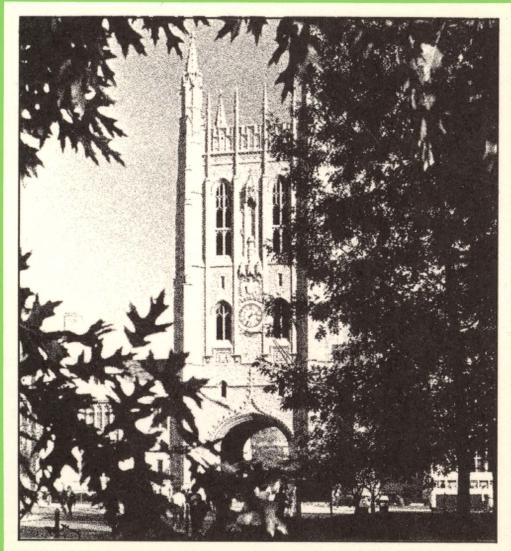


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University of Missouri-Columbia

Profile



**Medicine &
Health-Related Professions**

Profile 1980-81

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University of Missouri-Columbia Profile (USPS 651-820)

Volume 81 Number 11 May 30, 1980 General 1980 Series Number 11
Published by the UMC Publications Office, 311 South Fifth Street, Columbia, Missouri 65211.
Issued monthly as follows: three times in March and April; twice in January, February, June,
July, August, September, October and November; once in May and December. Second-class
postage paid at Columbia, Missouri.





UMC Trains Health Professionals for State & Nation

To Present and Future Physicians:

Health is the most prized of all human possessions. Without it the ability to enjoy other aspects of life is dimmed or destroyed. Those who enter the health professions have a sacred trust to do all within their power to restore their fellow man to good health and a useful role in society. This must often be accomplished at great cost to the professional person in terms of time and energy, and is rendered without regard to his personal likes or dislikes.

The responsibility of the University of Missouri-Columbia School of Medicine is to assist in the provision of health care for Missouri through the education of candidates for the health profession. The entire organization of the hospital and ancillary programs has as its focus care for Missourians and the educational process.

There is a growing national concern about the need for well prepared men and women in the health professions and the University of Missouri-Columbia is dedicated to the resolution of its share of this problem. Candidates of moral integrity and willingness to work, who are well suited for any post-collegiate academic work, need not hesitate to apply for admission to medical school. While academic competence is necessary, high motivation is also of great importance.

Lack of funds should not be a deterrent. Loan funds and scholarships are available for students with significant needs. No student, in recent years, has left medical school for financial reasons. Qualified candidates should apply for admission and seek information about financial assistance.

We hope you find this *Profile* of interest and will feel free to call or write our office for the additional information we have been unable to include.

A handwritten signature in cursive script that reads "Charles C. Lobeck". The signature is written in dark ink and is positioned above the printed name and title.

Charles C. Lobeck, M.D.
Dean, School of Medicine

General Information

The University of Missouri is one university with four campuses—Columbia, Kansas City, Rolla and St. Louis. Established in 1839 at Columbia (the oldest and largest of the four campuses), the University is recognized as the first state university west of the Mississippi River and was designated a land-grant university in 1870. In addition to its traditionally assigned tasks of teaching and research within the campus settings, the University has extended its educational benefits to all sections of the state of Missouri.

The University is governed by the Board of Curators. The president of the University and his staff coordinate programs of all four campuses. The chancellors are the chief academic and administrative officers for their respective campuses.

Medical education offered by the University of Missouri began in 1841 with the establishment of a medical school affiliated with Kemper College in St. Louis. This was the first state medical school west of the Mississippi River. The affiliation continued until 1855.

In December 1872 the Board of Curators approved the founding of a School of Medicine in Columbia and classes began in February, 1873. For most of its first century, the School offered a basic science program only and students transferred to other schools for their clinical years.

The present educational program dates from 1956 which marked the opening of the University of Missouri-Columbia health sciences complex, composed of a teaching hospital, outpatient clinics, facilities of the School of Medicine and School of Nursing, and research laboratories where faculty and students work together on projects. At that time the curriculum of the School of Medicine was expanded to the full four-year program, and medical education at UMC moved into a new phase.

Since then, the Health Sciences Center has been characterized by consistent growth, not only in greatly expanded facilities but also in depth. The best teachers, the most qualified students, the most skilled and enthusiastic hospital personnel have been sought. Patient care and teaching programs have been continually expanded and enhanced.

One hundred and ten medical students are admitted to the entering class. There are approximately 450 undergraduate and graduate nursing students, and nearly 600 students are enrolled in the health-related professional programs.

Residency training is offered in 21 medical specialties, and numerous programs are offered in continuing education for practicing physicians.

Location of the School of Medicine on the Columbia campus of the University makes numerous interdisciplinary programs possible. There are 17 schools and colleges on campus; approximately 1,700 undergraduates from other departments attend health-related classes at the Health Sciences Center. Graduate programs are offered in anatomy, biochemistry, microbiology, pathology, pharmacology, physiology, community health education, community medicine, and health services management; and graduate students in social work, speech pathology, medical psychology, nutrition, and special education take part of their clinical training at the Health Sciences Center.

Facilities

Three multimillion dollar additions to the original Medical Center were completed within the first thirteen years of its existence, primarily adding more classroom and laboratory space for medical students. The newest five-floor addition, completed in 1969, includes multidisciplinary laboratories—each laboratory accommodates 16 medical students—where first- and second-year students find valuable small group instruction and integrated interdepartmental educational programs. Within the laboratory, a personal office and laboratory area are available to each student 24 hours a day. The study-stations have their own separate instructional systems including audio tape, video tape, slides, closed circuit television receiver and facilities for computer-assisted instruction.

A half-million dollar extension to the outpatient clinic facilities was completed in 1978, and in 1979 renovation was undertaken to enlarge and modernize several patient areas of University Hospital, including the neonatal intensive care unit and the thoracic intensive care unit.

Two other hospitals and a rehabilitation center on sites adjoining University Hospital and Clinics provide additional educational experience for students and residents.

The 87-bed Mid-Missouri Mental Health Center for intensive treatment of mental diseases opened in 1967.

In 1968 the Rehabilitation Center accepted its first patients, transferred from University Hospital. A million dollar expansion program was completed in 1974 when the facility was named the Howard A. Rusk Rehabilitation Center to honor the Missouri graduate and leader in rehabilitation medicine.

The Harry S. Truman Memorial Veterans Medical Center admitted its first patients in April 1972. This hospital, connected to University Hospital by underground passageway, has become an integral part of our patient care, education and research activities.

In all clinical facilities of the Health Sciences complex, teaching and training programs are under the direction of the School of Medicine. More than 1,000 beds are available in the immediate area.

Health Sciences Center Services & Functions

The Health Sciences Center serves as a consulting center for physicians throughout Missouri, thus assuring a broad spectrum of cases.

While many of the patients are referred by their family physicians and participate in the teaching program, the University Hospital and Clinics also accept patients on referral by other health agencies and by direct request of the patients themselves.



Abundant referrals permit selectivity of teaching cases while using facilities to the fullest. During the past year, hospital admissions totaled more than 14,000 with outpatient clinics and emergency room visits an additional 147,000. More than 1,200 births were recorded, and nearly 6,000 major surgical procedures were performed.

The only Burn Unit between St. Louis and Kansas City, a federally supported Clinical Research Center, a Developmental Evaluation Center for children, a Birth Defects Center, a midwest regional Spinal Cord Injury Treatment Center, an Arthritis Center, and a Family Medical Care Clinic are all located within the Health Sciences Center complex. Headquarters for the Missouri State Crippled Children's Service is located in Columbia.

Nearly 14,000 patient admissions were recorded in the Clinical Research Center during its first 13 years (through 1979); 6,746 out-patient visits between 1975-79. The Center has been approved for continued funding and expansion of its activities. Patients have participated in such diverse projects as studies of effects of trace metals on vascular disease, metabolic effects of various chemotherapeutic programs on the molecular biology of tumors, metabolic effects resulting from bowel bypass procedures for obesity, relations of the renin-angiotensin-aldosterone system to human hypertension, and many other studies. Currently receiving international attention is a peritoneal dialysis program for patients with kidney disease that allows them to be ambulatory rather than attached to a hemodialysis machine.

The Spinal Cord Injury Treatment Center is one of 14 in the nation that is federally funded. The Arthritis Center, using a team approach to patient care by physicians from several specialties, has the potential of attracting patients from all over the Midwest. A Mid-America Bone Diagnostic Center and Registry directed by the Department of Radiology—one of three such centers in the United States—is located here. It aids referring physicians around the world.

Members of the School of Medicine faculty often join others on campus in research projects of mutual interest. These may involve nutritionists, agriculture experts, veterinarians, or sociologists, for example.

Medical faculty members also participate in projects of the Dalton Research Center, and members of that staff are actively engaged in the teaching program at the Health

Sciences Center. A Microcirculatory Systems Research Group there recently has acquired laboratory equipment unique in the world and promises to become the focus of international attention. Another related activity is research at the University's 10-megawatt nuclear reactor center, with laboratories for health-related studies.

Affiliations

Medical students receive part of their training at the adjacent Mid-Missouri Mental Health Center and the Veterans Administration hospital, since teaching programs in both are under the direction of the School of Medicine.

Several other health institutions in the state further enhance the medical teaching program, each selected for its particular nature.

Present affiliations include Ellis Fischel State Cancer Hospital and Woodhaven Home in Columbia; Audrain Medical Center in Mexico, Mo.; St. John's Mercy, Deaconess, and Missouri Baptist hospitals in St. Louis; and Missouri Chest Hospital in Mount Vernon.

Medical Library

The Medical Library, located in the wing which joins the University Hospital with the Medical Sciences building, has a collection of more than 120,000 volumes and regularly receives about 1,800 journals and most of the indexes and abstracts pertaining to medicine and related fields. It provides for the library needs of the entire Health Sciences Center including the School of Medicine, School of Nursing, School of Health-Related Professions, and the graduate and undergraduate programs in the medical sciences. MedLine and other data-bank searching is available.

The open stack library is available to the entire UMC community. It is part of the UMC Library system which consists of Ellis Library and eight subject-specialty libraries. Medical students, graduate students and residents have full access to all library facilities on campus. Material that is not available locally will be secured through interlibrary loan.

A fund-raising campaign is currently under way for construction of a new Health Sciences Learning Center, an enlarged facility to serve as a library/learning center for all the health sciences. Both private and state funds are being sought for the \$4.6 million project.

School of Medicine

Admission

Persons contemplating a career in medicine should establish a sound foundation in the natural sciences, the social sciences, and the humanities and should demonstrate facility in writing and speaking the English language. The School of Medicine strongly recommends a broad liberal arts program leading to a baccalaureate degree.

Requirements for Admission

An applicant must have at least 90 semester hours (exclusive of physical education and military science) from a recognized college or university. The following course work is required:

	Semesters
General biology or zoology (with lab)	1
Other biology (with lab)—may include comparative anatomy, embryology, genetics, or others	2
Inorganic chemistry (with lab)	2
Organic chemistry (with lab)	2
General physics (with lab)	2
Mathematics—algebra, calculus, statistics, or trigonometry	2
English composition and literature	2

Courses which overlap medical school course work should be avoided unless these courses are an integral part of the applicant's undergraduate program.

The new Medical College Admission Test is required. Applications and requests for

To introduce high school minority students to medicine and science-related fields, the School of Medicine offers several summer scholarships for research.

information about this test should be sent to MCAT Registration, American College Testing Program, P.O. Box 414, Iowa City, Iowa 52240.

Every applicant must submit a letter of recommendation from his/her premedical advisory committee. Where no premedical advisory system exists, the applicant must submit letters of recommendation from three

professors who have known the applicant. Nonacademic and personal letters of reference also are helpful to the Admissions Committee. Letters of recommendation should be mailed directly to the Director of Admission.

A personal interview is required for admission.

The Application Process

Two publications provide material helpful to medical school applicants, this *Profile*, which is available from the Admissions Office, School of Medicine, M228 Medical Sciences Bldg., Columbia, Mo. 65212, and the *Medical School Admission Requirements*, which is available from the Association of American Medical Colleges, 1 Dupont Circle N.W., Washington, D.C. 20036.

The School of Medicine uses the centralized application service, American Medical College Application Services (AMCAS), 1776 Massachusetts Avenue N.W., Washington, D.C. 20036. Applicants should request an AMCAS application request card and a current *School of Medicine Profile* from the Admissions Office. Application may be made through AMCAS after July 1, but not later than November 15, for the following academic year.

The Committee on Admissions, composed of faculty members and medical students, each year selects an entering class of 110 students. Preference will be given to Missouri residents; a very limited number of positions are available for non-residents. Based on the AMCAS application and letters of recommendation, approximately 70 percent of applicants are invited for interview. Both academic qualifications and nonacademic attributes are important in the selection process. A successful applicant usually has a grade point average above 3.35 ($A = 4.0$). The new MCAT scores provide some indication of an applicant's aptitude for medical studies. The Committee on Admissions also seeks to assess such attributes as motivation, maturity and leadership ability. Demographic factors also are considered. The entering class typically shows a wide range of undergraduate fields of concentration.

The School of Medicine participates in the AMCAS Early Decision Plan (EDP). This plan permits an applicant to file a single application, prior to August 15, and guarantees that the applicant will receive an early decision, prior to October 1, by that

Admissions Office, School of
Medicine, M-220A, 882-2923
Office of Student Affairs,
M-222, 882-2923
Financial Aids, 11 Jesse Hall,
882-7506
Cashier's Office, 123 Jesse Hall,
882-3095
Housing Information, 123 Jesse
Hall, 882-4031

school. As EDP applicants are interviewed, the Committee on Admissions places each applicant in one of three categories: accept, hold status or reject. Any applicant not accepted as an early-decision candidate may be reconsidered by other schools as a regular candidate.

It is important to understand that applicants who opt for early decision may not apply to any other U.S. medical school during the time their credentials are being considered for early decision. If admitted to an early-decision school, the applicant must then attend that school.

Special Programs for Nontraditional Students

A number of racial and socioeconomic groups are currently underrepresented in the medical profession. Applications from these nontraditional students are reviewed carefully. Such students are encouraged to review the chapter, "Information for Minority Group Students" in *Medical School Admission Requirements*. Such students also may wish to submit their names to the Association of American Medical Colleges Medical Minority Registry (MED-MAR) and review the fee waiver offered by AMCAS.

The Committee on Admissions seeks to identify minority, disadvantaged and other nontraditional applicants. Disadvantaged students may attend a prematriculation academic enrichment program. Some students are offered the option to decelerate to a five-year program.

Advanced Standing

Each year, a limited number of candidates are admitted with advanced standing into the second or third year of the medical

curriculum. Applicants for advanced standing have completed one or two years of premedical coursework in one of three settings: a U.S. medical school, a U.S. graduate school, or a foreign medical school. The Medical Science Knowledge Profile is required.

Application is made directly to the Admissions Office. The dates and selection factors already described pertain to candidates for advanced standing.

Fees & Expenses

The University reserves the right to change the fees at any time. UMC attempts to keep required fees at a minimum. The following schedule lists the fees and estimated expenses of an unmarried student.

