidosis; a national study on ocular hypertension, ocular manifestations of Lyme disease, botulinum toxin effects, and pathophysiology of Blepharospasm.

Department of Orthopaedics

Chair: Lawrence C. Hurst

Professors: Marie A. Badalamente, Roger Dee, Lawrence C. Hurst

Affiliated Professor: Peter C. Altner

Associate Professor: Steven P. Sampson

Affiliated Associate Professor: Frank DiMaio

Assistant Professors: Wesley Carrion, Nicholas Divaris, Susan Haralabatos, Stephen Kottmeier, James Nicholson, James Penna, Louis Romeo, Mark Stephen, David Wallach, Edward Wang

The Orthopaedic Surgery Residency Program provides the resident with a rich educational experience through its home institution and two affiliated hospitals, Veterans Affairs Medical Center and Winthrop University Hospital. A rotation is also provided in Orthopaedic Oncology at Memorial Sloan Kettering Cancer Center in New York City.

Rotations are provided in the clinical subspecialties of Hand and Foot Surgery, Microsurgery, Oncology, Pediatric Orthopaedics, Spinal Surgery, Sports Medicine, Joint Replacement and Reconstruction, and Upper Extremity Surgery. There is uninterrupted participation in the comprehensive management of patients in all subspecialties, from the initial ambulatory encounter through admission and treatment processes to rehabilitation and follow-up. All residents receive a balanced experience of clinical and diagnostic orthopaedics, as well as surgical management of orthopaedic problems.

Strong faculty commitment to teaching and academic development, combined with a full and varied surgical schedule, provides a vast amount of clinical material and support for the resident. This results in an experience that fulfills and exceeds the requirements of the American Board of Orthopaedic Surgeons (ABOS).

The orthopaedic faculty oversees the Connective Tissue Course for the medical students and Medical Imaging Course in the Physical Therapy Program. Medical students have an option of participating in an Orthopaedic Club, led by one of the orthopaedic faculty.

The academic resources of the program, including the Orthopaedic Cellular Biology/Structure Lab and Musculoskeletal Lab, provide basic research experience. Instruction in cellular physiology and biochemistry of musculoskeletal tissues (bone/cartilage; muscle/nerve; tendon/ligament) is given by the Ph.D. faculty of the Orthopaedic Department. Pathology is taught by the clinical faculty and supplemented by a visiting professor. Anatomy is taught on a regular basis, both in the operating room and the lab. Psychomotor skills are taught in a preliminary physical exam and psychomotor course that is given annually to entry-level (PGY-2) residents. Periodically throughout the year, psychomotor skills are refined through hands-on experience in the micro-lab suturing vessels, tendons and nerves. A trauma-oriented skill section is also included and offers experience with procedures such as internal fixation for wrist fractures and AO techniques in trauma. Multiple weekly conferences include Peds Conference, Peds X-ray Conference, Trauma Conference, and Hand Conference. There is also participation on a weekly basis with Grand Rounds (which consists of case or pathology presentations one to two occasions per month, formal senior resident presentations once per month, and QA Conference once per month). Resident Conference is held every Wednesday for three hours. Each section includes a lecture by a resident(s), based on PGY level, or an attending and/or lab by all residents and an attending. Sports Conference and Chairman's Rounds are held every other week.

A completed research project of publishable quality is required of each resident prior to graduation. Time and resources are available to the residents for required and elective research interests.

The department supports a fully accredited residency program in orthopaedic surgery, and post-residency fellowships in hand surgery.

Department of Pathology

Marvin Kuschner Professor and Chair: Kenneth R. Shroyer

Professors: Jorge Benach, Jay L. Bock, Richard Bronson, Eloy Caracuel, Arland L. Carsten, Marianne Frieri, Martha Furie, Berhane Ghebrehiwet, Dimitry Goldgaber, Marc Golightly, Gail S. Habicht, Mae Hultin, Jolyon Jesty, Darrel D. Joel, Cynthia Kaplan, Bernard P. Lane, Jen H. Lin, Leslie Lukash, Sergey Lyubsky, Kenneth Marcu, Frederick Miller, Ute M. Moll, Nancy Peress (Emeritus), Mildred E. Phillips (Emeritus), Kenneth R. Shroyer, Sanford Simon, Leon Sokoloff (Emeritus), Roy Steigbigel, Carmen Tornos, William Van Nostrand, Charles Wetli (Emeritus)

Associate Professors: John C. Chumas, Thomas S. Cottrell (Emeritus), Virginia Donovan, Howard Fleit, Dennis Galanakis, Eli Hatchwell, Alan Heimann, Philip B. Kane, Stanley Lipper (Emeritus), Kanokporn Rithidech, Roberta Seidman, Eric Spitzer, Silvia Spitzer, Sui Zee, Gary Zieve

Assistant Professors: Gary Clarke, Theodore Daly, Stuart Dawson, David Durand, Morris Edelman, William Engellener, Andrea Flieder, Mala Gupta, Youjun Hu, Sonya Hwang, Richard Kew, Ahmed Khapra, Poonam Khullar, Edward Klein, Sharon X. Liang, Jingxuan Liu, James S. Magidson, Yvonne Milewski, Prahba Pai, Mary Parisi, Alexei Petrenko, Alan Schuss, Lisa Senzel, Katarina Szabo, Ali Tamsen, David Tegay, Denise Trochesset, George Turi, James Wilson, Thomas Zimmermann

Instructors: Tahmeena Ahmed, Joseph Chiofolo, Michael DeMartino, Steven Drexler, Lester Freedman, Stephanie Horowitz

The Department of Pathology is concerned with the pathogenesis of disease, as well as with its manifestations of diagnosis. The department serves as a bridge between the preclinical and clinical sciences for students, clinicians, and non-clinicians at all stages of training. It has responsibility for teaching students in each school of the Health Sciences Center, in the College of Arts and Sciences, and in the Graduate School, and has responsibility for the postgraduate and continuing education of residing physicians, house staff and practitioners. In addition to its teaching responsibilities, the department operates the hospital laboratories. At the graduate level, programs leading to the Ph.D. degree are developed within the department and in cooperation with other departments.

Courses

HBP 310 Pathology

Studies the basic mechanisms of disease and the pathophysiology of the important illnesses of man. Primarily for Health Sciences students; others admitted with special permission.

Prerequisites: permission of instructor, BIO 151, 152

3 credits, fall modules 3-6, Dr. Furie

HBP 390 Basic Mechanisms in Pathology

Molecular mechanisms underlying human diseases. Includes inflammation, coagulation mechanisms, fibrinolysis, immunological defenses, viruses, oncogenes, and cancer.

Prerequisites: BIO 361 or BIO 362 required. Cell Biology and Genetics recommended.

3 credits, spring term, staff

HBP 393, 394 Special Topics from the Pathology Literature

Tutorial readings in pathology, with periodic conferences, reports, and examinations arranged with the instructor.

Prerequisite: permission of supervising instructor

1-2 credits per term, fall and spring terms, staff

HBP 398, 399 Research Project in Pathology

An independent research project under faculty supervision

that emphasizes the principles of experimental design, data collection, evaluation of findings, and reporting of results. Project report required. May be repeated.

Prerequisites: laboratory experience and permission of the supervising instructor

0-4 credits per term, fall and spring terms, staff

HBP 401 Applied Immunology

Introduces the principles of immunology for allied health professions students. Emphasizes applications of immunological principles to clinical and laboratory immunology.

Prerequisite: biology or pre-med major, or enrollment in School of Health Technology and Management

3 credits, spring modules 5 and 6, Dr. Golightly

HBP 511 Pathobiology

For graduate students who have obtained primary health care baccalaureate degrees through the case study approach. Covers the underlying principles of modern experimental pathology. Focuses on the clinical aspects of the body system, including relevant underlying biochemistry, structure, or pathophysiology at the organ, tissue, cell or molecular level.

Prerequisites: undergraduate degree, healthcare experience, biochemistry or cell biology, anatomy and microbiology

3 credits, fall modules 3-6, Dr. E. Spitzer

HBP 531 General Pathology

Introduces the nature and causes of disease, death, reaction to injury, and repair. Analyzes associated structural changes in cells and tissues, with reference to their functional correlates.

Prerequisites: histology, gross anatomy, physiology and biochemistry, prior or concurrent microbiology or permission of instructor

3-6 credits with lab, 3 credits without lab, spring modules 5-8, course coordinator: Dr. Fleit

HBP 533 Immunology

Principles of immunology for graduate students in the biological sciences, including definition of antigens and antibodies, specificity of the immune response, immunoglobulin structure, the genetics of immunoglobulin synthesis, cellular cooperation in the immune response, hypersensitivity, tolerance immunogenetics. Open to advanced undergraduates.

Prerequisites: advanced courses in biology and biochemistry, and permission of instructor.

3 credits, fall term, course coordinators: Drs. Fleit and Habicht

HBP 554 Advanced Immunology

Selected topics in immunology are discussed using original research literature as the central focus. Students present and discuss the literature in a seminar format.

Prerequisite: HBP 531 or 533 and permission of instructor

2 credits, spring term, Drs. Fleit, Habicht, and Miller

HBP 556 Laboratory Medicine

A four-week full-time (6 hr/day) course dealing with clinical laboratory decision making and the basis for the laboratory evaluation of human evaluation of human disease. Didactic and practical presentations by interdepartmental faculty. Intended principally for senior medical students, but also for

advanced microbiology or biochemistry students interested in clinical applications.

Prerequisite: permission of instructor

6 credits, spring module 5, Dr. Bock

HBP 561 Electron Microscopy for Experimental Pathologists

Uses electron microscope (EM), alone and in conjunction with other methodologies in studies of biological dysfunction. Special techniques include histochemistry, enzyme histochemistry, immunohistochemistry, diffraction, stereo-EM and scanning EM. Design of protocols, preparation and interpretation of data.

Prerequisite: permission of instructor

Variable credits, 2-6 per term, fall and spring terms, Dr. Lane

HBP 580 Teaching Honors

Selected students whose performance in the basic required courses for the graduate program is in the top 10 percent conduct tutorials for first-year graduate students in the program and other students taking graduate courses for credit. The tutors are supervised and graded by program faculty of the graduate program. Successful completion of this course will make the students eligible to receive an "Honors in Teaching" on their transcript.

Prerequisite: permission of instructor

1 credit, fall and spring terms, graduate program faculty

HBP 590 Seminars in Immunology

A series of monthly seminars focusing on research in progress by the participants, current journal articles in the field of immunobiology, and prepared reviews of specified areas in the general field.

Prerequisite: MCB graduate students

1 credit per term, fall and spring terms, staff, course coordinator: Dr. Fleit

HBP 622 Clinical Pathologic Correlations: Gross Pathology

Correlative exercises in clinical pathology and human gross anatomic pathology including surgical biopsy material. Open to students in medical sciences.

Prerequisites: systems pathology and general pathology course; permission of instructor

Variable credits, 1-3, fall term, course directors: Drs. Kane and Miller

HBP 691 Journal Club in Pathology

Provides students with a forum for acquiring skills involved in the critical analysis and presentation of scientific data by active participation in seminars of major topics in cellular and molecular pathology, and critical discussion of selected topics with presentation of papers from the literature.

Prerequisite: MCB graduate students

1 credit, fall term, Dr. Kew (only offered in fall)

HBP 966 Hematology Conference

Teaches a given aspect of hematology, oncology, or immunology. Staff from medicine, pathology, and nuclear medicine, participate, and usually present, a case to introduce the sub-

ject. Various teaching aids, such as review of pathological material, are used. Primarily for health sciences professionals. Prerequisite: permission of instructor
Variable credits, 1-2, fall, spring and summer terms I and II, staff (medicine, pathology and nuclear medicine)

HBP 967 Tumor Conference

Considers problems in the management of patients with a malignancy and recommendations for a course of therapy for each patient including a review of a particular aspect of cancer treatment or natural history in depth. Functions as the link between the Hospital and the Eastern Oncology Cooperative Group. Primarily for health science professionals. Prerequisite: permission of instructor
Variable credits, 1-3, fall, spring and summer terms I and II, staff

HBP 968 Advanced Clinical Pathologic Correlations: Gross Pathology

Postgraduate correlative exercises in human gross pathologic anatomy that emphasizes the gross pathologic basis for altered function and clinical manifestations of disease. Open to physicians and others with advanced degrees in medical sciences. Prerequisite: permission of instructor
Variable credits, 1-3, fall and spring terms, Dr. Kane

HBP 969 Anatomical and Surgical Pathology for Residents in Pathology

To provide practical and clinical experience in tissue pathology. During the four-week elective, the student is given the opportunity to participate in all aspects of autopsies as well as gross and microscopic examination of surgical specimens. There is ongoing review of general and organ system pathology to reinforce structural-functional correlations. This elective is selected by students who plan a career in pathology as a "hands-on" introduction to the specialty. The elective is also chosen by others, particularly individuals who will enter radiology, and who seek to correlate radiographic and pathologic anatomy. Students who are sufficiently interested and motivated may become involved in relatively independent work-up of selected cases. Primarily for health sciences professionals. Prerequisite: permission of instructor
Variable credits, 1-3, fall, spring, and summer terms, Dr. Kane

HBP 970 Gross Neuropathology

This elective is intended to expose the student to what it means to be a neuropathologist and to allow the student to read and directly study major diseases of the brain, spinal cord, nerve, and skeletal muscle. The focus of such study will be individualized. Available to the student will be (1) attendance at two weekly neuropathology autopsy brain clinical correlation conferences held at Stony Brook University Medical Center and at the Suffolk County Medical Examiner's Office in Hauppauge; (2) individual autopsy brain case assignment with attending student review and case sign-out; (3) Neurosurgical, neuropathological rotation to include: review of films and patient data, participation in frozen section diagnosis and final neurosurgical sign out (at Stony Brook University Medical Center only); (4) focus on peripheral nerve

and skeletal muscle to include independent review of: clinical findings, muscle histochemistry, routine microscopy, electron microscopy, teased fiber preparations and immunofluorescence to be followed by participation at final case review and sign-out with neuropathology attending (at Stony Brook University Medical Center only); (5) independent study of study sets, which include Kodachrome sets and microscope slide sets by topic (at Stony Brook University Medical Center only).

Prerequisite: permission of instructor
Variable credits, 1-3, fall, spring, and summer terms, Dr. Seidman

HBP 971 Renal Clinicopathologic Correlations

A case-oriented, postgraduate course in renal biopsy interpretation and its relationship to patient management. Prerequisites: M.D. or Ph.D. degree and clinical experience
1 credit, fall, spring and summer terms, Dr. Miller

Department of Pediatrics

Chair: Margaret M. McGovern

Professors: Harvey W. Aiges, David Annunziata, Thomas M. Biancaniello, Marion Castro-Magano, Jonathan Davis, Gabrielle Carlsson, Janet E. Fischel, Hossein Ghadimi, Joseph Greensher, Martin Gruber, Avinash C. Jerath, Margaret M. McGovern, Ronald V. Marino, Howard C. Mofenson, Sharon A. Nachman, Margaret M. Parker, Robert I. Parker, Cedric J. Priebe, Warren N. Rosenfeld, Leonard Rosenzweig, Alfred Scherzer, Grover J. Whitehurst, Thomas A. Wilson

Associate Professors: Eleni Bacola, Walter Backus, Anita Belman, Harvey Bernstein, Ivy Boydston, John B. Branche, Mary Cataletto, Latha Chandran, Anupama Chawla, Mariano Lev Chernobilsky, Peter Ciminera, Joseph D. DeCristofaro, Marian J. Evinger, Fred Ferguson, Hershel H. Glatt, Susan Guralnick, Cynthia Kaplan, Stephen Katz, Catherine E. Kier, Harvey Kolker, Marion L. Koomey, Andrew H. Lane, Janet Larson, Haesoon Lee, Boris Lustik, V. T. Maddaiah, Steven A. Maitinsky, Leonard Marino, Peter Morelli, Seymour B. Musiker, Pramod Narula, Michael Nussbaum, Stephen Parles, John C. Pomeroy, Devina Prakash, Leslie Quinn, Frederick J. Reindl III, Arnold Scherz, Irwin L. Schwartz, Jack Sherman, Richard Sosulski, Shanthi Sridhar, Peter S. Tolins, Rita P. Verma, David Volkman, Robert Wasnick, Dilys A. Whyte

Assistant Professors: Albert Adler, Renu R. Aggarwal, Milton Agulnek, Farzana Ahsan, Arie Aloni, Alisa Altman, Richard Ancona, Robert Angert, Jennifer Arnold, Jane Aronson, Viswanathan Balachandar, Howard Balbi, Rula S. Balluz, Taik-Yong Ban, Lena Baram, Alexander Benitt, Rachel A. Bergeson, William H. Bikoff, Manoj Biniwale, John F. Bisocco, Robyn Blair, Denise Blumberg, Harriet S. Boxer, Rachel Boykan, William Bryson-Brockman, Jose Canas, Aileen Cannon, Shang Yao Chen, Thulasi Cheruvanku, Maribeth B. Chitkara, J. Craig Cohen, Cathy Coleman, John A. Colucci, Sherry E. Courtney, Zenaida Cruz, Christopher Cuccia, Hema Dalal, Annamma Daniel, Christopher DeSanto,

