School of Medicine

Administration

Biomedical Science T-101
1960 East-West Road
Honolulu, HI 96822
Tel: (808) 956-8287
Fax: (808) 956-5506
Web: medworld.biomed.hawaii.edu

Interim Dean: Sherrel L. Hammar
Associate Dean: Satoru Izutsu
Associate Dean: Gwen S. Naguwa

Contents

General Information

The John A. Burns School of Medicine works to improve the quality, effectiveness, and equity of health-care delivery in Hawai'i and the Pacific region. The school provides opportunity for qualified residents of Hawai'i and the Pacific Islands, including students from various underrepresented socioeconomic and minority groups, to qualify for an MD degree; provides MD graduates with competency to enter postgraduate programs; and provides residency training programs with emphasis on primary-care specialties.

The school also administers graduate research programs leading to MS and PhD degrees in the basic medical sciences and health-related fields; BS degree programs in speech pathology and audiology and medical technology; and undergraduate courses for majors in nursing, dental hygiene, biology, nutrition, and other fields.

In addition, the school—together with the Hawai'i Medical Association and the Hawai'i Consortium for Continuing Medical Education—sponsors continuing medical education for physicians in the state of Hawai'i.

The school provides instruction for four major categories of students:

1. Candidates for the MD degree, admitted directly by the school's own admissions committee;
2. Candidates for MS degrees in biomedical sciences (with concentrations in anatomy and reproductive biology, biochemistry, biophysics, genetics and molecular biology, pharmacology, physiology, and tropical medicine) or in speech pathology and audiology who apply through the Graduate Division of the Mānoa campus;
3. Candidates for PhD degrees in biomedical sciences with concentrations in anatomy and reproductive biology, biochemistry, biophysics, genetics and molecular biology, pharmacology, physiology, tropical medicine, and biostatistics-epidemiology, or to the biomedical sciences interdisciplinary program (offered by the School of Public Health) or without a concentration, i.e., interdisciplinary, who apply through the Graduate Division of the University of Hawai'i at Mānoa; and
4. Candidates for undergraduate degrees in speech pathology and audiology or in medical technology, who apply through the undergraduate admissions office.

Additionally, all graduate medical education programs in Honolulu hospitals are accredited as University of Hawai'i School of Medicine residency programs. Approximately 240 physicians serve as house staff members in these hospitals under the direction of the medical school faculty.

Accreditation

The school is accredited by the Liaison Committee for Medical Education of the Association of American Medical Colleges and the Council on Medical Education of the American Medical Association.

Affiliations

The school maintains affiliations with the following community hospitals and medical facilities for medical student and resident training: Hawai'i State Hospital; Hilo Family Medical Center; Hilo Medical Center; Kaiser Foundation Hospital; Kalihi-Pālama Health Clinic; Kapi'olani Medical Center for Women and Children; Kapi'olani Medical Center at Pali Momi; Kuakini Medical Center; Lē'ahi Hospital; Queen Emma Clinics; Queen's Medical Center; Rehabilitation Hospital of the Pacific; St. Francis Medical Center; St. Francis Medical Center–West; Shriners Hospital for Crippled Children; Straub Clinic & Hospital; Tripler Army Medical Center; Wahiawā General Hospital;

Wai'anae Coast Comprehensive Health Center; and the Veterans Affairs Outpatient Clinic.

Degrees

Bachelor's Degrees: BS in medical technology, BS in speech pathology and audiology

Professional Degree: MD

Master's Degrees: MS in biomedical sciences (anatomy and reproductive biology, biochemistry, biophysics, genetics, pharmacology, physiology, and tropical medicine); MS in speech pathology and audiology

Doctoral Degrees: PhD in biomedical sciences (anatomy and reproductive biology, biochemistry, biophysics, biostatistics-epidemiology [School of Public Health], genetics and molecular biology, pharmacology, physiology, and tropical medicine); PhD in interdisciplinary biomedical sciences

Advising

Premedical advising is conducted by the Student Academic Services Office of the Colleges of Arts and Sciences.

Academic Policies

Undergraduate and graduate students in the School of Medicine must adhere to the academic policies of the University. Medical students are exempted from certain Mānoa policies and instead must follow academic policies germane to the MD program. Copies are available in the school's Office of Student Affairs and the Learning Resource Room.

Undergraduate Programs

For information on medical technology or speech pathology and audiology refer to the respective sections of the *Catalog*.

MD Program

The MD program follows a problem-based curriculum, which was implemented in fall 1989. It includes the following key features: knowledge is acquired in problem-based modules; self-directed learning is fostered in small group tutorials; students are actively involved in the learning process; faculty members function as both facilitators of learning and resource experts; basic sciences are learned in the context of solving clinical problems; no discipline-specific courses are required; and interdisciplinary basic science lectures are integrated around cases. In addition, students are trained to think critically and to evaluate new information and research data. Evaluation is based on competence in a variety of problem-solving exercises. Early clinical and community experiences are also unique features of the curriculum. The curriculum courses are listed under biomedical sciences (BIOM).

Admission Requirements/ Application Process

Candidates for MD training must have completed a minimum of 90 credit hours of college-level course work. A baccalaureate degree is strongly recommended.

- Biology (with lab) (8)
- Molecular & Cell Biology (with lab) (4)
- General Chemistry (with lab) (4)
- Biochemistry (4)
- General Physics (with lab) (8)

The science courses should be of the type acceptable for students majoring in the above areas (not survey-level) AND, where indicated, include laboratory experience. Additional enrichment in the biological and social sciences (e.g., immunology, genetics, microbiology, human anatomy, physiology, embryology, psychology, and sociology) are encouraged. Applicants also must be fully competent in reading, speaking, and writing the English language.

Applicants must apply through the American Medical Colleges Application Service (AMCAS). The service permits an applicant to file a single application, which is forwarded to as many participating medical schools as designated. Application request forms may be obtained from a pre-med adviser, any participating medical school, or the Office of Student Affairs after April of each year.

Applicants also must take the nationally administered Medical College Admission Test (MCAT), which deals with knowledge of the physical and biological sciences and skills in verbal reasoning and writing, within three years of expected date of matriculation.

Each entering class of MD candidates is limited to 58 students. Correspondence regarding admissions should be directed to Admissions Office, John A. Burns School of Medicine, 1960 East-West Road, Honolulu, HI 96822 or via e-mail nishikim@jabsom.biomed.hawaii.edu. Further information may be obtained on the Web at medworld.biomed.hawaii.edu. Applications are accepted from **June 1** through **December 1** for entry the following year.

Graduate Programs

The School of Medicine offers the MS and PhD degrees in biomedical sciences, with concentrations in anatomy and reproductive biology, biochemistry, biophysics, genetics and molecular biology, pharmacology, physiology, and tropical medicine. In addition, a non-discipline-oriented program–in which students take a one-year interdisciplinary core of courses and laboratory rotations before selecting a thesis topic–leads to a PhD degree in biomedical sciences with an interdisciplinary concentration. A cell, molecular, and neuro-sciences (CMNS) program is also available in conjunction with a cooperating graduate department.

Correspondence regarding admissions to the interdisciplinary, genetics, reproductive biology, and CMNS programs should be addressed to Graduate Admissions, Cell and Molecular Biology, University of Hawai'i John A. Burns School of Medicine, 1960 East-West Rd., A-209, Honolulu, HI 96822.

Additionally, the school offers an MS degree in speech pathology and audiology.

Refer to the specific departments for further information. Inquiries should be addressed to the chair of the specific concentration.

Postgraduate Programs

Postgraduate medical education programs in Honolulu hospitals in family practice, geriatric medicine, internal medicine, obstetrics and gynecology, pathology, pediatrics, psychiatry, surgery, orthopedic surgery, and a transitional year are conducted by faculty and accredited as University of Hawai'i School of Medicine residency programs. Approximately 240 physicians are involved in training, which lasts one to seven years. These physicians serve as members of the house staff in the hospitals while studying their chosen specialty.

The school conducts a postgraduate medical education program at Chubu Hospital in Okinawa for graduates of Japanese medical schools.

Special Programs

Liberal Arts/MD Program

The medical school has developed a program whereby a limited number of undergraduates may apply early in their college careers and be given provisional admission to medical school. Students in this program are required to complete the bachelor's degree and all prerequisites necessary for the study of medicine during their undergraduate years.

Imi Hoʻola Post-Baccalaureate Program

The John A. Burns School of Medicine is actively involved in the recruitment, admission, and retention of students from disadvantaged backgrounds, who are interested in pursuing an MD degree. Imi Hoʻola (Hawaiian for "Those who seek to Heal") is a post-baccalaureate program designed to provide educational opportunities to students from disadvantaged backgrounds capable of succeeding in medical school. Although Imi Hoʻola is not limited to persons of Hawaiian, Filipino, Samoan, Chamorro, and Micronesian descent, a large number of these students in the past have been able to demonstrate that they are from a disadvantaged background.