First Year (Aug.-May)

Tuition	\$2,604
Includes UMC incidental fee, medical school supplemental fee and student activities fee.	
Supplies, Books, Instruments	790
Living Expenses	3,780
Includes (off-campus) rent and utilities, food, transportation, clothing and personal items, laundry, insurance and recreation.	
Total Estimated Fees & Expenses	\$7,174

Second Year (Aug.-May)

Tuition	\$2,604
Supplies, Books, Instruments	480
Living Expenses	3,780
Total Estimated Fees & Expenses	\$6,864

Third Year (June-May)

Tuition	\$2,930
Supplies, Books, Instruments	360
Living Expenses	5,350
Total Estimated Fees & Expenses	\$8,640

Fourth Year (June-May)

Tuition	\$2,910
Supplies, Books, Instruments	110
Living Expenses	5,870
Includes travel expenses for interviewing	
Total Estimated Fees & Expenses	\$8,890

Detailed information on fees and expenses, including supplemental fees, is furnished in the *Schedule of Courses*.

Refund of Academic Fees. Subject to certain exceptions and upon receipt of a written request to the Manager of Cashiering, students leaving school or dropping courses for which they have paid fees will receive a refund of fees. Fee refunds are paid in accordance with the following schedule:

Time of Withdrawal	Percent Refunded
16-Week Semester	
Before day classwork begins	100% (less \$10 cost of handling registration)
Within two calendar weeks from day classwork begins	70%

After two calendar weeks and up to and including six calendar weeks	50%
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8-Week Summer Session

Before day classwork begins	100% (less \$10 for cost of handling registration)
Within one calendar week from day classwork begins	70%
After one calendar week and up to and including three calendar weeks	50%
After three calendar weeks	No refund

Refund of Housing Fees. University room and board charges and the contract deposit are refunded in accordance with the terms of the contract.

Financial Assistance

The School of Medicine has a financial aid program to supplement various federal loan programs. Approximately 60 percent of the student body receive aid from this program. The applicant's financial status plays no part in the admissions process. In recent years, no one who has been accepted to medical school has discontinued medical studies due to financial need.

Loan Funds

Federal Insured Student Loan (FISL) and Missouri Guaranteed Student Loan (MGSL). These are special bank loans, generally through the University or the student's or parents' bank, in which the Federal Government pays the interest until graduation. Financial aid applicants, in general, must seek such aid before other aid is granted.

Robert Wood Johnson Fund. Limited funds are available for those women, ethnic minorities, and persons from rural backgrounds who have financial need.

M. Pinson Neal Loan Fund. Established by the Medical School Foundation.

Health Professions Student Loan Fund. Under this program federal money is provided to the University to aid deserving students in meeting educational costs. The loans are based on financial need and are repayable, at low interest, within ten years after completion of internship and residency. Special provisions for loan forgiveness exist for physicians who practice in underserved areas.

Missouri State Medical Foundation. A loan fund established in 1961 and supported by the Missouri State Medical Association is available to Missouri residents.

University of Missouri Medical School Foundation. A perpetual non-profit corporation whose purpose is to promote and further medical education in Missouri.

George William Gay Memorial Fund. A loan fund available to Missouri residents, particularly from south-east Missouri.

Greene County Medical Society Loan Fund. A loan fund supported by the Greene County Medical Society; preference to residents of Greene County.

Raymond A. McCaase Memorial Fund. provides short-term loans without interest.

Other emergency loan funds, including one sponsored by *Mutation* (the student yearbook), are available.

AMA Loan Program. The American Medical Association has established a loan program to provide financial assistance to students whose grades in the first semester of medical study are satisfactory. As much as \$2,500 may be borrowed annually, with a limit of \$15,000 for a period of seven years. The loans are repayable with interest, after the medical training is completed. The interest charges prior to repayment may be waived in some instances for minority students.

Applicants for financial aid are made to the Dean's Office, Student Affairs, School of Medicine.

Scholarships

Health Professions Scholarship Funds. Funds are available from the federal government to aid "students of exceptional financial need" in completing their medical education. In general, eligibility involves parental or student (if no longer parents' dependent) net federal taxable incomes of less than \$10,000 per year. Scholarships are available only to students who have received Health Professions Loans in previous years.

Federal Armed Forces Medical Scholarships. Accepted or enrolled medical students are eligible to apply for these scholarships through application to the Surgeon General of the Army, Navy or Air Force. Students accepted into the program receive military junior officers' pay plus reimbursement for all medical school educational costs. For each year medical students participate in the program they must commit one year to the appropriate military service.

The Department of Medicine offers summer scholarships to accepted pre-med and first year students who work on departmental research projects.

Public Health Service Scholarships. Scholarships similar to those for the Armed Services are available based on contractual arrangements to serve in the Public Health Service, including the National Health Service Corps.

Curators' Scholarships. Two accepted applicants (who are Missouri residents) of unusual promise as medical students and physicians are selected to receive a waiver-of-fees equal to the incidental fee and the supplemental fee for the first two semesters.

Joseph Collins Foundation. A limited number of national scholarships are awarded each year. Each school may submit a nominee for the award which provides a maximum of \$1,500 yearly.

National Medical Fellowships. Minority students often obtain support for their early years in medical school.

New York Life Medical Scholars. Two \$1,500 scholarships are given each year to incoming freshmen medical students, on the basis of need.

Southern Medical Association Scholarships. Two first-year students are selected each year to be recipients of this scholarship in the amount of \$375. Recipients are selected on the basis of excellence in scholarship.

Elmer C. Peper Scholarships. Approximately ten first-year students are selected to receive this scholarship in the amount of tuition and fees. Recipients are selected on the basis of financial need.

Awards

Women's Auxiliary to the Boone County Medical Society. Two cash awards are made annually to one outstanding second- and one fourth-year medical student.

Russell D. Sheldon Award in Anesthesiology. One or two awards are made annually to students who have demonstrated outstanding achievement in anesthesiology service.

Anatomy Department Award. An award presented annually to the outstanding student in anatomy.

Medical Biochemistry Award. A book award is presented each year to a first-year student who has done outstanding work in medical biochemistry.

Pharmacology Honors Award. An award is made annually to the second-year student who has done outstanding work in pharmacology.

Physiology Award. A three-year subscription to the *New England Journal of Medicine* is awarded each year to the first-year student who has done outstanding work in physiology.

Microbiology Award. A book award is presented annually to the outstanding student in microbiology.

Dean's Award. An annual award made to the fourth-year student for outstanding achievement in academic and clinical proficiency.

Missouri State Medical Association Award. An award of \$100 and a scroll are given to an outstanding medical student in each graduating class.

Student Leadership Award. An annual award for student leadership is given each year at graduation. The recipient is selected by his/her classmates.

Robert L. Jackson Award. An award is made each year to a graduating student who is demonstrated outstanding performance in pediatrics.

Family Practice Award. One or two awards are made to graduating students each year for outstanding performance in family practice.

Internal Medicine Award. A graduating senior is recognized each year for outstanding performance in internal medicine.

Obstetrics/Gynecology Award. An award is made annually to a senior student who has achieved outstanding work in obstetrics/gynecology.

Radiology Department Award. An award is made annually to a senior student who has done outstanding work in radiology.

Surgery Department Award. One or two awards are presented annually to a graduating student for outstanding achievement in surgery.

Elfriede Tachman Memorial Award. An award is made each year to a graduating senior who has demonstrated exceptional qualities of responsibility and devotion in the compassionate care and understanding of the sick.

Psychiatry Award. An award is presented each year to a fourth-year student for outstanding work in the field of psychiatry.



Student Groups & Projects

The Student Affairs Council functions as an advisory group to the Dean on policy matters involving students and student-faculty interrelations. The SAC membership includes class presidents, the AMSA president, representatives of other student organizations, and specifically designated SAC representatives elected by each class. The president of SAC is elected by school-wide ballot. Invited faculty members serve as consultants.

The local chapter of the American Medical Student Association (AMSA) sponsors a variety of medical, social and cultural events; seminars, intramural athletics and faculty home visits are among AMSA activities.

A junior chapter of the American Medical Women's Association was chartered at UMC in 1974 to increase awareness of issues facing women in medicine and to provide encouragement and advisement for female students. Programs on humanistic issues are regularly offered.

An Honor Council composed of elected representatives of each class administers the honor code. This code, written by the student body during the early 1960s, was revised in 1970 and again in 1976.

The yearbook *MU*tation is produced annually by a student staff.

Student Fellowships

A limited number of fellowships are made available by grants from the National Institutes of Health, voluntary health agencies and other groups to encourage research which contributes to the student's training and development as a physician.

Each year several first- and second-year students are invited to spend a fellowship year in one of the preclinical departments, working closely with a faculty member and participating in activities of the department. Similarly, during the clinical years, students frequently accept departmental fellowships during their free blocks.

Student Research Day

As a means of recognizing student research projects of unusual excellence, a Biomedical Student Research Symposium is an annual part of medical school activities.

Medical students and others in the biomedical sciences present brief reports of

their research before assembled faculty and students and defend their presentations in the discussion which follows. Those individuals considered to have presented the best papers subsequently represent the University at national research forums. In recent years, several Missouri students have won national recognition at these scientific meetings.

Alpha Omega Alpha

In 1957, a chapter of Alpha Omega Alpha, the national honorary medical society, was established at the UMC School of Medicine. The society is composed of faculty, house staff and students; this honor is awarded to outstanding junior and senior medical students.

As a means of recognizing and promoting academic excellence, the Society sponsors the annual AOA lecture, presentations on leaders in medicine, and seminars on current issues in medicine.

Medical School Curriculum

The goal of the educational program is to help the medical student acquire a basic fund of knowledge, to learn those skills and attitudes essential in all physicians, and to encourage an inquiring mind.

The faculty places high priority on giving students a great deal of responsibility for their own educational progress. The curriculum offers flexibility in terms of combined-degree programs (see below), course projects, and the sequence of clinical clerkships. The faculty further has recognized the value of small group instruction and an integrated interdepartmental educational program.

At the end of the second year, each student is involved in selecting a sequence of clinical rotations for the third and fourth years. Major emphasis is on freedom for students to vary their curriculum, recognizing the variance in learning styles, previous educational experience and future goals.

Research and the scientific experiment have become an integral part of the teaching techniques of the medical school since it is essential that the well-prepared physician must not only be acquainted with current medical knowledge but also must have the capacity to accept and synthesize a vast complex of new information as it becomes

available. Most students use free blocks for further clinical and research experience.

The four-year curriculum is as follows:

First Year	Contact Hours
First Semester Aug.-Dec.	
Gross Anatomy; Embryology	180
Biochemistry	210
Social and Behavioral Science	45
Perspectives in Medicine (not required)	<u>(30)</u>
	435

Second Semester Jan.-May	
Histology; Neuroanatomy	240
Physiology	180
Social and Behavioral Science	30
Introduction to Clinical Medicine	<u>15</u>
	465

Second Year

First Semester Aug.-Dec.	
Microbiology	180
Pathology	180
Introduction to Clinical Medicine	75
Social and Behavioral Science	<u>15</u>
	450

Second Semester Jan.-May	
Pathology	180
Pharmacology	135
Introduction to Clinical Medicine	75
Radiology	15
Social and Behavioral Science	<u>15</u>
	420

Third & Fourth Years

A two-year sequence commences in June following the second-year coursework. Required blocks include:

- Medicine—12 weeks
- Surgery and Surgical Subspecialties—12 weeks
- Child Health—8 weeks
- Psychiatry—8 weeks
- Obstetrics/Gynecology—8 weeks
- Neurology—4 weeks
- Elective—12 weeks
- Family Medicine Preceptorship—4 weeks
- Emergency Medicine—4 weeks
- Free time—24 weeks

The preceptorship, sponsored by the Department of Family and Community Medicine, provides each student the opportunity to share in the role of a practicing physician in a small community. Student response to this program has been enthusiastic. It provides experience with the practice of medicine outside an academic setting.

The elective block is to be spent in some educational pursuit. Numerous opportunities exist, both at the Health Sciences Center and at other institutions. The free time blocks may be spent in any way a student chooses. Most students spend part of this time in further clinical experience, including studies abroad; some students partici-

pate in research programs at the Health Sciences Center. Others enroll in graduate degree programs at the University.

Evaluation, Promotion & Graduation

The School of Medicine currently uses an honors/pass/fail grading system, supplemented by narrative commentary from faculty. A Promotions and Advisory Committee, composed of students and faculty members, is responsible for reviewing performance. The faculty of the School of Medicine, responsible for awarding the M.D. degree, recognizes that candidates for the degree must demonstrate both academic and personal qualities of a competent physician.

Graduate and Dual Degree Programs. Medical students have the opportunity for combined M.D.-graduate degree programs in several areas. A master's program uses the flexibility of the medical curriculum to enable a medical student to pursue and receive a master's degree within the four-year span of enrollment in medical school.

Consult the Graduate Studies section of this *Profile* for additional information.

An M.D.-Ph.D. program is available for the student seeking a research career. After acceptance into medical school, students must be accepted by the graduate program of their choice. A minimum of two additional years are to be worked into the medical curriculum to satisfy requirements for the Ph.D.

Ph.D. programs are available in anatomy, biochemistry, microbiology, nutrition, pharmacology, physiology, psychology, pathology and medical sociology with School of Medicine faculty and in various other disciplines of other colleges and divisions of the campus.

Fellowship support may be provided for the Ph.D. portion of this program while loan and scholarship funds may be available for the M.D. curriculum, based on need.

Inquiries concerning combined degrees should be made to the Dean's Office, School of Medicine.

Residencies & Graduate Fellowships

All residency training programs at the UMC Health Sciences Center are accredited by the national accrediting groups. Refer to the section on Residency Training Programs in this *Profile* for details.

A limited number of fellowships are available in the clinical departments for post-graduate study beyond the residency level.

Office of Continuing Education & Extension

Continuing education programs for many of the health professionals of the state are developed, promoted and coordinated through the Office of Continuing Education for the Health Professions. The audiences for these programs include physicians, nurses, technologists, nutritionists, health service managers, hospital pharmacists and others involved in health care.

Frequent conferences and short courses are held at the Health Sciences Center and at other locations in Missouri. Faculty visits to local communities are arranged to fit the needs of the practicing professionals in those communities.

Sabbatical programs for individual practicing physicians can be arranged. In this program, a physician may spend time in a particular clinical department at University Hospital, arranging the time and curriculum by mutual agreement between an appropriate faculty member and the physician. In this way, a tailored educational experience can be developed to meet the individual physician's needs.

The School of Medicine is fully accredited by the AMA Council of Medical Education for continuing medical education of physicians.

Departments & Courses

Interdepartmental Courses

Perspectives in Medicine. Perspectives in Medicine is a not-for-credit course with three primary aims: professionalization of the student, including understanding of the role model of the physician and the interaction of the physician with patients and society; clinical correlation allowing a better understanding of the clinical relationship of the courses offered in the first year; and orientation and faculty guidance during the first semester.

At present, three faculty members are assigned per multidisciplinary lab, giving a ratio of three physicians to sixteen students.

The course has a diversified content, aiming directly at the needs of the students

within each multidisciplinary laboratory. Emphasis on clinical correlation and patient contact is an important part of the course. Other recurrent topics include discussions of patient/physician relationships and medical ethics, the life of the physician, and health care delivery.