Carla DeVincent, Mehmet Yilmaz Dincsoy, Divona Djokin, Charles J. Dunn, Michael Egnor, Nelson S. Erhart, Juan Espinoza, Stanley Everett, Kimberly Fenton, Robert Festa, Damian Forletti, Jay A. Freed, Patricia Galvin-Parton, Blanca R. Gamboa, Mireya H. Garcia, Joseph Gartner, Lynda L. Geller, Linda Genen, Mohammad Ghofrani, Louis M. Goldblum, Ilene Goldstein, Abby J. Greenberg, M. Myrtha Gregoire-Bottex, Susan Gunduz, Anne G. Hansen, Gerald R. Hartman, Martin Hauptman, Jason Halegoua, Darius Holmes, Kenneth G. Huml, David Hyman, Sharon L. Inkeles, Jay Iype, George M. Johnson, Kimberly Joyner, Gail G. Kaden, Ivan Kalina, Aadaobi Kanu, Martin P. Kaplan, Eileen Kelly, Mitchell Kleinberg, Sujatha Kosuri, Leonard Kristal, Mark J. Kropf, Betty Chimei Lee Kuo, Bernard Lau, Edward Langenback, Mark S. Lowenheim, Susan Mangiameli, Adelaide Masakayan, Daniel Mayer, Carolyn Milana, Jeffrey Morganstern, Roberta Nataloni, Richard Nickerson, Bettina Niederer, Patricia Nolan, Ellen Oppenheimer, Jagan N. Pahuja, Anil G. Palekar, James Parles, Kalpana Patel, Ammukutty Paulose, Nancy Pearson, Paul H. Penzer, Joseph Puccio, Youchan Rhee, Catherine Riley, Carlos J. Rivera, Carolyn Robbins, Michael P. Rodriguez, Marion Rose, Irina Rubin, Lycia Ryder, Dominick Sabatino, Richard Salo, Michael Schessel, Howard Schreiber, Arthur J. Schwager, Anna Schwartz, Michelle Seitz, Shetal Shah, Jila Sharif, Saroja Siddharth, Robbyn Sockolow, Yosef Soleymani, Daniel E. Sloniewsky, Tracey L. Spinnato, Raphael Strauss, Salma Syed, Behzad Talebian, David H. Tegay, Liliana Tique, Joseph Thomas, Gerardo Tolentino, Shelly Toussi, Janice Valmassoi, Lizy Varughese, Kristen Wallis, Nora E. Wecker, Santiago A. Wong, Janaki Yadlapalli, Barbara Young, Rose Marie Young, Shelly Zeira

Instructors: Keith Ancona, Donna Baranek, Laura Bennett, Stuart Berman, Jennifer Byrne, Teresa Carney, Siobhan Cassidy, Lisa Clark, Jennifer Clarke-Nastasi, William W. Colden, Christine Danzi, Traci Downs, Agboola O. Fatiregun, Ada Fenick, Barbra Francisco, Laurence J. Galinkin, Kerry Gallagher-Walsh, Jeanne Greenfield, Jack M. Greenwood, Deborah Guigliano, Mohinder K. Guram, Ann Hajduk-Bennett, Harriet Hellman, Claudia Herbert, Celso Hofelena, Roy Horowitz, Soma S. Johnkutty, Gail Kaden, Susan Katz, Mitsu A. Kee, Michele Kelly, Nikhat S. Khan, Grace Kim-Lu, Jason Kronberg, Allison Lasner, Alexander Lee, Amy Leonard, George V. LoVece, Rosemary Mahan, Richard E. Manners, Phyllis Marion, Paul Martinez, Kumar Mecheri-Madam, Patricia Mele, Maria Mineo, Pamela Minett, Kerry B. Moore, Stephan Nagler, Jeanmarie A. Napolitano, Tulika Narain, Jennifer A. Nastasi, Roberta Nataloni, Magalena Oleszak, Fernando Ordonez, Marc Ovardia, John Pastore, Linda H. Perangelo, Jane Perillo, Mihailo Petrovic, Linda H. Ponzer, Shahina Qureshi, Sarala Radhakrishnan, Jennifer L. Reinitz, Anne Rohan, Lisa Romard, Dov Rosen, David E. Sanchez, Debra Sansoucie, Patricia Schwarz, Barbara Seifert, Reid Selden, Marjorie Serotoff, Foazia Siddiq, Michael P. Stein, Karen Sulitzer, Rohit Talwar, Alexander A. Tocher, Robert Trepel, Decerina Uy, Mona Vani, Jason Waterman, Barbara Wieder, Ian Winkler

The Department of Pediatrics defines three broad areas within its mission:

- 1) Excellence in patient care and patient education in our service to the communities around us.
- 2) Excellence in medical education within each phase of the

training of physicians, allied health professionals, and scientists.

- 3) Excellence in scholarship and research related to childhood health and development, childhood diseases and disorders.

The department goals align with the three-part mission, including the provision of the highest standards of care for children and families, while providing exemplary training programs, highest quality educational and service leadership, and opportunities for research and scholarship so that the department can continue to improve pediatric medical care both in the surrounding communities and at the national level. Faculty roles in teaching encompass trainee education from the start of undergraduate medical and allied health education through residency and subspecialty fellowship training, combining basic and clinical knowledge with inpatient and ambulatory clinical experiences to facilitate the development of astute, competent, knowledgeable, and caring professionals. Ongoing research among the faculty and trainees helps to prepare new investigators with the skills to expand understanding of pediatric diseases, and provide evidence-based and effective interventions for the challenging health problems of the pediatric population.

The department is comprised of the following clinical and academic divisions, each with its own designated Division Chief.

Division of Adolescent Medicine: Primary care for adolescents including menstrual abnormalities, gynecological care, contraception, sexually transmitted infection screening, including HIV testing. Evaluations for acne, anorexia nervosa, bulimia nervosa, obesity, ADD, ADHD, depression, anxiety, alcohol and substance abuse, school difficulties, self injurious behaviors (cutting), and sexuality are also available.

Division of Pediatric Cardiology: Inpatient and outpatient consultations are available for premature and newborn infants, children, and adolescents with congenital heart defects. Complete diagnostic services include electrocardiography, echo-doppler studies, ambulatory ECG monitoring, stress testing, and cardiac catheterization. In addition, percutaneous interventional catheterization procedures and fetal echocardiography are performed. A comprehensive pediatric cardiac surgical service works in conjunction with pediatric cardiology to provide complete surgical care. The division also manages a lifestyle modification program for obese, hypertensive, and hypercholesterolemic children. Cardiology consultations are also available at the South Shore satellite office, located in Patchogue.

Division of Pediatric Critical Care Medicine: This division provides staff and oversight to the Pediatric Intensive Care Unit at Stony Brook University Hospital. The 12-bed intensive care unit, staffed by Board Certified Pediatric Intensivists, offers state-of-the-art care for children, unavailable anywhere else in Suffolk County.

Division of Developmental and Behavioral Pediatrics: Diagnosis and treatment are available for a wide range of behavior problems and developmental disturbances of infancy and early childhood. Specialties include assessments of

concerns about high-risk and premature infants, disorders of parenting and problems of early childhood (such as sleep disturbances, tantrums, toilet skill training, and self-control). Developmental assessment is provided for children from birth to five years of age. For children with complex medical management needs, joint consultation in the behavioral and developmental aspects of the disease is provided.

Division of Developmental Disabilities (The Cody Center):

The division operates the Matt and Debra Cody Center for Autism and Developmental Disabilities, recognized by the NY State Legislature as a State University Center for Autism and Developmental Disabilities. The clinical service consists of a multidisciplinary evaluation and treatment program that offers primary, specialty medical (e.g., neurology and genetics), and mental health care, plus educational and training programs, for the families and individuals of all ages who are affected by developmental disabilities. Other division programs provide school-based consultation services, undergraduate and postgraduate educational courses in the field of autism and developmental disabilities, and a multi-site collaborative research program. The broad mission of the Cody Center is to:

- Advance the standard of care for individuals with autism spectrum disorders and other developmental disabilities.
- Provide an educational setting for professionals.
- Contribute significant research outcomes to the body of science surrounding autism and related disorders.
- Practice a multidisciplinary approach to treating people with developmental disabilities.

Division of Pediatric Endocrinology: The endocrine division consists of board-certified pediatric endocrinologists and a pediatric endocrine nurse practitioner. Consultations, diagnostic testing, and ongoing treatment are available for the full range of pediatric endocrine disorders, including those involving abnormalities of growth, puberty, sexual differentiation, thyroid and adrenal function, rickets, calcium regulation, hypoglycemia, diabetes, hypertension, and hyperlipidemia. Full ancillary laboratory, radiological, dietary, surgical, and social work services are available for those patients who require them. Outpatient services are available at Stony Brook University Medical Center as well as a satellite facility in Patchogue.

Division of Pediatric Gastroenterology: Inpatient and outpatient consultations are available for children with illnesses including inflammatory bowel disease (Crohn's disease and ulcerative colitis), irritable bowel syndrome, acute and chronic hepatitis, gastrointestinal bleeding, failure to thrive, lactose intolerance, malabsorption syndromes, chronic constipation, esophageal reflux, as well as unexplained abdominal pain. Lactose breath testing, urea breath testing, placement of percutaneous feeding gastrostomies, endoscopy/colonoscopy, liver and rectal biopsies as well as esophageal pH studies (pH probe study as well as Bravo studies) are performed. Nutritional counseling in conjunction with a registered dietitian is offered. Outpatient services are available at Stony Brook University Medical Center as well as satellite facilities in Islip and Riverhead. The division also provides gastrointestinal consultative services at Association for the Help of Retarded Children (AHRC) in Bohemia, NY and the Association for Children with Down's Syndrome in Plainview, NY.

Division of Genetics: The division at the Children's Medical Center at Stony Brook offers evaluation of any child with dysmorphic features, unexplained mental retardation, or birth defects on an inpatient or outpatient basis, as needed. Services include comprehensive genetic counseling for families with a child who has a genetic disorder and for prenatal patients. Evaluation and treatment is also offered for patients suspected of having inborn errors of metabolism especially newborns with abnormal or unclear newborn screening results.

Division of General Pediatric Medicine: Comprehensive and confidential health care is offered for teens and young adults between birth and 21 years. Full service general pediatrics is offered at the following locations: Stony Brook University Medical Center, University Pediatrics at Tech Park, Stony Brook Primary Care at Patchogue, Stony Brook Primary Care at Islip, Stony Brook Primary Care at East Moriches, Stony Brook Pediatrics at Southold, and Stony Brook Pediatrics at Riverhead.

Division of Pediatric Hematology and Oncology: Staffed by a team of physicians, specialized nurses, and ancillary personnel, this division provides the most advanced diagnostic and treatment modalities for pediatric patients with hematologic and/or oncologic disorders. Care is provided in a multidisciplinary, team setting to offer state of the art care to children. Some of the services offered include:

- Inpatient and outpatient services for chemotherapy and transfusion needs
- Autologous and cord blood stem cell transplantation
- Care of patients with sickle cell disease, thalassemia and other hemoglobinopathies, bleeding disorders, Gaucher's disease, and other metabolic disorders

Division of Pediatric Infectious Diseases: Inpatient and outpatient services include diagnosis and treatment of all pediatric infectious diseases using a team approach to track children with infections. Special attention is paid to involving the family in their treatment plan. Additionally, the Children's Medical Center at Stony Brook is a New York State certified pediatric AIDS unit and a National Institute of Health Pediatric AIDS Clinical Trial Unit.

Division of Neonatology: Provides comprehensive care for sick babies throughout Suffolk County. Approximately 800 children born each year at University, and surrounding hospitals, are cared for by perinatal-neonatal board-certified physicians. We also provide neonatal education on newborn resuscitation and consultation services to all our affiliates as part of our perinatal outreach program. The Neonatology Division has particular interest and expertise in lung development, lung injury and cell biology.

Division of Pediatric Nephrology: Diagnosis and treatment of pediatric kidney disease and hypertension are available. Advanced diagnostic techniques include urinary tract imaging modalities, ambulatory blood pressure monitoring and renal biopsy. Dialysis and transplantation services are active components of the division.

Division of Pediatric Pulmonology/Allergy and Immunology:

Inpatient and outpatient consultations are available for premature and newborn infants, children, and adolescents with allergy and immunology problems, chronic or acute asthma, and recurrent pulmonary infections. Complete inpatient and outpatient diagnostic services include pulmonary bronchoscopy and comprehensive laboratory services. Outpatient services are available in Stony Brook University Medical Center as well as satellite facilities in Patchogue and Islip.

Cystic Fibrosis: As a Cystic Fibrosis Center certified by the Cystic Fibrosis Foundation, our Center at Stony Brook University Hospital offers the most up-to-date diagnostic and management techniques available for pediatric and adult patients. A multi-disciplinary approach to patient care is provided by a staff that specializes in children and adults with cystic fibrosis. Services including pulmonary medicine, gastroenterology, otolaryngology surgery, radiology, pathology, nursing, respiratory therapy, genetic counseling, physical therapy, nutrition, and social work are provided. Staff is available for consultation, patient management issues and diagnostic procedures, such as sweat testing and genotyping. A Cystic Fibrosis support group for patients and families meets monthly on Wednesday evenings.

The pediatric teaching program is an accredited three-year residency program designed to provide a solid foundation for clinical practice or for further study in the pediatric specialties, including pediatric research. The program emphasizes basic principles of scientific medicine and reasoning, training pediatricians to apply evidence-based medicine to the clinical care of children. While learning to care for the sick child in the inpatient setting, the resident also develop an outpatient primary care continuity practice throughout their three years of training. The program is based at University Hospital, which provides 40 pediatric beds, 10 Pediatric Intensive Care (PICU) beds, 40 newborn intensive care beds, 30 bassinets and active ambulatory care, including the Urgent Care Center. In addition, the service operates in the Coram Health Center, an ambulatory care center of Suffolk County; in the University Health Service, for adolescent medicine; and in satellite affiliates in Central Islip, East Moriches, East Setauket, Patchogue Southold, Riverhead, and the Cody Center for Autism and Developmental Disabilities, which together provide for 72,000 ambulatory encounters per year. Elective experiences are available in all fields of pediatrics, either at University Hospital or at affiliated programs at Nassau University Medical Center or Winthrop-University Hospital.

Department of Physical Medicine and Rehabilitation

Chair: Jennifer Semel (Acting, St. Charles)

Professor: Lyn Weiss (NUMC)

Associate Professor: Walter Gaudino (NUMC), Adam Isaacson (NUMC), Thomas Pobre (NUMC)

Assistant Professors: Ernesto S. Capulong (South Nassau), Magda Fahmy (VA), Harvey Goldberg (NUMC), Karen James (VA), Dae-Song Kim (VA), Yu-Jen Lai (St. Charles), Benson Ong-Hai, Jonathan Ranaan, Ajendra Sohal (NUMC), Susan Stickevers (VA), Jay Weiss (NUMC), Jun Zhang (St Charles)

The Department of Physical Medicine and Rehabilitation provides an educational experience for fourth-year students who are interested in the specialty. Students will gain exposure to the field of rehabilitation medicine in a variety of settings including inpatient, outpatient and electromyography. Students will learn the physiatric approach to patient care, and the roles of the various rehabilitation team members. The elective is based at St. Charles Hospital. Students may contact Jennifer Semel-Concepcion, M.D., Acting Chair of the department, at (631) 474-6011.

Department of Preventive Medicine

Acting Chair: Iris A. Granek

Distinguished Professor: M. Cristina Leske

Distinguished Service Professor: Dorothy S. Lane

Professors: Evelyn Bromet, John Coulehan (Emeritus), Norman Edelman, Raymond Goldstein, Leslie Hyman, Steven Jonas, John Kovach, Nancy R. Mendell, John Rizzo, John Shanley, A. Laure Shroyer, Andre O. Varma (Emeritus), Peter C. Williams

Associate Professors: Clare B. Bradley, John Chen, Steven Finch, Iris A. Granek, Anselm J. Hennis, S. Van McCrary, Catherine Messina, Elza Mylona, Barbara G. Nemesure, Elinor Schoenfeld

Assistant Professors: Matthew Caddell, Mary F. Cavanagh, Linda Cocchiarella, Patricia Dillon, LiMing Dong, Melody Goodman, David G. Graham, Abby T. Greenberg, Lauren Hale, Evonne Kaplan-Liss, David Kreiner, Jayme Meliker, Hongdao Meng, Sara Mendelsohn, Linda Mermelstein, Hector Sepulveda, Anthony Shih, Michael Vetrano, Suh-Yuh Wu

Lecturers: Eugene Theissen, Mahfouz H. Zaki

Instructors: Lynette Dias, Terry Mahotiere, Aletha Maybank, Lucille Weinstein

The Department of Preventive Medicine was established when the medical school first opened in 1971 with goals and composition that were well aligned with the school's focus on community service and an interdisciplinary approach to research and teaching. The result is a faculty that represents the clinical, social, and behavioral sciences, as well as the humanities. With its population health perspective and focus on all aspects of preventing disease and disability, the Department has developed into an important force in establishing linkages with area-wide agencies such as the two county health departments. Research activities address understanding the multiple determinants of health and illness including social, behavioral, environmental, demographic,

occupational, policy, economic, and genetic, as well as investigating the effectiveness of medical, behavioral and public health interventions.

The Department's mission is accomplished through the work of the faculty and staff within its Divisions and programs. There are five divisions: Epidemiology; Community and Behavioral Health; Medicine in Society; Evaluative Sciences; and Occupational, Environmental and Clinical Preventive Medicine. Major programs include The Graduate Program in Public Health (GPPH); the Residency Program in General Preventive Medicine and Public Health; the Biostatistical Consulting Core, the Institute for Medicine in Contemporary Society, and the Long Island Occupational and Environmental Health Center (LIOEHC).

The major departmental goals are:

1. Teaching of the disciplines of preventive medicine (e.g., biostatistics and epidemiology) and the social and ethical context of health care
2. Conducting a broad range of research in the epidemiology and prevention of disease as well as in healthcare delivery, evaluation and policy
3. Practicing occupational, environmental and preventive medicine

Teaching

Teaching has always been a primary focus of departmental activities. It is responsible for courses integrating social sciences and humanities into the medical school curriculum as well as teaching the principles of epidemiology, biostatistics, health service delivery and economics to medical students, public health graduate students, clinical research scientist trainees, preventive medicine residents, as well as residents in other departments. The Department of Preventive Medicine has teaching responsibilities at every stage of education in the Stony Brook School of Medicine. Presently the teaching program for medical students in the first year occurs during a course entitled Foundations of Medical Practice, specifically within its content areas of Prevention, Medicine in Contemporary Society (MCS) and Self Awareness. The Prevention content area includes biostatistics, epidemiology, clinical preventive services, and health care delivery concepts. The MCS content area is part of a 4-year curriculum focused on ethical issues and the social context of health care. The Self Awareness sessions focus on interpersonal skills, communication and behavioral aspects of health. In the second year, disease epidemiology is presented on an integrated basis in the medical school's curriculum in organ systems teaching. The departmental teaching program also includes a broad spectrum of third and fourth year electives ranging from clinical experience in a neighborhood health center to basic research in epidemiology, injury control, computing, occupational medicine and health services systems, is offered in the fourth year.

In addition to teaching medical students, under the leadership of the Division of Community and Behavioral Health, the department offers an ACGME-accredited, two-year, combined academic and practicum residency training program in General Preventive Medicine and Public Health. Residents in the program are taught the components of specialty training in preventive medicine, including a core curriculum in epi-

demology and biostatistics, health services administration, environmental and occupational health, cultural and behavioral factors in health and disease, and clinical applications of preventive medicine. The program is designed to develop knowledge and skills in the preventive medicine core and specialty area competencies.