Each school year, 10 students are selected to participate in this one-year program, and upon successful completion, they matriculate the following year into the John A. Burns School of Medicine. The curriculum emphasizes the integration of concepts and principles in the sciences and humanities and further develops students' communication and learning skills. Eligible individuals are from a disadvantaged socioeconomic and/or educational background who have demonstrated a commitment to serve areas of need in Hawaiʻi and the Pacific.

Native Hawaiian Center of Excellence

The Native Hawaiian Center of Excellence is a project undertaken by the John A. Burns School of Medicine to address the barriers to health care for native Hawaiians. The mission is to improve the school's ability to train physicians with the commitment and special skills to care for the indigenous peoples of the state. The center offers recruitment initiatives to interest Hawaiian high school and college students in medical careers and prepare them for entry into medical school; development of a student tracking system to identify Hawaiian students at academic risk early in their medical training so that appropriate interventions can be made; a one-year fellowship to recruit additional native Hawaiian faculty for the school; revision of the medical school's curriculum to ensure that all students are exposed to the unique health problems and interpersonal skills involved in dealing with Hawaiian patients; and student research electives in Hawaiian health and medical care.

Honors and Awards

Alpha Omega Alpha is the honorary society for medical students.

Allied Medical Sciences

Biomedical Science T-101
1960 East-West Road
Honolulu, HI 96822
Tel: (808) 956-8287
Fax: (808) 956-5506

Faculty

I. Else, MA—communication, minority education
D. Little, EdD—educational administration, minority education
N. Judd, PhD—public health, minority education
S. Matsumoto, PhD—anatomy and reproductive biology, minority education
C. Murry, DPH—public health, minority education
C. Peterson, PhD—biochemistry, minority education
B. Young, MD—psychiatry, minority education

Allied Medical Sciences department offers course work in a number of fields that do not lead to the MD degree. These include medical history, medical technology, and speech pathology and audiology. For a description of these programs, see the appropriate sections.

Anatomy and Reproductive Biology

Biomedical Science T-101
1960 East-West Road
Honolulu, HI 96822
Tel: (808) 956-8287
Fax: (808) 956-5506
Web: www.hawaii.edu/catalog/medicine/anat.html

Faculty

*S. Lozanoff, PhD (Chair)—craniofacial biology
*V. J. DeFeo, PhD—embryo-uterine interactions, pregnancy maintenance, human sexuality
*M. Diamond, PhD—sexual behavior and reproduction, neural and hormonal influences on sexuality
A. Perry, PhD—cell and molecular biology of gametes, including cloning
J. L. Rosenheimer, PhD—neurobiology of aging
T. Wakayama, PhD—gamete manipulation, including cloning
*R. Yanagimachi, DSc—mammalian gametes and fertilization, fertility control, gamete and embryo manipulation

Cooperating Graduate Faculty

R. V. Cooney, PhD—role of nitrogen oxides in carcinogenesis
F. C. Greenwood, DSc—molecular aspects of endocrinology
T. Huang, PhD—molecular biology of egg-sperm interaction, human male infertility and *in vitro* fertilization
D. L. Vincent, PhD—reproductive physiology
C. W. Weems, PhD—reproductive endocrinology and physiology, biology of the ovary

Adjunct Faculty

C. D. Boyd, PhD—matrix pathobiology
K. Csiszar, PhD—matrix pathobiology

Degrees Offered: MS in biomedical science (anatomy and reproductive biology) (restricted), PhD in biomedical sciences (interdisciplinary)

The Academic Program

Anatomy (ANAT) and reproductive biology (REPR) is a discipline that embraces biological structure from the molecular level to the body as a whole. It provides the student with an opportunity to develop a broad base of knowledge in biological structure for subsequent research into specific processes in mammalian development, neurobiology of behavior, endocrinology, and reproduc-

* Graduate Faculty

tion, including that of farm animals. Students will have access to the other biomedical science disciplines in an integrated curriculum. Collaborative research projects with clinical and basic science faculty offer students unique opportunities for clinically oriented research. Students may work with faculty members who are world renowned in the areas of fertilization, reproductive endocrinology, and neurobiology of behavior.

This interdisciplinary area of concentration is administered by the Biomedical Sciences Interdisciplinary Program in which graduate faculty from several departments participate and contribute to the program.

Advising

Students will receive advising by the chair of the Biomedical Sciences Interdisciplinary Program and the chair of the department of Anatomy and Reproductive Biology prior to the selection of their faculty adviser and thesis committee. For additional information, students may contact the following graduate program chairs:

Dr. Martin D. Rayner
John A. Burns School of Medicine
Biomedical Sciences Interdisciplinary Program
1960 East-West Road, Biomed A-209
Honolulu, HI 96822

Dr. Scott Lozanoff
John A. Burns School of Medicine
Department of Anatomy and Reproductive Biology
1960 East-West Road, Biomed T-309
Honolulu, HI 96822

Graduate Study

Master's Degree

In general, only students possessing or working on an advanced degree (e.g., MD) may be admitted to the master's degree program. Specific information regarding qualifications for admission may be obtained from the Department of Anatomy and Reproductive Biology graduate program chair.

Requirements

The master's degree is restricted to Plan A (thesis), in which students conduct thesis research in addition to a minimum of 12 credit hours of approved course work. Admission and examination requirements are similar to those listed for the PhD program.

Doctoral Degree

Students participate in research projects relating to the anatomical sciences or reproductive biology in mammals, including humans and large farm animals. The research strengths of the program include endocrinology, female reproductive biology, gamete maturation and fertilization, and neuroscience of behavior. Faculty interests include developmental, biochemical, molecular, and physiological aspects. Excellent, well-equipped research facilities exist, including electron microscopy.

Specialization in cell and molecular biology and neuroscience of behavior is available in conjunction with the anatomy and reproductive biology program, as well as with various other graduate departmental programs throughout the University. A concurrent degree program for students enrolled as MD candidates can also be arranged (requirements of both the Graduate Division and the School of Medicine must be met).

Requirements

The GRE General Test and the subject test (biology or chemistry) are required before requests for admission are considered. Students with an undergraduate major in biology or a strong background in the biological sciences are preferred. Two letters of recommendation and a statement of the applicant's career goals and reasons for applying specifically to the program should be sent directly to the program chair.

Formal course requirements are specified by the advisory committee as appropriate to the student's background and research plan. A written, qualifying examination covering completed course work is usually given during the second year. A dissertation committee and program adviser are appointed in consultation with the student at this time. An oral comprehensive examination conducted by the dissertation committee, as well as the presentation of the dissertation proposal, should be completed by the end of the second year of the program. Submission and defense of an acceptable dissertation complete the PhD program requirements.

* Graduate Faculty

Biochemistry and Biophysics

Biomedical Science T-705
1960 East-West Road
Honolulu, HI 96822
Tel: (808) 956-8490
Fax: (808) 956-9498

Faculty

*N. V. Bhagavan, PhD (Chair)—clinical biochemistry, role of surfactant in pulmonary function, thyroid and cholesterol metabolism, structural studies on human serum albumin

*R. J. Guillory, PhD—bioenergetics, mechanism of mitochondrial oxidative phosphorylation and membrane-dependent energy-linked reactions, structure of contractile proteins

*H. F. Mower, PhD—problems in carcinogenesis in normal and neoplastic systems

Cooperating Graduate Faculty

R. V. Cooney, PhD—role of nitrogen oxides in carcinogenesis

M. A. Dunn, PhD—nutritional biochemistry, trace elements

J. Stollberg, PhD—synaptogenesis, localization of membrane constituents

J. S. Bertram, PhD—carcinogenesis, growth regulation, chemo-prevention of cancer

Adjunct Faculty

G. Edlin, PhD—regulation of viruses and bacteria, molecular mechanism of disease, molecular evolution

B. Vennesland, PhD—enzymology of photosynthesis and nitrate reduction

G. Weber, MD, PhD—thermodynamics of biomolecular interactions, fluorescence spectroscopy

Degrees Offered: MS in biomedical science (biochemistry), MS in biomedical science (biophysics), PhD in biomedical science (biochemistry), PhD in biomedical science (biophysics)

The Academic Program

Biochemistry (BIOC) and biophysics (BIOP) entail the study of the chemistry and physics of living systems. In these disciplines, students learn how the fundamental compounds present in all cells react in enzyme-catalyzed processes to form the macromolecular assemblies that in turn govern cell growth, cell function, and cell senescence. The understanding of these myriad and complex processes ultimately requires an understanding of the underlying chemical and physical processes. Indeed, molecular biophysics attempts to evaluate, by the methods of physics, biological

processes at the molecular level. These disciplines are currently in a time of explosive growth and development. New knowledge is rapidly being discovered; new theories are being proposed and tested; and ever wider application of the principles of biochemistry, biophysics, and molecular biology to the understanding of other biological and medical sciences is occurring.