Social and Behavioral Sciences. The Social and Behavioral Sciences course sequence, for all first- and second-year medical students, examines issues of health, health care and health care delivery from the point of view of the behavioral sciences. The course sequence seeks to develop awareness of the factors which account for the interaction and continuity in human life, health and disease.

The staff of the Section of Behavioral Sciences also contributes to the Nurse Practitioner Training Program and the Family Medicine Program of the Department of Family and Community Medicine.

Introduction to Clinical Medicine. Introduction to Clinical Medicine is a three-semester interdepartmental course for all first- and second-year medical students.

Goals and curriculum are set by a committee composed of representatives of the Departments of Medicine, Obstetrics-Gynecology, Surgery, Child Health, Family and Community Medicine, Psychiatry, and of the student classes. The means to accomplish these goals include lectures, laboratory sessions and, in particular, teaching in small groups in the clinical setting, led by members of the hospital teaching staff.

The objective of the course is to facilitate the student's transition to a practitioner of medicine. The course introduces basic skills of recognition of clinical symptoms and signs and of formulation and management of patient problems.

Anatomy

The Department of Anatomy offers courses to undergraduate, graduate and medical students. Courses taken by first-year medical students are developmental anatomy, gross anatomy, histology and neuroanatomy. Other courses are available to medical students as electives (See Statement of Courses section in this *Profile*.) Dissection facilities are available to residents and other medical postgraduates.

Medical students who have completed their first year in the School of Medicine may apply for a two-year assistantship in the department. The assistants who are accepted

spread the second year of the medical curriculum over a two-year period and graduate in five years instead of the traditional four years.

Medical students who wish to combine an advanced graduate degree with a medical degree may arrange to pursue work in anatomy. In this instance the completed course work for the first year of medicine would meet many of the course requirements of the basic graduate program. For additional information about any aspect of the graduate program in anatomy consult the *Graduate School Profile* or write to the Director of Graduate Studies, Department of Anatomy.

Anesthesiology

Anesthesiology is defined as a practice of medicine dealing with: (1) the management of procedures for rendering a patient insensible to pain during surgical, obstetrical and certain medical procedures; (2) the support of life functions under the stress of anesthetic and surgical manipulations; (3) the clinical management of the patient unconscious from whatever cause; (4) the management of problems in pain relief; (5) the management of problems in cardiac and respiratory resuscitation; (6) the application of specific methods of respiratory therapy;

Columbia is fast gaining a reputation as a regional health care center. The state of Missouri is our "community."

(7) the clinical management of various fluid, electrolyte, and metabolic disturbances.

Student contact is established and maintained throughout the four years of medical school education.

Teaching methods are varied, comprising informal seminars, formal seminars, interdepartmental conferences, and direct personal supervision of students administering anesthesia in the operating rooms.

Didactic presentations are held Tuesday mornings and Friday afternoons, 48 weeks each year.

Biochemistry

The departmental faculty teaches biochemistry for medical students along with beginning and advanced biochemistry courses for both undergraduate and graduate

students. In addition to B.S., M.S. and Ph.D. degree programs, the department also offers combination M.S.-M.D. and Ph.D.-M.D. programs. Before matriculation, applicants for the combined degree programs must first be accepted by the UMC School of Medicine. Enrollment in either the M.S. or Ph.D. degree programs can also be arranged after entrance to medical school.

Research opportunities are available to students through the expanding research activities of the faculty. In particular, medical students may pursue laboratory research interests as a part of the first year biochemistry course, or during the summer following the first year, or during elective blocks. Financial assistance is available for students who choose to carry out research during the summer or through degree programs.

Refer to the Graduate Studies section for information about the research programs in the department.

Child Health

The focus of the Child Health Department is on the model of a child within a family within a society. Growth, nutrition, development, mental and physical health, interviewing, and patient care are the major areas of emphasis. The special emotional and physical features of infancy and childhood distinguishing children from adults are emphasized.

In the first two years the early processes of growth and development are described. In the third year appraisal of normal newborns, infants and older children, as well as intensive illness in these groups, is carried out by students. In the ambulatory setting, intensive focus is placed on optimum health maintenance, acute care needs, and consultative and continuous management of complex health problems.

The pediatric training experience base involves daily conferences, lectures, teaching rounds, admission and care of hospitalized patients, and examination of ambulatory patients. Participation in an active neonatal unit provides newborn experience. Research activities of the department are involved with cardiology, child abuse, cystic fibrosis, diabetes, endocrinology, gastroenterology, growth, hematology, rheumatology, infectious diseases, nutrition, neonatology and renology.

The department is also involved in developing some programs of patient care for children in conjunction with other agencies

in the surrounding areas. It also has evolved an interdisciplinary program dealing with children having multiple handicaps.

Family & Community Medicine

Each undergraduate medical student rotates through a four-week preceptorship with a physician in private family practice. The medical student may take an additional preceptorship on an elective or free block.

There are four- and eight-week elective clerkships in family medicine that are operated out of the Family Medical Care Center (located within the Health Sciences Center) that require the student to study family practice under the supervision of the family medicine attending faculty.

Outpatient experience under the supervision of family medicine attending faculty is also provided in Fulton, Mo., at the Callaway Family Medical Care Center.

Medicine

The primary concern and responsibility of departments of medicine traditionally have been to teach the student to think and act like a doctor. The fundamental teaching activities and work available in this department are directed toward that goal. Those efforts begin with our role in teaching the fundamental procedures necessary for the intelligent examination of patients. Emphasis is also placed on the principles of differential diagnosis and the approach to solving the patient's problems as well as on the importance of extrapolating "basic science" information into the art of care of patients. The clinical years provide actual responsible clinical experience in both outpatient and inpatient settings.

At the present time, the inpatient service of the total Department of Medicine is comprised of two major areas, one located in University Hospital, consisting of approximately 120 beds. The second area in the VA Hospital contains a comparable number of beds. All the medicine bed areas are divided into nursing units and attending teams. Each group of approximately 20-25 patients is the responsibility of a team of senior staff attending physicians, residents, and students.

Medical outpatient activities are housed in both University Hospital and the VA Hospital.

Elective opportunities for specialized in-depth clinical and laboratory activities are also available. A student who might wish to

develop such an area of concentration within the Department of Medicine is assigned a preceptor. This preceptor can guide the clinical work, research and other elective activities, and can be especially useful in advising the student regarding the effective use of elective time.

Each division of the Department of Medicine offers opportunities for various elective experiences: (1) advanced clinical studies in the medical clinics or on the wards; (2) clinical investigations; (3) laboratory research.

The total teaching activities of the department include first-, second-, third-, and fourth year medical students, physicians, and clinical or research fellows in formal postgraduate training programs.

Microbiology

The Department of Microbiology is located primarily on the second and sixth floors of the Medical Sciences building. Common instrument and glassware preparation facilities serve the research needs of the faculty and graduate students. There is also a departmental seminar room and library.

The department has ready access to the animal quarters, on the floor directly below, where specially designed laboratory animal rooms for work on infectious agents are located.

Medical students study microbiology in the first semester of their second year.

Neurology

The academic activities of the Department of Neurology are primarily concerned with the students' development of certain fundamental skills in the diagnosis and treatment of disease of the nervous system.

Fundamental to the acquisition of skills in clinical neurology is a firm foundation in the basic sciences of neurology: anatomy, biochemistry, physiology, pharmacology and pathology. The Department of Neurology participates in the teaching of these basic sciences during the first two years of medical school. The techniques of neurological examination and diagnosis are taught in the Introduction to Medicine course. Didactic and bedside teaching are provided during the third or fourth years of medical school.

Elective clerkships allow participation in the care of hospitalized patients on the Neurology Service.

Obstetrics & Gynecology

The program in obstetrics and gynecology is designed to provide a thorough experience for the medical student, resident or post-graduate physician in human reproductive biology, normal and abnormal obstetrics, clinical gynecology, gynecologic endocrinology, gynecologic oncology, and gynecological surgery.

Student teaching is integrated through a four-year interval. An elective experience is offered to freshman medical students in basic human reproductive biology. During the sophomore year, participation in correlative courses is directed at reinforcement of knowledge of human reproductive physiology and its relationship to normal obstetrics. Clinical Obstetrics and Gynecology is scheduled during the final 24 months of medical training and provides experience for the student in normal and abnormal obstetrics and clinical and operative gynecology.

Teaching methods vary from informal discussion, laboratory research, lectures, and interdepartmental conferences to graded assignments of patient responsibility.

Ophthalmology

There are two main areas of concern in the teaching of ophthalmology. The first of these has to do with the intrinsic diseases of the eye which may lead to blindness; the second concerns examination of the eyes as a reflector of systemic disease. In the first instance we have an obligation to make sure that the general physician is properly aware of those diseases and conditions which threaten vision. In the second instance we must provide the physician with those powers of observation which make the examination of the eye an indispensable part of the general physical examination and evaluation. Changes in the eye accompany a great variety of physiologic and pathologic changes of all organ systems. Some of these have highly specific diagnostic value and become powerful tools for the internist.

The teaching of ophthalmology is interdisciplinary and must take place at each step of the medical curriculum, beginning with the basic sciences. The technique of ophthalmoscopy is taught during the course in Introduction to Medicine. Small group conferences and teaching at the bedside on the wards of Medicine and Pediatrics continue throughout the third and fourth years.

An elective is provided for those students who wish to acquire more clinical or research experience.

The department has well-equipped clinical and surgical facilities which provide for all the recognized subspecialty activities of ophthalmology. A unique patient population makes clinical research possible in a wide variety of areas. Laboratory research capability currently centers about the facilities of the Missouri Eye Research Foundation, a fully affiliated organization located in Columbia.

Pathology

Pathology is often referred to as "the bridge between the basic sciences and clinical medicine." The Department of Pathology has responsibilities not only in the education of medical students but also undergraduate students preparing for the various health-related professions, graduate students working toward M.S. or Ph.D. degrees, and physicians taking postgraduate work toward qualification as specialists in residency programs. Undergraduate groups for which the department assumes a major responsibility are the medical technology,

Students who have completed their second year in medical school may apply for a year's fellowship in the Pathology Department.

cytotechnology, and histotechnology students. In addition, a non-degree educational program for preparation for the Specialist in Blood Banking certification is offered to qualified registered medical technologists. For descriptions of the department's programs in medical technology, cytotechnology, histotechnology graduate studies, and residency programs refer to those sections elsewhere in this *Profile*.

For medical students, the department is responsible for teaching general pathology, systemic pathology and clinical pathology. General pathology involves the basic mechanisms of disease, including such things as inflammation and repair, infectious disease and neoplasia. The study of organ systems, in which the diseases of each body system are systematically covered, is the subject of systemic pathology. In clinical pathology, the application of clinical laboratory procedures to the assessment of human disease is

studied. In teaching pathology, considerable emphasis is devoted to integrating the subject matter with what the student learns in anatomy, biochemistry, physiology and clinical medicine. In general, this is achieved by teaching via the case study method. During the second semester special cases are studied and discussed in conjunction with several other courses.

Pharmacology

A course in pharmacology is included in the medical student's schedule during the fourth semester. The purpose of the course is to provide a background in the science of pharmacology sufficient to prepare the student for transition to the clinical years of medical study or advanced study in the Graduate School. Special emphasis is placed on actions, mechanisms of action, therapeutic uses and toxicological manifestations of selected drugs from the major groups of therapeutic compounds.

The objective of instruction in medical pharmacology is to produce physicians who will prescribe drugs intelligently for the benefit of their patients. The course in medical pharmacology is not one in practical therapeutics with primary emphasis on drug therapy in clinical medicine, since the student is not yet experienced in the clinical sciences.

Physical Medicine & Rehabilitation

Conventional and curative medical resources, while essential to physical medicine and rehabilitation, are not sufficient for the management of those disease processes which result in loss or defect in normal human function such as mobility, self care, and communication skills. Such defects limit personal, social, recreational and economic activities. The patient's needs may be so broad that, in addition to applying specialized clinical medical skills, the program in physical medicine and rehabilitation must incorporate the contributions of many medical, medically related and behavioral sciences in the restorative process.

Educational programs in the department include: medical students' clinical clerkship; residency training program; clinical training in other health-related programs; and continuing education for the health professions.

Medical students are offered a four-week supervised clinical elective during their third or fourth years. A three-year residency training program leading to board eligibility is currently provided for two residents a year.

Also within the department, clinical training is offered in social work, vocational rehabilitation counseling, recreation therapy, speech pathology, audiology, rehabilitation nursing, and psychology. Recently enlarged clinical facilities for all training programs are available in University Hospital and the adjacent Rusk Rehabilitation Center.

The department is comprised of a unique pattern of elements drawn from several scientific and medical disciplines; thus research opportunities are quite varied. Scientific studies include:



(1) the structural and functional characteristics of the human organism in relation to mobility, self-care and other normal human activities;

(2) the physiological and biochemical responses of tissues, organs, and body systems to external physical sources of energy and to internal energy production in exercise, which enhance and aid the healing process and the restoration of useful function;

(3) pathology of the neuromusculoskeletal system and the physiologic disturbances produced thereby;

(4) electrophysiology as applied to the diagnosis of neuromuscular disease and measurement of impaired function; and

(5) the compensatory mechanisms, including the prescribed use of drugs and exercise, artificial limbs, etc., and the behavioral sciences (psychopathology, motivation, and learning) in relation to, adjustment to, and compensation for lost or impaired mental, social, or vocational abilities associated with physical disability.

Physiology

The Department of Physiology has the responsibility of teaching the physiological sciences to undergraduate, medical and graduate students. Medical physiology is offered in the second semester of the medical student's curriculum.

Among research programs being conducted by faculty in this department are: the renin-angiotensin-aldosterone system, congestive heart failure, hypertension, ion transport, factors affecting lipid metabolism, physiology of hibernation and cold stress, renal tubular function, and cardiac metabolism, circadian rhythms, microcirculation, and synaptic transmission in the central nervous system.

A number of research programs are open to medical students for summer fellowships and elective blocks.

Well-qualified students may be considered for the dual-degree M.D.-Ph.D. program, which requires a minimum of six years' study. After acceptance into medical school, students must be approved for the Ph.D. program. (See Statement of Courses section of this *Profile* for course listings.)

Psychiatry

Psychiatry and the basic behavioral sciences are taught in all four years of the medical curriculum. Members of the Department of Psychiatry participate actively in planning and teaching the first-year course Social and Behavioral Sciences and the second-year course, Introduction to Clinical Medicine. The educational objectives of the psychiatry faculty, both in those courses taught independently and in those taught in cooperation with other departments, are to develop the students' understanding of the biology of human adaptation

and the behavioral components which are an integral part of medical science and medical practice; to develop their awareness of the role of emotional factors in human health and illness, and the relationship between physician and patient; to develop their skill in using communication as a preventive, diagnostic, and therapeutic technique; and to develop their abilities to practice comprehensive medical care.

All members of the staff participate in both educational and clinical activities. Research interests of the department are broad, but tend to center about the interrelationships between psychiatric disorder and the social environment, psychobiology, and various aspects of child development. In both research and teaching activities—as well as in clinical activities—close cooperation is maintained with other departments of the School of Medicine and UMC, and with appropriate community and state agencies and divisions.