The department also provides courses in Epidemiology, Biostatistics, Data Management and Informatics and Clinical Trials as part of the National Institutes of Health funded Clinical Research Training Program, which is designed to offer highly focused training to outstanding postgraduate fellows and junior faculty interested in pursuing careers in clinical biomedical research. Participants in this program who complete the didactic portion receive an Advanced Certificate in Clinical Research.

Research

The Division of Community and Behavioral Health focuses on testing of interventions to promote health and prevent disease. The interventions are directed to the major causes of morbidity and mortality and on improving the health behaviors among community population groups and the preventive practice behaviors of community health providers.

The Division of Epidemiology focuses on the epidemiology and prevention of chronic diseases. The major emphasis is on the epidemiology and treatment of eye diseases, cancer and osteoporosis and is achieved by conducting clinical trials, cohort and case-control studies, and community intervention trials.

The Division of Evaluative Sciences is concerned with the effectiveness and efficiency of resource allocations related to population health. The division faculty plays an active role in the Graduate Program in Public Health through research in health economics and health sciences research.

The Division of Medicine in Society focuses on investigating the ethical and social context of health care. The Division is responsible for an extensive 4-year interdisciplinary curriculum for medical students, as well as a program of ethics education and consultation in University Hospital. Its research interests focus on innovative medical pedagogy and the role of ethics, law, and humanities in health care.

Clinical Services

The Division of Occupational, Environmental and Clinical Preventive Medicine was initially created in 1986 to establish a clinical service to address the occupational and environmental health needs of the LI community. As the Department's clinical arm, the Division continues to expand and now includes clinical preventive medicine services such as immunizations, cancer screening, travel medicine, management of chronic illness, as well as wellness and integrative medicine services. Areas of research focus include planning, operating, and evaluation of disease prevention; healthcare and health maintenance programs; and employee health services.

Department of Psychiatry and Behavioral Science

Chair: Mark J. Sedler

Professors: Evelyn Bromet, Gabrielle A. Carlson, Steven Cole, Judith Crowell, Max Fink (Emeritus), Laura Fochtman, Andrew Francis, Kenneth Gadow, Dimitry Goldgaber, Jan Loney (Emeritus), Richard Mattison, Lawrence Morin, Nisson Schechter, Joseph Schwartz, Arthur Stone (Distinguished), Nora Volkow

Associate Professors: Joan Broderick, Peter Halperin, Harold Pass, Wolfgang Quitschke, Michael Schwartz, Mark J. Sedler, Joyce Sprafkin, Deborah Weisbrot

Assistant Professors: Ashraf Abaza, Joseph Blader, Lory Bright-Long, Darla Broberg, Christopher Burke, Michael Cohen, Eduardo Constantino, Cindy de Frias, Erik Fink, Fred Friedberg, Paul Garson, Yakov Greenstein, Marsha Tanenberg-Karant, Leighann Litcher-Kelly, Daniel Klages, David Margulies, Lilianne Mujica-Parodi, Donna Osikowicz, E. Victoria Rundberg-Rivera, David Schlager, Alan Steinberg, Robert Vincent, Sheldon Weintraub, Adeeb Yacoub

Instructors: Antoinette Foster, Rita Gal-Vetrano, Marlene Gralnick, Michael Greenberg, Kevin Kelly, Maureen Largan

The Department of Psychiatry and Behavioral Science provides a complete range of instruction from beginning medical education through post-residency fellowships. Members of the department are involved in teaching in psychology, neurobiology, pharmacology, and biomedical engineering, as well as psychiatry. The faculty within the department is dedicated to research related to an understanding of psychiatric disorders, ranging from basic neurobiological research to applied clinical studies. Through joint appointments with other departments, many faculty members supervise and support graduate and post-doctoral students in related disciplines.

Clinical Services: The department is organized into three clinical divisions. The clinical divisions include Adult Psychiatry, Child Psychiatry, and Medical/Geriatric Psychiatry. Services in these divisions may be provided at Stony Brook University Hospital, at the Northport Veterans Affairs Medical Center, and at Eastern Long Island Hospital. University Hospital services provide 30 adult care beds, adult day hospital facilities, 10 children's beds, a comprehensive psychiatric emergency program, a consultation-liaison service and out patient clinics for adults and children. Northport Veterans Affairs Medical Center provides a 50-bed acute inpatient service and a 50-bed chronic care service. Eastern Long Island Hospital provides an 18-bed and adult inpatient service.

Medical Student Education: The department is committed to an interdisciplinary approach to mental health throughout its curricular activities. Within the curriculum of the medical school, the department provides psychiatric curriculum in the first year introduction to human behavior course, the second year neuroscience course, the third year clerkship in clinical

psychiatry (four weeks), and the fourth year clerkship in behavioral medicine (two weeks). A psychiatry sub-internship is available to students in their third and fourth years on an elective basis.

Residency Program: The Department of Psychiatry and Behavioral Science offers a four-year residency program in psychiatry with the first year designed as a categorical post-graduate-1 "mixed" clinical experience. The residency program provides a broad variety of situations, subjects and settings from which residents and students may select their learning experiences. The program goal is to train a physician who specializes in the treatment and understanding of diseases and abnormalities that manifest themselves in behavioral change. Such a physician should be well grounded in diagnostics, psychopharmacological interventions and behavioral management techniques. The training program pays particular attention to the neurobiological foundations of psychiatry, while at the same time providing training in psychotherapeutics and other skills necessary to the general practice of psychiatry.

Fellowship Training: The department offers several fellowships including accredited clinical fellowships in child psychiatry, and geriatric psychiatry.

Institute for Mental Health Research: founded in 1982, the IMHR is the research division of the department. With several million dollars of extramural support annually the research and clinical research faculty are engaged in psychiatric research ranging from basic science investigations of circadian rhythms, the molecular biology of Alzheimer's disease, to cutting edge research in behavioral medicine and in the epidemiology of mental disorders.

In addition to this umbrella research organization the department is also home to the Alzheimer's Disease Center of Long Island, and the Applied Behavioral Medicine Research Institute.

Department of Radiation Oncology

Chair: Allen G. Meek

Professors: Allen G. Meek, Lawrence Reinstein

Associate Professors: Tae L. Park, Tamara E. Weiss

Assistant Professors: Leon Forman, Bong S. Kim, Magdy S. Shady, Edward S. Valentine

Instructors: Edward H. Glenn

The Department of Radiation Oncology is organized to develop and teach the disciplines of radiation physics, radiation biology and therapeutic radiology as applied to the treatment of malignancies and selected benign disorders. Active basic and clinical research programs operate in conjunction with other medical school departments and the Brookhaven National Laboratory.

For medical students already career oriented in radiation oncology and for those who desire greater depth than permit-

ted by the core curriculum, fourth year electives are offered in radiation oncology.

Undergraduate and graduate as well as medical students interested in research collaboration or the clinical oncology of solid tumors, are encouraged to apply for elective rotations.

The mission of the Department of Radiation Oncology is to develop a well-rounded academic program in radiation oncology, to include:

- Expert cost effective radiation therapy services
- Education of medical professionals in the management of oncology patients
- Improvement of patient care through science and technology transfer
- University leadership in oncology

The Radiation Oncology Department fosters and supports three nationally recognized programs that encourage the Stony Brook University community to continue its education in the fields of Medical Dosimetry and Medical Physics.

Medical Dosimetry Program

The Medical Dosimetry Program is a one-year Post-Baccalaureate program offered as a continuation of the Health Science major and provides students eligibility for the Medical Dosimetry Certification Board exam. Students work along side the Radiation Oncology staff within the department, as well as several satellite facilities as to further their experience. Students work clinically to hone their skills in a professional setting, while continuing academic classes taught by departmental faculty and staff.

The Post-Baccalaureate Medical Dosimetry program offers accepted students a first hand experience in treatment planning, dose calculations, and responsibilities pertinent to that of a board certified Medical Dosimetrist. As the students continue with a regular regimen of classes, the program concurrently prepares students to handle clinical responsibilities that one would encounter on a daily basis as well as obstacles that may appear on an occasional agenda. During the clinical year, students also undergo a series of tasks that render them competent in basic dosimetry techniques.

Medical Physics Residency Program

The Medical Physics Residency Program is a two-year program that provides preparation for the Board Certification by the American Board of Radiology (ABR). Residents are involved in all aspects of the clinic including, but not limited to machine QA, IMRT, HDR and LDR Quality Assurance, instruction of Medical Dosimetry and Biomedical Engineering students, 3D conformal and IMRT planning, Stereotactic Radiotherapy and administrative responsibilities. Residents are encouraged to partake in projects that are run in the clinic and are provided with continued educational opportunities. Residents are trained to be fully functioning Medical Physicist upon the completion of their program.

Biomedical Engineering Masters of Science

In conjunction with these programs, the Stony Brook Radiation Oncology Department offers the Biomedical Engineering Masters of Science Candidates a forum of

advanced learning. Through hands on experience in the clinic and classes taught by our residents and departmental faculty, the MS candidates are afforded an opportunity to acquire experience in Medical Physics.

Department of Radiology

Chair: John Ferretti (acting)

Professors: Harold L. Atkins (Emeritus), Dvorah Balsam, Nancy E. Budorick, Harris L. Cohen, John Ferretti, Donald P. Harrington, Arie E. Kaufman, Jerome Z. Liang, Morton A. Meyers (Emeritus), Zvi H. Oster (Emeritus), Robert G. Peyster

Associate Professors: Terry M. Button, Paul R. Fisher, Gene R. Gindi, Elaine S. Gould, Seth O. Mankes, Steven Perlmutter, Clemente T. Roque, Sol Spector, Mark E. Wagshul, Wei Zhao

Assistant Professors: Matthew Barish, Cliff Bernstein, Corazon J. Cabahug, Bruce M. Chernofsky, Sheri Ford, Dinko Franceschi, Andrei Kranz, Maryanna Mason, Robert Matthews, William H. Moore, Roxanne B. Palermo, Erica J. Posniak, G. Lucy van de Vegte, Paul L. Vitulli, Barbara Wajsbrot-Kandel, Henry H. Woo, Zengmin Yan, Marlene Zawin

Divisions

- Division of Breast Imaging
- Division of Diagnostic Radiology (Emergency, GI/GU Thoracic Imaging)
- Division of Cardiac Imaging
- Division of Cross-sectional Imaging
- Division of Interventional Radiology
- Division of Musculoskeletal
- Division of Neuroradiology
- Division of Nuclear Medicine
- Division of Pediatric Imaging

Our Department transverses both Stony Brook University Medical Center and the Veterans Administration Medical Center and our common mission is a commitment to excellence in medical imaging, responsive service and the responsible use of our resources in clinical care, education and research. Our goal is to help our customers achieve their goals.

The medical students rotate through the Nassau University Medical Center and Winthrop University Hospital. The third-year medical students rotate on the radiology service for two weeks. The course combines daily lectures, which address basic image interpretation and an algorithmic approach for the selection of imaging studies. In addition, the student completes a series of programmed learning seminars and teaching files, which review principles of image interpretation. There will be extensive exposure to many of the subspecialty areas with observation of procedures and participation in film review sessions with Radiology faculty. Schedules will be distributed at the start of the clerkship.

A fourth-year medical student elective is offered. Rotation is for two or four weeks. The student will be able to exercise choice in time commitment to various subspecialties according to perceived need. The student will attend departmental conferences, participate in daily activities of the department, meet with visiting professors, and attend student rounds for case presentations. Overall supervision is by the Course Director, with day-to-day contact with attending staff members. Self-teaching with teaching files is also part of the curriculum.

The Department offers a four-year residency in diagnostic radiology. The program includes all aspects of radiology, including neuroradiology, musculoskeletal, thoracic, cardiac, interventional, abdominal, and pediatric radiology, as well as nuclear medicine. The residency provides the resident with a strong foundation to meet his or her goals, whether in clinical practice, academic teaching or in research. Teaching is the core mission of the department. The clinical rotations, core curriculum, and research project provide each resident with the fundamentals necessary to pursue a clinical and/or academic career. All modalities, including evolving technologies, are included in the program. A one-month research rotation is supplemented by elective research opportunities. The rotations are primarily at Stony Brook University Hospital, with additional rotations at the Northport Veterans Administration Hospital. The department offers fellowships in abdominal imaging, neuroradiology, interventional radiology, musculoskeletal, and breast imaging.

Department of Surgery

Chair: John J. Ricotta

Professors: Thomas V. Bilfinger, Marvin L. Corman, Arnold E. Katz, Nicos Labropoulos, Margaret A. McNurlan, Cedric J. Priebe Jr. (Emeritus), William P. Reed Jr., John J. Ricotta, Todd K. Rosengart, Marc J. Shapiro, Maisie L. Shindo, Harry S. Soroff (Emeritus)

Associate Professors: Martyn W. Burk, Alexander B. Dagum, Thomas K. Lee, Eugene P. Mohan, Brian J. O'Hea, David A. Schessel, Frank C. Seifert, Joseph J. Sorrento Jr.

Assistant Professors: Balvant P. Arora, Valerie A. Brunetti, Duc T. Bui, Patricia A. Farrelly, Antonios P. Gasparis, Andrea J. Hendrzak, Steven M. Katz, Sami U. Khan, Cheng H. Lo, Bernard F. Martin, Allison J. McLarty, Louis T. Merriam, Denise C. Monte, Michael F. Paccione, Colette R.J. Pameijer, Shaji P. Poovathoor, David E. Rivadeneira, Ghassan J. Samara, Steven Sandoval, Richard J. Scriven, William B. Smithy, Alexander Sorin, Apostolos K. Tassiopoulos, James A. Vosswinkel, John H. Wang, Kevin T. Watkins

Instructor: Vimala S. Sivaraman

The Department of Surgery is organized into clinical divisions, each with its own chief: general surgery, including trauma and surgical critical care; cardiothoracic surgery; otolaryngology–head and neck surgery; pediatric surgery; plastic and reconstructive surgery; surgical oncology, including colon and rectal surgery; transplantation; and vascular surgery. In

addition, the department includes two nonclinical divisions, namely, education and surgical research.

The department provides instruction for medical students throughout their four years of training. Most of the department's effort is directed at third- and fourth-year students in the form of a general surgery clerkship and surgical selectives/electives, plus a sub-internship.

The third-year clerkship in surgery is designed to provide students with a broad experience in the general surgical disciplines. This experience emphasizes direct patient contact, including all phases of evaluation, diagnosis, and treatment. Students spend a period of time on a general surgical service. During this portion of the clerkship, they are given the opportunity to follow patients from initial presentation and evaluation, participate in the patient's surgical therapy, and care for the patient in the postoperative recovery period until discharge from the hospital. Opportunity is also provided to participate in surgical office practice or in outpatient clinics, allowing greater participation in both the pre-hospital evaluation of elective patients and the long-term follow-up of patients seen in-hospital.

To give students a broad experience in the surgical disciplines, one-week electives are offered in the associated surgical services, such as cardiothoracic surgery, urology, orthopaedic surgery, otolaryngology, and head and neck surgery.

While patient care responsibilities are foremost, didactic teaching sessions are held each week throughout the rotation. These sessions utilize group presentations, lecture, and problem-based learning formats. During these sessions, the student is expected to master and demonstrate the fund of knowledge necessary for the general practice of medicine as it relates to surgical disease. Performance on problem sessions, presentations, and ward responsibilities form the basis of the clinical grade. In addition, each student meets regularly with a faculty preceptor. Finally, evaluations include a written (in-house) exam, written board examination, and oral examination.

The objective of the fourth-year surgical electives is to provide additional exposure in surgery not gained in the third-year clerkship. The intent is to allow students to pursue areas of interest, to expand their knowledge, to further strengthen existing areas of personal interest, and to foster future interest in the fields of surgery and anesthesiology.

During a required one-month selective, students are exposed to the mandatory two-week rotation in anesthesiology. During the other two weeks, they have the opportunity to choose from several elective courses. Although not designed to provide in-depth training, the courses offered during this month provide students with a foundation of knowledge adequate to reach the objectives set forth above. Regardless of each student's chosen upcoming residency and ultimate career, this one-month rotation can prove an invaluable resource for future training.

The surgical sub-internship is a focused month designed to prepare fourth-year students for upcoming residency. Students participate directly in the care of surgical patients; that is, initial evaluation, formulation of differential diagnoses, establishment of treatment plans, and eventual daily care of the patient. Students function at the PGY-1 level with close supervision from the resident and attending surgical team. Students actively participate on rounds, daily care tasks, procedures, and conferences.

The sub-internship provides an opportunity for the soon-to-be resident to gain and/or polish the clinical skills critical for entering residency. Students actively participate in procedures, clinical decision-making, and patient interaction. This month is a chance to establish a preliminary comfort level in taking care of patients, and is designed to simulate what it may be like as a PGY-1, with appropriate supervision. Although the patient population is primarily of a surgical nature, students gain a broad clinical exposure that provides a solid experience for entrance into any type of residency program.

An advanced surgery elective (sub-internship) is also offered at an affiliated hospital. This rotation provides greater in-depth experience in the management of patients with a wide spectrum of surgical problems. Students are exposed to patients in different surgical specialties: general, oncology, pediatric, head and neck, colorectal, and trauma surgery. Students participate in both clinical and educational activities of the general surgery service, including rounds, conferences, surgeries, and office hours. Students learn pre- and post-operative management of surgical patients and participate in the operating room, assisting surgeons, to gain experience and train in various surgical techniques and learn to problem solve surgical issues in patients.

Opportunity is also available there to participate in the inanimate and animal laboratory to learn laparoscopic skills. Interested students are given the opportunity to spend one half day per week in the office of practicing surgeons in the community. Clinical research opportunities are also available.

All told, the department's fourth-year programs encourage students interested in choosing a career in surgery, and enable them to develop their skills and knowledge in surgical problem solving and apply their acquired knowledge in evaluating patients with surgical disease. Students have broad exposure to operative technique and an opportunity to develop technical skills. Thus, they are able to function at a more advanced level on the surgical floors and in the operating room.

Residency/Fellowship Programs: The department offers a five-year nonpyramidal residency in general surgery that fulfills the standards of professional excellence adopted by the American Board of Surgery, and leads to eligibility for board certification. This residency is fully accredited by the Accreditation Council for Graduate Medical Education (ACGME). Six surgical residents are selected each year through the National Resident Matching Program.