Students benefit from the study of biochemistry and biophysics in many ways. Productive and fulfilling lifelong careers are available to graduates of master's and doctoral degree programs. Opportunities exist in government, industrial, and academic institutions that can lead to administrative responsibilities and policy-making positions. Teaching positions at the undergraduate and graduate levels are also available.

The study of biochemistry and biophysics provides the student with a broad understanding of life processes that are also fundamental to the understanding of many of the disciplines of biological, agricultural, and medical sciences. It is often an advantage to enter these fields after the completion of a program of study in biochemistry or biophysics.

The Department of Biochemistry and Biophysics at the University of Hawai'i offers the student broad training in the fundamentals of both biochemistry and biophysics. Courses are offered at introductory and advanced levels. Specialty courses that bring the student to the frontiers of the developing subdisciplines are a part of the department's curriculum. Laboratory and research experience is available either through formal courses or through participation in one of the many funded research programs of the department. Interdisciplinary degree programs with molecular biology and neuroscience are also offered.

Advising

Each incoming student is advised by the department and chair student adviser. They will assess the student's academic needs, establish a curriculum plan, and monitor the student's progress.

Graduate Study

The MS Plan A (thesis), MS Plan B (nonthesis), and PhD degrees are offered in both biochemistry and biophysics. The department requires all applicants to submit results of the GRE General Test and subject test within any scientific area. The application deadline for admission in the fall semester is **February 1**. An oral qualifying examination is required of all students. This is to be taken before the end of the second year, after successful completion of a minimum of six 600- or 700-level courses.

Further details of the program may be obtained from the *Prospectus for Graduate Training* and *Guide for Incoming PhD or MS Candidates,* available from the department office.

Intended candidates must have acquired adequate preparation in organic, physical, and analytical chemistry; biology; mathematics; and physics. They should consult initially with the departmental student advisory committee in planning their curricula and in choosing appropriate courses offered by other departments. Such courses can be taken within the departments of microbiology, physiology, pharmacology, psychology, genetics, zoology, chemistry, mathematics, and physics. Students may participate in a large number of research programs offered by the members of the department. In particular, fundamental research is presently being conducted within the areas of enzyme structure and function; kinetics and catalytic function of metal enzymes; mechanism of protein and hormone biosynthesis in both normal and neoplastic systems; virus and nucleic acid synthesis and structure; genetic mechanisms of growth and development; recombinant DNA technology and genetic engineering; regulation at the cellular and tissue level; neurotransmitter receptor distribution, densities, and binding affinities as related to brain function and pathology; bioenergetics and membrane energy conservation systems; and application of biochemical, chemical, and physical techniques to the elucidation of enzyme and membrane structure and function, as well as in the study of cancer tissue.

Candidates for the MS and PhD degrees are required to participate in the departmental teaching program. Also required is registration in BIOC 671 seminar (four semesters).

Master's Degree

Requirements

Candidates for the MS Plan A degree must complete 22 credit hours of course work in addition to 8 credit hours of thesis research (BIOC or BIOP 700). For the MS Plan B degree, 28 credit hours of course work are required in addition to 2 credit hours of directed research (BIOC or BIOP 699).

The thesis committee may require a final oral examination of the MS Plan A candidates. The oral examination in defense of the candidate's thesis follows University regulations.

Doctoral Degree

PhD students are admitted to candidacy upon satisfactory completion of the qualifying oral examination. The next required examination is an oral examination dealing with candidate's dissertation proposal. This examination is conducted by the members of the dissertation committee and is based upon the dissertation outline that describes the actual research work planned for the doctoral degree and that includes supporting data and bibliography. Upon completion of this examination, students are permitted to enroll in dissertation research (BIOC or BIOP 800).

Requirements

Doctoral students are generally required to complete 20 credit hours of biochemistry and/or biophysics courses (including 4 credit hours in seminar) and 4 credit hours in biochemistry and biophysics laboratory.

Biomedical Sciences

Biomedical Building, A-209
1960 East-West Road
Honolulu, HI 96822
Tel: (808) 956-5498
Fax: (808) 956-9530

Degrees Offered: MS in biomedical sciences, PhD in biomedical sciences

The Academic Program

The biomedical sciences (BIOM) graduate program provides an integrated course of study for students seeking careers in health-related research. With its focus on interdisciplinary research training rather than on extensive disciplinary course work, this program offers research opportunities in, for example, molecular biology, immunology, medical microbiology, neurosciences, cancer, reproduction, heart disease, AIDS-research, biostatistics and epidemiology. Participating faculty members, drawn principally from the basic and clinical sciences in the medical school, Pacific Biomedical Research Center, and Cancer Research Center of Hawai'i–are

involved in active research programs pursuing questions that typically extend from the molecular and cellular level to the organism and population levels.

Both PhD and MS degrees are offered, and applicants with prior MD degrees are welcomed. Entering students will take a first-year curriculum, which includes a two-semester course in molecular and cell biology, while pursuing concurrent rotations in research laboratories selected to expand their interdisciplinary knowledge. Additional courses (e.g., biochemistry and epidemiology/statistics) may be required to cover background deficiencies. Following completion of these core requirements, students passing a qualifying exam (covering the required course content) will then select a mentor and research laboratory in which they will complete their dissertation research. In addition to their required courses, students may choose to select from a broad range of advanced graduate courses in the traditional disciplines of anatomy and reproductive biology, biochemistry, biophysics, genetics, physiology, pharmacology, tropical medicine, epidemiology and biostatistics. This program is expected to be combined with Genetics and Molecular Biology under the title "Cell and Molecular Biology."

Graduate Study

Master's Degree

Requirements

Plan B MS students will be required to complete 30 credits of courses at the 600 level. These 30 credits must include the two-semester course sequence BIOM 621 and 622 as well as at least one lab rotation BIOM 631 (or the equivalent of these courses, as certified by the program chair). Additionally, all Plan B students will be required to complete a "mini-dissertation" describing one component of the directed research that they have carried out during their time in the program, including the aims of that research, the primary methods involved and the significance of the results obtained.

Plan A MS students will be required to complete at least 20 credits of graduate-level course work including BIOM 621, 622, and 631 (unless equivalencies have been certified by the program chair). At least 6 credits of 699 (or 700) will be expected within that total, indicating an appropriate amount of one-on-one laboratory instruction. In addition, students will be required to complete a full master's level research thesis in accordance with the requirements of the Graduate Division (12 credits). Students in this program will be required to complete both the normal qualifying exam and a comprehensive exam administered by their committee.

Doctoral Degree

Requirements

Students are required to complete a one-year basic program including BIOM 621, 622, and three semesters of lab rotations in 631 (unless equivalencies have been certified by the program chair). Students normally select a research mentor after completing this program and taking their qualifying exam. Thereafter, they are eligible to select a dissertation committee (normally chaired by the research mentor). No additional courses are required unless specified by the committee to expand the student's background or to fill apparent deficiencies in background knowledge that may be needed for successful performance within the student's chosen research area. However, students retain the option of selecting any courses that may interest them from the wide range offered at UH Mānoa. At least one credit of BIOM 800 is required in the semester prior to graduation.

Family Practice and Community Health

The Physician Center at Mililani
95-390 Kuahelani Avenue
Mililani, HI 96789
Tel: (808) 627-3235
Fax: (808) 627-3262

Faculty

K. A. Bauman, MD, MPH (Co-Chair)—family practice and community health
N. A. Palafox, MD, MPH (Co-Chair)—family practice and community health
S. P. Berry, MD—family practice
P. J. Bohnert, MD—psychiatry
D. R. Brown, MD—family practice
L. E. Buenconsejo, MD—family practice
L. M. Dolan, MD—family practice
G. M. Greene, PhD—education specialist
L. W. Hopman, MD—family practice
J. V. Martell, MD—family practice
J. S. Minami, MD—family practice
A. W. Nichols, MD—family practice, sports medicine
K. M. Withy, MD—family practice
S. Yamada, MD, MPH—family practice

Degree Offered: MD

The Academic Program

The family practice and community health (FPCH) department is a cooperative effort whose faculty members are involved with community partnerships in health professions education. Teaching goals are based on the assumption that primary medical care includes not only high quality, accessible, and acceptable care for episodes of illness, but also a concern for the promotion of a healthy lifestyle and environment for the population served.

Medical-student instruction focuses on basic conceptual tools and practical preceptorships with people providing primary care.