Radiology

Radiology, a medical specialty deeply rooted in the physical and biological sciences, contributes strongly to undergraduate medical education because it provides additional perspectives into subject matter taught in each of the four years of the medical school curriculum. There are many sub-specialties within the field. Three of the four sections within the Department of Radiology are centered around subspecialties; the remaining section is organized for teaching and research.

Diagnostic Radiology. Radiography, fluoroscopy, ultrasound, thermography and computerized axial tomography are used to visualize normal and abnormal structure and function. Through interpretation of such examinations the radiologist provides essential diagnostic and clinical information for patient care. In teaching, the radiologist adds additional techniques to those already employed by the anatomist, physiologist and pathologist for displaying normal and diseased structure and function. A unique aspect of the radiological method is that it permits structure and function to be demonstrated in the living subject. Specialized techniques in angiography, pharmacoradiology, video recording, ultrasonography and computed tomographic scanning have added further dimensions to radiologic demonstration of disease.

Radiotherapy. A clinical service, radiotherapy deals exclusively with the

treatment of neoplastic diseases. Treatment modalities include Telecobalt, 2 Mev super-voltage (VanDeGraaff), conventional orthovoltage, and superficial therapy. Radium and other radioactive closed sources are selectively used for cancer therapy. Combined clinical tumor conferences are scheduled to provide teaching to medical students, graduate and postgraduate students, and staff. Radiotherapists participate as members of the oncological team. Radiobiological problems, chemotherapy, radiation therapy combinations, radiation physics and protection are subjects of daily review, and are also discussed in weekly radiation therapy seminars.

Nuclear Medicine. The clinical exploitation of radioisotopes for diagnosis, therapy and investigation is the concern of nuclear medicine. As tracers, radionuclides permit determining sites of localization and deposition, spaces and volumes, metabolic rate and turnover, and flow and circulation. Particularly significant diagnostic applications are rapidly evolving which entail *in vivo* scanning of patients to delineate organs, lesions and tumors for the evaluation of their functional characteristics, giving rise to the development of specific radiopharmaceuticals. Also, *in vitro* tests such as radioimmunoassay provide exquisitely sensitive means of analyzing body fluids and their components, as well as endogenous and exogenous organic materials ingested or injected. Higher activities of radionuclides are administered to patients as internal sources of radiation for the treatment of hyperactive organs and systems, neoplasms and metastases.

Radiological Sciences. Teaching activities of this section include basic science curriculum planning and classroom instruction to implement clinical training of resident physicians. The staff is also engaged in research in a variety of physical, chemical, and biological systems.

Surgery

The Department of Surgery consists of a faculty and supporting staff dedicated to the teaching of surgery through the mechanisms of providing superior care for surgical patients and the generation of new basic and clinical information about surgical problems. The surgical discipline offers a student the opportunity to use basic skills to formulate a thesis of patient management and then, frequently, to test the thesis in the operating

suite or on the wards. The department emphasizes close personal interactions between students and instructors.

The professional components of the department are staffed by full-time board-certified specialists who are members of the divisions of Cardiothoracic Surgery, General Surgery, Neurological Surgery, Orthopedic Surgery, Otolaryngology, Plastic Surgery, and Urologic Surgery. Surgical patients and activities interface all functions of University Hospital (e.g., child health, medicine, obstetrics and gynecology, nuclear medicine, radiology, laboratories, etc.) so that intra- and interdepartmental interchanges are common. Each division offers clinical and laboratory experiences to students. The surgical clinics and wards, special diagnostic units, operating rooms, recovery rooms and intensive care units offer the surgical student an opportunity to participate in the diagnosis and management of surgical disorders.

Members of the surgical faculty are engaged in a wide variety of clinical and laboratory research projects. Students are encouraged to participate in these programs during their free and elective time and to develop research interests of their own as well.



Health-Related Professions

The School of Health-Related Professions was established on the Columbia campus of the University of Missouri on July 1, 1978, to be administered as a school within the School of Medicine on an interim basis. The school is an upper division unit, accepting students for professional preparation at the baccalaureate and graduate levels.

Undergraduate Programs

Undergraduate preparation is offered in the following areas:

Health Services Management

*Medical Dietetics

*Food Systems Management

Medical Technology

Cytotechnology

Histology

Occupational Therapy

Physical Therapy

Radiologic Technology

Radiography

Nuclear Medicine Technology

Respiratory Therapy

The curriculum for each program is designed to prepare the individual to meet the clinical, teaching, and/or administrative responsibilities usually assigned to the fully trained professional. All curricula meet the standards of the respective accrediting agencies.

Admission

The School of Health-Related Professions is an upper division unit, accepting students only when they have been selected to participate in the professional component of one of the programs. Students may be admitted to UMC and enrolled in the College of Education while completing general education and pre-professional requirements. While enrolled in the College of Education, students will be advised by faculty from the School of Health-Related Professions.

Upon completion of pre-professional requirements, students may make application for admission to the program of their choice. Because space in each program is limited, all interested persons making application may

*offered in collaboration with the College of Home Economics with the degree awarded by that division.

Admissions Office, School of Health-Related Professions, Roger Harting, 200 Clark Hall, 882-8011

Financial Aids, 11 Jesse Hall, 882-7506

Cashier's Office, 123 Jesse Hall, 882-3097

Housing Information, residence halls, 882-4031

not be admitted. Admission to a program is a formal process which involves screening of applicants and which is governed by an Admissions Committee. Priority for admission must go to qualified residents of Missouri. This policy applies to students who begin their higher education at the University as well as those who wish to transfer to UMC. Transfer students and non-residents must correspond with a representative of the program prior to effecting the transfer to determine eligibility for admission.

In addition to the student's academic record, attributes such as personality, motivation, attitude, interest, commitment, and knowledge of the field are considered in selecting students for the professional phase of a program.

Degree Requirements

The curricular requirements for the Bachelor of Health Science are divided into three parts: General Education requirements which are required of all programs; pre-professional requirements which may be unique to a program; and coursework required for the major which is specific to the program.

General Education requirements for the Bachelor of Health Science include the following:

Humanities (8 Semester Hours)

Must include at least one course from two of the following fields: art, classical studies, foreign language, humanities, literature, music theory/appreciation, philosophy, religion, or theatre/drama.

Communicative Skills (6 Semester Hours)

To be chosen from: Composition I, expository writing, or public speaking.

Social Sciences (9 Semester Hours)

To be chosen from: Am. history/Am. government, soc/anthro/econ, or general psychology.

Biological Science (3 Semester Hours)

Physical Science (3 Semester Hours)

Mathematics (3 Semester Hours)

To qualify for the Bachelor of Health Science, students must meet the requirements of the University and the School of Health-Related Professions. Students entering with advanced standing in the field must spend at least the senior year enrolled at UMC and must complete a minimum of 6 semester hours (two courses) in that major at UMC.

In addition to meeting the academic and clinical education requirements of a program, the student should possess and exhibit those personal qualities and characteristics which are associated with patient welfare and professional trust. These elements are a part of the overall evaluation process for the professional phase of each program. Should it be determined that these qualities are not present in sufficient degree or that satisfactory growth and progress in this area is not being demonstrated, the student is subject to removal from the program.

Health Services Management

The Health Services Management program includes both baccalaureate and master's degree options. The baccalaureate program awards the Bachelor of Health Science and includes options in health planning and health administration. The program is designed to prepare health professionals for positions as managers of community-based programs and small facilities, as mid-level administrators in large facilities, and for a variety of staff positions in health related organizations and agencies.

The baccalaureate program can be completed by students in the residential program who are on-campus as full-time students. The extended degree program exists for students who wish to continue their employment in the health system and attend the University on a part-time basis.

Admission to UMC does not constitute admission to the baccalaureate Health Services Management program. A limited number of qualified students are accepted after they have completed 57 satisfactory credit hours of coursework. By the Fall 1980 semester, freshmen students will be taken under advisement by the faculty.

The extended degree in health care administration will admit students for the Fall 1980 semester. This program is designed to accommodate health professionals who are currently working and who have extensive lifelearning experiences. Application to this

non-residential program should be submitted by January. The entering class will be selected by April with work beginning in May.

Inquiries and requests for applications should be made to the Program Coordinator, Baccalaureate Degree Program in Health Services Management, 403 Noyes, University of Missouri, Columbia, MO, 65211.

Medical Dietetics & Food Systems Management

The School of Health-Related Professions, in collaboration with the College of Home Economics, offers Coordinated Undergraduate Programs (CUP) with an emphasis in foods systems management and medical dietetics. Students are accepted into these programs at the end of four semesters at an accredited college or university. Clinical experience is coordinated with the didactic component of the curriculum, so that after four academic years (plus one summer of eight weeks) the student will have earned a bachelor's degree and fulfilled the requirements of the American Dietetic Association for membership.

Additional information may be obtained by writing: Medical Dietetics and Food Systems Management, M128 Medical Sciences Bldg., University of Missouri-Columbia, Columbia, MO 65212.

Medical Technology

Medical Technology

Medical technologists are health professionals who are responsible for many routine and specialized tests in the clinical laboratory. Data from these tests is used by a qualified physician for the determination of the presence and cause of disease. There are many tests and procedures performed or supervised by the medical technologist in the areas of hematology, immunology, chemistry, blood banking, microbiology, mycology, parasitology and urinalysis.

To be eligible for the Bachelor of Health Science degree in Medical Technology, students must complete the requirements of the University and those specified by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) and the Committee on Allied Health Education and Accreditation (CAHEA).

Cytotechnology

Cytotechnologists are health professionals trained in special laboratory techniques for detecting body cell changes that are particularly important in the early detection of cancer. Their main responsibility is to detect evidence of cell disease by microscopic study of cell samples. These samples are obtained from various sites, such as the female reproductive tract, respiratory tract, the gastrointestinal area, and any other body cavity that sheds cells. It is through the findings of the cytotechnologist that the physician is frequently able to diagnose cancer long before it would be detected by other methods.

To be eligible for the Bachelor of Health Science degree with an emphasis in Cytotechnology, students must complete the requirements of the University and those of the American Society of Cytology and the Committee on Allied Health Education and Accreditation (CAHEA).

Histotechnology

Histotechnologists prepare and stain thin tissue specimens for microscopic examinations of various tissue components. Routine procedures involved in the histology laboratory include fixation of tissue, dehydration, paraffin infiltration, embedding, sectioning and staining. After staining is complete, the tissue section is delivered to the pathologist for diagnosis.

Students interested in the Histotechnology emphasis area must satisfy the requirements of the University and those of the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) and the Committee on Allied Health Education and Accreditation (CAHEA).

The last year of these programs is spent in rotation through the laboratories within the Department of Pathology of the School of Medicine. The year includes lectures, demonstrations and performance of various laboratory tests in the pathology laboratories at the UMC Hospital and Clinics and Harry S. Truman Memorial Veterans Administration Hospital. Graduates are eligible for examination and certification by the Board of Registry of the American Society of Clinical Pathologists (ASCP).

Because of limited space in these programs, students must correspond with the program director regarding procedures for admission to the twelve-month clinical curricula. Official application must be made as

early as the freshman year for the Histotechnology Program, the sophomore year for the Medical Technology program, and the first semester junior year for the Cytotechnology Program. Admission to UMC does not constitute admission to the clinical curricula.

Additional information, including a list of course requirements and admissions guidelines may be obtained by writing, Director, Medical Technology Curriculum, School of Health-Related Professions, M646 UMC Health Sciences Center, Columbia, MO 65212.

Occupational Therapy

Occupational therapists are health professionals who are concerned with alleviating physical or emotional problems, modifying functional ability, and encouraging health adaptations as illustrated by the skills of daily living, play, recreation and work. Through these activities, selected for their therapeutic value, the occupational therapist calls for a response from individuals which alters or influences their physical or emotional condition, tests and evaluates capacity for employment and broadens their independent living ability and social well being.

To be eligible for the Bachelor of Health Science in Occupational Therapy, students must complete the requirements of the University and those outlined collaboratively by the American Medical Association and the American Occupational Therapy Association.

In conjunction with the Department of Higher and Adult Education of the College of Education, a program leading to a basic master's degree with emphasis in occupational therapy is offered. Students seeking admission to this program must hold a bachelor's degree in an area other than occupational therapy.

Admission to UMC does not constitute admission to the occupational therapy curriculum. Qualified students are selected in December of each year. Students must apply by letter for admission to the occupational therapy curriculum by October of each year. All off-campus students selected for the program must spend their fourth semester on the Columbia campus prior to starting the program in the Summer Session.

Because of the high number of well-qualified Missouri residents who have applied to the occupational therapy curriculum in the past several years and the

limited number of places available within each class, the following policy in regard to non-resident applicants has been instituted:

Beginning with the fall semester 1977 and until further notice, applications to the undergraduate professional curriculum (the final two years) from students who are not residents of Missouri will not be accepted for screening for admission (with the exception of those students covered by the RASE agreement with the University of Nebraska).

All students must spend at least two years on the Columbia campus. Much of this time will consist of professional classes and clinical experiences. The student evaluates and treats patients at UMC Hospital and Clinics and at other hospitals and rehabilitation facilities in Missouri. This experience, under the supervision of a qualified therapist, is necessary before the student is fully qualified to practice occupational therapy.

Additional information, including a list of course requirements and guidelines regarding admission procedures, may be obtained by writing: Director, Occupational Therapy Curriculum, School of Health-Related Professions, 305 Rusk Rehabilitation Center, University of Missouri-Columbia, Columbia, MO 65212.

Physical Therapy

Physical therapy means the examination, treatment and instruction of people to detect, assess, prevent, correct, alleviate and limit physical disability, bodily malfunction and pain from injury, disease and any other bodily and mental condition. It includes administration, interpretation and evaluation of tests and measurements of bodily function and structure; the planning, administration, evaluation and modification of treatment and instruction, including the use of physical measures, activities and devices for preventive and therapeutic purposes; and the provision of consultive, educational and other advisory services for reducing the incidence and severity of physical disability, bodily malfunction and pain.

To be eligible for the Bachelor of Health Science in Physical Therapy, students must complete the requirements of the University and those of the national accrediting agency. No certificate program or graduate program is offered in physical therapy.

Admission to UMC does not constitute admission to the physical therapy program.

Application forms for the professional phase of the program must be requested during October from the physical therapy curriculum office. Students selected for the program begin during the summer immediately following their acceptance.

Because of the high number of well-qualified Missouri residents who have applied to the physical therapy curriculum in the past several years and the limited places available within each class, the following policy has been instituted. Beginning January 1, 1977, and until further notice, applications to the professional curriculum (final two years) from students who are not residents of Missouri will not be accepted by the Physical Therapy Admissions Committee. This policy applies to non-resident students who begin their higher education at the University of Missouri-Columbia as well as those who wish to transfer to the University.

The last two years of the curriculum consist of professional courses, laboratory experiences, independent study and clinical education. Full-time clinical education is obtained during the summer between junior and senior years as well as the second semester of the senior year although the student is introduced to patient care from the very beginning of the program. During the clinical education, a student evaluates and treats patients at various hospitals, clinics and rehabilitation centers. This experience, under the supervision of a qualified therapist, is necessary before the student is fully qualified to practice physical therapy.