In addition, individual divisions/sections within the department offer an ACGME-accredited residency in otolaryngology-head and neck surgery, ACGME-accredited residency plus fellowship in vascular surgery, ACGME-accredited residency (fellowship) in colon and rectal surgery, and ACGME-accredited residency (fellowship) in surgical critical care.

All residency/fellowship programs in the department require residents to develop the six competencies, as defined by the ACGME, in the following areas: patient care; medical knowledge; practice-based learning and improvement; interpersonal and communication skills; professionalism; and systems-based practice. To successfully complete residency/fellowship training, these competencies must be developed to the level expected of a new practitioner.

General Surgery: The department has assembled a faculty interested in resident education, clinical innovations, and advances in basic and clinical research. In this way, the department has assured that its resident trainees are not only exposed to the scientific basis of surgical practice, but interact with faculty who are dedicated to the pursuit of new knowledge and the development of new technologies in surgical care.

The department is committed first and foremost to providing surgical residents with both broad and in-depth exposure to surgical diseases. This is achieved by rotations at three hospitals, each of which provides a somewhat different environment for learning. The department's training program is based on graded resident responsibility with the emphasis in the first two years on preoperative assessment, perioperative care, and performance of basic procedures, followed in later years by progressive responsibility for increasingly complex operative procedures and clinical management. As a result, graduating residents are solidly grounded in all aspects of the essential components of general surgery.

The department also puts significant emphasis on teaching the fundamentals of surgery and on surgical research. This is accomplished through a regular series of structured educational sessions that follow a standard curriculum and occur both departmentally and in each individual hospital on a weekly basis. A visiting professor series is an essential component of the curriculum, which allows exposure of both faculty and residents to national leaders in surgery.

Opportunities for basic and applied research exist within many divisions of the department and through collaborations with other basic science departments. Residents are encouraged to produce and analyze data for both local, regional, and national presentation and publication in peer-reviewed journals. The faculty is dedicated to working closely with each of the residents to achieve these ends. This intellectual and academic exercise is designed to be useful in forming patterns of scholarly activity and analysis that will be useful in the future for all residents whether or not they choose an academic career.

In sum, the department's residency in general surgery has a broad clinical base that enables residents to experience a variety of educational environments with faculty dedicated to resident education and the advancement of surgical science. As such, this residency is a superior program for clinical training.

Otolaryngology-Head and Neck Surgery: The department's residency in otolaryngology-head and neck surgery is devoted to the task of educating and training physicians to function independently as specialists in the field. This residency is based in the Division of Otolaryngology-Head and Neck Surgery. Residents are trained to be competent in all aspects of the specialty. They learn to diagnose medical problems of the head and neck, and acquire surgical skill in this complex area, mastering the fundamental knowledge of this specialty and related specialties. They also gain first-hand experience with basic science. This residency consists of one year of general surgery followed by four years of otolaryngology-head and neck surgery. Upon completion of the residency, trainees are ready to enter into clinical practice, into fellowship training, or into basic medical or clinical research.

Vascular Surgery: The department offers a new five-year vascular surgery residency, which is among the few such programs available nationwide. A traditional two-year residency (fellowship) is also offered. Based in the Division of Vascular Surgery, both training programs are designed to prepare physicians for the pursuit of an academic career in vascular surgery equally as well as for private practice in vascular surgery. Residents are chosen out of medical school for the integrated five-year program, which culminates in eligibility for certification in vascular surgery (not for general surgery). For those physicians who are sure that they want vascular surgery as a career, this program provides focused training and reduces the amount of training time from the standard training period by two years. Residents and fellows are taught open and endovascular interventions, medical management of vascular disease, and use of noninvasive techniques. Clinical research is an important part of both training programs in vascular surgery.

Colon and Rectal Surgery: The department offers a one-year colon and rectal surgery residency (fellowship) based in the Section of Colon and Rectal Surgery. The content of the educational experience is directed toward fulfilling the requirements of the American Board of Colon and Rectal Surgery. Fellows gain operative experience through a large volume of diverse surgical procedures, including reconstructive anorectal surgery, surgery for inflammatory bowel disease, emergency colon resections, ambulatory anorectal surgery, and all aspects of office and endoscopic procedures. Upon completion of the training program, fellows are ready to enter into clinical practice, and are eligible for board certification in colon and rectal surgery.

Surgical Critical Care: The surgical critical care residency (fellowship) is a one-year experience (two fellows per year) centered at Stony Brook University Medical Center, which is the only regional (Level 1) trauma center in Suffolk County. The fellows are provided clinical experience in surgical critical care, including burn care, and do rotations on the hospital's specialized intensive care units. Fellows are actively involved in clinical research with members of the Division of General Surgery, Trauma, Surgical Critical Care, and Burns.

Department of Urology

Chair: Wayne C. Waltzer

Professors: Zelik I. Frischer, Sardar Ali Khan, Wayne C. Waltzer, Robert J. Wasnick

Associate Professors: Frank Darras, Yefim Sheynkin

Assistant Professors: Howard L. Adler, Rahuldev Bhalla, Christopher S. Lee, Jamil U. Rehman, David A. Schulsinger

Nurse Practitioners: Anne Klassert, Yvonne Kwok, Kathy Kelly-Lyons, Jeanne Martin

Physician Assistants: Robert Newman, Matthew Petersen

The Department of Urology at Stony Brook University Hospital provides a wide range of general and tertiary urological care. Subspecialty services include urologic oncology, female urology, laparoscopy, infertility and microsurgery, kidney stone disease and lithotripsy, pediatric urology, reconstructive urology, sexual dysfunction, kidney transplantation and minimally invasive surgery via laparoscopy and robot-assisted surgery using the da Vinci® S HD™ Surgical System.

The majority of the faculty of the Department of Urology are fellowship trained at elite institutions. They offer a wide array of experience in all aspects of urological procedures. The department has a four-year ACGME accredited residency program, and works in conjunction with the School of Medicine in training medical students.

The department participates in the second-year medical student curriculum. In the Introduction to Clinical Medicine course, students are taught the male genitourinary physical examination. Following the study of the exam techniques utilizing audiovisual aids and models, small groups of students spend a session with the instructing physician and professional patients, who assist the student in conducting the physical examinations.

Stony Brook medical students, during their fourth year, are not required to rotate to the urology service, however, they may elect a clerkship. During this rotation, emphasis is placed on the urologic history, physical examinations, and differential diagnosis of urologic problems. The basic pathophysiology of urologic disease is emphasized and the rationale for medical and surgical intervention will be reviewed. This consists of a four-week rotation, which gives a more in-depth exposure to urology. Research-based electives are also available to medical students within the Department of Urology.

All students are taught directly by the attending faculty and urology residents. The residents are responsible for orienting the medical students to the day-to-day activities of the service. This gives the residents a chance to exhibit their professionalism, communications and system-based practice skills. These activities include morning rounds, selection of participation in specific surgical cases performed within the department, and participation in the out-patient clinic. The residents are also directly responsible for assisting the medical students with history and physical examinations and other routine patient care activities. The Chief Resident participates with the attending staff in evaluating all medical students while on their Urology Rotation.

Residency Program: The educational philosophy of the Department of Urology at Stony Brook University Hospital is to provide the urology resident with an in-depth understanding of the practice of urology, including, but not limited to, patient care, communication skills, medical knowledge, practice-based learning and improvement, professionalism, and system-based practices. In addition to the six competencies, the department provides a strong understanding of the basic scientific, medical and surgical principles of urology. The department believes that basic and clinical sciences should be integrated into the residency in order to cultivate a physician/urologic surgeon who is well versed not only in the technical aspects of the specialty, but also in a fundamental understanding of the disease processes which affect the urinary tract and the male genital system. The objectives of the urology resident education at Stony Brook are to:

1. Provide a strong didactic, educational environment focused on the six competencies listed above
2. Provide a supervised surgical education with the appropriate evaluative tools
3. Reinforce the concept of self-motivated education, which will serve the resident well in his/her practice in the community, in research, or in academics
4. Provide a strong understanding of the six competencies and emphasize how they are important to the functioning of the physician in today's complex health care environment

In summary, the overall emphasis of our program is to provide residents with a well rounded educational experience that will prepare them for a productive and satisfying career in urology. Since the career goals of individual residents may differ, it is our goal to provide a broad base of urologic education from which any career in urology can be achieved.

Basic Science Departments in the School of Medicine

Department of Anatomical Sciences

Chair: William L. Jungers

Professors: Peter R. Brink (joint), Brigitte Demes, Diane Doran-Sheehy (joint), John G. Fleagle, Frederick E. Grine (joint), Françoise Jouffroy (adjunct), William L. Jungers, David W. Krause, Susan G. Larson, Lawrence Martin (joint), Russell A. Mittermeier (adjunct), Clinton Rubin (joint), Jack T. Stern, Randall L. Susman, David L. Williamson

Associate Professors: Catherine Forster, Maureen O'Leary

Assistant Professors: Nathan Kley, Scott Sampson (adjunct)

The department conducts graduate studies leading to the PhD. degree, through its own and interdisciplinary programs (e.g., the Interdepartmental Doctoral Program in Anthropological Sciences). It also provides instruction in the anatomical sciences for students in the Schools of Medicine, Health Technology and Management, and Dental Medicine.

Courses

HBA 393, 394 Special Topics from the Anatomical Sciences Literature

Tutorial readings in anatomical sciences with periodic conferences, reports and examinations arranged with the instructor. Open to junior or senior students.

Prerequisite: permission of instructor

Variable credits, 1-2 per term, fall and spring terms, staff

HBA 398, 399 Research Projects in Anatomical Sciences

An independent research project under faculty supervision emphasizes the principles of experimental design, data

collection, evaluation of findings, and reporting of results. Project report required. May be repeated.

Prerequisites: laboratory experience and permission of instructor

2-4 credits per term, fall and spring terms, staff

HBA 460 Regional Human Anatomy for Cytotechnology Students

A lecture and laboratory course that includes the dissection of the head, neck and trunk. The course is organized in two modules: 1) thorax and abdomen, and 2) head and neck, including neuroanatomy. It covers regional and conceptual information on a gross anatomical level.

Enrollment Requirement Group

Prerequisite: permission of instructor for students not enrolled in Stony Brook's Cytotechnology Program

Summer modules, Dr. Demes

HBA 521 Gross Anatomy of Head, Neck and Trunk

Tutorial laboratories. Emphasizes dissections of the human head, neck and trunk.

Prerequisite: permission of instructor

4 credits, fall modules, Dr. Krause

HBA 522 Human Embryology for Dental Students

The development of human structure with emphasis on normal adult anatomy and the more common congenital anomalies, particularly those of the head and neck. Covers the events of early embryonic formation and subsequent organogenesis, excluding that of the urogenital system.

Prerequisite: HBA 521

1 credit, fall term, Dr. Krause

HBA 531 The Body

A lecture and laboratory with emphasis on dissection of the entire human body. Includes functional and topographic anatomy, embryology, clinical correlations and an introduction to radiology.

Prerequisite: permission of instructor

8 credits, fall modules, Dr. Stern

HBA 540 Human Anatomy for Physical Therapists (DPT)

Lecture followed by laboratory dissection of the human body. Regional approach to the gross anatomy of the human body for physical therapy graduate students. The course is presented in three modules. Module one covers the back, thorax, abdomen, pelvis and perineum. Lectures will cover the regional anatomy of the above as well as conceptual information about the peripheral nervous system, the heart and respiratory system. Module two covers the brain, head and neck. Lecture will address the anatomy and organization of the central nervous system, the cranial nerves, introduction to the anatomy of the special senses and mastication. Module three will offer an expanded view of the functional anatomy of the limbs and musculoskeletal system.

Prerequisite: admission to the Doctoral Program in Physical Therapy

6 credits, summer/fall, Dr. Susman

HBA/DPA 541 Human Evolutionary Anatomy

A lecture and laboratory with emphasis on dissection of the entire human body. Includes functional and comparative anatomy with special emphasis on the musculoskeletal morphology of humans and higher primates.

Prerequisite: permission of instructor
8 credits, fall term, Dr. Jungers

HBA 550 Vertebrate Evolution

Survey of the fossil record of vertebrate evolution. The course emphasizes the origin, phylogeny, comparative and functional morphology, biogeography, and paleontology of vertebrate animals. Laboratory included. The lectures and laboratories will utilize an extensive collection of comparative anatomical material, fossil casts, and slides.

Prerequisites: previous course in human or vertebrate anatomy and permission of instructor
4 credits, spring term, alternate years, ABCF grading, Dr. Kley

HBA 560 Advanced Regional Anatomy

Advanced human gross anatomy for graduate students or advanced undergraduates in biology, anthropology and other life sciences.

Prerequisite: permission of instructor
variable credits, summer modules, Dr. Demes

HBA 561 Human Gross Anatomy

A lecture and laboratory course that includes dissection of the entire human body. The course is organized in three modules: (1) thorax and abdomen, (2) head and neck, including neuroanatomy, and (3) limbs. It covers regional and conceptual information on the gross anatomy of all organ systems in the human body.

Prerequisite: permission of instructor for students that are not enrolled in Stony Brook's Occupational Therapy, Physician Assistant or Respiratory Therapy Programs
5 credits, ABCF Grading

HBA 563 Aspects of Animal Mechanics

An introduction to biomechanics. Covers free-body mechanics and kinetics as applied to vertebrate locomotion. Also covers scaling, stress and strain, and muscle physiology as these topics relate to adaptations of the musculoskeletal system.

Prerequisite: introductory physics and biology or permission of instructor
2 credits, spring term, alternate (odd) years, Drs. Stern, Jungers and Demes

HBA/DPA 564 Primate Evolution

The taxonomic relationships of the primates and evolutionary history as documented by the fossil record and structural and chemical evidence. Emphasizes primates prior to the origin of the human lineage. Laboratory included. Open to senior undergraduates.

Prerequisite: permission of instructor
4 credits, spring term, alternate years, Dr. Fleagle

HBA/DPA 565 Human Evolution

Surveys the fossil record of human evolution from the later Tertiary through the Pleistocene with emphasis on the record

of morphological evolution including evolution of the skull, teeth and limbs. Includes the ape-human furcation, radiation of the early hominids, the evolution of Homo Erectus, Neanderthal man, later human ancestors, the evolution of the brain and intelligence, bipedalism and other morphological complexes. Utilization of comparative anatomical material, fossil casts, and slide collection. Cross-listed with ANT 565.

Prerequisite: permission of instructor
4 credits, fall term, alternate years, Dr. Grine

HBA/DPA 566 Studies in Functional Morphology

Introduces the theory and methods of functional morphology. Covers various methods of analysis and the application of experimental techniques such as electromyography or motion analysis as they pertain to the understanding of the interaction between form and function. Emphasizes the analysis of human and non-human primate morphology, and its application to the interpretation of fossil evidence for human and non-human primate evolution.

Prerequisite: permission of instructor
2 credits, spring term, alternate (even) years. Dr. Larson

HBA 580 Comparative Anatomy and Evolution of Mammals

The comparative anatomy, evolutionary history and radiation of fossil and living mammals. A major research project on any aspect of mammalian comparative anatomy is required. Supplemented by lectures on the evolutionary history and radiation of mammals. Comparative osteological and fossil cast collections will be utilized. Lecture series can be taken separately as HBA 581.

Prerequisites: previous course in human or vertebrate anatomy and permission of instructor
4 credits, spring term, alternate years, Dr. Krause

HBA 581 Evolution of Mammals

The evolutionary history and radiation of mammals from the Mesozoic to the present from a paleontological and anatomical perspective. Emphasizes the origin of mammals and the origin, evolution and anatomical diversity of modern and extinct orders of mammals.

Prerequisites: previous course in human or vertebrate anatomy and permission of instructor
2 credits, spring term, alternate years, Dr. Krause

HBA 582 Comparative Anatomy of Primates

Laboratory dissection that emphasizes relating structural diversity to behavior and biometrics.

Prerequisites: HBA 564 and previous course in human or vertebrate anatomy and permission of instructor
4 credits, alternate spring term, Dr. Fleagle

HBA 590 Projects in Anatomical Sciences

Individual laboratory projects closely supervised by faculty members to be carried out in staff research laboratories.

Prerequisite: permission of instructor
1-6 credits per term, fall and spring terms, staff

HBA 690 Graduate Seminar

Seminars by graduate students on current literature in the areas of the anatomical sciences.

Prerequisite: permission of instructor.
1 credit, fall and spring terms, staff

HBA 692 Advanced Topics in Anatomical Sciences Literature

Tutorial readings in anatomical sciences with periodic conferences, reports and examinations arranged with the instructor. Prerequisite: permission of instructor
variable and repetitive credits, 1-2 per term, fall and spring terms, staff

HBA 695 Practicum in Teaching

Practical instruction in the teaching of anatomical sciences carried out under faculty supervision. Prerequisite: permission of instructor
variable and repetitive credits, 1-4 per term, fall and spring terms, staff

HBA 699 Dissertation Research

Original investigation under supervision of thesis advisor and committee. Prerequisite: permission of thesis adviser
variable and repetitive credits, 1-9 per term, fall and spring terms, staff

HBA 800 Full-Time Summer Research

Full-time laboratory research projects supervised by staff members. Prerequisite: permission of instructor and full-time graduate student status
0 credit, summer term, staff

Department of Biochemistry and Cell Biology

Professor and Interim Chair: Robert S. Haltiwanger

Distinguished Professors: William J. Lennarz, Rolf Sternglanz

Professors: Deborah Brown, David Bynum, Vitaly Citovsky, Neta Dean, Dale Deutsch, Peter Gergen, Robert S. Haltiwanger, Nancy Hollingsworth, Masayori Inouye (adjunct), Erwin London, Chang-Jun Liu (adjunct) Kenneth Marcu, Nisson Schechter, Richard Setlow (adjunct), John Shanklin (adjunct), Stanford Simon, Steven Smith, James Staros, F. William Studier (adjunct), Associate professors: Paul Bingham, Bernadette Holdener, A. Wali Karzai, Harvard Lyman, Aaron Neiman, Herman Schindelin (adjunct), Keith Sheppard, Gerald Thomsen

This department offers fundamental courses in biochemistry and cell biology to students in the health professions, as well as to undergraduates and graduates in biochemistry and biology. Its graduate studies are centered on an interdisciplinary program in molecular biology, biochemistry and cell biology, and also a graduate program in structural biology.

Courses

Refer to the Undergraduate Bulletin (Biological Sciences Section) for a complete listing of undergraduate course offerings.