Genetics and Molecular Biology

Biomedical Science A-209
1960 East-West Road
Honolulu, HI 96822
Tel: (808) 956-8552
Fax: (808) 956-9530

Faculty

*J. S. Bertram, PhD—carcinogenesis, growth regulation and chemoprevention of cancer panic and depression; gender differences in emotional behavior
*D. C. Blanchard, PhD—ethoexperimental analysis of defense and aggression; preclined pharmacoethology of anxiety,
*J. L. Brewbaker, PhD—horticultural genetics
*G. D. Bryant-Greenwood, PhD—preterm birth in the human, role of relaxins in fetal membrane rupture
*R. L. Cann, PhD—molecular and evolutionary genetics
*F. C. Greenwood, PhD—biochemical endocrinology, measurement and metabolism of protein hormones, particularly relaxin
*D. S. Haymer, PhD—molecular evolution and developmental genetics
*Y. E. Hsia, MD—medical genetics
*T. D. Humpreys II, PhD—molecular biology of development
*J. A. Hunt, PhD—molecular and evolutionary genetics
*D. M. Jameson, PhD—flourescence spectroscopy; biomolecular dynamics and interactions; ribosomal proteins

* Graduate Faculty

*A. F. Lau, PhD—molecular biology of cancer
*T. W. Lyttle, PhD—population genetics, cytogenetics
B. R. Powell, MD—human genetics
*M. D. Rayner, PhD—structure-function relationships in voltage-gated ion channels
*J. F. Scott, PhD—molecular biology of DNA
*S. E. Seifried, PhD—macromolecular interactions, transcription factor recognition of specific DNA sequences, protein subunit assembly

Adjunct Faculty

T. A. Donlon, PhD—human genetics
A. Fleig, PhD—electrophysiology (patch-clamp); calcium signaling in muscle cells; regulation of calcium signaling; cellular neuroimmunology
R. Penner, PhD—electrophysiology (patch-clamp); intra- and intercellular signal transduction; regulation of calcium signaling; cellular neuroimmunology

Degrees Offered: MS in biomedical science (genetics), PhD in biomedical science (genetics)

The Academic Program

The department offers the MS and PhD degrees in biomedical science (genetics) with concentrations in the areas of human and evolutionary genetics, molecular and cell genetics, and population and evolutionary genetics. Intended candidates for the MS degree must have or acquire adequate preparation in biology, calculus, chemistry through organic chemistry, physics, and genetics. Additional preparation will depend upon the area of genetics in which the candidate wishes to specialize. For population and statistical genetics, an adequate mathematical background is advisable. For molecular genetics, organic chemistry and biochemistry are desirable.

Students pursuing an MS in biomedical sciences (genetics) fall into two categories, depending on whether they opt for a Plan A (thesis) or Plan B (non-thesis) master's degree. The MS Plan B is usually a terminal degree, appropriate for professionals in primary and secondary education, nursing, medical technology, government, and related fields who wish to obtain broad training in modern genetics to advance their credentials in their chosen fields. The MS Plan A serves as a qualifying examination for students who intend to continue toward the PhD in any of several biomedical sciences degree programs, particularly genetics. It may also serve as a terminal degree for those who wish to pursue careers as research technicians, either in the public or private sector. Those who seek the PhD degree usually wish to make a career in college and university teaching and research, in research for industry and government, or in medicine, dentistry, or medical technology.

All students registered for graduate degrees in genetics are expected to participate in GENE 654 each semester. In order to develop skills and basic genetic knowledge necessary for interaction with students in both discussion and laboratory settings, degree candidates are required to assist in the department's undergraduate curriculum. MS and PhD candidates must assist in at least one course.

Advising

Complete details about the graduate programs and faculty in genetics, as well as financial aid available to prospective students, may be obtained upon request from the department.

Graduate Study

Master's Degree

Prospective MS candidates may choose either the Plan A (thesis) or Plan B (non-thesis) programs. Plan A is taken by students wishing to proceed to the PhD degree. The Plan B option is offered for medical students, students in the health sciences, or others who would benefit from a knowledge of genetics in their chosen fields.

Requirements

Minimum required course work for both options consists of BIOM 621 and GENE 650, 671, 672, 680, and two semesters of 654. Equivalent courses may be substituted for students concurrently enrolled in the Cellular, Molecular, and Neurosciences (CMNS) or other graduate special programs. Additional requirements for Plan A students are at least 2 credit hours of GENE 699, for which enrollment is required by no later than the fifth semester; GENE 700; any individualized course work specified by the thesis committee; and successful defense of the thesis. In lieu of a thesis, additional course requirements for Plan B are at least 6 credit hours of further course work chosen from the department's graduate courses; GENE 699 (6 credit hours); and successful presentation of both oral and written reports on the directed research project to the program committee.

Doctoral Degree

Intended candidates for the PhD degree are expected to possess an MS Plan A degree in genetics or its equivalent. PhD candidates must have demonstrated a potential for undertaking original research in genetics.

Requirements

Formal course requirements for the PhD, beyond completion of the requirements for the MS Plan A option or equivalent are GENE 654 (two semesters), GENE 699 (enrollment required by the third semester), GENE 800, and any additional courses specified by the dissertation committee.

Medical History

Biomedical Science T-101
1960 East-West Road
Honolulu, HI 96822
Tel: (808) 956-8287
Fax: (808) 956-5506

The Division of Medical History (MDHX) examines the general area of medical history, particularly that of the Pacific and Asia. It is strengthened by a growing collection of material in the Hawai'i Medical Library.

Medical Technology

Biomedical Science C-206
1960 East-West Road
Honolulu, HI 96822
Tel: (808) 956-8557
Fax: (808) 956-5506
Web: www.hawaii.edu/medtech/Medtech.html

Faculty

P. L. Taylor, MS (Chair)—medical technology
N. N. Ebisu, BS—medical technology
K. K. Hamamoto, BS—medical technology
K. K. Morton, BS—medical technology
D. Y. Teshima, MPH—medical technology
*A. G. Theriault, PhD—clinical chemistry

Degree Offered: BS in medical technology

The Academic Program

Medical technology (MEDT) is a health-care profession in which medical technologists (clinical laboratory scientists) perform laboratory procedures used

* Graduate Faculty

for the promotion of health and the diagnosis, monitoring, and treatment of diseases. Technical skills needed to carry out the tasks include microscopy, venipuncture, manipulation of various labware, and operation of automated instruments. Results of these procedures are essential to the delivery of quality health care. The field is broad and involves several disciplines: chemistry, hematology, immunohematology (blood banking), immunology, and microbiology.

Medical technology is a constantly evolving profession. The continued development of the health-care industry and the emergence of other career opportunities have sustained the demand for clinical laboratory scientists. Employment opportunities exist in hospitals, clinics, physician's offices, reference laboratories, DNA labs, research, education, forensic medicine, industry, consulting, sales, marketing, veterinary medicine, and many more areas.

Admission Requirements

Courses listed in the first two years of the curriculum are required before admission to the medical technology program. Clinical laboratory scientists perform various procedures which directly impact patient care, so it is important that all applicants be able to perform certain essential functions (technical standards). With appropriate accommodations, if needed, everyone must be able to perform the activities listed below. Additional professional skills are taught in classes after admission.

- Manipulate labware to transfer or prepare reagents and samples (e.g., pipet, charge hemocytometer, prepare blood smear)
- Operate simple instruments according to instructions (e.g., cell counter, centrifuge, spectrophotometer)
- Perform microscopic examinations on various specimens and report the results (e.g., leukocyte differential count, cell morphology, urinary sediments)
- Follow written or verbal directions to perform laboratory tests and report results

Applicants are assessed through performance in MEDT and other courses, an interview, an essay, and personal evaluations. Academic record, interests and aptitude, communication skills, scientific orientation, and personal traits are also considered.

Special Expenses

Medical technology majors are required to have professional liability insurance, which costs about $40 per year. In addition, students may incur expenses for vaccinations. Safety equipment such as lab coats, gloves, and masks are provided at no charge.

Advising

Students are encouraged to see a medical technology adviser as soon as possible and prior to each registration period. Appointments can be made by contacting the division office.

Clinical Training

Clinical training follows graduation and takes place in an affiliated clinical facility. Some clinical affiliates may require students to be U. S. citizens. A limited number of positions are available in Hawai'i. An alternate route is to apply to a clinical training program on the continental United States.

Accreditation and Affiliations

The program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences.

Clinical affiliations are with the Blood Bank of Hawai'i, Hawai'i State Department of Health, Diagnostic Laboratory Services/Accupath, Hilo Medical Center, Kaiser Permanente Medical Center, St. Francis Medical Center, Tripler Army Medical Center, Castle Medical Center, Clinical Laboratories of Hawai'i, Kapi'olani Medical Center, Kaua'i Veterans Memorial Hospital, Kona Community Hospital, Kuakini Medical Center, Maui Memorial Hospital, Straub Clinic and Hospital, Tri-City Medical Center, University Health Services, Wai'anae Coast Comprehensive Health Center, and Wilcox Memorial Hospital.

Certification and Licensure

After clinical training, students are eligible to take a national certification exam. In Hawai'i, state licensure is also required.