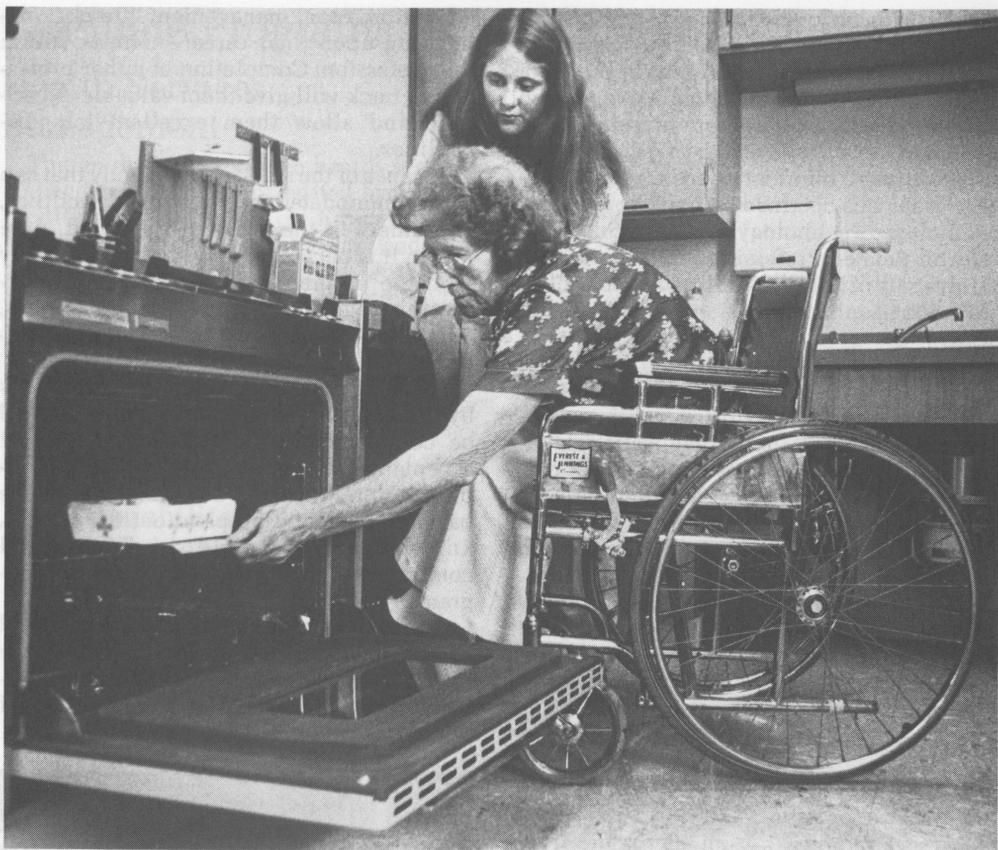
Upon satisfactory completion of degree requirements, the student is eligible to take the licensure examination in any state.

A descriptive brochure and additional information may be obtained by writing: Director, Physical Therapy Curriculum, School of Health-Related Professions, 206 Rusk Rehabilitation Center, University of Missouri-Columbia, Columbia, MO 65212.

Radiologic Technology

Radiography

Radiographers are health professionals who work closely with physicians specializing in the use of X-ray and radioisotopes in patient diagnosis and treatment. They are responsible for operating equipment, positioning and preparing patients for X-rays, keeping patient records, and taking X-ray films of internal parts of the body. The radiologic technologist must be



capable of keeping delicate and complicated equipment in working order and must often deal with patients who are under stress. Radioactive substances involved with the use of the X-ray and patient treatment are potentially dangerous, requiring specialized knowledge and expertise in the performance of professional tasks.

Nuclear Medicine Technology

Nuclear medicine technologists are health professionals concerned with the use of radioactivity for diagnostic, therapeutic and research purposes.

The nuclear medicine technologist utilizes radioactive materials to: perform body function studies and organ images; analyze biological specimens. Specific responsibilities of the technologist in the daily operation of the nuclear medicine department include: radiation safety, radiopharmaceutical preparation and administration, operation of radiation detection instruments, patient care and positioning during imaging procedures, conducting laboratory studies on biological specimens

(e.g., radioimmunoassays and related techniques) and preparing data for the physician's interpretation.

Programs in radiography and nuclear medicine technology are both available to qualified students. Both programs encompass the standards endorsed by the American Medical Association to prepare technologists for teaching, research, administrative and clinical positions.

To be eligible for the Bachelor of Health Science, the student must complete the requirements of the University and of the American Registry of Radiologic Technologists and the Nuclear Medicine Technology Certification Board. Certification is granted upon successful completion of examination.

Students planning to major in either of these areas must correspond with a representative of the program to determine admissibility. Classes in radiography begin in January of each year; students are selected during the previous July. The nuclear medicine curriculum begins in September with selection of students completed by

March of each year. Students must exhibit proven interest and capability in the appropriate areas and must obtain the approval of the program prior to enrollment. Admission to UMC does not constitute admission to the program.

Additional information concerning programs may be obtained by writing: Director, Radiologic Technology Program, School of Health-Related Professions, 206 Clark Hall, University of Missouri-Columbia, Columbia, MO 65212.

Respiratory Therapy

Respiratory therapists are health professionals who specialize in diagnostic evaluation and care of patients with deficiencies and abnormalities of the cardio-pulmonary system. Involved are therapeutic use of medical gases and administration apparatus, environmental control systems, humidification, aerosols, medications, ventilatory support, rehabilitation, assistance with cardio-pulmonary resuscitation, and maintenance of natural and artificial airways. Specific testing techniques are employed in respiratory therapy to assist in diagnosis, monitoring, treatment and research. These activities include measurement of ventilatory volumes, pressures and flows, blood gas analysis and other physiologic monitoring.

To be eligible for the Bachelor of Health Science in Respiratory Therapy, students must complete the requirements of the University and the curricular essentials stipulated by the Joint Review Committee for Respiratory Therapy Education. JRCRTE is sponsored by the Committee on Allied Health Education and Accreditation (CAHEA) of the American Medical Association. After graduation, students will be qualified to take the registry examination given by the National Board for Respiratory Therapy.

The professional component of the program at UMC consists of the last two years. During this time, students are enrolled in professional therapy and clinical training courses, in which they demonstrate competencies consistent with the current standards of practice for equipment and techniques associated with the profession. Students will also be directly and extensively involved in the care of post-surgical patients as well as those with cardio-pulmonary, medical and other disorders.

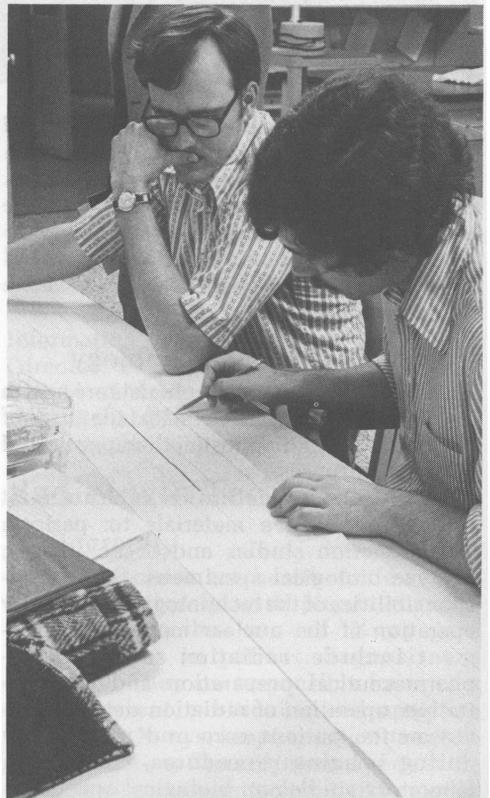
While in the professional component of the program, students will select either an

education or a management "track," depending upon their career interests within the profession. Completion of either professional track will give them valuable experience and allow them excellent job possibilities.

Because of the small student body that can be accommodated in the clinical facilities, enrollment in the program is limited. As a result, it is necessary to correspond directly with the program director to obtain information regarding course requirements, admission policies and application procedures.

Screening and interviewing of applicants by the program admissions committee will be conducted during February; letters of acceptance are mailed by mid-March. Candidates for admission are evaluated on the basis of academic preparation, experience, knowledge of the field, leadership and commitment to the objectives of the program.

Additional information may be obtained by writing: Director, Respiratory Therapy Curriculum, School of Health-Related Professions, 203 Clark Hall, University of Missouri-Columbia, Columbia, MO 65212.



Graduate Programs

Health Services Management

The graduate program in health services management is fully accredited by the Accrediting Commission on Education for Health Services Administration, and is a member of the Association of University Programs in Health Administration. The master's program in health services management consists of four semesters on campus, plus a three-month summer externship in a hospital or other health agency. The externship occurs between the first and second years of the program.

Rusk Rehabilitation Center/University Hospital are federally funded as a model regional spinal cord injury treatment center.

UMC offers specialized training in health services management through a Master of Science in Public Health with specialization in either administration or planning. In addition, areas of emphasis within administration include long-term care, ambulatory care and mental health administration. In all cases, the approach is to tailor the program to the individual student's needs. The health services management concentration may also be a major for a Master of Business Administration or the Master of Science in Public Administration.

A wide variety of educational opportunities is provided for students through the program's close affiliation with local, state and national associations in hospital administration, health administration and health planning, and through its clinical faculty comprised of key hospital and health administrators and health planning officials throughout the nation.

To be accepted for advisement in this program, an applicant, in earning a baccalaureate, master's, or doctoral degree, must have maintained an overall grade average of the least 3.0 (A = 4.0). In the selection process for each program, more emphasis is placed on sound scholarship and the promise of development for the field than on the precise content of the program which the prospective student has followed before applying to study in health services manage-

ment. Applicants are required to take the Graduate Record Exam.

Applicants are required to complete the health services management application. A personal interview in Columbia is arranged for each applicant who meets the necessary requirements. In exceptional cases, a health care executive selected by the faculty is asked to conduct an interview when travel to Columbia is not feasible.

Financial aid is available in the form of research assistantships, traineeships, fellowships and loans.

A more descriptive brochure and appropriate forms may be obtained by writing: Admissions Coordinator, Graduate Studies in Health Services Management, 403 Noyes Bldg., School of Health-Related Professions, University of Missouri-Columbia, Columbia, MO 65212.



School of Medicine

Graduate Studies

The biomedical sciences form the basis of modern medicine. They include the disciplines of anatomy, biochemistry, microbiology, pathology, pharmacology and physiology. Each of these departments offers programs of graduate courses which lead to M.S. and/or Ph.D. degrees. Varied programs of research, which culminate in the doctoral thesis, form the core of the graduate program. Students, under the guidance of a faculty preceptor, are expected to apply their individual skills in investigations which are of greatest interest to them. In addition to research training, opportunity is provided so that graduate students may gain experience in teaching, too, if this is a major goal.

The master's degree is offered in public health, with emphasis on community health education or on community medicine, through the Department of Family and Community Medicine. A program for the master's degree in health services management is offered by the School of Health-Related Professions.

Master's and Ph.D. degrees in nutrition, medical sociology and psychology are offered through interdisciplinary programs; faculty also includes staff members from other schools and colleges on campus.

Facilities

The biomedical science departments and the Department of Family and Community Medicine are located in the Medical Sciences Building in the Health Sciences Center complex. This building is equipped with laboratories which facilitate a wide variety of research studies. Many special installations, such as electron microscopes, low temperature laboratories, germfree laboratories, furnace rooms, etc., are included. Laboratory animal quarters are located on the ground floor of this building and thus are convenient to all departments. A well-equipped shop with an experienced staff for constructing experimental equipment also is located in this building. The University's Sinclair Research Farm and Dalton Research Center serve as unique resources for research studies. In addition, the College of Veterinary Medicine's research farm provides facilities for comparative medicine studies on larger animals not usually studied in laboratory research.

Admission

Applications for admission to graduate programs are available from each departmental chairman. Inquiries concerning fellowships and graduate assistantships should be directed, also, to the chairman of the department in which the applicant wishes to pursue graduate study.

Non-resident graduate students on a 25 percent full-time equivalent or more appointment or on full-time hourly status will not be charged tuition. Students holding certain fellowships may expect stipends to reflect compensation for the tuition if they do not qualify for exemption from it. Prospective students should contact the Graduate School or chairman of the department in which they are interested to determine the fees that might apply in each case.

UMC-owned apartments near the Health Sciences Center are available for rent to married graduate students. Information on these apartments and UMC-owned dormitories may be obtained from the Housing Office, 123 Jesse Hall, Columbia, Mo. 65211. Meals are offered at moderate prices at cafeterias in the Health Sciences Center, Memorial Union, and Brady Commons, as well as in dormitory dining rooms.

Fees & Expenses

Students who are dually enrolled in Graduate School and the School of Medicine must also pay the Supplemental Medical School Fee. See fees information in The School of Medicine section in this *Profile*.

Anatomy

The Department of Anatomy offers graduate programs leading to the M.S. and the Ph.D. degrees. The basic program is essentially the same for the two degrees but may vary to some extent depending on the background and past experience of the student.

Current research in the department is concerned with anatomy of the reproductive system, postnatal organ development in the marsupial, morphology and function of blood leukocytes and hematopoietic tissues, morphology of the cardiac conduction system, fine structure of the nervous system, avian anatomy, and neuroembryology.

Research facilities include an RCA EMU-4 electron microscope, preparation laboratories for histology, scanning electron microscopy and ultramicrotomy, and complete darkroom facilities.

Fees & Expenses 1980-81

To determine your fees, go through this list and add all the fees that apply to you.

	16 week semester		8 week session	
	1-11 hours	12 or more hours	1-5 hours	6 or more hours
Incidental Fee	All students must pay an incidental fee which includes laboratory fees, library privileges, health services.			
Undergraduate	\$32.25 per hour	\$387	\$32.25 per hour	\$193.50
Graduate/First Professional	\$35.50 per hour	\$426	\$35.50 per hour	\$213

Student Activities Fee

All students are required to pay a student activities fee which includes student government, student activities, programs, guest lecturers, etc. Tickets for UMC athletic events are not included.

All Students	\$2 per hour	\$24	\$2 per hour	\$12
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Supplemental Fee

Students registered in the School of Medicine, College of Veterinary Medicine and the School of Law must pay a supplemental fee.

Medical Students	\$71 per hour	\$852	\$71 per hour	\$426
Veterinary Students	\$35.50 per hour	\$426	\$35.50 per hour	\$213
Law Students	\$8.75 per hour	\$105	\$8.75 per hour	\$52.50

Non-Resident Tuition

You must pay non-resident tuition if you have not been a resident for at least a year immediately prior to the time you first register. There are some exceptions to this rule. Check the *Tuition and Residence Rules* brochure, available at the Cashier's Office, 123 Jesse Hall.

Undergraduate	\$129 per hour*	\$774	\$129 per hour**	\$387
Graduate/First Professional	\$142 per hour*	\$852	\$142 per hour**	\$426

Housing

Includes double room in an UMC residence hall, 20 meals per week in the 16-week session (no Sunday evening meal) and \$10 social fee. Students are not required to live in residence halls.