HBC 331 Introductory Biochemistry

An introduction to biochemistry including all aspects of metabolism and the synthesis, structure, and function of DNA, RNA, and protein stresses the medical significance of these aspects of biochemistry.
3 credits, fall modules, Dr. Schechter

HBC 531 Molecules, Genes and Cells

An integrated course covering the important aspects of biochemistry, cell biology, human and molecular genetics, and histology. Includes lectures, small group conferences and laboratories and stresses the clinical relevance of the basic science material.
8 credits, fall term, Course Directors: Dr. El Maghrabi and Dr. Schechter

MCB 500 Directed Readings in Molecular and Cellular Biology

Directed readings in topics of current interest, under supervision of a faculty sponsor culminating in one or more critical review papers. Prerequisites: matriculation in graduate program or permission of instructor.
1-3 credits, yearly, faculty

MCB 503 Molecular Genetics

Covers gene structure and regulation in prokaryotic and eukaryotic organisms, mutational analysis and mapping, transposable elements and biological DNA transfer mechanisms. Bacteriophage as well as lower and higher eukaryotic systems, are used to illustrate aspects of molecular genetic structure and function. (Note: this course jointly listed as HBM 503)
Prerequisites: matriculation in graduate program or permission of instructor
3 credits, fall term, staff

MCB 509, 510 Experimental Molecular & Cellular Biology

An introduction to modern biochemical research techniques. The student spends a half term in the laboratory of each of four different members of the staff selected in consultation with the course director. In each laboratory the student participates in some aspect of the ongoing research pursued by the faculty member.
1-4 credits each term, variable, fall and spring, faculty

MCB 512 Physical Biochemistry

Theoretical principles and experimental methods used in the study of proteins and nucleic acids, e.g., spectroscopy, magnetic resonance and diffraction. Prerequisites: MCB 520, or undergraduate physical chemistry course, plus matriculation in graduate program or permission of instructor.
2 credits, spring term, Dr. London

MCB 517 Membrane Biochemistry

Examines the molecular architecture of membranes; the organization, functions, and assembly of lipids and proteins in biological membranes.

Prerequisite: matriculation in graduate program or permission of instructor

1 credit, fall term, Dr. London

MCB 520 Graduate Biochemistry I

Several topics in modern biochemistry are treated at an advanced level. Topics covered will include protein structure, enzyme kinetics and mechanisms, and enzyme regulation. Prerequisite: HBC 331, or undergraduate biochemistry course, plus matriculation in graduate program or permission of instructor

3 credits, fall term, Dr. London

MCB 531, 532 Graduate Seminar in Molecular & Cellular Biology

Seminars are given by graduate students on current literature in the fields of biochemistry, molecular biology, cell biology or developmental biology.

Prerequisite: matriculation in graduate program or permission of instructor

1 credit, fall and spring, Letter graded (A, A-, B+, etc.)

MCB 580 Teaching Honors

Selected students whose performance in the basic required courses for the graduate program is in the top 10 percent conduct tutorials for first-year graduate students in the program and other students taking graduate courses for credit. The tutors are supervised and graded by program faculty of the graduate program. Successful completion of this course will make the students eligible to receive an "Honors in Teaching" on their transcript.

1 credit, fall and spring terms

MCB 599 Dissertation Research

Original investigation under the supervision of a member of the staff.

Prerequisite: matriculation in graduate program or permission of instructor

1 - 12 credits, fall and spring, S/U grading

MCB 601, 602 Colloquium in Molecular and Cellular Biology

A weekly series of talks and discussions by visiting scientists covering current research and thinking in various aspects of molecular and cellular biology. Required for all MCB graduate students. Attendance is mandatory. Visitors welcome.

Prerequisite: matriculation in graduate program or permission of instructor.

1 credit, fall and spring, S/U grading

MCB 603, 604 Student Seminar in Molecular and Cellular Biology

Seminars given by graduate students on the progress of their own thesis research. Required of all students every term in which they are registered in Graduate Studies in Molecular

Biology and Biochemistry. Attendance is mandatory. Visitors welcome.

1 credit each, fall and spring terms, faculty

MCB 656 Cell Biology

Introduces the structural and functional organization of cells and tissues and the way structure relates to function. Emphasizes cell organelle structure and function in specialized cells in tissues. The organization and interaction of cells in tissues also covered. The course is comparative and includes examples of tissues from vertebrates, invertebrates, and plant prokaryotic systems. Cross-listed with HBA 656.

4 credits, spring term, Dr. Gary Zieve

MCB 657 Principles of Development

Covers developing systems at all levels from the morphological to the molecular. Illustrative material from both animal and plant kingdoms are used. Special attention given to gametogenesis, genetic control of early development, transcriptional and translational control of protein synthesis, the role of cell division and cell movements, and cell-to-cell interactions in defining developing systems. Cross-listed with HBA 657.

Prerequisite: MCB 656

3 credits, fall, Dr. Lyman

MCB 688 Advanced Seminars

Topics to be arranged. Visitors are welcome.

Prerequisite: matriculation in graduate program or permission of instructor

1 credit each, fall and spring terms

MCB 699 Dissertation Research on Campus

Prerequisite: Must be advanced to candidacy (G5). Major portion of research must take place on SBU campus, at Cold Spring Harbor, or at the Brookhaven National Lab.

Prerequisite: matriculation in graduate program or permission of instructor.

1 - 12 credits, fall, spring, and summer, S/U grading, may be repeated for credit

MCB 800 Summer Research

Prerequisite: matriculation in graduate program or permission of instructor

0 credits, S/U grading

BSB 509, 510 Experimental Biochemistry and Structural Biology

An introduction to modern biochemical research techniques. The student spends a half-semester in the laboratory of each of four different members of the faculty. In each laboratory, the student participates in some aspect of the research being pursued by the faculty member.

1 - 6 credits, fall and spring, ABCF grading, may be repeated for credit

BSB 515 Computational Methods in Biochemistry and Structural Biology

Computational methods used in sequence searching and analysis, bioinformatics, graphical analysis of proteins, and nucleic acids.

Prerequisite: this class is restricted to first-year BSB, HBM and HBH Ph.D., students and second-year MCB Ph.D. students. Exceptions require approval from the course instructor
1 credit, fall, S/U grading

BSB 517 Membrane Biochemistry

Examines the molecular architecture of membranes; the organization, function and assembly of lipids and proteins in biological membranes.

Prerequisites: undergraduate biochemistry
1 credit, fall, ABCF grading, may be repeated for credit

BSB 531, 532 Journal Club in Biochemistry and Structural Biology

Provides students with a forum for acquiring skills involved in the critical analysis and presentation of scientific data by active participation in seminars of major topics in structural biology and biochemistry, and critical discussion of selected topics with presentation of papers from the literature. Prerequisites: must be registered in the BSB Program
1 credit, fall and spring, ABCF grading, may be repeated for credit

BSB 580 Advanced Structural Biology

Advanced topics in NMR spectroscopy and structural biology
Prerequisites: Physical Biochemistry (MCB 512)
2 credits, spring, ABCF grading, may be repeated for credit

BSB 581 Teaching Honors

Selected students whose performance in the basic required courses for the graduate program is in the top 10 percent conduct tutorials for first-year graduate students in the program and other students taking graduate courses for credit. The tutors are supervised and graded by faculty of the graduate program. Successful completion of this course makes students eligible to receive "Honors in Teaching" on their transcripts.
1 credit, fall and spring, S/U grading, may be repeated for credit

BSB 599 Research

Original investigation undertaken with the supervision of a faculty member.
1 - 12 credits, fall and spring, S/U grading, may be repeated for credit

BSB 601, 602 Colloquium in Biochemistry and Structural Biology

A weekly series of talks and discussions by visiting scientists covering current research and thinking in various aspects of structural biology and biochemistry.
Prerequisite: must be registered in the BSB Program
1 credit, fall and spring, S/U grading, may be repeated for credit

BSB 603, 604 Student Seminars in Biochemistry and Structural Biology

Seminars given by graduate students on the progress of their own thesis research. Required of all students every semester in which they are registered in the Graduate Program in

Biochemistry and Structural Biology. Attendance is mandatory. Visitors are welcome.

Prerequisite: must be registered in the BSB Program.
1 credit, fall and spring, S/U grading, visitors are welcome

BSB 699 Dissertation Research on Campus

Original investigations undertaken as part of the Ph.D. program under supervision of a research committee. Prerequisite: Advancement to candidacy (G5). Major portion of research must take place on SBU campus, or at the Brookhaven National Laboratory and Cold Spring Harbor Laboratory.
1 - 12 credits, fall, spring, and summer, S/U grading, may be repeated for credit

BSB 800 Summer Research

0 credits, S/U grading, may be repeated for credit

Department of Biomedical Engineering

Chair: Clinton T. Rubin

Graduate Program Director: Helmut Strey

Undergraduate Program Director: Mary Frame

Professors: Peter Brink, Fu-Pen Chiang, Benjamin Chu, Richard Clark, Peter Djuric, Joanna Fowler, Donald P. Harrington, Benjamin Hsiao, Chris Jacobsen, Jolyon Jesty, Arie E. Kaufman, Jerome Liang, Miriam Rafailovich, Nathaniel Reichel, Clinton T. Rubin

Associate Professors: Helene Benveniste, Danny Bluestein, Terry Button, Weiliam Chen, Ki Chon, Avraham Dilmanian, Mary Frame, Gene Gindi, Michael Hadjiargyrou, Stefan Judex, W.R. McCombie, Klaus Mueller, Yingtian Pan, Yi-Xian Qin, Jahangir Rastegar, John Reinitz, Lawrence Reinstein, Steven Skiena, Lincoln Stein

Assistant Professors: Anil Dhundale, Yu-Shin Ding, Emilia Entcheva, James W. Goldfarb, Rita Goldstein, James Hainfeld, Kathryn Kolsky, Jean Logan, Lisa Miller, Michiko Miura, Robert Rizzo, David Schlyer, Robert Shorr, Balaji Sitharaman, Helmut Strey, Lilianne Strey, Peter Thanos, Paul Vaska, Marcelo Vazquez, Mark Wagshul, Yi Wang, Michael Zhang, Wei Zhao, Zhong Zhong, Wei Zhu

The Program in Biomedical Engineering trains individuals with baccalaureate degrees in engineering, applied mathematics, and the sciences to provide them with the synthesis, design, and analysis skills necessary to contribute effectively to the advancement of science and technology in health and medical care.

Graduate degree programs are offered at the Master's (M.S.) and Doctoral (Ph.D.) levels. These programs provide two distinct avenues of graduate study in biomedical engineering: the doctoral level is directed toward the student interested in a research or academic career, and the master's level for those primarily interested in the application of bio-

medical engineering concepts in the development of advanced technology in biomedical products and processes. The department's goal of actively promoting the development of a creative, versatile biomedical engineer is accomplished by exposing the individual to the biology, engineering, and business concepts critical to succeeding in the biomedical research and development environment. The program's goal is to actively promote the development of versatile biomedical engineers. This includes in-depth exposure to the biological and the engineering concepts underlying physiological processes.

To provide the permanent foundation on which to build a career in biomedical engineering, an integrated core set of biomedical engineering courses have been implemented. These provide our biomedical engineering students with the underlying engineering principles required to understand how biological organisms are formed and how they respond to their environment. Students will attain a credible level of sophistication in their understanding of cell, tissue, and organ physiology. The student is then able to complement this background with additional engineering courses either within the Program in Biomedical Engineering (PIBE), or in the other disciplines of engineering.

The graduate program relies on the core set of courses to provide our biomedical engineering students with an overview of the biophysical principles involved in cell, tissue, and organ biology. The progression of the four PIBE core courses requires three resident terms to complete. In addition to these four courses, a seminar series providing exposure to the breadth of bioengineering research and development activities both within the university, as well as throughout the scientific/industrial community, is required of all PIBE students through their first two years of study. Finally, each course has a component of independent study to nurture the student's abilities to pursue a topic specialized interest.

Curriculum Requirements

Master's Degree Curriculum: The Master of Science Degree in BME is achieved by completing the Core Course and Track/Specialization Requirements. The program study can be chosen from any of the following approved tracks/specializations: General, Biomechanics, Biosignals, Medical Physics, or Molecular Bioengineering. The General program of study can be custom tailored in consultation with your faculty advisor/mentor to accommodate almost any BME area of interest. The Core Courses that all new graduate students must take are as follows: BME 501 Molecular Principles in Cell Biology, BME 502 Adv. Num. Comput. Analysis Appl. Biol. Syst., BME 505 Prin. & Practice of BME I, BME 520 Lab. Rotation I, BME 521 Lab. Rotation II. All students (except those pursuing the Medical Physics Track) must also fulfill a business/management course requirement, which can be met by taking: BME 509 Fundamentals of the Bioscience Industry or any MBA class (MBA 501 – 507, 511 or 589) from the School of Business. A given track/specialization will have additional requirements, which includes a minimum of six technical elective courses, 3 of which have to be BME. Students must maintain an overall grade point average (GPA) of 3.0 or better, and must maintain a GPA of 3.0 or better for all core courses.

Thesis or Non-Thesis Options. The student has the option of earning the Master of Science Degree in BME on either a thesis or non-thesis track. The non-thesis option is recommended for students who wish to pursue a career in industry that does not involve Research & Development (R&D). If non-thesis, the student undertakes elective graduate coursework to complete the 31 credits. The thesis option is recommended for students who will be continuing on for their doctoral degree and for students who wish to pursue an industrial career with an R&D focus. If non-thesis, the student can generally complete the requirements in three full-time academic semesters. In the thesis option, in addition to the general requirements, the student must complete at least 6 credits of thesis research (BME 599), and submit and defend a written thesis. Generally, it takes four full-time academic semesters to complete the M.S. degree with the Thesis option.

Doctoral Degree Curriculum: a minimum of fifteen graduate credits, beyond the Masters in BME level, is required for completion of the Doctor of Philosophy degree in BME. There are no course requirements per se, though certain courses may be required to fill any gaps in the student's knowledge. Following completion of a qualifying exam, and independent basic research program will be undertaken. One semester of teaching practicum must be satisfactorily performed. Completion of this research program will culminate in the submission and oral defense of a dissertation. The University requires at least two consecutive semesters of full-time graduate studies. All requirements for the Ph.D. must be completed within seven years after the completion of 24 credits of graduate study.

Undergraduate Biomedical Engineering Program

The Department of Biomedical Engineering offers the major in biomedical engineering, leading to the Bachelor of Engineering (B.E.) degree. In a rigorous, cross-disciplinary training and research environment, the major program provides an engineering education along with a strong background in the biological and physical sciences. It is designed to enhance the development of creativity and collaboration through study of a specialization within the field of biomedical engineering. Teamwork, communication skills, and hands-on laboratory and research experience are emphasized. The curriculum provides students with the underlying engineering principles required to understand how biological organisms are formed and how they respond to their environment.

Graduate Biomedical Engineering Program

The graduate program relies on the core set of courses to provide our biomedical engineering students with an overview of the biophysical principles involved in cell, tissue, and organ biology. The progression of the five BME core courses requires three resident terms to complete. In addition to these four courses, a seminar series providing exposure to the breadth of Biomedical Engineering research and development activities, both within the University as well as throughout the scientific/industrial community, is required of all BME students through their first two years of study. Finally, each course has a component of independent study to nurture the student's abilities to pursue a topic of specialized interest.

Certificates and degrees available through this program include the following:

- Master of Science (M.S.) in Biomedical Engineering
- Doctor of Philosophy (Ph.D.) in Biomedical Engineering

The First Year

For M.S. and Certificate students, the first year of study includes core courses, electives, and attending the PIBE seminars. Students in the M.S. research track are required to identify a research advisor by the end of their first spring semester in the program. For doctoral students, the first year includes preparation for the qualifying examination, taking any classes as directed by their Dissertation Defense Committee, and initiation of independent research. Most Doctoral students will take their qualifying examination within the first year. Some international students may be required to take remedial English courses, depending upon their mastery of the language. Students who are being financially supported by teaching assistantships will assist designated faculty in instructing undergraduate students.

The Second Year and Beyond

In the second year, most students will finish any remaining core and elective courses. M.S. research track students will have begun their research projects under a faculty member's supervision.

Once Ph.D. students have successfully passed their qualifying examination, they have no further requirements except the completion and defense of an original dissertation. To improve scientific communication skills, all students participate in the weekly program laboratory seminars where faculty, Postdoc, and graduate students present the latest research from their laboratories. These intimate, yet informal, meetings allow students to learn by watching and presenting research in a friendly and critical environment.

Graduate Course Offering

BME 501 Molecular Principles in Cell Biology

Course content is directed towards describing the microscopic physical interactions between cells and their environment as electro-mechano-chemical processes occurring at surfaces. This is provided in the context of basic molecular biology and cell physiology concepts. Emphasis is placed on developing an understanding of the critical role of non-linear dynamics, physical chemistry of adsorption and desorption processes, self-assembly in cellular automata, and how complexity arises within simple physical systems;

3 credits, fall semester, Course Director: Michael Hadjiargyrou

BME 502 Advanced Numerical and Computation Analysis Applied to Biological Systems

Course Objectives: Numerical analyses of Biological Data. A unified mathematical/time series framework for modeling and mining biological data. Applications range from cardio-respiratory, renal blood pressure/flow and sequence (DNA, RNA, proteins) to gene expression data. Tools of data analysis include linear algebra, interpolation and extrapolation, parametric and nonparametric spectral estimation with the FFT

and singular value decomposition, statistical description of data and integration of ordinary differential equations. Special focus will be placed on the use of linear and nonlinear numerical methods for the identification of physiological system dynamics and the development of computer simulation techniques to study dynamic response of physiological systems.

3 credits, spring semester, Course Director: Yingtian Pan

BME 503 Cell & Molecular Imaging

This course will cover basics of optics, microscopy, spectroscopy and fluorescence in the context of imaging at the cellular and molecular level. Recently developed advanced imaging techniques for probing protein interactions and live cell functions will also be discussed.

3 credits, fall semester, Course Director: Emilia Entcheva

BME 504 Biomaterials Science and Analysis

Course content is directed toward providing an introductory treatment of the engineering issues implicit in understanding living tissue interactions with processed materials. Emphasis on identifying and eliminating surface contamination, corrosion, and optimizing material surface properties and compatibility.