Undergraduate Study

Bachelor's Degree

Requirements

- Complete the degree requirements that satisfy the University's General Education Core requirements and program requirements
- Earn a minimum of 123 credit hours plus fulfill the language requirement
- Earn a minimum cumulative GPA of 2.0
- Submit by the specified deadline an application for graduation to the Cashier's Office during the semester preceding the awarding of the degree

Curriculum for Medical Technology

First Semester

- CHEM 161/161L (3/1)
- BIOL 171/171L (3/1)
- ENG 100 (3)
- †MEDT 151 (2)
- Core/Language/Electives

Second Semester

- CHEM 162/162L (3/1)
- PHYS 151/151L (3/1)
- HIST 151 (3)
- MATH 205 (4)
- Core/Language/Electives

Third Semester

- CHEM 272/272L (3/1)
- †MEDT 251 (2)
- PHYS 152/152L (3/1)
- HIST 152 (3)
- Core/Language/Electives

Fourth Semester

- CHEM 274/274L (3/2)
- MICR 351/351L (3/2)
- SP 151 (3) or SP 251 (3)
- Core/Language/Electives

Fifth Semester

- PHYL 301 (4)
- BIOC 441 (4)
- †MEDT 301 (3)
- Core/Language/Electives

Sixth Semester

- PHYL 302 (4)
- †MEDT 471 (4)
- †MEDT 302 (3)
- †MEDT 431 (3)
- Core/Language/Electives

Summer Session

- †MEDT 366 (2)

Seventh Semester

- †MEDT 331 (1)
- †MEDT 451 (3)

- †MEDT 457/457L (3/2)
- †MICR 461/461L (3/2)

Eighth Semester

- †MEDT 464 (3)
- †MEDT 458/458L (3/2)
- †MICR 463/463L (3/2)
- Core/Language/Electives

Postgraduate Clinical Training

- †MEDT 591 (26)

†Note: Grade of C or equivalent is required for courses highlighted with a dagger (†).

Medicine

University Tower, Queen's Medical Center
1356 Lusitana Street, 7th Floor
Honolulu, HI 96813
Tel: (808) 586-2910
Fax: (808) 586-7486
Web: medworld.biomed.hawaii.edu/

Faculty

J. E. Hastings, MD (Chair)—general internal medicine, cardiology
R. F. Arakaki, MD—endocrinology
S. Au, MD—neurology
R. D. Bart, MD—neurology
E. F. Bello, MD—infectious disease
R. K. Blaisdell, MD—hematology
P. L. Blanchette, MD—geriatric medicine
P. E. Bogden, MD—general internal medicine
J. Brown, MD—infectious disease
S. Buto, MD—gastroenterology
C. S. Chan, MD—general internal medicine
J. D. Curb, MD—geriatric medicine
R. I. Frankel, MD—general internal medicine
R. Friedman, MD—general internal medicine
C. S. Hew, MD—general internal medicine
C. M. Higuchi, MD—oncology
R. T. Kasuya, MD—general internal medicine, inpatient care
S. B. Kemble, MD—general internal medicine, inpatient care
E. Kroop-Martin, MD—general internal medicine
K. H. Masaki, MD—geriatric medicine
M. K. Mau, MD—endocrinology
J. S. Melish, MD—endocrinology
D. Minaai, MD—general internal medicine
E. J. Morgan, MD—pulmonary
S. Nakamoto, MD—general internal medicine
J. Onopa, MD—general internal medicine
G. A. Rediger, MD—general internal medicine
B. L. Rodriguez, MD, PhD—clinical epidemiologist
S. M. Saiki Jr., MD—general internal medicine
D. Sakai, MD—general internal medicine
I. J. Schatz, MD—cardiology
E. N. Shen, MD—cardiology
D. Shiramizu, MD—pediatrics, hematology, oncology
C. M. Shikuma, MD—infectious disease, AIDS
B. A. Soll, MD—pulmonary medicine
P. Sousa, MD—general internal medicine
K. N. Sumida, MD—hematology
E. K. Tam, MD—pulmonary
L. M. Tam, MD—general internal medicine
S. Y. Tan, MD—endocrinology
L. A. Tom, MD—geriatric medicine
N. Tsai, MD—gastroenterology
G. L. Wergowske, MD—geriatric medicine
M. H. C. Yee, MD—neurology

Degree Offered: MD

The Academic Program

The Department of Medicine (MED) assists the student in integrating learning in the humanities, social sciences, and the physical and biological sciences by providing progressive experiences in clinical medicine. Early attention is given to the student's acquisition of habits of continuing self-education and basic clinical skills. These skills include collection and evaluation of data, clinical problem solving, and consideration and perceptiveness in dealing with patients, their families, and other members of the health team.

The department directs integrated residency training programs in community hospitals. The close association of students and graduate physicians in these programs affords valuable learning experiences. Research in selected clinical fields, for which facilities are available, is fostered.

Obstetrics, Gynecology, and Women's Health

Kapi'olani Medical Center for Women and Children
1319 Punahou Street, Room 824
Honolulu, HI 96826
Tel: (808) 956-7457
Fax: (808) 955-2174

Faculty

R. T. Nakayama, MD (Chair)—obstetrics and gynecology
T. C. Aeby, MD—obstetrics and gynecology
S. S. Brizzolara, MD—obstetrics and gynecology
T. T. F. Huang, PhD—reproductive endocrinology, anatomy
L. E. Kamemoto, MD—obstetrics and gynecology
T. Kosasa, MD—perinatology
G. G. Li, MD—obstetrics and gynecology
J. H. Morikawa, MD—obstetrics and gynecology
A. T. Ngo, MD—obstetrics and gynecology
A. M. Rahall, MD—obstetrics and gynecology
S. D. Sharma, MD—obstetrics and gynecology
J. K. Silva, MD—perinatology
K. Y. Terada, MD—gynecology
M. T. Wakabayashi, MD—obstetrics and gynecology

Degree Offered: MD

The Academic Program

Instruction in obstetrics and gynecology (OBGN) is divided into four general areas: basic clerkship, student electives, residency training, and continuing medical education. The main objectives of the basic clerkship during the third year is to give students an overall perspective of the entire field, an in-depth knowledge of women's health care, and an ability to perform those technical skills necessary for the care of women. The elective experiences are developed to allow interested students the opportunity to acquire detailed knowledge and experience in women's health care or within specific areas of care.

The department directs a residency training program for medical graduates who desire specialty training in the field. The MD education program is closely integrated with residency training to maintain communication and learning experience throughout training. The department has an active research program in the clinical area of human reproduction. The department is divided into the following divisions: ambulatory care, education, endocrinology-infertility, fetal-maternal medicine, gynecology, obstetrics, oncology, urogynecology, and research.

Pathology

Biomedical Science T-509
1960 East-West Road
Honolulu, HI 96822
Tel: (808) 956-8860
Fax: (808) 956-5506

Faculty

J. M. Hardman, MD (Chair)—neuropathology and laboratory medicine
Y. Hokama, PhD—immunopathology
S. T. Komura, MD—general pathology

R. J. Mack, MD—general pathology
*M. L. Nelson, PhD—environmental influences on growth and development of endocrine systems, clinical anatomy
E. A. Porta, MD—liver disease
*M. Volini, PhD—molecular mechanisms of biological regulatory processes; mechanism, function, and biochemical genetics of enzymes; signal transduction to the mitochondria
H. Y. Yang, MD, PhD—kidney and surgical pathology, electron microscopy

Degree Offered: MD

The Academic Program

Pathology (PATH) is the study of disease. Instruction in pathology is open to undergraduate, graduate, and medical students and residents. All medical students may elect to take PATH 515 as a part of the problem-based learning curriculum. PATH 541 provides essential autopsy experience for all third- and fourth-year medical students, and residents may enroll in one or more of PATH 545, 670, and 699. Instruction in laboratory medicine for the practicing physician, clinical pathology, anatomic pathology, clinical immunology, and pathology of aging, nutrition, and/or alcoholism is offered.

The department directs an integrated residency program in pathology. Residents are based at Kaiser Hospital, Queen's Medical Center, and St. Francis Hospital and participate in the training of medical students and residents alike. Clinical faculty come from all the community hospitals and provide gross and microscopic specimens for demonstration and clinico-pathologic correlations for medical students and residents. In addition, they participate in seminars and give lectures along with the full- and part-time faculty.