16 week semester: \$730	8 week session: \$300	4 week session: \$150
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Refund of Fees

If you leave the University or drop a course for which you have paid, you must file a written request with the manager of cashiering for a refund. Refunds will, with some exceptions, be paid according to the following schedule. For any session other than these the refund will be calculated in the same way, i.e. 70% during the first 1/3 of the session. Deductions may be made from the refund for any money you owe the University. Housing fees are refunded according to the housing contract.

	Full Refund	70%	50%	None
16 week semester	Before classes begin or during "full refund period"†	Within 2 weeks from day classes begin	Between 2 and 6 weeks after classes begin	After 6 weeks
8 week session	Before classes begin or during "full refund period"†	Within 1 week from day classes begin	Between 1 and 3 weeks after classes begin	After 3 weeks

*1-6 hours—no non-resident tuition charged. \$129 or \$142 per hour for each hour from 7 to 12.

**1-3 hours—no non-resident tuition charged. \$129 or \$142 per hour for each hour from 4 to 6.

†The "full refund period" for a 16 week semester is 4 class days starting with the petitioning period. The "full refund period" for a 8 week session is 2 class days starting with the petitioning period.

All fees statements are announcements only and are not to be regarded as offers to contract. The University of Missouri-Columbia reserves the right to change any and all fees at any time.

Medical students who wish to combine an advanced graduate degree with a medical degree may arrange to pursue work in anatomy. In this instance the completed course work for the first year of medicine would meet many of the course requirements of the basic graduate program. For additional information about any aspect of the graduate program in anatomy consult the *Graduate School Profile* or write to the Director of Graduate Studies, Department of Anatomy.

A limited number of graduate assistantships are available to qualified students.

Graduate School, 205 Jesse Hall,
882-6311

Financial Aids, 11 Jesse Hall,
882-7506

Cashier's Office, 123 Jesse Hall,
882-3097

Housing Information, 123 Jesse
Hall, married students:
882-4544; dormitories:
882-4031

Biochemistry

The Department of Biochemistry carries out teaching, research and extension missions. The departmental faculty teaches biochemistry for medical students and offers courses in biochemistry for undergraduate and graduate students.

Ph.D. and M.S. graduate degrees are offered as well as M.S.-M.D. and Ph.D.-M.D. degree programs. The admission procedure for the latter two programs is the same as for other graduate degrees. However, applicants must have already been accepted by the UMC School of Medicine. Prerequisites for graduate programs include mathematics through integral calculus, biology, physics, general chemistry, quantitative analysis, one year of organic chemistry with laboratory, and a physical chemistry course with a calculus preprerequisite. All prerequisites must be met before any graduate degree in biochemistry can be obtained, although some may be made up after acceptance as a graduate student. All graduate degrees require the performance of original research in biochemistry resulting in a thesis. For additional information, contact Milton S. Feather, Ph.D., Chairman of Graduate Student Admissions, 322 Chemistry Bldg.

Presently there are active research programs in most areas of biochemistry including structure and function of neuromembranes, characterization of peptides, proteins and enzymes, mechanism of enzyme action, carbohydrate chemistry, metabolic control, hormone action, biochemistry of development, mechanism of cholesterol biosynthesis, oxidative phosphorylation, plant toxicity, biochemistry of cancer, analytical methodology, molecular photobiology, nutritional biochemistry, mitochondria structure and function, alcohol abuse, ruminant biochemistry, role of trace elements, t-RNA function and processing, recombinant DNA studies, gene isolation, biochemistry of the eye, photosynthesis, regulation of nitrogen fixation, biochemical thermodynamics, cyclic nucleotide function, amino acid metabolism, cell culture studies, growth factors, and the biochemistry of reproduction.

The department is located on the third floor of the Chemistry building, and also has offices and laboratories on the first floor of the Medical Sciences building. In addition, staff members are housed at the Dalton Research Center, Eye Research Foundation, Sinclair Research Center, Agricultural Experiment Station Chemical Laboratories, Missouri Institute of Psychiatry and, in the School of Medicine, the departments of microbiology, ophthalmology, pathology, and radiology. For general information, contact James L. Gaylor, Chairman, Department of Biochemistry, M122 Medical Sciences Building.

Community Health Education

The graduate education program leads to the Master of Science in Public Health. The program includes research and/or field experience. A minimum of 9-11 months of full-time enrollment should be anticipated by the student.

The requirements for the degree are those established by the Graduate School and the Department of Family and Community Medicine.

Preparation to become a professionally qualified community health educator is offered as an area of concentration with the M.S.P.H. degree program. This preparation includes the attainment of special skills to understand the factors which influence health-related behavior and how such un-

derstanding is applied to modify health practices.

In addition to the M.S.P.H. degree admission requirements given above, preparation on the bachelor's level or above in one of the sciences or social sciences is preferred for those interested in entering the Community Health Education Section. A minimum of two years of community health experience is preferred. Applicants without such experience may be required to undertake an additional semester of field experience and course work.

The course of study consists of 35 hours of graduate credit, including field experience. A written comprehensive final examination or thesis is required. The field experience component consists of the equivalent of one day per week of concurrent field work during the winter semester and a 12-week block of full-time field experience during the summer.

With the University and two private colleges, Columbia offers a wide array of cultural activities—plus Big 8 sports events.

The community health education program is accredited by the Council on Education for Public Health.

For additional information concerning the program contact: Director, Section of Community Health Education, Department of Family and Community Medicine, UMC Medical Center, Columbia Mo. 65212.

Community Medicine

In addition to its program in Community Health Education, the Department of Family and Community Medicine offers an individually tailored course of studies for exceptionally qualified individuals, usually at the post-doctoral level with practical experience in one of the health sciences. The program consists of 32 credit hours leading to the degree of Master of Science in Public Health (M.S.P.H.) and is intended principally for physicians planning academic careers.

For additional information concerning the program write: Director of Graduate Studies, Department of Family & Community Medicine, UMC School of Medicine, Columbia, MO 65212.

Dietetics & Food Systems Management

See section on the Health-Related Professions.

Health Services Management

See section on the Health-Related Professions.

Microbiology

The Department of Microbiology occupies offices and laboratories on the sixth and second floors of the Medical Sciences building, the latter being in close proximity to the Medical Library. The department has ready access to the animal quarters directly beneath, where specially designed laboratory animal rooms for work on infectious agents are located. Facilities accommodating spectrophotometry, chromatography, electrophoresis, ultracentrifugation, sonic vibration, lyophilization, tissue culture, germ-free animals, anaerobic isolators and other specialized techniques are available for work with viruses, rickettsia, fungi, bacteria, and animal parasites.

To be accepted for candidacy in the department's Ph.D. program, applicants must perform satisfactorily on a qualifying examination prepared and evaluated by all full-time faculty members in residence at the time of the examination. Part-time faculty members and joint appointees may contribute to the qualifying examination.

The Ph.D. program normally requires at least three years beyond the master's degree and consists of:

- (1) a course of study in which a minor field may be recommended;
- (2) either a demonstration of competence in a foreign language or 3 hours of course work of an advanced nature in a discipline outside the usual study plan approved by the department;
- (3) practical experience in teaching;
- (4) successful completion of a comprehensive examination; and
- (5) demonstration of research and writing ability by completing a scholarly dissertation on an approved research problem.

Under the guidance of an advisory committee, a course of study is individually designed to fit each student's academic background, experience and objectives.

Minor fields may include biochemistry, chemistry, genetics, statistics or other areas.

The minor field(s) provides breadth and balance in each student's program and enhances the student's research abilities. First and second minors may be so designated; a minor field shall comprise 15 semester hours of work carrying graduate credit in a single department.

A final examination covers the dissertation chiefly. Refer also to the regulations governing Ph.D. degrees in the *Graduate School Profile*.

Although the Ph.D. program is emphasized, the department does also, under special circumstances, offer masters' degrees. For the master's degree, the department requires a minimum of 30 hours of graduate credit, 16 hours of which must be in courses numbered 400 or above. The 30 hours are composed of the following:

- 301 Medical Microbiology (8 hours)
- 401 Advanced Medical Microbiology (2 hours)
- 410 Seminar (continuous enrollment to a maximum of 4 hours toward the required 30 hours)
- 490 Research; 400 Problems (7 hours)
- Other departmental courses not listed above (9 hours)

It is strongly recommended that new students enroll in a biochemistry course during their first semester as a graduate student in the department.

In addition, a student must complete original research in preparation of a thesis and pass an oral examination in its defense and covering the course work. A student should also refer to the regulations given in the *Graduate School Profile* regarding master's degrees.

For further information and departmental brochure, write Richard A. Finkelstein, Ph.D., Chairman, Department of Microbiology.

Nutrition Area Program

The area program in nutrition, an interdisciplinary program approved by the Graduate School, leads to a Master of Science in Nutrition or a Ph.D. in Nutrition. The area program provides a foundation in the many scientific aspects of nutrition through a core of courses on which the student builds the entire graduate program. The faculty are members of various departments on campus who work together to provide the pertinent special research resources available on this campus.

An applicant for the master's should have a B.S. with a grade average of at least 3.0 ($A=4$) for the last two years of undergraduate study. Background should include general and analytical chemistry, organic chemistry, biology, mathematics through calculus, and

a general course in nutrition and biochemistry. Statistics is recommended. A maximum of six hours of these courses may be taken for graduate credit. An applicant should have completed the GRE.

Course requirements for the M.S. degree include: general nutrition (3 hours); advanced nutrition courses, nutrition seminar, and research (11 hours); biochemistry (5 hours); and physiology (5 hours). There is no language requirement. A thesis, based on experimental research, is required and must be defended by an oral examination. All graduate nutrition courses, nutrition seminars and research must be passed with a grade of A or B.

An applicant for a Ph.D. should have a B.S. with a grade average of 3.0 ($A=4$) for the last two years of undergraduate study. An M.S. degree may be accepted in lieu of this requirement. Prerequisites are listed above for the M.S. degree. A maximum of six hours of these courses may be taken for graduate credit. An applicant should have completed the GRE.

Before consideration for admission to the Ph.D. program, an applicant must pass a qualifying examination normally administered by the department in which the student's research will be done. However, the area program may also require a qualifying examination.

Minimum course requirements for the Ph.D. degree in nutrition are: advanced nutrition courses and research (24 hours); seminars (4 hours, of which 2 hours must be in nutrition), biochemistry (10 hours), physiology (10 hours). All graduate nutrition courses, nutrition seminars, and research must be passed with a grade of A or B.

Two foreign languages, one foreign language in depth, or one foreign language and a collateral field of research technique are required.

A dissertation based on original experimental research and a final oral examination in its defense are required.

Students interested in this program should contact the following faculty in the School of Medicine: Dr. Margaret Flynn, Dept. of Family and Community Medicine, Dr. James Gaylor, Dr. Robert L. Wixom or Dr. Thomas D. Luckey, Dept. of Biochemistry.

Pathology

The Department of Pathology offers graduate programs leading to the M.S. and Ph.D. degrees in Pathology. Research inter-



ests of the faculty are wide-ranging and include: morphology of immune processes, cytogenetics, studies on the cellular and molecular basis of disease, animal models in diabetes mellitus, microvascular disorders, computer analysis of disease patterns, biochemical changes in early cell injury, coagulation abnormalities, cell culture, ultra-structural studies of melanoma and other tumors, neuropathological problems, renal disease, and structure and biogenesis of membranes.

Resources for research in pathology include both transmission and scanning electron microscopes, standard laboratory apparatus and many special purpose pieces of equipment. Research may be basic or applied clinical research provided the problem is deemed to have sufficient scientific merit and importance. Faculty and staff members provide guidance and practical supervision.

The master's degree program is open to medical students and other students holding a bachelor's degree with medical technology background. The student must meet all requirements of the Graduate School and must have had the required medical subject courses in anatomy, biochemistry, micro-

biology, physiology and pathology, or their equivalents. A dissertation and a minimum of 30 semester hours of course work are required.

The M.S. degree is designed to prepare students for teaching in medical technology schools or for supervisory roles in clinical laboratories. It is also considered a preparation for the doctoral degree.

The Department of Pathology, in conjunction with the Department of Plant Pathology and the Department of Veterinary Pathology, offers a Ph.D. in Pathology. This is an area degree program and is open to post-doctoral fellows, including those who have earned the D.D.S., M.D., or D.V.M. degree, or those with an M.S. degree in the biomedical sciences. The program is designed to provide students with the opportunity to examine and use research concepts and methods indigenous or specific to each of the three areas of pathology. In its approach to comparative pathology, the program allows the opportunity to obtain training in breadth or in depth in studies of disease mechanisms or processes in various host species. Joint seminars, committee appointments and cooperative efforts in course offerings promote the interdisciplinary character of this

program. Each candidate has an advisor from his own discipline but will be examined by representatives of all three.

The student must meet all requirements of the Graduate School. A core curriculum, specially designed for this degree, must be taken in addition to other course work and research. A dissertation is required.

For more detailed information on the master's or Ph.D. program consult the *Graduate School Profile* or contact Arlene P. Martin, Ph.D., Director of Graduate Studies, Department of Pathology.

Pharmacology

Pharmacology is the science concerned with the actions of various chemicals (drugs and toxic agents) on living systems. By the study of such interactions, knowledge is obtained about biological processes, the mechanisms by which drugs and toxic agents exert their actions, and the discovery and evaluation of drugs which may be useful therapeutic agents in medicine.

The science of pharmacology unites the disciplines of biochemistry, physiology, molecular biology and medicine for the study of drug action. The student of pharmacology investigates actions of drugs at various levels of biological organization, from interactions at the molecular level to that in the living animal or human. Students who wish to pursue graduate work in pharmacology should therefore be prepared in inorganic, organic and physical chemistry, and in biology or zoology. Mathematics through calculus and statistics would be most helpful. It is possible for students who are deficient in certain of these areas to be considered, and to correct these deficiencies during graduate work. Because of the broad nature of the discipline of pharmacology, flexibility is necessary in consideration of prospective graduate students.

Individuals educated in pharmacology are prepared for careers in research and teaching in medical, dental, veterinary or pharmacy schools. Research positions are also available in government and industrial laboratories, or in various research institutes.

Current research in the Department of Pharmacology includes various aspects of endocrine, metabolic and biochemical pharmacology. Research is in progress on regulation of hepatic lipid metabolism and control of plasma lipids and lipoproteins by hypolipidemic drugs; hormones and other agents; effects of drugs on biomembranes;

molecular pharmacology of renal plasma membranes, hormone and neurohormone receptor interactions; mechanisms of hepatotoxicity; toxicology of organotins and other heavy metals; drug metabolism; disposition, pharmaco-kinetics, and binding of drugs to plasma proteins; and mechanism of action of psychotropic drugs.

Admission to the Department of Pharmacology for graduate study requires a baccalaureate degree from an accredited four-year college or university, and approval by the faculty and chairman of the department.

Programs toward the advanced degrees in the department include original research leading to a dissertation for each of the graduate degrees. See the *Graduate School Bulletin* for general requirements for both the M.S. and Ph.D. degrees.

For further details write Murray Heimberg, M.D., Ph.D., Chairman, Department of Pharmacology.

Physiology

The Department of Physiology offers a graduate program leading to the doctor of philosophy degree. The candidate must be accepted by the Graduate School and the chairman of the department. The student entering graduate work should have, as minimal background, mathematics through calculus; inorganic, organic and physical chemistry; one year of college physics; and a year of biological sciences. Competence in at least one modern foreign language is recommended. Some of this background may be obtained while working on an advanced degree but it will increase the time necessary to complete the program.