3 credits, spring semester, Course Director: Weiliam Chen

BME 505 Principles and Practice in Biomedical Engineering

Introduces first year graduate students to the basic and clinical research at the cutting edge of biomedical engineering. The course has two key components: the first is a seminar series presented by internationally renowned bioengineers. An interactive discussion of topic-specific scientific literature precedes the formal presentation. The second component of the course is teaming up with a physician, in rounds, the operating theatre, clinics, etc., to get exposure to the real-life problems that face the medical community. It is hoped that the mix of science and clinic will move students towards determining how they can make contributions to health and society.

2 credits, fall semester, Course Director: C. Rubin

BME 508 Molecular and Cellular Biomechanics

Course content revolves around the effects and interactions of mechanical forces at the cellular and molecular level. The topics will range from describing the molecular and cellular basis of the adaptation of tissues to physical signals, through prescribing specific mechanical environments for improved tissue engineering, delineating relevant molecular, cellular, and biomechanical techniques, all the way to issues involved in the development and approval of diagnostics and therapeutics in molecular engineering. For a deeper understanding of the course material as well as to allow students to apply their newly gained knowledge, this course will contain a module on the design and analysis of experiments (i.e., applied biostatistics) and incorporate practical exercises in both laboratory (e.g., a real time PCR experiment) or simulated computer settings (e.g., modeling of cell behavior).

3 credits, fall semester, Course Director: Stefan Judea

BME 509 Fundamentals of the Bioscience Industry

A 4-module course set up to provide students with a comprehensive introduction to the complexities of the bioscience business environment. Registration in BME 509 is by permission of Graduate Program Director.

3 credits, spring semester, Course Director: Srinivas Pentylala

BME 517 Radiation Physics

This graduate offering provides an initial physical background required for the study of the medical physics. Sources of ionizing radiation including radioactivity (natural and manmade) and x-ray producing devices are studied as well as sources of non-ionizing radiations such as radiofrequency and ultrasound. The physical aspects of these radiations are characterized by their interaction with matter and methods for their detection.

3 credits, Course Director: Terry Button

BME 518 Radiobiology

The biological consequences of irradiation (ionizing, ultrasound, laser, RF etc.) will be examined. Interaction mechanisms will first be examined followed by examination of the of the radiation impact at the molecular and cellular level. The use of radiation for therapeutic gain will be considered. As well, models will be developed for risk estimates. Topics to be covered will include: target theory, biological response, NSD and risk estimates.

3 credits, Course Director: Terry Button

BME 519 Medical Health Physics

This course discusses the health physics and safety issues associated with radiological devices, facilities and procedures.

Course Director: Nand Reland

BME 520 Lab Rotation I

The first of two required semester-long research rotations in BME Faculty laboratories. Students learn and perform new research skills with the aim of completing a research project that would be suitable for presentation at a national BME research conference.

BME 521 Lab Rotation II

The second of two required semester-long research rotations in BME Faculty laboratories. Students learn and perform new research skills with the aim of completing a research project that would be suitable for presentation at a national BME research conference.

1-3 credits

BME 525 Tissue Engineering

Course deals with basics of molecular and cellular biology, biomaterial formulation and engineering principles that are relevant to tissue engineering, leading to the principles and practice of designing an engineered tissue, which will be facilitated by a design project.

3 credits, spring semester, Course Director: Richard Clark

BME 526 Biological Systems Engineering

This course is a hands-on study of systems engineering in biology, using computer modeling to conceptualize and simulate a

wide variety of applications. Computer wizardry not required; all skills taught in class. Appropriate and applicable to all BME tracks.

3 credits, Course Director: Lilianne Mujica-Parodi

BME 530 Medical Image Formation

This course covers the physical aspects of medical image formation. Image receptor design/optimization, reconstruction techniques, device hardware and performance characteristics are considered.

3 credits, Course Director: Wei Zhao

BME 531 Biosensing and Bioimaging

Basic concepts of biosensing and bioimaging, which include the elements of biological systems and bioimmobilizers, traditional electrode and novel optical transducers, and advanced biomedical optical imaging systems.

3 credits, Course Director: Yingtian Pan

BME 532 Time Series Based Modeling of Biological Data

Unified mathematical/time series framework for modeling and mining biological data. Applications range from cardio-respiratory, renal blood pressure/flow and sequence (DNA, RNA, proteins) to gene expression data. Tools of data analysis include neural networks, time-invariant and time-varying spectral methods, fractal and nonlinear dynamics techniques, hidden markov model, clustering analysis, and various system identification techniques.

3 credits, Course Director: Ki Chon

BME 534 Functional Genomics

Course provides foundation in concepts of functional genomics and proteomics. Topics include organization and complexity of the mammalian genome and mechanisms of expression of genes, gene expression analysis technologies with a strong focus on construction and utilization of DNA microarrays, and tools for determining gene function by perturbation of gene expression.

3 credits, Course Director: Michael Hadjiargyrou

BME 540 Radiation Oncology Physics

This course provides a background in therapeutic instrumentation, dosimetry and treatment planning.

3 credits

BME 545 Cellular Physiology and Biophysics

Cellular structure and function. Topics include ion channels excitability, transport, energetics and metabolism, contraction, secretion, and communication within and between cells. Emphasizes quantitative analysis of cellular processes. Course includes a laboratory with demonstrations and discussions of current issues in cellular physiology and biophysics.

4 credits

BME 571 Microfluids in the Biological Systems

This course will outline theory and applications of special fluid handling conditions associated with living systems.

3 credits, Course Director: Mary Frame

BME 572 Biomolecular Analysis

This interdisciplinary course is intended for graduate students and advanced undergraduates in departments such as Biomedical Engineering, Chemistry, Physics, Biology and Chemical Engineering. This course will give an introduction to single molecule experiments using fluorescence, optical traps, AFM cantilevers, microneedles, magnetic microbeads as well as micro and nanofluidic devices.

3 credits

BME 599 Biomedical Engineering Research

Research to be supervised by a faculty member of the Program in Biomedical Engineering. Students must have permission of instructor and enroll in appropriate section. Faculty to be identified by the student.

1-9 credits

BME 601 Cardiovascular Fluid Mechanics

The course will cover the application of fluid mechanics principles to the analysis of blood flow in the cardiovascular system under normal and pathological conditions. It will follow an historical time line by beginning with the most basic models of arterial blood flow, and proceed to the most advanced theories related to physiology and pathology flow phenomena, including an examination of the most up to date research in the area and the development of devices and implants.

3 credits

BME 602 Topics in Biomedical Applications of Neural Networks

This is a project-based course, which includes weekly seminars discussing advanced topics in fuzzy logic and neural networks and their applications, in biomedical devices. Applications include drug delivery, diagnostics, management information handling. Students utilize simulation software to develop algorithms to deal successfully with training data sets of their own choosing.

3 credits

BME 604 Finite Element Modeling in Biology and Medicine

Both finite difference and FEM are applied to solve the equations of incompressible and compressible fluid flow in porous media with emphasis on flows in skeletal tissues, i.e., bone and cartilage. Steady-state, transient flow, permeability and surface boundary conditions are discussed. Practical and recent studies in the field are also discussed. Programming using FORTRAN or C languages will be required. The student is also introduced to commercially available software packages.

3 credits, Course Director: Y.X. Qin

BME 605 Biomechanics of Tactile Sensory Systems

Detailed study of the biomechanics of tactile neurophysiology for engineers entering the field of haptics and robotics manipulations. Anatomy and electrophysiology of transducer cells and neurons starting at the fingertips and extending to the somatosensory cortex. Characteristics of the external stimulus and its peripheral transformation. Relations of these topics to perceptual and/or behavioral responses.

3 credits

BME 606 Drug Gene Delivery

Applications of biodegradable and biocompatible polymers in the design of drug and gene delivery systems for site-specific applications. A broad overview on the origin and development of controlled release therapeutic devices will be provided. Existing and proven commercial products will be examined. The second half of the course will be devoted to the use of DNA as a therapeutic entity and issues relevant to DNA delivery will be explored. An assessment of the most up-to-date DNA delivery technologies will be presented. Students are required to write a term paper on a drug or gene delivery topics of their choice. Students are also expected to give presentations on drug delivery and gene therapy related topics during the course.

3 credits, Course Director: Weiliam Chen

BME 610 Magnetic Resonance

This course provides a comprehensive study of magnetic resonance and its applications in medical imaging. An introduction of NMR is followed with development of the hardware and processing aspects required for MR image formation. An overview of basic and advanced MR imaging techniques is provided. Each student will select a topic in MR imaging for presentation at the conclusion of the course.

3 credits, Course Director: Mark Wagshul

BME 612 Biomedical Engineering Aspects for the Use of Radiation in Medicine

This course provides a comprehensive study of the use of radiation in medicine. Physical aspects of the interaction of radiation with matter and for the radiation production are initially considered. The underlying principles of current radiation based medical imaging are considered next. Topics include radiography, fluoroscopy, radionuclide imaging and computed tomography. The use of radiation for the treatment of malignancy is considered with the focus on required technology. Finally advanced applications of radiation are considered with focus on imaging and treatment. Each student will select a topic examining the engineering or technical application of radiation in medicine for presentation at the conclusion of the course.

3 credits

BME 615 Clinical Nuclear Imaging

This course is designed to prepare the Medical Physics graduate student in the area of clinical Medical Imaging. In this clinical rotation, medical physics methods for: planar film, DR, CR, mammography, fluoroscopy, CT, ultrasound and MRI performance evaluations will be introduced. In addition, basic medical ethics, radiographic anatomy and radiation safety will be covered. A total of 200 clinical hours will be completed in this program.

4 credits

BME 616 Clinical Nuclear Medical Imaging

This course is designed to prepare the Medical Physics graduate student in the area of clinical Nuclear Medicine Imaging. In this clinical rotation, the students will be exposed to radionuclide processes, radiopharmaceuticals including radioactive gases and aerosols-prepartio, characteristics and

radiation dosimetry, in vitro and in vivo radiation detection systems, imaging systems and their performance evaluations. In addition, basic medical ethics, clinical interpretations and radiation safety will be covered. A total of 150 clinical hours will be completed in this program.

4 credits

BME 617 Clinical Radiation Oncology Physics

This course is designed to prepare the Medical Physics graduate student in the area of clinical radiation oncology physics. In this clinical rotation, the student will learn by observation and participation some of a selection of the following medical physics procedures: LINAC Beam Dosimetry (ion chamber measurement techniques, film dosimetry (radiographic and radiochromic), diode dosimetry, TLD dosimetry, water phantom scanning), implementation of photon and electron beam calibration protocols (AAPM TG51), LINAC beam data measurement and tabulation, commissioning a TPS system, LINAC, acceptance testing, LINAC monthly QA, HDR QA and planning, and IMRT inverse planning and IMRT clinical QA. A total of 120 clinical hours will be completed in this program.

4 credits

BME 690 Biomedical Engineering Research

Biomedical Engineering research for doctoral students who have already received their M.S. degree, but have not yet advanced to candidacy.

1-9 credits

BME 698 Practicum in Teaching

Undergraduate teaching to be supervised by a faculty member of the Program in Biomedical Engineering. Course to be identified by the student and graduate studies director.

1-3 credits

BME 699 Biomedical Engineering Dissertation Research on Campus

Research to be supervised by a faculty member of the Program.

Prerequisite: students must be advanced to candidacy (G5); permission of instructor and enroll in appropriate section

1-9 credits

BME 700 Biomedical Engineering Dissertation Research Off Campus

Prerequisite: Must be advanced to candidacy (G5). Major portion of research will take place off-campus, but in the United States and/or U.S. provinces.

BME 800 Biomedical Engineering Research

Full-time summer research.

Department of Molecular Genetics and Microbiology

Chair: Jorge L. Benach

Professors: Jorge L. Benach, James B. Bliska, Carol A. Carter, Nicholas Delihias, Martha Furie, A. Bruce Fletcher, Michael J. Hayman, Patrick Hearing, Eugene R. Katz, James B. Konopka, Kenneth B. Marcu, Nancy C. Reich, Roy Steigbigel, Eckard Wimmer (Distinguished)

Associate Professors: Janet C. Hearing, A. Wali Karzai, Janet K. Leatherwood, Aniko Paul, Eric Spitzer, David Thanassi

Assistant Professors: Nicholas A. Carpino, Edward Chan, Howard Crawford, Christopher Lee, Ando van der Velden, Wei-Xing Zong

Research Assistant Professors: Jeronimo Cello, Sangeet Honey, Laura Katona, Steffen Mueller, Anjaruwee Nimnual, Philomena Ostapchuk, Anne Savitt, Nobuhide Ueki, Gloria Viboud

Adjunct Professors: Carl W. Anderson, Dafna Bar-Sagi, John J. Dunn, Christine Ginocchio, Gregory Hannon, Huilin Li, Bettie M. Steinberg, Bruce W. Stillman, William F. Studier, Kevin J. Tracey

Instructor: George J. Burton

The Department of Molecular Genetics and Microbiology provides a focus for research activities ranging from the analysis of mechanisms responsible for the pathogenicity of microorganisms to the identification of genes involved in human cancer. Key discoveries in molecular genetics have been made in this department and world-renown scientists have flourished in this environment.

The department occupies laboratories and offices in the Life Sciences Building and the Centers for Molecular Medicine, a state of the art research and teaching facility. The research laboratories are fully equipped and, in addition, the department provides access to a variety of central facilities and services: a cell culture and hybridoma facility, microinjection facility, microscopy facilities, glassware washing, microarray facility, an analytical equipment lab, environmental rooms, darkrooms, and other department-shared equipment which are readily available to students and trainees.

As a basic science department of the School of Medicine, the department offers a diversified course of study leading to the Ph.D. degree in Molecular Genetics and Microbiology. The major areas of study are the basic mechanisms of viral and bacterial pathogenesis, cell growth, signal transduction and the molecular mechanisms of cancer. The pre-doctoral training program offers its students the opportunity to study topics in virology, bacteriology, immunology, biochemistry, and cell and developmental biology utilizing the experimental approaches of the molecular biologist and geneticist. Instruction and course planning involve faculty members from the Department of Molecular Genetics and Microbiology, and selected members from the Departments of Biochemistry and

Cell Biology, Medicine, Pathology, and Pharmacology, and from three outside institutions, Cold Spring Harbor Laboratory, Brookhaven National Laboratory, and The Feinstein Institute for Medical Research. The department also offers undergraduate and graduate courses that are required for majors in the health-related professions as well as the basic sciences.

The department has an active seminar program of outside speakers who present topics relevant to molecular microbiology and genetics. In addition, there is a yearly retreat in which ongoing research in the department and recent progress in the field are presented and discussed. The department also presents a colloquium each fall on human diseases, with outstanding researchers from throughout the world presenting their current work on the selected topic.

Our training opportunities lead the way in interdisciplinary research with clinical and basic research cooperation in the fields of cancer research and infectious disease.

Courses

HBM 320 General Microbiology

A study of the molecular structure, functional anatomy, growth, genetics, and pathogenic mechanisms of microbial agents with an emphasis on bacteria and viruses. Non-specific and specific host defenses and the control of microorganisms will also be covered. Satisfies the microbiology requirements for admission to most allied health, nursing, optometry, and veterinary medicine professional schools.

Prerequisites: BIO 202, CHE 132

3 credits, spring term

HBM 321 General Microbiology Laboratory

Complementing the lecture material of HBM 320, this optional laboratory covers basic and applied microbiological methods. Students are introduced to methods for isolating pure cultures, microscopy and staining, quantitation of bacteria, and determination of sensitivity to antimicrobial agents. This laboratory is limited to pre-veterinary and pre-health professional students.

Corequisite: HBM 320

1 credit, spring term

HBM 393, 394 Special Topics from the Microbiology Literature

Directed readings in molecular genetics and microbiology with periodic conferences, reports, and examinations arranged with the instructors in the department, culminating in a final paper reviewing the literature.

Prerequisite: permission of instructor

1-2 credits, fall/spring terms

HBM 398, 399 Research Project in Microbiology

An independent research project under faculty supervision, with emphasis on the principles of experimental design, data collection, evaluation of findings and reporting of results. Project report required.

Prerequisites: laboratory experience and permission of the supervising instructor

2-4 credits, fall/spring term, may be repeated for credit

HBM 503 Molecular Genetics

Introduces the classical work and current developments in lower and higher genetic systems. Covers gene structure and regulation in prokaryotic and eukaryotic organisms, mutational analysis and mapping, transposable elements, and biological DNA transfer mechanisms. Bacteriophage as well as lower and higher eukaryotic systems are used to illustrate aspects of molecular genetic structure and function. This course is offered as both MCB 503 and HBM 503.

Prerequisite: matriculation in graduate program or permission of instructor

3 credits, fall term, ABCF grading

HBM 509, 510 Experimental Microbiology

An introduction to modern microbiological research for graduate students. The selection of laboratories is made in consultation with the student's advisory committee. By taking part in ongoing projects, the student will learn experimental procedures and techniques and become acquainted with research opportunities in the Molecular Genetics and Microbiology Program.

Prerequisites: matriculation in a graduate program and permission of the graduate studies director and the lab director

1-8 credits, fall term, S/U grading

HBM 511 Introduction to Biophysical Chemistry

Introduces the chemical principles and techniques needed for the study of biological macromolecules. Topics to be covered include solution chemistry, chemical thermodynamics, binding and dissociation equilibrium, denaturation phenomena, spectroscopy, and hydrodynamics. This course is intended to prepare non-chemistry majors for more advanced work in biophysics.

3 credits, fall term, ABCF grading

HBM 522 Biology of Cancer

A short course with the emphasis on cancer as a disease of man. Lectures address human cancer as seen by the clinician and as basic research relating to human disease. This course provides students with a link between courses in cell and molecular biology and the application of this basic information to tumor management.

1 credit, spring term, even years, ABCF grading

HBM 531 Medical Microbiology

Provides a foundation for understanding the basic aspects of the growth, regulation, structure and function of viruses, bacteria and eukaryotic pathogens. This microbiological foundation is used to understand the pathogenesis of infection. The properties of the infectious agents are correlated to human disease. Laboratory experiments demonstrate basic techniques to identify and quantitate microorganisms.

Prerequisite: matriculated Stony Brook second-year medical and dental students.

1-4 credits, fall term, H, HP, and P grading

HBM 599 Graduate Research in Microbiology

Original investigations under faculty supervision.