Pediatrics

Kapi'olani Medical Center for Women and Children
1319 Punahou Street, Room 742
Honolulu, HI 96826
Tel: (808) 956-6525
Fax: (808) 949-4232

Faculty

R. C. Rudoy, MD (Chair)—infectious disease
B. Y. Aoki, MD—critical care
K. M. Ash, MD—neonatology
V. Balaraman, MD—neonatology
R. D. Bart, MD—neurology
R. J. Bidwell, MD—adolescent medicine
R. B. Boychuk, MD—critical care/emergency medicine
A. G. Britten, MD—critical care
F. M. Burkle Jr., MD—emergency medicine
R. K. S. Chang, MD—critical care
D. C. Derauf, MD—ambulatory pediatrics
D. Easa, MD—neonatology
S. L. Hammar, MD—adolescent medicine
C. Hirai, MD—neonatology
A. S. Inaba, MD—emergency medicine
L. K. Iwaishi, MD—developmental pediatrics
L. M. Iwamoto, MD—neonatology
D. K. Kurahara, MD—pediatric rheumatology
W. T. Kyono, MD—hematology/oncology
M. T. Lee, MD—ambulatory pediatrics
S. W. H. Loo, MD—neonatology
D. Medeiros, MD—hematology/oncology
M. E. Melish, MD—infectious disease
M. S. Michels, MD—ambulatory pediatrics
D. T. Murai, MD—neonatology
J. E. Musgrave, MD—pediatric nephrology
G. S. Naguwa, MD—ambulatory pediatrics
L. Y. Nakagawa, MD—emergency medicine
K. T. Nakamura, MD—neonatology
J. K. Okamoto, MD—developmental pediatrics
M. E. Patrinos, MD—neonatology
B. R. Powell, MD—clinical genetics
V. Reddy, MD—pediatric cardiology
L. M. Rosen, MD—emergency medicine
D. S. Y. Seto, MD—infectious disease
B. Shiramizu, MD—hematology/oncology
S. L. Sood, MD—neonatology
C. H. Tinsley, MD—critical care
L. R. Tinsley, MD—neonatology
P. A. Vanderford, MD—critical care
R. Wada, MD—hematology/oncology
R. W. Wilkinson, MD—hematology/oncology
K. A. Woodruff, MD—hematology/oncology
F. Y. Yamamoto, MD—allergy/immunology
L. G. Yamamoto, MD—emergency medicine
K. S. Yamamoto, MD—pediatric rheumatology
L. L. Yee, MD—emergency medicine

Degree Offered: MD

The Academic Program

Pediatrics (PED) is the specialty of medical science concerned with the physical, emotional, and social health of children from birth to young adulthood. The discipline deals with biological, social, and environmental influences on the developing child and with the impact of disease and dysfunction on development.

The Department of Pediatrics offers specialty training for the medical student, as well as post-MD residency training and subspecialty experience.

* Graduate Faculty

Pharmacology

Biomedical Science T-408
1960 East-West Road
Honolulu, HI 96822
Tel: (808) 956-8936
Fax: (808) 956-3165

Faculty

*B. K. B. Lum, PhD, MD (Chair)—autonomic and cardiovascular pharmacology
*E. Furusawa, MD, PhD—viral chemotherapy
*S. Ramanathan, PhD—biochemical pharmacology
*S. Shibata, MD, PhD—cardiovascular, smooth muscle pharmacology
*E. K. Tam, MD—pulmonary pathophysiology and pharmacology
*C. F. T. Uyehara, PhD—developmental and cardiovascular pharmacology

Affiliate Graduate Faculty

J. F. Lenney, PhD—biochemical pharmacology

Degrees Offered: MS in biomedical science (pharmacology), PhD in biomedical science (pharmacology)

The Academic Program

Pharmacology (PHRM) is a medical science concerned with the effects of drugs and chemicals on living organisms. The subject embraces a knowledge of the chemistry, actions, absorption, fate, excretion, and uses of drugs. Traditionally, the greatest interest in drugs has been with the health professions. Today, however, a knowledge of pharmacology and the allied field of toxicology is relevant to all segments of society. It is important that the general public acquire a better understanding of the value, limitations, and potentially harmful effects of drugs and chemicals.

The general objectives and functions of the Department of Pharmacology include (a) teaching the discipline to both health professionals and nonprofessionals, (b) training graduate students, (c) conducting scholarly research in the discipline, and (d) participating in community-service activities that require the expertise of pharmacologists.

Graduate Study

The department offers the requisite work for medical students and for the MS and PhD degrees. Doctoral applicants are required to submit GRE General Test scores.

Required course work includes basic courses in related sciences or demonstrated competence in these fields, plus other courses adapted to the needs of the particular student as determined by the major professor and the thesis or dissertation committee. Most students will be expected to take graduate courses in biochemistry, physiology, and pharmacology. Elective courses in pathology, microbiology, anatomy, chemistry, and clinical medicine are recommended.

Further details on the program and faculty may be requested from the department.

Master's Degree

MS graduates usually pursue further graduate training in pharmacology, its related fields, or medicine.

Doctoral Degree

After postdoctoral training, recipients of the PhD have accepted teaching and/or research positions in universities, the pharmaceutical industry, and private and governmental research institutes.

Physiology

Biomedical Science T-608
1960 East-West Road
Honolulu, HI 96822
Tel: (808) 956-8640
Fax: (808) 956-9722

Faculty

*G. C. Whittow, PhD (Chair)—thermoregulation
*J. R. Claybaugh, PhD—body fluid regulation
*H. L. Gillary, PhD—human evoked potentials
*J. M. Hanna, PhD—physiological anthropology
*D. A. Lally, PhD—exercise physiology
*Y. C. Lin, PhD—cardiovascular, hyperbaric physiology
*M. D. Rayner, PhD—neurophysiology
*D. O. Smith, PhD—molecular neurobiology
*R. M. Smith, PhD—free radical biology
R. K. Wada, MD—cell pathophysiology

Cooperating Graduate Faculty

S. Batkin, MD—physiology of the spinal cord
K. P. Jeraj, DVM—verterinary physiology
J. J. McNamara, MD—cardiopulmonary physiology
J. G. Starkus, PhD—axonology
F. L. Tabrah, MD—environmental physiology
*C. W. Weems, PhD—reproductive endocrinology

Affiliate Graduate Faculty

R. Brill, PhD—fish physiology
*G. H. Hartung, PhD—exercise physiology
S. E. McNeil, PhD—molecular physiology
J. Pegg, MD—diving medicine

Degrees Offered: MS in biomedical science (physiology), PhD in biomedical science (physiology)

The Academic Program

Physiology (PHYL) is the study of the function of animals, i.e., how they work. As part of the School of Medicine, the department places emphasis on human physiology in its teaching. However, research is conducted on animals as diverse as laboratory rats and tropical seabirds. Many of the department's courses are needed by students seeking health-related careers, such as dental hygiene, dentistry, medical technology, medicine, nursing, nutrition, physical therapy, public health, and the social sciences. Graduate students in physiology may elect to conduct research at the molecular or cellular level, on organs such as the lungs, or on the whole animal or person. There are special opportunities in the department for hyperbaric research. Higher degrees in physiology prepare students for teaching careers in universities, community colleges, and high schools, as well as for research careers at universities, government laboratories, and large pharmaceutical companies. Other students obtain positions in sports-training activities or in health and fitness programs in hospitals or private businesses.

Graduate Study

The PhD and MS Plan A programs require a combination of course work and original research, the latter forming the basis of the student's thesis or dissertation. Both degrees may serve as an introduction to a research career. The MS Plan B program is also offered.

Applicants must submit three letters of recommendation together with either GRE or MCAT scores. All applicants are expected to have adequate backgrounds in biology, chemistry, mathematics, molecular biology, physics. The course requirements of admitted students vary with their degree and specialization, but all candidates for the MS and PhD degrees must take a written qualifying examination.

Opportunities for research exist in the areas of hyperbaric and diving physiology; cardiovascular, respiratory, and environmental physiology; endocrinology; neurophysiology; physiological anthropology; and thermoregulation. In addition to laboratories in the Biomedical Sciences building, there are special facilities for research in endocrinology at Tripler Army Medical Center.

Master's Degree

The MS (Plan B) degree serves as training for teaching positions at the high school, community college, or four-year college level. It may also be a prelude to a medical or dental education. The MS concentration in exercise physiology provides adequate preparation for a career in sports medicine and training and in health and fitness programs in hospitals and private businesses.

Requirements

Candidates for the MS Plan B degree are required to pass a written qualifying examination and to prepare a written paper and give an oral presentation in addition to fulfilling course requirements (total of 30 credits). Candidates for the MS Plan A degree must submit an acceptable outline of their proposed thesis research, submit and defend a thesis, and fulfill all course requirements. The MS Plan A degree requires a combination of course work and original research, the latter forming the basis of the student's thesis. In addition to qualifying students for opportunities available to MS Plan B students, the MS Plan A may serve as an introduction to a research career.

Doctoral Degree

PhD graduates usually obtain postdoctoral positions elsewhere as further preparation for a career in teaching and research at the university level.

Requirements

PhD candidates must take a written qualifying examination and an oral comprehensive examination and submit an acceptable outline of their proposed dissertation research. They must also submit and defend their dissertation.