The graduate program is planned by each student's advisory committee to include a well-rounded education in physiology. Anatomy, biochemistry, pharmacology, statistics and other disciplines are included in the graduate program.

Original research leading to a dissertation is required for the Ph.D. degree.

Active research programs are being conducted by the faculty in many fields of vertebrate physiology. Current investigations include the following areas: the renin-angiotensin-aldosterone system, congestive heart failure, hypertension, ion transport, factors affecting lipid metabolism, physiology of hibernation and cold stress, renal tubular function, and cardiac metabolism, circadian rhythms, the microcirculation, and synaptic transmission in the central nervous system.

Residency Programs

The residency program in graduate medical education is integrated with the total teaching program at the UMC Health Sciences Center. An academic setting in close association with clinical faculty members and other residents offers a well-balanced residency training program. Categorical residencies are available in 21 specialties and subspecialties. All listed programs are approved. Shared residency positions may be available upon petition to the program directors.

Emphasis is placed upon the total development of the physician in preparation for future responsibilities. Accordingly, residents assume a direct responsibility for patient care; participate in a formal program of rounds, conferences and case presentations; take an active part in the teaching program; and are encouraged throughout to pursue their particular research interests. Senior residents receive faculty appointments.

Liability insurance is provided for all members of the house staff through the self-insurance plan of the University Hospital. All house staff are eligible to participate in the staff benefits provided by the University. Uniforms and laundry are furnished and a paid vacation period, usually three weeks, is granted annually.

Stipends paid to resident physicians are competitive with other Midwest medical centers.

Anesthesiology

The residency program in anesthesiology is accredited by the Residency Review Committee on Anesthesiology of the American Medical Association for the continuum of training in anesthesiology and the optional year. The continuum consists of the clinical base year and two clinical anesthesia years.

The anesthesiology program may be entered through a categorical (diversified) program which includes six months in anesthesiology (including respiratory therapy) and four months in general internal medicine. The remaining two months are spent in a medical subspecialty. Six additional months of elective clinical experience must be completed during the subsequent twenty-four months.

For residency information: Brent M. Parker, M.D., Chief of Staff, University Hospital and Clinics, 882-4913

The program director may accept previous clinical experience (e.g., rotating internship, specialty training), so that the trainee may enter directly into the clinical anesthesia years. The latter includes twenty-two months of classical operating room anesthesia and two months of respiratory care.

Requirements for appointment are:

(1) be a graduate of a medical school of the United States and its territories—approved by the Council on Medical Education—or of Canada, or a graduate of an osteopathic school of the United States who has fulfilled the requirements for acceptance for graduate training as outlined in the "Essentials of Approved Internships and Residencies." Candidates also may be appointed who are graduates of foreign schools and possess a standard FLEX certificate or a full and unrestricted license to practice medicine in the United States, its territories or possessions;

(2) be licensed or licensable to practice medicine in the state of Missouri;

(3) have completed an internship approved by the Council on Medical Education and Hospitals; and

(4) have a personal interview.

Every patient scheduled for anesthesia and surgery is presented and the pre-anesthetic preparation, medications, techniques, and agents indicated are discussed with the permanent staff. A weekly morbidity and mortality conference is held each Wednesday afternoon. Didactic sessions are held Tuesday and Friday.

Residents are assigned to the more difficult anesthesiological techniques as they acquire knowledge and skill. Statistics are deemed relatively unimportant; however, each resident is expected to administer approximately 500 anesthetics each year, utilizing various techniques.

An optional year is offered to the trainee desirous of obtaining a full academic background and/or interested in and capable of participating in either basic research or specialized clinical training related to anesthesiology.

Anesthesiology research is directed by members of the full-time staff. Each resident

is encouraged to participate in a research project (either clinical or basic) and to publish observations and conclusions in an accredited journal.

Each resident is expected to seek certification as a specialist in anesthesiology following satisfactory completion of the examination offered by the Joint Council on In-Training Examinations.

The department is staffed by six anesthesiologists, each of whom is a Diplomate of the American Board of Anesthesiology or a Fellow of the American College of Anesthesiologists. In addition to the full-time staff, there are four anesthesiologists with clinical appointments.

The basic philosophy is to make this residency program an educational experience for the trainee. The goal is the development of a physician consultant in anesthesiology.

Inquiries concerning this program should be directed to G. W. N. Eggers, Jr., M.D., Chairman, Department of Anesthesiology.

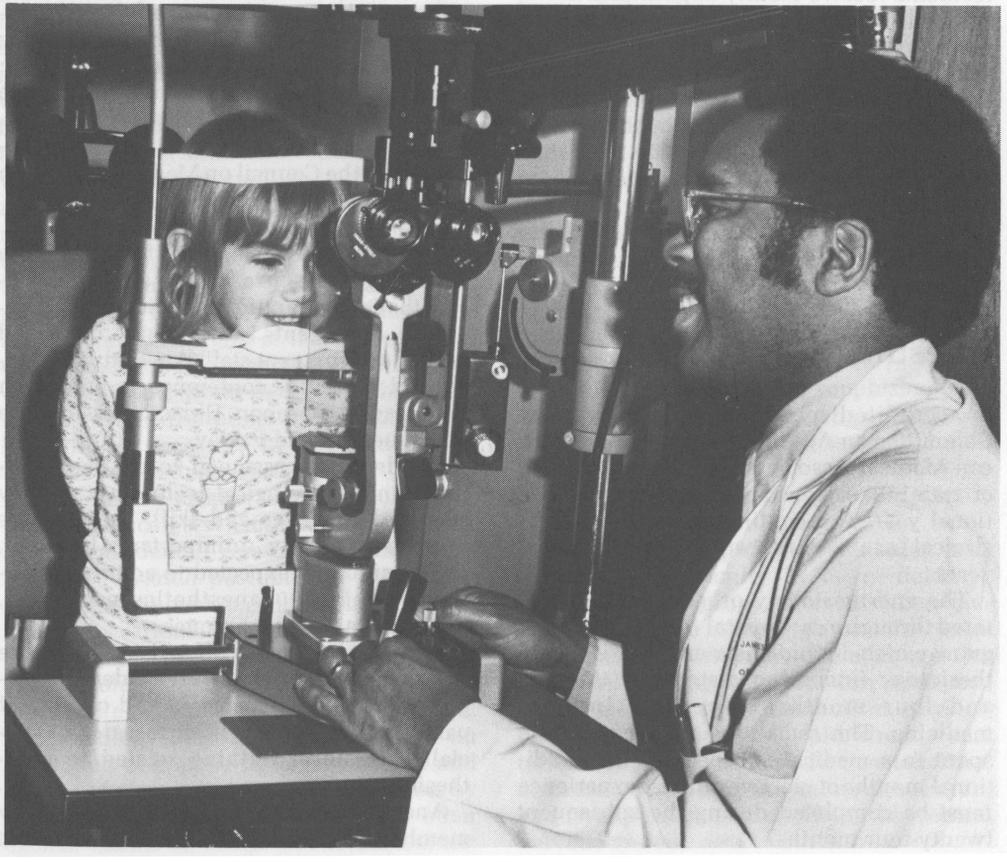
Child Health (Pediatrics)

The Department of Child Health offers a graduate training program in child health covering the first, second and third years after graduation from medical school.

The first-year residency is devoted to general pediatric training on the ward, newborn nursery and outpatient clinic, with major responsibility for patient care. The house officer supervises the work of medical students and makes daily rounds with attending staff. Emphasis is placed on continuing follow-up care of well and sick children by the same house officer.

During the second year, general pediatrics experience continues with increasing independent responsibility and with more intensive experience in the pediatric specialties for short periods of time.

The third year is a further development of the second year, with additional responsibility of supervision of first-and second-year resident staff and medical students. Third-year resident staff members participate to a greater extent in the specialty clinics and have their own clinics. Elective work and



research are encouraged during the third year, with emphasis on community health and working experience with other health agencies.

Fellowships for two or three years are available in several subspecialties: endocrinology (with or without emphasis on diabetes mellitus), metabolism, neonatology, cardiology, gastroenterology, hematology, ambulatory care and developmental pediatrics.

Facilities. The pediatric service, which operates as a referral center for a wide area, assures an excellent variety of clinical material. The children's floor in the hospital includes 47 beds. There are over 100 admissions to the newborn nursery each month, 10 percent of which are transported neonates. Total admissions to the intensive care newborn nursery are over 1,000 per year.

A hospital school for inpatients who are elementary through high school age is maintained as a supportive, therapeutic component of hospitalization.

The pediatric outpatient department has approximately 15,000 patient visits per year. In addition to daily general clinics, the following clinics are held weekly: general pediatrics as well as neurology, cardiology, hematology, gastrointestinal, cystic fibrosis, diabetic, endocrine, renal, allergy, high-risk, rheumatology, genetics counseling, and counseling for children with school problems. A developmental evaluation program provides a multidisciplinary approach for the management of children with complex problems. A Birth Defects Program provides for the diagnosis and comprehensive care of selected patients. A Muscular Dystrophy Clinic, sponsored by the Muscular Dystrophy Association of America, serves patients from a 23-county area of central Missouri.

Conferences and Rounds. Teaching rounds are conducted daily on the pediatric ward and in the nurseries with attending staff physicians. The staff also participates in frequent conferences devoted to discussions of problem patients from both inpatient and outpatient services. Weekly grand rounds and a daily radiology conference are held. Research seminars and journal review conferences are held twice monthly. Clinical-pathological conferences, pediatric surgery grand rounds, neonatology conferences and mortality conferences are conducted at regular intervals.

The full-time staff is 22 members whose subspecialty interests include cardiology, endocrinology, hematology, neurology, al-

lergy, diabetes, infectious disease, gastroenterology, developmental disabilities, social pediatrics, nutrition, rheumatology, genetics and birth defects, child abuse, neonatology, metabolism and renology.

For further information concerning this program, write to: Giulio J. Barbero, M.D., Chairman, Department of Child Health.

Dermatology

A three-year residency in dermatology includes both clinical and scientific training in accordance with the recommendations of the American Board of Dermatology. Two or three trainees may be accepted each year, receiving the same stipend as do residents in medicine. All residents are expected to teach, carry on some research, write a thesis, and to take the Board examination.

Clinical Training. Both children and adults may be hospitalized under the direct care of the Dermatology Service. In addition, numerous consultations provide inpatient experience in every speciality of medicine. Outpatients are seen at the University Clinics and the adjacent Veterans Hospital by appointment, providing a means by which cases of high teaching value may be encouraged and selected. Outpatient and consultation experience is available in all three years of residency.

Exceptional training in the diagnosis and the management of visible tumors is available through an affiliation with the Ellis Fischel State Cancer Hospital in Columbia. The University's Student Health Service, the Marshall (Mo.) State Hospital, and an "out-reach" consulting service to private clinics offer further diverse clinical experience.

Academic Training. Organized seminars are required in clinical dermatology, as well as in the applied sciences applicable to dermatology. Weekly conferences are held in mycology and histopathology. Training for an academic career is available. This program includes both research training and instructorship. Dermatology in context with general medical problems of all types is emphasized and a comprehensive scientific base extending beyond traditional dermatology is presented.

Research Training. Facilities for research include the departmental laboratories which can be involved in tissue culture, immunology and histocompatibility, mycology, biochemistry, and electron microscopy. Clinical research can be evaluated on outpatients and in the Clinical Research Center.

Computer equipment is available as a separate unit in the hospital.

For further information concerning the residency program, write Philip C. Anderson, M.D., Chief of Dermatology.

Family Medicine

The Department of Family and Community Medicine has responsibility for teaching, research and service activities covering the spectrum from primary medical care to community medicine. Departmental activities include the training of family medicine residents. Organizational units of the department include sections of behavioral sciences, community medicine, community health education and family medicine.

UMC has an approved three-year residency leading to board eligibility in Family Medicine. Ten positions currently are available at each level of the program. Appointments at the first-year level are provided through the National Internship and Residency Matching Program.

The program is fully integrated into the UMC Hospital. Faculty consists of a core staff of eight family physicians, an internist, a psychiatrist, an obstetrician, six nurse practitioners, a nutritionist, and a social worker—plus physician consultants from each major specialty area.

The program is designed to facilitate the education of highly qualified family physicians who are competent to deal with 90 percent of the problems of their practice. It is recognized that the program must vary from resident to resident, based upon the location in which each wishes to practice and upon individual desires. Consequently, flexibility is the key. The core of the program lies in family medicine with approximately one-third of the first year and one-half of the subsequent years within family medicine.

Residents practice in two model units. The Family Medical Care Center is located as a separate facility within the UMC Health Sciences Center and offers an ongoing program of preventive and acute care for families who reside within the Columbia area. The Callaway Family Care Center is located in the rural community of Fulton, 25 miles from Columbia. More than 2,000 patients are seen monthly in the two model units. Inpatient beds are assigned to the Family Medicine Program so patients cared for by residents and staff in family medicine may be hospitalized on their own service at both the

University Hospital and the Callaway County Hospital.

In addition to the core program in the Family Medical Care Center, rotations are available on each inpatient service, as well as ambulatory areas, both within the UMC Hospital and Clinics and in other locations. Residents function as teams when assigned to inpatient services. Each team of two residents is responsible for approximately 15 inpatient beds on each important service, as well as for their own patients in the Family Medical Care Center. With continuing care responsibility for their own patients, they are in a better position to use the inpatient rotations for their specific needs as family physicians.

During the first year of the training program, the trainees divide their time on inpatient services in internal medicine, child health, and ob-gyn while maintaining major responsibilities in the Family Medical Care Center program. The second and third years of the residency permit opportunities in surgery, psychiatry, anesthesiology, medical subspecialties, and surgical subspecialties. Opportunities are available both on University services and in affiliated practices in the community.

For additional information write Jack M. Colwill, M.D., Director of Family Medicine Residency Program.

General Preventive Medicine

The residency program in general preventive medicine provides residents with training which would make them eligible for certification by the American Board of Preventive Medicine. This includes 12 months of academic training leading to a Master of Science in Public Health (M.S.P.H.) degree, 12 months of clinical training in one or more specialties related to preventive medicine, and 12 months of field experience in preventive medicine. There are positions for six residents, two in each of three years of the program.

During the three years of training, the resident completes the total time required in each component of the program. However, two or more of these activities may be carried on at any one time. For example, academic training may be spread over a two- or three-year period. The resident may be on a research assignment while taking some formal course work. In other words, this residency

is not conducted using a rigid block system of assignments. However, the block system is provided to an occasional resident who feels more comfortable with it.

Clinical Training. The clinical phase of the training totals one year; however, it can be spread over a two-year period. Ordinarily, clinical training begins in the first year of the residency. No clinical assignment is shorter than three months or longer than 12 months. The nature of the clinical assignment is based on the resident's clinical interests. Arrangements can be made for the resident to have training in one or more of the following specialties: internal medicine, child health, obstetrics and gynecology, psychiatry, physical medicine and rehabilitation, family medicine. The percentage of time spent on each service is determined according to the resident's needs and interests.