Prerequisite: permission of instructor

1-9 credits, fall/spring terms, ABCF grading, may be repeated for credit

HBM 640 Molecular Mechanisms of Microbial Pathogenesis

This course covers the principles and molecular mechanisms of pathogenesis of a selected group of the best understood viral and bacterial pathogens. A major focus of the course relates to pathogen modification of host extracellular and intracellular signaling events, as well as pathogen-host interactions pertaining to the innate, humoral and cellular responses to infection. The material is presented by invited lecturers who are leaders in their fields. This course is directed to graduate students, post-doctorate and medical fellows, and advanced medical students who are contemplating careers in infectious disease research.

Prerequisite: HBM/BMO 503 and BMO 520
3 credits, fall term, ABCF grading

HBM 690 Microbiology Student Seminar

A weekly meeting devoted to current research in the department. Enrolled students present seminars each week throughout the term.

Prerequisite: permission of instructor
1 credit, fall/spring term, S/U grading, may be repeated for credit

HBM 691 Readings in Microbiology Literature

Readings in microbiology literature that cover areas of molecular biology and genetics.

Prerequisite: permission of instructor
1 credit, fall term, ABCF grading

HBM 692 Experimental Methods in Molecular Genetics and Microbiology

An introduction to methods used in molecular biology. Lectures, presented by invited faculty, focus on specific techniques in molecular biology and are followed by group discussions of one or several papers from the literature that utilized these techniques.

Prerequisite: permission of instructor
1-2 credits, spring term, ABCF grading

HBM 699 Dissertation Research on Campus

For the student who has advanced to candidacy. Original research will be under the supervision of the dissertation adviser and advisory committee.

Prerequisite: advancement to candidacy; permission of the dissertation advisor; major portion of research must take place on the SBU campus, at CSHL, BNL, or The Feinstein Institute for Medical Research

1-9 credits, fall/spring/summer terms, ABCF grading, may be repeated for credit

HBM 800 Full-time Summer Research

Full-time laboratory research projects supervised by staff members.

Prerequisites: permission of instructor and full-time graduate student status
0 credits, summer term, S/U grading

Department of Neurobiology and Behavior

Chair: Lorna Role

Distinguished Professor: Lorne M. Mendell

Leading Professor: Gary G. Matthews

Professors: Paul R. Adams, John B. Cabot, L. Craig Evinger, Simon Halegoua, Joel M. Levine, Gary G. Matthews, David McKinnon, Lorne M. Mendell, Lorna Role, Stephen Yazulla

Associate Professors: William F. Collins III, Maurice Kernan, Mary Kritzer, Howard Sirotkin, Lonnie Wollmuth

This department offers fundamental courses in neurobiology to students in the health professions as well as to undergraduates and graduates in biology. Its graduate studies are centered on the program in neuroscience.

Courses**BIO 203-E Fundamentals of Biology: Cellular and Organ Physiology**

An introduction to the fundamentals of cellular and organ system physiology in mammalian and non-mammalian organisms. The structure and function of cell membranes and the physiology of cell to cell signaling, cellular respiration and homeostasis of organs and organisms are examined with an emphasis on the comparative physiology of vertebrates and invertebrates. Three hours of lecture.

Prerequisite: level 3 or higher on the mathematics placement exam or BME 100

Pre- or Corequisites: CHE 123 or 129 or 131 or 141, MAT 125 or higher or AMS 151

Note: Not for credit after completion of BIO 328
3 credits

BIO 208-H Cell, Brain, Mind

An introduction to the human brain and how it is the target of diseases, drugs and psychological disturbances. The course explores these topics through a knowledge of basic cell neurobiology. The implications of brain science for human behavior in society are also considered. Not for major credit.

Prerequisite: BIO 101 or 150

Advisory Prerequisite: High school chemistry
3 credits

BIO 317 Principles of Cellular Signaling

Basic principles of cellular signaling and maintenance of cellular and organismic homeostasis through intra and intercellular signaling mechanisms. Emphasis is on relationships between nuclear events and ongoing processes of the cell. The roles of membrane receptors and second-messenger pathways in mediating such diverse events as bacterial chemotaxis, protozoan locomotion, and secretion are discussed.

Prerequisites: C or higher in BIO 202 and 203
3 credits

BIO 328 Mammalian Physiology

The course covers basic principles of mammalian physiology. The subject matter includes cellular physiology, introduction to peripheral and CNS sensory and motor function, immune system, endocrine system, skeletal and smooth muscle physiology, cardiovascular function, respiration, renal physiology and reproduction. May not be taken for credit in addition to HBY 350.

Prerequisite: BIO 203

Advisory Prerequisite: CHE 132 or 142

3 credits

BIO 334 Principles of Neurobiology

The ionic basis of nerve potentials, the physiology of synapses, sense organs and effectors, and the integrative action of the nervous system are discussed.

Prerequisites: BIO 203, CHE 131 or 141

3 credits

BIO 335 Animal Physiology Laboratory

Laboratory exercises designed to illustrate principles learned in BIO 328. Topics include compound action potentials; synaptic transmission; isometric and isotonic skeletal muscle contraction; neural, hormonal, and ionic control of cardiac function; and human respiration. One hour of lecture, one hour of recitation and one three-hour laboratory per week.

Prerequisites: CHE 132 or 133

Pre- or Corequisite: BIO 328

3 credits

BIO 338 Self-organization of the Brain

Exploration of basic neural and synaptic mechanism and the operation of representative brain circuits, using both theoretical approaches and experimental evidence. Particular attention is given to Hebb's Rule, its cellular basis, its consequences for circuit self-organization, and its limits. A solid background in a mathematical, physical, or biological science is desirable, but most relevant background material is covered in the course.

Prerequisite: BIO 203 or CHE 132 or PHY 122

Advisory Prerequisite: BIO 334

3 credits

BIO 339 Molecular Development of the Nervous System

An introduction to the molecular events that underlie development and plasticity of both the peripheral and central nervous systems, with a focus on neuronal mechanisms. Molecular and genetic approaches to the analysis of neural induction, neuronal differentiation, neuronal death and survival, neurotrophic factors, synapse formation and plasticity are presented.

Prerequisite: BIO 202

Advisory Prerequisite: BIO 203 or 325

3 credits

BIO 446 Readings in Neurobiology and Physiology

Tutorial readings in the biological sciences. This course may be repeated, but not more than two credits may be used

toward biology major requirements. Limit of one topic per semester.

Prerequisite: written permission of instructor and undergraduate studies committee

1-2 credits per course, S/U grading

BIO 486 Research in Neurobiology and Physiology

In this course, the student works under the supervision of a faculty member in developing an individual project that makes use of the knowledge and techniques acquired in previous courses. The student prepares an appropriate report on the project. Any of the courses may be taken for more than two semesters but no more than four credits of research may be used for biology major requirements. Limit of one topic per semester.

Prerequisite: Written permission of instructor and undergraduate studies committee. Request for approval of the undergraduate studies committee must be submitted no later than two days prior to the last day of the add period as scheduled in the academic calendar.

0-6 credits, S/U grading

BNB 551 Writing Neuroscience

Seminar course for doctoral students providing practical instruction in written communication in neuroscience. Topics include writing effective abstracts, cover letters, figure captions, and grant specific aims, among others.

1-2 credits, fall term, faculty

BNB 555 Laboratory Rotations in Neuroscience

Course for doctoral students in Neuroscience in which students participate in three formal laboratory rotations in program faculty laboratories during the first year. Students make oral presentations for each rotation. Instruction is provided in how to organize and present material in a seminar format, including the proper use of visual aids. Enrollment restricted to students in the graduate Program in Neuroscience.

Prerequisite: faculty approval

1-3 credits, fall/spring term, faculty

BNB 561 Introduction to Neuroscience I

First of a two-semester neuroscience core course introducing students to basic principles of neuroscience. The major focus is cellular and molecular neuroscience. Topics covered include the ionic basis of resting potentials and electrical excitability, the structure, function and molecular biology of voltage- and ligand-gated ion channels, exocytosis, cellular networks, and gene regulation.

Prerequisites: BIO 334 or equivalent and permission of instructor

4 credits, fall term, faculty

BNB 562 Introduction to Neuroscience II

Second of a two-semester core course introducing students to basic principles of neuroscience. The major focus is systems neuroscience. Topics covered include analyses of all of the major sensory systems, motor systems, and systems mediating higher order, cognitive functions in the nervous system.

4 credits, spring term, faculty

BNB 563 Advanced Topics in Neuroscience I

This course includes one to three separate modules taught by different faculty on focused topics in neuroscience, typically focusing on synaptic plasticity and development.

3 credits fall term, faculty

BNB 564 Advanced Topics in Neuroscience II

This course includes one to three separate modules taught by different faculty on focused topics in neuroscience.

1-3 credits spring term, faculty

BNB 599 Research

Original investigation undertaken with supervision of a member of the Program in Neuroscience.

variable credit, fall and spring terms, faculty

BNB 655 Neuropharmacology

An advanced course for graduate students interested in developing an understanding of neuropharmacology. Following a general introduction to the nerve cell structure, synaptic and chemical transmission, three themes receptors, receptors as channels, and G-protein-coupled receptors are developed. Recent advances in cell and molecular biology provide the framework for instruction and discussion. Cross-listed with HBH 655.

BNB 697 Advanced Neuroscience Seminar

Students attend weekly seminar presentations given by visiting speakers. Seminars include sub-series of three to four lectures that focus on a particular topic in contemporary neuroscience.

1 credit, fall and spring terms, faculty

BNB 699 Dissertation Research

Original investigations undertaken as part of the Ph.D. program under the supervision of the dissertation committee.

credits to be arranged, fall and spring terms

Department of Pharmacological Sciences

Interim Chair: Michael A. Frohman

Distinguished Professors: Seymour Cohen (Emeritus), Arthur P. Grollman, William Van der Kloot (Emeritus), Edward Reich (Emeritus)

Professors: Daniel Bogenhagen, Moises Eisenberg, Paul Fisher, Michael Frohman, Francis Johnson, Craig C. Malbon, Jeffrey Pessin, Joav Prives, Basil Rigas, Shinya Shibutani, Roy Steigbigel, Joel Sussman, Masaru Takeshita (Emeritus), Stephen Vitkun

Associate Professors: Miguel Berrios, Carlos de los Santos, Laura Fochtmann, Charles Iden, Caroline Kisker, Irwin Kurland, Masaaki Moriya, Sidonie A. Morrison, Orlando Scharer, David Talmage, Styliani-Anna Tsirka

Assistant Professors: Roger Cameron, Emily Chen, Holly Colognato, Howard Crawford, Guangwei Du, Dax Fu, Miguel

Garcia-Diaz, Kathleen G. Dickman, Feng-Qian Li, Mirjana Maletic-Savatic, Thomas Rosenquist, Howard Sussman, Ken-ichi Takemaru, Panayotis K. Thanos, FAYANNE THORNGATE, Robert Watson

Adjunct Professors: Rodney Bednar, Colin Dingwall, Phil Marcus, Barbara Messina, Richard Miksicek, Fernando Salles, Sidney Strickland

Instructors: Kimberly Conlon, Daryl Henderson, Ping Huang, June Hou

Pharmacology is an interdisciplinary science that explores the effects of exogenous chemicals and endogenous signals on biological systems. Faculty research interests emphasize the molecular mechanisms of the action of drugs, hormones, and toxins. Areas of research include chemical biology and toxicology, neuropharmacology, and a variety of types of signal transduction. Teaching is directed towards an understanding of the basic principles underlying the therapeutic and toxic actions of drugs and chemicals.

The department provides instruction for professional students in the schools of the Health Sciences Center and offers graduate and upper-division courses in pharmacology, toxicology, and therapeutics. A Ph.D. granting graduate program is offered through the Graduate School and the School of Medicine. An undergraduate pharmacology program is provided through the College of Arts and Sciences.

Courses

HBH 330 Fundamentals of Pharmacology I

Covers the basic principles that underlie the action of drugs on physiological processes. These principles are applied to the specific action of drugs on the autonomic nervous system. In addition, the pharmacology of cardiovascular drugs is covered in detail.

2 credits, module 3, Dr. Berrios

HBH 331 Fundamentals of Pharmacology II

A continuation of HBH 330. Covers the action of drugs on individual systems as well as drug-drug interactions emphasizing the mechanisms of drug action. Surveys therapeutic applications and adverse drug reactions.

Prerequisite: HBH 330

3 credits, modules 4-6, Dr. Berrios

HBH 332 Pharmacology in Cardiorespiratory Sciences

Includes the basic principles of drug actions and covers drug applications in the autonomic, cardiovascular and respiratory systems. For cardiorespiratory sciences students enrolled in the School of Health Technology and Management.

3 credits, modules 3, 4, not offered all semesters, Dr. Prives

HBH 393, 394 Topics in Pharmacology*

Tutorial readings in pharmacology with the periodic conferences, reports and examinations arranged with the instructor. Open to third and fourth year students.

Prerequisite: permission of the instructor

1-5 credits per term, fall and spring terms, staff

*Joint Appointment, Cold Spring Harbor Laboratory

HBH 396, 398, 399 Research Project in Pharmacology**

Independent research under faculty supervision, emphasizing principles of experimental design, data collection, evaluation of findings and reporting of results. Project report required. May be repeated.

Prerequisites: laboratory experience and permission of supervising instructor

1-6 credits per term, summer, fall and spring terms, staff

HBH 501 Principles of Pharmacology

Basic principles and mechanism of drug distribution, absorption, metabolism and elimination. Principles of chemical carcinogenesis and tumor promotion. Autonomic, Smooth Muscle and CNS Pharmacology. Pharmacology of specific drugs of historical interest including alcohol, antibiotics, aspirin, nicotine and morphine. Review of anticoagulants and thrombolytic agents, antiparasitic, and drugs for the treatment of allergic conditions and gout. Includes discussion of specific cases taken from clinical practice and a presentation based on a set of selected readings. Cross-listed with BCP 401 Principles of Pharmacology.

Prerequisites: permission of instructor

4 credits, fall

HBH 502 Advanced Principles of Pharmacology

Advanced concepts of drug metabolism, pharmacokinetics, biochemical and molecular mechanisms of drug action and drug resistance in human disease states. Toxicological agents and environmental pollutants. The pharmacology of auto-coids, anti-inflammatories, immunosuppressants and anti-asthmatics. Rational drug design and drug receptor interactions using computer molecular modeling techniques. Includes discussion of specific cases taken from clinical practice and a presentation based on a set of selected readings. Cross-listed with BCP 402 Advanced Principles of Pharmacology.

Prerequisite: HBH 501

Spring, 4 credits

HBH 510 Pharmacology: Principles & Practice

Introduces the basic principles of pharmacology and covers drugs with action in the autonomic and central nervous systems. Includes the discussion of specific cases taken from the clinical practice.

Prerequisite: open only to students enrolled in the Physician Assistant Graduate Program

2 credits, module, Dr. Berrios

HBH 511 Pharmacology: Principles & Practice

Continuation of HBH 510. Covers the action of drugs acting in the cardiovascular, respiratory, gastrointestinal, renal, and endocrine systems, as well as anticoagulant, anti-inflammatory, anti-microbial and anticancer agents. Includes the discussion of specific cases taken from the clinical practice.

Prerequisite: HBH 510, open only to students enrolled in the Physician Assistant Graduate Program

4 credits, module, Dr. Berrios

HBH 531 Principles of Medical Pharmacology

Basic principles that underlie actions of drugs on physiological processes with particular reference to their therapeutic and toxic actions. For medical and dental students.

Prerequisites: physiology, biochemistry, and permission of instructor and admission to Graduate Health Sciences Center Program

5 credits, modules 4-6, Dr. Fisher and staff

HBH 545 Biochemical Laboratory Techniques

Introduces theoretical principles and experimental techniques used in modern biological research. Lectures and homework assignments explore topics in basic molecular and cellular techniques.

Prerequisites: permission of instructor, admission to graduate Health Sciences Center program

1 credit, fall, ABCF grading, Dr Crawford and staff

HBH 546 Biochemical Laboratory Techniques

Continuation of HBH 545. Lectures and demonstrations present topics in chromatography, mass spectrometry, protein sequencing, sedimentation, electrophoresis, ligand binding, basic pharmacological methods and statistical analysis of data. Includes procedures for the safe handling of toxic chemicals and radioisotopes.

Prerequisites: permission of instructor, admission to graduate Health Sciences Center program

1 credit, spring, ABCF grading, Dr Crawford and staff

HBH 553 Signal Transduction

The course will emphasize fundamental concepts in signal transduction (e.g. membrane-protein and protein-protein interactions, amplification signals) and individual lectures will apply these concepts at each stage of cell signaling from the cell surface to the nucleus, where signal transduction leads to specific gene expression. Cross listed with HBY 533.

Prerequisite: admission to Graduate Health Sciences Center Program

2 credits, spring/odd years, staff, ABCF grading

HBH 560 Proposal Preparation in Regulatory Biology

A literature-based course focusing on major research areas in molecular, cellular and biochemical pharmacology. The first part of the course will expose students to styles of research grant writing. The second part of the course will focus on student research grant writing and presentations of these research proposals.

Due to the coordination of this course with the Qualifying Exam, registration is limited to Pharmacology graduate students.

3, 4, 5; 2 credits, fall and spring, Term O mods, ABCF grading, Drs. Fisher and Frohman and staff

HBH 580 Selected Topics in Pharmacology

Student seminars and readings on topics arranged through consultation with staff.

Prerequisite: full-time pharmacology graduate status

variable and repetitive credits, 0-1 per term, fall and spring terms, Drs. Colognato and Du

** Arts & Sciences students may receive no more than a total of six credits in one semester of any combination of courses numbered HBH 393 -399.