* Graduate Faculty

Psychiatry

University Tower, Queen's Medical Center, 4th Floor
1356 Lusitana Street
Honolulu, HI 96813
Tel: (808) 586-2900
Fax: (808) 586-2940

Faculty

N. Andrade, MD (Chair)—general adult psychiatry
I. Ahmed, MD (Program Director)—general adult and geriatric psychiatry; consult-liaison psychiatry
A. Austria, MD—general adult psychiatry
F. M. Baker, MD—general adult psychiatry
A. Buffenstein, MD—general adult psychiatry
B. Carlton, MD—adult, child, and adolescent psychiatry
A. Darmal, MD—adult, child and adolescent psychiatry
D. Elting, PhD—Director of Psycho-Social Rehabilitation
D. Friar, MD—general adult psychiatry
S. Ham, MD—general adult psychiatry
W. Haning, MD—general adult psychiatry, addictions psychiatry
A. Hawk, MD—general adult psychiatry
E. Hishinuma, MD—adult, child and adolescent psychiatry
M. Ikeda, MD—general adult psychiatry
K. Jones, MD—adult, child and adolescent psychiatry
H. Kim, MD—general adult psychiatry
S. P. Kim, MD—child and adolescent psychiatry
M. Komeya, MD—general adult psychiatry, geriatric psychiatry
L. Lettich, MD—general adult psychiatry, geriatric and addictions psychiatry
G. Makini, MD—child and adolescent psychiatry
L. Matsukawa, MD—general adult psychiatry
C. McGee Jr., MD—child and adolescent psychiatry
M. McGrath, MD—general adult psychiatry
R. Mesco, DO—child and adolescent psychiatry
L. Mulrooney, RN, MPH—AIDS education
L. Nahulu, MD—child and adolescent psychiatry
N. Partika, RN, MPH—AIDS education
R. Neeper, MD—child and adolescent psychiatry
V. Patrick, MD—general adult psychiatry
D. Ponce, MD—child and adolescent psychiatry
S. Rose, EdD—Associate Specialist
A. Serrano, MD—child and adolescent psychiatry
T. Shibata, MD—general adult psychiatry, forensic psychiatry
D. Smith, MD—general adult psychiatry, forensic psychiatry
J. Smolenski, MD—general adult psychiatry
R. Snead, MD—child and adolescent psychiatry
J. Streltzer, MD—general adult psychiatry, addictions psychiatry
J. Takeshita, MD—geriatric and consult-liaison psychiatry
W. S. Tseng, MD—general adult psychiatry
J. Waldron, PhD—child and adolescent psychiatry
A. Yates, MD—child and adolescent psychiatry
V. Yee, PhD—Associate Specialist
N. Yuen, MD—child and adolescent psychiatry

Degree Offered: MD

The Academic Program

Psychiatry (PSTY) is a branch of medicine that derives its theoretical foundations from the neurosciences, as well as the psychological and social sciences. The investigation of the biological basis of mental illness is one of the most exciting areas of medical research today and is revolutionizing our understanding of mind-body relationships.

The Department of Psychiatry contributes to the overall mission of the School of Medicine by providing leadership in psychiatric training, teaching, research, and services in Hawai'i, Asia, and the Pacific Basin. The department is committed to expanding knowledge within a cross-cultural and bio-psycho-social framework.

Traditional courses have been replaced with the problem-based learning curriculum. Psychiatric issues are addressed throughout the curriculum but are particularly emphasized in the second year during the brain and behavior sub-unit of Unit IV and in the third year during the Unit VI Psychiatry Clerkship.

Speech Pathology and Audiology

1410 Lower Campus Road
Honolulu, HI 96822
Tel: (808) 956-8279
Fax: (808) 956-5482

Faculty

*J. T. Yates, PhD (Chair)—audiology
*L. Boles, PhD—speech-language pathology
*C. Canady, PhD—speech-language pathology
*D. D. Craven, MA—speech-language pathology
E. Hirohata, MS—audiology
J. K. Oshiro, MS—speech-language pathology
B. Luterman, PhD—audiology
P. Seymour, PhD—speech-language pathology
R. Weirather, PhD—speech-language pathology
L. Weiss, PhD—speech-language pathology

Cooperating Graduate Faculty
A. Peters, PhD—linguistics
R. Stodden, PhD—special education

Adjunct Faculty
K. Campbell, MS—audiology
D. Kau, MS—audiology
C. Kikuta, MS—speech-language pathology
E. Lum, MS—speech-language pathology
L. Nakashima, MS—audiology
B. Ward, MS—speech-language pathology

Degrees Offered: BS in speech pathology and audiology, MS in speech pathology and audiology

The Academic Program

Speech pathology and audiology (SPA) are interrelated disciplines that deal with disorders of speech-language and/or hearing. Audiology is the study of human hearing and the diagnosis and treatment of hearing-related disorders. Speech-language pathology is the study of human communication and its developed or acquired disorders. Through these two disciplines students have the opportunity to deal with a wide variety of disabilities and disorders affecting people of all ages. Speech pathologists and audiologists treat children and adults in public and private practice in a wide variety of settings. A recent report by the federal government projected the combined fields of audiology and speech pathology as one of the fastest growing of the next decade.

The program for speech pathology and audiology at the University of Hawai'i is recognized nationally for its quality and is accredited in both areas. It is one of the few programs in the United States featuring preparation in a multilingual/multicultural environment.

Accreditation

The Division of Speech Pathology and Audiology is accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association in Speech Pathology and Audiology.

Advising

Students considering the major may call the Division of Speech Pathology and Audiology to schedule an appointment with an adviser.

* Graduate Faculty

Undergraduate Study

Bachelor's Degree

Students pursuing a BS degree in speech pathology and audiology should enroll in the Colleges of Arts and Sciences to complete Mānoa's General Education Core curriculum and other specific requirements during their first two years of residence. Upon completion of at least 54 credit hours with a minimum GPA of 2.6, the student should apply to the Division of Speech Pathology and Audiology, School of Medicine, by filing a College and Curriculum Transfer Request form. This form may be filed at any time except during registration periods. For students applying after completion of more than 54 credit hours, the minimum required GPA will be increased.

Students in any UH community college should obtain program outlines from the Division of Speech Pathology and Audiology to familiarize themselves with the pre-SPA requirements so they can complete them during their first two years.

Requirements

- A minimum of 124 credit hours
- 60 credit hours of non-introductory courses
- 15 credit hours in courses dealing with normal development of speech, hearing, and language
- 6 credit hours in linguistics (including LING 410 and 470)
- 3 credit hours in mathematics
- 4 credit hours in zoology
- 4 credit hours in physics
- 3 credit hours in inferential statistics
- At least one speech course dealing primarily with public speaking or discussion and practice in these areas
- 9 credit hours in psychology beyond the basic course

Required specialized courses for the undergraduate major are ordinarily taken in sequence. By taking introductory courses in the summer session, the student may accelerate completion of the required program.

Junior Year

- Semester I: SPA 300, 301, and 320
- Semester II: SPA 302, 303, and 321

Senior Year

- Semester I: SPA 402, SPA 404, SPA 412
- Semester II: SPA 414, SPA 415, and SPA 421

If qualified, students may complete 1 or more credit hours of practicum in audiology.

Graduate Study

Master's Degree

The department offers the MS degree in speech pathology and audiology, with a specialization in either speech-language pathology or audiology, or a dual concentration of these professional disciplines. Candidates for the MS degree must present a minimum of 30 undergraduate credit hours in the area of study. Background preparation should include basic courses in speech-language pathology, clinical methodology, audiology, testing of hearing, habilitation and rehabilitation of hearing, speech and hearing science, clinical practicum, and a minimum of 15 credit hours relating to normal development of speech, hearing and language. If a course in statistics is not part of the undergraduate record, one must be completed as part of the graduate program.

For admission as a regular classified graduate student, applicants must present (a) a baccalaureate degree from an accredited institution of higher learning, (b) a minimum GPA of 3.0 in the major and/or in all courses taken during the final four semesters or six quarters of undergraduate preparation, (c) adequate, appropriate undergraduate preparation, and (d) satisfactory performance on Graduate Record Exam.

If undergraduate deficiencies are present, students with a minimum cumulative GPA of 3.0 may be considered for admission as conditional graduate students upon application to the Graduate Division. This status can be changed to regular when all deficiencies are removed with at least a B average in all courses taken. Students with the best academic records and with limited or no undergraduate deficiencies will be considered for admission first.

Students who do not meet the general admission requirements or who have extensive undergraduate deficiencies may also choose to enroll as post-baccalaureate unclassified students until admission standards are met. Foreign students are not eligible for post-baccalaureate unclassified status. If an unclassified student completes the first 12 credit hours in SPA with a GPA of less than 3.0, no further registration will be permitted.

Each student will have a preliminary conference with an adviser prior to initial enrollment in courses. This evaluation will include a thorough analysis of previous academic preparation to determine the plan of study, including the removal of undergraduate deficiencies if they exist. Recommendations concerning admission to candidacy for fully qualified students will be made at the end of the first semester of study. The student's adviser will determine action to be taken in this regard. A general examination may be required upon completion of the first semester of study (minimum 12 credit hours).

Requirements

Both Plan A (thesis) and Plan B (non-thesis) are available for graduate study. The plan to be followed is determined by the student and his or her advisory committee. The decision is based upon the specific interests of the individual student and future educational and occupational objectives.

Under Plan A, 38 credit hours in course work, a thesis (SPA 700—6 credit hours), and a final oral examination on the thesis subject are required. Plan B requires satisfactory completion of 44 credit hours of course work, including SPA 695 or 696 in which a research study is completed. A seminar appearance is also required for Plan B. For both Plan A and Plan B, a final written comprehensive examination in which the student will be examined on his or her course of study is required.