HBH 590 Pharmacology Seminars

Advanced research seminars by staff and visiting lecturers.
Prerequisite: Full-time pharmacology graduate status
0-1 credits, repetitive, fall and spring terms

HBH 599 Graduate Research in Pharmacological Sciences

Original research projects under faculty supervision.
Prerequisite: permission of instructor
Variable credits, 0-12 per term, fall, spring and summer terms, staff

HBH 601 Practicum in Teaching Pharmacology

Practical experience and instruction in the teaching of pharmacology carried out under faculty orientation and supervision.
Prerequisite: permission of instructor and full-time pharmacology graduate status
0-1 credits, fall and spring term

HBH 631 Principles of Drug Action

This course is designed to provide a quantitative understanding of the basic principles by which drugs interact with living systems at the cellular and organismal levels. Topics include the mechanisms of drug transport through membranes, interaction of drugs with receptors and binding proteins, drug distribution, biotransformation of drugs, enzymes of stage I and stage II metabolism, cytochrome p450 gene families and regulation of p450 gene expression, mechanisms of renal excretion of drugs and metabolites, pharmacokinetics of constant drug infusions and intermittent dosing regimens, and applications of pharmacokinetic principles to protein and mRNA induction and turnover. Students apply pharmacological principles in a series of problem solving exercises.
Prerequisites: full-time matriculated graduate status and permission of instructor, Dr. Takemaru
1 credit, fall or spring semester, ABCF grading

HBH 632 Molecular Interactions of Drug Structures

The course provides an overview of the most current approaches to analyze and understand the interactions between a drug and its target and how this information is used for the design and development of new drugs. The detailed structural analysis of drug target interactions by X-ray crystallography and NMR spectroscopy as a basis for the design of new drugs will be discussed on the basis of very recent examples. Advanced computer simulation techniques will be discussed and will include the use of molecular mechanics energy functions to optimize biomolecular structures, predict ligand binding modes and energetics.
Prerequisites: full-time matriculated graduate status and permission of instructor, Dr. de los Santos
1 credit, fall or spring semester, ABCF grading

HBH 633 Physiological Action of Drugs

Selected applications of drugs used in clinical medicine, illustrating current concepts and problems at the intersection of pharmacological basic science and therapeutic treatment. Settings to include the management of obesity, osteoporosis, diabetes, and cardiac disease.

Prerequisite: full-time matriculated graduate status and permission of instructor, Dr. Frohman
1 credit, fall or spring semester, ABCF grading

HBH 634 Organ Physiology and Pharmacology

The goals of the class are to provide a general introduction to the normal physiology of the cardiovascular/blood, respiratory, gastrointestinal and muscle systems at the cellular, tissue, and organ level. Additionally students learn how normal function may be changed by disease and pharmacology.
Prerequisites: full-time matriculated graduate status and permission of instructor, Dr. Prives
1 credit, fall or spring semester, ABCF grading

HBH 635 New Concepts in Chemotherapy

This course compares mechanisms of action of drugs used for antibacterial and anti-cancer chemotherapy. The lecture material stresses how selective toxicity is achieved in each case with either cell death or inhibition of cell growth as the ultimate mechanism. Original research papers are discussed on mechanisms whereby cells develop resistance to chemotherapy and novel strategies to overcome this resistance.
Prerequisite: full-time matriculated graduate status and permission of instructor, Dr. Bogenhagen
1 credit, fall or spring semester, ABCF grading

HBH 636 Drug Discovery and Drug Interactions

An advanced series of lectures and student presentations will develop a basic understanding of modern methods of drug discovery and drug receptor interactions. Topics include the structural and physiological factors essential for drug action, quantitative structure activity relationships, and unintended toxicities produced by drug substances.
Prerequisite: Full-time matriculated graduate status and permission of instructor, Dr. Iden
1 credit, fall or spring semester, ABCF grading

HBH 655 Neuropharmacology

An advanced course for graduate students interested in developing an understanding of neuropharmacology and research on this topic. Following a general introduction to the nerve cell structure, synaptic and chemical transmission, three themes receptors, receptors as channels, and G-protein-coupled receptors are developed. Recent advances in cell and molecular biology provide the framework for instruction and discussion.
Prerequisites: full-time matriculated graduate status and permission of instructor, Drs. S. Tsirka and M. Evinger
3 credit, spring semester, even years, ABCF grading

HBH 686 Mini-course: Advanced Seminars in Pharmacological Sciences

A series of five to six lectures by members of the Stony Brook faculty in conjunction with distinguished outside speakers on topics of current importance in pharmacology and related areas of biochemistry, molecular biology, and cell biology.
Prerequisite: admission to Graduate Health Sciences Center Program.
1-2 credits, fall and spring, S/U grading

HBH 699 Dissertation Research on Campus

Original investigation undertaken as part of the Ph.D. program under supervision of thesis adviser and committee on site, where major portion of their research will take place on Stony Brook University Campus, Cold Spring Harbor or Brookhaven National Laboratory

Prerequisite: permission of thesis adviser
variable and repetitive credits, 1-9, fall, spring and summer

HBH 700 Dissertation Research in Pharmacology off Campus-Domestic

Original investigation undertaken as part of the Ph.D., program under supervision of thesis adviser and committee off site, and is to be registered for when a major portion of the student's research will take place off-campus but in the United States and or United States provinces.

Prerequisite: permission of thesis adviser
variable and repetitive credits, 1-9, fall, spring and summer

HBH 701 Dissertation Research Off Campus-International

Original investigation undertaken as part of the Ph.D., program under supervision of thesis adviser and committee off site, and is to be registered for when a major portion or research will take place outside of the United States and or United States provinces.

Prerequisite: permission of thesis adviser
variable and repetitive credits, 1-9, fall, spring and summer

HBH 800 Full-Time Summer Research

Full-time laboratory research projects supervised by staff members.

Prerequisites: permission of instructor and full-time pharmacology graduate student status
0 credit, summer term, staff

HM 800 Clinical Pharmacology

This course is designed to provide fourth-year medical students with practical information about therapeutics. Using a case-oriented approach, students are taught to develop a systematic approach to specific, more common, therapeutic interventions. Basic principles of clinical pharmacology are emphasized with the goal of having students understand drug interactions, dosing schedules, alterations needed in treating the elderly and patients with renal or hepatic dysfunction. Restricted to fourth-year students only.

Prerequisite: permission of instructor
Drs. Grollman and Steigbigel

For the undergraduate pharmacology program offerings in the College of Arts and Sciences, please refer to the Undergraduate Bulletin.

BCP 394 Environmental Toxicology and Public Health

Principles of toxicology will be presented and problems associated with major classes of toxic chemicals to human and environmental health examined. Case studies dealing with current waste management issues will also be discussed. Students will be required to integrate basic information on the chemistry and biology of toxic compounds and apply this

knowledge in a multidisciplinary context.

Prerequisites: BIO 201 (or the discontinued BIO 151), CHEM 131 (or equivalent) or permission

This course fulfills an upper division DEC requirement in Category H.

BCP 400 Writing in Pharmacology

See requirements for the major in pharmacology, upper-division writing requirement.

Prerequisites: pharmacology major; upper-division standing
0 credits, fall and spring, S/U grading

BCP 401 Principles of Pharmacology

Basic principles and mechanisms of drug distribution, absorption, metabolism, and elimination. Principles of chemical carcinogenesis and tumor promotion. Autonomic, smooth-muscle, and CNS pharmacology. Pharmacology of specific drugs of historical interest including alcohol, antibiotics, aspirin, nicotine, and morphine. Review of anticoagulants and thrombolytic agents, antiparasitics, and drugs for the treatment of allergic conditions and gout.

Prerequisites: BIO 362, CHE 322 and 327, a GPA of 3.0 or higher in these courses and their prerequisites

Corequisite: BCP 403
3 credits, fall

BCP 402 Advanced Pharmacology

Advanced concepts of drug metabolism, pharmacokinetics, biochemical and molecular mechanisms of drug action, and drug resistance in human disease states. Toxicological agents and environmental pollutants. The pharmacology of autocooids, anti-inflammatories, immunosuppressants, and antiasthmatics. Rational drug design and drug receptor interactions using computer molecular modeling techniques.

Prerequisites: BCP 401 and 403

Corequisite: BCP 404

3 credits, spring

BCP 403 Principles of Pharmacology Laboratory

The use of computer software for data collection and analysis. Illustrations of the principles of drug absorption, distribution, metabolism, and elimination. In vitro assays that demonstrate dose response relationships. Principles of bioassays. Determination of drug potency using isolated tissue preparations. Determination of the affinity of an antagonist for an agonist at a receptor site. Evaluation of potencies of anesthetics, analgesics, and anticonvulsant agents.

Corequisite: BCP 401

2 credits, fall

BCP 404 Advanced Pharmacology Laboratory

The use of molecular modeling software for the understanding of structure activity relationships. In vivo studies to demonstrate the pharmacological mechanism of action of drugs acting on the autonomic, cardiovascular, and renal systems. Pharmacokinetic studies, using HPLC, to determine the rate of absorption, distribution, and excretion of therapeutic agents. Radio- and enzyme-immunoassays for the detection of

circulating hormones. Cell culture techniques for drug determination and evaluation.

Prerequisites: BCP 401 and 403

Corequisite: BCP 402

2 credits, spring

BCP 406 Pharmacology Colloquium

Research Seminars in Pharmacology and toxicology presented by faculty and distinguished scientists from academic and industrial institutions. A one-hour Journal Club/Discussion Session precedes seminar to review a reference paper relevant to the research concepts to be presented. Students are expected to develop an understanding of the scientific principles given in the colloquium. Speakers meet with the students after the seminar to discuss research concepts and to answer questions. May be repeated.

Prerequisites: BIO 202 and 203, CHE 322, GPA of 3.0 required in these courses and their prerequisites

2 credits, spring

BCP 475 Undergraduate Teaching Practicum in Pharmacology

Prerequisites: Pharmacology Major; U-4 standing; permission of department

3 credits, S/U grading

BCP 487 Research in Pharmacology

Completion of an individual student research project under the supervision of a faculty member. Previously acquired laboratory course techniques and new procedures are utilized. Experimental results must be submitted to the department for grade evaluation in the format of a research report. Not for credit in addition to HBH 396, 398, and 399. May be repeated.

Prerequisites: BIO 202 and 203 (or the discontinued BIO 152); CHE 322 and 327; a G.P.A. of 3.0 in these courses and their prerequisites; permission of instructor and department

0 to 3 credits, fall and spring

BCP 488 Internship

Research participation in off-campus laboratories, the pharmaceutical industry, and other academic and public agencies. Students are required to submit to the department a proposal at the time of registration and a report at the end of the semester. Satisfactory/Unsatisfactory grading only.

Prerequisites: BIO 361, CHE 322, GPA of 3.0 or higher in these courses and their prerequisites; permission of department and Office of Undergraduate Studies

3 to 6 credits, summer

Department of Physiology and Biophysics

Chair: Peter R. Brink

Vice Chair: W. Todd Miller

Professors: Peter R. Brink, John B. Cabot, Carol Carter, Ira S. Cohen, James P. Dilger, Norman H. Edelman, Emelia

Entcheva, Roger A. Johnson, Sardar Ali Kahn, Irvin B. Krukenkamp, Irwin J. Kurland, Richard T. Mathias, Stuart G.A. McLaughlin, Lorne Mendell, W. Todd Miller, Leon C. Moore, Michael R. Rosen, Sami Said, Suzanne Scarlata, Gerald Smaldone, Steven O. Smith, George Stephano, John C. Sutherland, William Van der Kloot (Emeritus)

Associate Professors: Ki H. Chon, Chris Clausen, Raafat El-Maghrabi, James B. Konopka, Richard Z. Lin, David McKinnon, Mario Rebecchi, Irene C. Solomon, Ilan Spector, Hsien-Yu Wang, Thomas White

Assistant Professors: Mark Bowen, Roger Cameron, Howard Crawford, Sergey Doronin, Mary Frame, Junyuan Gao, Sindhu Kaumari, Zhongju Lu, Scott Lowe, Nicholas Nassar, Srinivas Pentylala, Irina Potopova, Barbara Rosati, Virginijus Valiunas, Kulandiaappan Varadaraj

The Department of Physiology and Biophysics offers a program of study leading to a Doctor of Philosophy or Master of Science degree. The Department of Physiology and Biophysics has responsibility for teaching in the schools of the Health Sciences Center and for graduate studies. Molecular, cellular, organ physiology and biophysics are the principle areas of teaching and research specialization. The department's focus of interest is in the following general areas:

- 1) Hormonal regulation of cell function and metabolism, with special emphasis on intercellular and intracellular signaling mechanisms
- 2) Biophysical studies of membranes and proteins
- 3) Cellular physiology and electrophysiology
- 4) Preconditioning and arrhythmia prevention. Studies are conducted at the molecular, sub-cellular, cellular, organ and intact animal levels
- 5) Biosystems

Courses

HBY 350 Physiology

The normal functioning of human tissues and organs and their regulation and integration by the nervous and endocrine systems. Emphasizes physiological control systems and the preservation of the constancy of the internal environment.

Prerequisites: college courses in biology and chemistry and some background in physical sciences or permission of the instructor; Primarily intended for students in the SHTM Program and Pharmacology majors.

4 credits, fall term, Dr. Clausen and staff

HBY 393, 394 Special Topics from Physiology and Biophysics Literature

Tutorial readings in physiology and biophysics with periodic conferences, reports and examinations arranged with the instructor. Open to junior and senior students.

Prerequisite: permission of instructor

1-2 credits per term, fall and spring terms, staff

HBY 398, 399 Research Project in Physiology and Biophysics

An independent research project under faculty supervision that emphasizes the principles of experimental design, data

collection, evaluation of findings, and reporting of results. Project report required. May be repeated.

Prerequisites: laboratory experience and permission of the supervising instructor

0-4 credits per term, fall and spring terms, staff

HBY 501 Physiology

Introduces normal function of human tissues and organs and their regulation by nervous and endocrine systems. Emphasizes the organization and function of physiological control systems and the maintenance of a constant internal environment. Enrollment restricted to fully matriculated graduate students, with permission of instructor.

4 credits, fall term, Dr. Clausen and staff

HBY 530 Cellular Physiology and Biophysics

Cellular structure and function. Topics include ion channels, excitability, transport, energetics and metabolism, contraction, secretion, and communication within and between cells. Emphasizes quantitative analysis of cellular processes.

Prerequisite: undergraduate physics, physical chemistry, biology, calculus, or permission of instructor

1-3 credits, variable, fall term, Drs. Mathias, Miller and staff

HBY 531 Medical Physiology

A graduate-level introduction to the physiology of the organ systems with ultrastructural correlations. Ultrastructural correlations are demonstrated in a laboratory setting using histological preparations in conjunction with electron micrographs illustrating the relevant ultrastructure needed to understand the normal functioning of tissues and organs. The physiology of the major organ systems is addressed in a lecture format with the emphasis on problem solving. Relevant clinical correlations are addressed at the end of each block in so far as they illustrate how symptoms and signs of disease result from disordered physiology. Organ Systems addresses the structure and function of the cardiovascular, respiratory, renal, gastrointestinal, endocrine, skeletal, reproductive, and integumentary systems.

Prerequisites: permission of instructor

8 credits, spring term, Dr. Cameron and staff

HBY 553 Signal Transduction

The course will emphasize fundamental concepts in signal transduction (e.g., membrane-protein and protein-protein interactions, amplification of signals), and individual lectures will apply these concepts at each stage of cell signaling from the cell surface to the nucleus, where signal transduction leads to specific gene expression.

3 credits, spring term, odd year, staff

HBY 554 Principles of Neuroscience

The aim of this course is to highlight and create an understanding as to how the human nervous system operates.

Prerequisite: Undergraduate biochemistry, biology and chemistry; Permission of instructor.

2 credits, ABCF grading

HBY 557 Advanced Physiology

This course is designed to introduce students to integrative approaches in biomedical research. Emphasis will be placed on the primary physiological concepts of control, communication, signal processing, metabolism and replication.

Prerequisites: systems Physiology, biochemistry; and permission of instructor

3 credits, fall term, Dr. Solomon and staff

HBY 561 Statistical Analysis of Physiological Data

1 credit, spring term, Drs. Moore, Clausen and staff

HBY 562 Model-Based Analysis of Physiological Data

1 credit, spring term, Drs. Moore, Clausen and staff

HBY 564 Experimental Teaching in System Physiology

A series of lectures and laboratory exercises designed to introduce students to in vivo experimental techniques used in systems physiology. Emphasis will be placed on the ethical use of rodents in biomedical research the measurement of physiological variables. Data acquisition and analysis procedures used in cardiovascular, respiratory, neural, and renal physiology will also be covered.

1 credit, spring term, Dr. Solomon

HBY 565 Mathematical Models of Physiological and Biophysical Systems

An introduction to mathematical modeling of cell and tissue function. Topics include the derivation and numerical solution of models of cell homeostasis, membrane transport and presentations, and completion of a modeling project.

3 credits, fall term, Drs. Moore and Clausen

HBY 570 Student Journal Club

Graduate student presentation on a selected topic with faculty consultation.

Prerequisite: limited to students of the Physiology and Biophysics Program

1 credit per semester, repetitive, fall and spring terms, staff

HBY 590 Special Topics in Physiology and Biophysics

Student's seminars on topics to be arranged through consultation with faculty members.

Prerequisite: permission of instructor

1 credit per term, repetitive, fall and spring terms, staff

HBY 591 Physiology and Biophysics Research

Original investigation under the supervision of a staff member.

Prerequisite: permission of instructor

1-12 credits per term, repetitive, fall and spring terms, staff

HBY 690 Seminar in Physiology and Biophysics

Seminars and discussions on major topics in physiology and biophysics by students, staff and visiting scientists.

Prerequisite: limited to students of the Physiology and Biophysics Program

0-1 credit per term, repetitive, fall and spring terms, staff

HBY 695 Practicum in Teaching in Physiology and Biophysics

Practical experience and instruction in the teaching of physiology and biophysics carried out under faculty orientation and supervision.

Prerequisite: permission of instructor

1 credit per term, repetitive, fall and spring terms, staff

HBY 699 Dissertation Research in Physiology

Original thesis research undertaken with the supervision of a member of the staff.

Prerequisite: must be advanced to candidacy (G5); permission of thesis advisor

1-9 credits, fall, spring and summer terms, may be repeated for credit

HBY 700 Dissertation Research Off Campus-Domestic

Major portion of research will take place off-campus, but in the United States and/or U.S. provinces. Please note, Brookhaven National Lab and the Cold Spring Harbor Lab are considered on-campus.

Prerequisite: advancement to candidacy (G5); permission of thesis advisor

1-9 credits, fall, spring and summer terms, may be repeated for credit

HBY 701 Dissertation Research Off-Campus—International

Major portion of research will take place outside of the United States and/or U.S. provinces.

Prerequisite: must be advanced to candidacy (G5), permission thesis advisor

1-9 credits, fall, spring and summer terms, may be repeated for credit

HBY 800 Full-Time Summer Research

Full-time laboratory research projects supervised by staff members.

Prerequisites: permission of instructor and full-time graduate status

0 credit, summer term, staff

HBY 554 Principles of Neuroscience

The aim of this course is to highlight and create an understanding as to how the human nervous system operates.

Prerequisite: undergraduate biochemistry, biology and chemistry; permission of instructor

2 credits, ABCF grading