The median time required for completion of this program by an individual admitted with no undergraduate deficiencies is two years.

Continued enrollment and completion of the master's program require both satisfactory academic progress to maintain minimum Graduate Division GPA standards and demonstrated clinical proficiency in clinical practicum in speech-language pathology and audiology.

Each classified and unclassified graduate student is personally responsible for knowing any additional information and regulations contained in the *Catalog* and the informational circular available through the Division of Speech Pathology and Audiology. If questions arise, the student's adviser should be consulted.

These programs are designed so that students who complete either Plan A or

Plan B will meet the academic requirements for the Certificate of Clinical Competence in speech-language pathology, audiology, or both, as established by the American Speech-Language-Hearing Association (the national certifying authority). Students must complete all academic and practical training requirements for national certification, as well as departmental requirements, to qualify for the master's degree. Following graduation, students may qualify for national certification by taking and passing an examination in their area(s) and successfully completing a nine-month clinical fellowship in their area(s) of training. Upon certification (and, in most states, licensure), an individual may secure employment and/or engage in private practice in his or her area(s) of training.

Admission to courses requires graduate standing, except for certain senior students in their last semester of undergraduate study, and permission of the graduate chair. All graduate courses in the division require instructor's consent.

The Speech and Hearing Clinic is operated by the Division of Speech Pathology and Audiology of the John A. Burns School of Medicine. Staff members and supervised student clinicians provide diagnostic and therapeutic services without charge to children, University students, and other members of the community.

Surgery

University Tower, Queen's Medical Center
1356 Lusitana Street, 6th Floor
Honolulu, HI 96813
Tel: (808) 586-2920
Fax: (808) 536-1140

Faculty

J. J. McNamara, MD (Chair)—cardiovascular and thoracic surgery
A. H. S. Cheung, MD—transplant surgery
M. B. Ghows, MD—anesthesiology
P. Halford, MD—general surgery
T. J. Kane III, MD—orthopaedic surgery
W. M. L. Limm, MD—transplant surgery
S. Lozanoff, MD—general surgery
J. Machi, PhD—craniofacial biology
G. O. McPheeters, MD—general surgery
M. M. Mugiishi, MD—general surgery
R. H. Oishi, MD—general surgery
F. D. Parsa, MD—plastic surgery
E. C. Pohlson, MD—pediatric surgery
A. B. Richardson, MD—orthopaedic surgery
J. H. Wong, MD—surgical oncology
L. L. Wong, MD—transplant surgery
L. M. F. Wong, MD—transplant surgery
M. Yu, MD—surgical intensive care

The Academic Program

Surgery (SURG) is the branch of medicine that deals with the use of manual or instrumental operations to treat disease, injury, or deformity.

The department provides instruction and training to medical students and residents in surgery and the subspecialties and involves research, etiology, diagnosis, pre- and post-operative care, and surgical techniques. It directs surgical and orthopaedic residency programs, as well as a surgical intensive-care fellowship program. It conducts and participates in continuing medical education programs for physicians and other health professionals. The program utilizes a large and varied faculty of general and specialty surgeons, as well as numerous local hospitals, giving students ample exposure to surgical disease and therapy.

Tropical Medicine and Medical Microbiology

Lē'ahi Hospital
3675 Kīlauea Avenue, 3rd Floor
Honolulu, HI 96816
Tel: (808) 732-1477
Fax: (808) 732-1483
E-mail: sandrac@hawaii.edu
Web: medworld.biomed.hawaii.edu/tropmed/Tropmed1.htm

Faculty

*K. Yamaga, PhD (Interim Chair)—immunological mechanisms of diseases
*S. P. Chang, PhD—immunology, molecular biology, molecular approaches to vaccine development
*A. R. Diwan, PhD—medical virology: chemotherapy, vaccines
*G. S. N. Hui, PhD—parasitology, immunology, cell biology
K. J. Kramer, PhD—parasitology, epidemiology, leptospirosis, HIV serodiagnosis
*L. Tam, PhD—malaria and pox antigens, HIV serodiagnosis

Cooperating Graduate Faculty

R. D. Allen, PhD—ultrastructure and cell biology
M. E. Melish, MD—staphylococcal infection and toxins, clinical infectious disease, Kawasaki syndrome
F. D. Pien, MD—clinical microbiology, diagnostic bacteriology and parasitology, efficacy of antimicrobial agents
R. C. Rudoy, MD—clinical aspects of viral and bacterial diseases

* Graduate Faculty

Degrees Offered: MS in biomedical science (tropical medicine), PhD in biomedical science (tropical medicine)

The Academic Program

Tropical medicine (TRMD) is the study of diseases that occur in the tropics. These are essentially the same diseases, with a few exceptions, that occur in other regions of the world. Some may be more common in the tropics than elsewhere; hence, they are referred to as "tropical diseases." The Department of Tropical Medicine and Medical Microbiology is devoted to the study of infectious diseases, with emphasis on those that occur in Hawai'i and other tropical regions, especially Southeast Asia and the Pacific Basin. Epidemiological and ecological investigations of specific diseases are conducted at least partially in the field. Studies on the infectious organisms themselves (culture, characterization, and molecular biology) and the diseases they cause (immunology, pathogenesis, diagnosis, prevention, and treatment) are mostly laboratory-based. An important aspect of the department's research effort is the development of vaccines for the prevention of important tropical diseases (e.g., malaria).

The department is loosely arranged around four subdisciplines of medical microbiology: bacteriology, immunology, parasitology, and virology. However, there is a great deal of interaction and collaboration among the subdisciplines. Graduate students in tropical medicine may specialize in one of these fields, but all are expected to develop a basic knowledge of all aspects of infectious disease microbiology. The program offers students the opportunity to acquire a variety of experiences in a wide range of biological sciences (cell biology, biochemistry, epidemiology, molecular biology, biostatistics, etc.), as well as in their specific field of interest, along with vigorous training in scientific methodology. Such a program provides students with the background to take advantage of numerous professional options in the

biological sciences. In this respect, the tropical medicine program provides learning opportunities in a range of biological disciplines available in few university departments.

Graduate Study

The department offers programs leading to the MS Plan A, MS Plan B, and PhD in tropical medicine, within the broader field of biomedical sciences, in the following areas of specialization: medical bacteriology, immunology, parasitology, and virology. The general purpose of the program is to prepare students for creative leadership in the field of tropical medicine.

Applicants to the program must meet established Graduate Division requirements and have a baccalaureate degree in biology or related fields. Other majors may be acceptable if applicants have sufficient strength in biological science courses. Candidates are expected to have completed one and a half years of course work in life sciences, including microbiology; two years in chemistry, including organic and biochemistry; one year in physics; and one year in mathematics, including calculus. Exceptional students who do not meet all the above requirements may be accepted on a probational basis at the discretion of the graduate committee of the department and the Graduate Division. Admission to candidacy for a graduate degree is contingent upon the applicant's satisfactorily completing the necessary courses to correct any deficiencies. Official scores of the GRE General Test and the subject test (biology) and two letters of recommendation are required of all applicants.

The MS and PhD degrees are recognized Western Intercollegiate Commission for Higher Education (WICHE) regional graduate programs. Residents of Alaska, Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, Utah, Washington, and Wyoming are eligible, upon admission, to enroll at resident tuition rates.

Master's Degree

Graduates with a master's degree have generally gone on to further graduate study in other departments or universities.

Requirements

A minimum of 30 credit hours is required for master's Plan A and Plan B. For Plan A, students must complete 9 credit hours of thesis research and 21 credit hours in courses numbered 600–699. For Plan B, students must complete a minimum of 30 credit hours in courses numbered 600–699. A general examination, oral or written, is required before a student is advanced to candidacy for the MS degree. The final oral (Plan A) or oral and written (Plan B) examination, is given at least three weeks before the end of the term during which the degree is conferred. The student will be required to demonstrate a basic knowledge of the various fields of tropical medicine.

Doctoral Degree

Graduates with a PhD degree often fill teaching and research positions at various universities, research institutions, and industries.

Requirements

There are no course credit requirements for the doctoral degree. Nonetheless, candidates may be advised or required to enroll in courses if, in the opinion of their advisory committee, these courses are essential to preparation for the examinations required of all candidates. A reading knowledge of a foreign language considered by the department graduate committee to be pertinent to the student's area of interest is recommended but not required of a PhD candidate. Requirements consist of qualifying, comprehensive, and final examinations and a written dissertation. The purpose of a qualifying examination is to determine whether to encourage a student to proceed in a doctoral program and to assist the student in planning a program of study. Through a comprehensive examination the student must satisfactorily demonstrate to the members of the examination committee that he or she has a broad knowledge and basic understanding of tropical medicine in general and of the chosen minor fields. A final examination in defense of the dissertation is required of all PhD candidates.