Academic Training. Formal academic training for the resident is provided through the approved graduate program which leads to the Master of Science in Public Health (M.S.P.H.) degree. This is a 32 semester-hour degree. Each resident is required to complete a research project which is presented as a formal thesis for this degree.

Field Training. During the field training experience the resident spends approximately six months at an institution in which preventive medicine is practiced and six months gaining additional experience, skill and practice in epidemiology, or some other area of preventive medicine research.

When assigned to an institution for the practice of preventive medicine, no less than one day or more than seven days is spent for a general orientation of that agency. Assignments are made to an area of practice consistent with each resident's academic, clinical and research interests and needs. In this setting, they see the application of their academic training and research to the every-day practice of preventive medicine. Service in this institutional setting is of at least three months' duration.

The following Missouri institutions have agreed to provide field training: Missouri Division of Health, Jefferson City; Columbia City Health Department, Columbia; and the Kansas City Department of Health, Kansas City.

Occasionally, a resident may wish to spend 12 months at one or more institutions in which preventive medicine is practiced. This is possible within the framework of the residency program.

Research skill, experience and practice is supervised by a faculty member. The School of Medicine probably will be the center from which this research is conducted. If research is conducted elsewhere, a faculty adviser maintains close communication with the resident.

For additional information, write William C. Allen, M.D., Director, Residency Program in Preventive Medicine.

Medicine

Graduate education in the Department of Medicine represents a progression from medical school experiences to increasing responsibility and competence in the care of patients. Twenty-two new postgraduates may be appointed each year. The residency in internal medicine is approved for three or more years of training.

Rotations are available in the divisions of cardiology, infectious disease, hematology and oncology, gastroenterology, endocrinology and metabolism, immunology and rheumatology, nephrology, pulmonary and environmental medicine, ambulatory care, the Arthritis Center and the emergency room. The third-year program is flexible.

Fellowships are available after completion of residency in all major subspecialty areas.

For further details concerning this program, write Charles E. Mengel, M.D., Chairman, Department of Medicine.

Neurology

There is no neurology residency for the first year of graduate medical education. Individuals interested in the approved neurology residency for the second, third and fourth years of graduate medical education must complete their first year in an approved internal medicine or pediatrics program. The Department of Medicine gives consideration to medical students applying for a first year of graduate education in internal medicine and already accepted by the Department of Neurology for the subsequent year.

The residency in neurology is approved for three years of training. Usually two residents from each level of training are appointed each year for a total of six residents annually.

The resident's first year is spent largely on the neurology wards of the University and V.A. hospitals, with approximately three months devoted to the consultation service. The second year includes rotations on

neuropathology, electromyography, pediatric neurology, electroencephalography, and the consultation service. The physician usually spends half of the third year as the chief resident and pursues elective activities during the remaining six months. Electives may include neuroradiology, psychiatry, physical medicine and rehabilitation, research, experience with a practicing neurologist(s), etc.

For further details concerning this program, write J. Donald Easton, M.D., Chairman, Department of Neurology.

Obstetrics & Gynecology

An accredited four year postgraduate residency program is offered to medical school graduates with firm career goals in obstetrics and gynecology, which results in American Board eligibility.

Six months of extra-disciplinary elective time is made available to the first-year resident physician. Electives include but are not limited to: internal medicine, anesthesiology and child health. The remaining six months are divided equally between obstetrics and gynecology.

The second year of the resident's time is divided equally between obstetrics and gynecology. Residents assigned to obstetrics assume responsibility for the care of patients on the obstetric ward and in the labor and delivery rooms. They conduct both nonoperative and operative deliveries under appropriate supervision.

Residents assigned to gynecologic services are responsible for the pre-operative and post-operative care of patients and perform minor gynecologic operative procedures.

The third year resident obstetrician-gynecologist assumes primary responsibility in the outpatient clinic under direction of a chief resident. During the year, the resident consults with first-year residents on both obstetrics and gynecology, manages the more complicated problems, gains surgical experiences as first assistant, and performs major gynecologic operative procedures.

During the last year, the chief resident obstetrician-gynecologist is responsible for the operation of the entire service, consulting as necessary with attending faculty. Liberal surgical experience is acquired.

Scheduled rounds are conducted with the attending staff at least three times weekly. Departmental conferences, as well as joint conferences with radiotherapy and pathol-

ogy staff, are held weekly. A joint conference with pediatricians is held monthly.

All residents participate actively in the teaching of medical and nursing students. Participation in departmental research programs, as well as in projects of the resident's choosing, is encouraged. Opportunities are provided for attendance at regional and national medical meetings.

Physical facilities for the Department of Obstetrics and Gynecology consist of an obstetric wing providing 32 beds for ante- and post-partum patients, and labor and delivery room suites. Rooming-in facilities are available to patients who request them. This medical center is designated a Level III High Risk Maternity Referral Center.

A separate 25-bed area is reserved for gynecologic patients. Additional facilities of the department include the out-patient clinic, operating rooms, administrative offices, and research laboratories.

Occupancy rates in the obstetric-gynecology units average 75 to 90 percent capacity. Births at the UMC Medical Center totaled more than 1,200 last year, and approximately the same number of gynecologic operative procedures were carried out. A high proportion of the obstetric census (75 percent) is complicated, referred for consultation or therapy. More than 15,000 patients are seen in the department's outpatient clinics each year. These patients are referred from all sections of Missouri and thus provide a variety of problems for teaching purposes.

For information contact David G. Hall, M.D., Chairman, Department of Obstetrics and Gynecology.

Ophthalmology

A three-year residency in ophthalmology is offered by UMC. Beginning residents are added to the program on July 1 of each year. Candidates apply through the Ophthalmology Matching Program, sponsored by the Association of University Professors of Ophthalmology, P.O. Box 7999, San Francisco, California 94120.

During the first year, residents are required to attend a formal postgraduate course in ophthalmology as approved by UMC. The ophthalmology postgraduate courses conducted by the Harvard University Graduate School of Medicine, the University of Pennsylvania Graduate School of Medicine, the Stanford University Graduate School of Medicine, or the Lancaster Course

in Ophthalmology given at Colby College are examples of approved programs for this purpose. The resident is given leave of absence with pay for the time required to complete the course.

Facilities for training include well-equipped clinics, operating rooms and laboratories at the Veterans Hospital and the Eye Research Foundation of Missouri. Conferences, seminars and teaching rounds are conducted daily. General ophthalmology clinics are held on Monday, Wednesday and Friday, and surgery is performed on Tuesday and Thursday. Subspecialty clinics are being developed. Specialty teaching seminars, photography sessions, and problem case sessions are conducted weekly.

All residents are expected to enroll for the Home Study Course as given by the Academy of Ophthalmology and Otolaryngology and to engage in a continuous and systematic reading program as outlined by the staff.

All residents are encouraged to participate in research in the laboratories or clinics. This may take the form of assistance to the re-

The Newborn Intensive Care Unit is a major referral center for highrisk newborns. About 1,000 are treated here each year.

search interests of the staff, or residents may develop their own independent project under staff approval and supervision.

Residents have a minimum of independent responsibility for care of patients during the first year. They are instructed in the details of ophthalmological examination, inpatient and outpatient care, and surgical procedures. During the second year, they assume more responsibility in diagnosis and treatment and begin major eye surgery. Extensive experience in surgery is provided in the third year.

Close and readily available supervisory or consultative guidance is provided by the full-time staff throughout the whole program.

Clinical and research fellowships are available for a fourth year of training. Post-doctoral fellowships and graduate assistantships for candidates for advanced degrees are made possible through collaboration with the Department of Biochemistry.

For further information, contact Robert Patrick Burns, M.D., Chairman, Department of Ophthalmology.

Pathology

The Department of Pathology is committed to its residency training program; residents are welcomed into all aspects of departmental activities. The residency is a categorical program and the first year is an integral part of the training offered. Designed primarily to provide a broad basis of knowledge, experience and technical ability for those who wish to practice pathology, the program provides opportunity, as well as encouragement from the staff, for those interested in academic pathology to gain experience in teaching and research. While the residency program follows a general scheme, it is flexible enough to be adapted to the needs and interests of the individual through elective opportunities. Satisfactory completion of the four-year program satisfies the training requirements for admission to the qualifying examination for certification by the American Board of Pathology in anatomic and clinical pathology (AP/CP 4 certificate).

The department has been approved for a total of 16 residents in the general pathology AP-CP program. Generally, four are accepted per year. Residents are usually accepted through the National Resident Matching Plan to start on July 1 following their graduation from medical school. On occasion, highly qualified individuals may be accepted to start at other times if positions are available. Applicants who have had experience in other clinical disciplines are considered on an equal basis with current graduates.

Rotation schedules provide for six months of anatomic pathology and six months of clinical pathology during each of the four years. In anatomical pathology the resident will gain experience in all aspects, including autopsy and surgical pathology, cytology, aspiration cytology and electron microscopy. Clinical pathology rotations are arranged so that the resident will spend at least two periods in each of the major areas of chemistry, microbiology, hematology (including blood bank and coagulation), immunology and serology.

The first rotation period emphasizes basic principles and methodology of the objective measurement of disease by laboratory techniques. The second rotation extends the resident's basic knowledge and introduces him to troubleshooting problems. He serves as a consultant to the clinician and manages that section of the laboratory. A rotation

through the Ellis Fischel State Cancer Hospital introduces the resident to the operation of a smaller laboratory, more comparable to most community hospital laboratories, and affords him experience in the highly specialized anatomical pathology seen in such a specialty hospital. Fourth-year residents are accorded increased professional and managerial opportunities and participate in the organizational mechanics and problem solving of the hospital laboratory. Through proper use of elective time an individual can acquire considerable knowledge in an area of special interest.

Conferences and Teaching. Residents have a daily morning didactic conference in which lectures are presented by pathology faculty, invited speakers or residents themselves. Equal time is devoted to anatomical pathology and to clinical pathology subjects. Once weekly this conference is devoted to a review of the organs and tissues from interesting autopsy cases of the preceding week. Residents also participate in inter-departmental teaching conferences and patient care conferences on a regular basis. Case presentations at morbidity and mortality conferences of other departments are given by the residents closely associated with the cases. Pathology faculty members are available to assist the residents in preparing to present the anatomical or clinical laboratory findings and to discuss the disease mechanisms involved.

Because teaching at various levels for different groups is frequently a responsibility of the practicing pathologist, residents are required to gain experience by assuming some responsibility for teaching the pathology courses for second-year medical students. The minimum requirement is supervision of a number of laboratory sessions during the academic year. This teaching experience is largely based on the case-study approach and involves general, special and clinical pathology subject matter. Residents who wish to gain more teaching experience may become involved in planning laboratory sessions and sections of the course, or may give lectures by invitation of the faculty member in charge of a section of the course. Further opportunities for teaching may be found in the medical technology, cytotechnology and histotechnology programs.

Research Opportunities. Research is not required of residents, but is encouraged by the staff. Opportunities to become involved in existing projects of the staff are available. Within the limited space and budgetary

constraints of the department, it may be possible for a highly motivated resident to establish his own project with a member of the faculty assigned to guide him. Research may be in an aspect of basic science or in applied clinical research. Research interests of the faculty are listed in the Graduate Studies section of this *Profile*.

Within budgetary constraints, opportunity will be provided to residents to attend regional or national meetings of their choosing in the field of pathology. Residents are encouraged to submit case reports or results of research to national organizations for public presentation or publication.

For application or additional information regarding this program, write: John F. Townsend, M.D., Chairman, Department of Pathology.

Physical Medicine & Rehabilitation

Two positions are approved for each of three years in the residency training program in physical medicine and rehabilitation.

The first year is spent in the inpatient rehabilitation service, in the physical medicine and rehabilitation outpatient clinics, and in the elective services, e.g., orthopedics, internal medicine, neurology or child health.

To be eligible for the second year of residency, the physician must have completed one year of residency in a physical medicine and rehabilitation program, or have at least one year of approved training in another recognized residency program or have completed four or more years of general practice. This year is devoted to anatomy, kinesiology, biophysics, research and electives.

The resident must have completed a two-year residency program in physical medicine and rehabilitation to be eligible for the third year of training in this program. This final year is spent on the inpatient rehabilitation service, the outpatient clinic and inpatient consultation of the Section of Physical Medicine and Rehabilitation.

A million-dollar expansion program has been completed in the Howard A. Rusk Rehabilitation Center. The enlarged facility handles 600 outpatient visits a month and has 52 beds for inpatients.

For further details regarding this program write Charles R. Peterson, M.D., Chairman,

Department of Physical Medicine and Rehabilitation.

Psychiatry

The Department of Psychiatry currently offers a four-year, approved residency program, with academic and clinical training in all requisite phases of psychiatry necessary to produce competent specialists. In accordance with guidelines set by the American Board of Psychiatry and Neurology, the department offers a first post-M.D. year categorical program, including an internship equivalent year which is flexible in content to meet the educational needs and interests of the individual resident. The first year includes a minimum four-month rotation on those medical services of particular value to the psychiatrist in training. This initial year is followed by three years of general psychiatry residency. The categorical program is for applicants entering directly from medical school. Those having sufficient training begin at the second post-M.D. year level. The first three years of the four-year training sequence are devoted to core experience, while the fourth year consists primarily of elective work.

Facilities. The Mid-Missouri Mental Health Center, an 87-bed, comprehensive-care state unit adjoining the Health Sciences Center, functions under the educational supervision of the Department of Psychiatry. Active out-patient, psychosomatic, consultation, child psychiatry and rehabilitation divisions operate jointly with sections in clinical psychology, psychiatric social work, psychiatric nursing and ancillary therapies to provide the highest level of education and patient service.

An additional 60 beds for psychiatry are included in the Veterans Hospital, located in the Health Sciences Center complex.

On the clinical services, acutely ill and some chronically ill patients demonstrating all types of major psychopathology are evaluated and treated. All operationally useful therapeutic techniques are utilized. These include individual and group psychotherapy; psychopharmacologic treatment; behavior modification techniques; biofeedback; hypnosis; sexual, marital and family therapy; and electro-convulsive therapy. Provision also is made for evaluation of forensic cases. Generic principles and basic techniques are identified and stressed in the teaching program so that residents obtain experience in many types of diagnostic and

therapeutic procedures, including interviewing techniques, psychological testing, brief psychotherapy and others.

Research. The Health Sciences Center provides a setting for intensive psychiatric, psychological, physiological and sociological investigation of mental and emotional disorders. Facilities and equipment include a psychiatric research wing, electroencephalographic recording equipment, electronic brain wave analyzers, a computer center, advanced equipment and laboratories for biochemical investigation, and quarters for animal investigation. Also, sound-proof, air-conditioned interviewing rooms equipped with one-way mirrors and high fidelity tape recording apparatus are provided for research and training in psychotherapy and interviewing techniques. Closed-circuit television and other new audiovisual facilities are available within the Health Sciences Center. Consultants from all relevant medical school and other UMC departments participate in the educational programs.

Special research training in psychiatric biochemistry and mental health information systems is available in the years following basic residency training at the Missouri Institute of Psychiatry in St. Louis, an affiliate of the Department of Psychiatry at Columbia.

Clinical Training. A basic principle of this department is that, within the structure of the residency training program, continuity of patient care is not sacrificed to expediency. The same resident, throughout the training period, follows and treats at least some of the same patients, both adults and children.

In keeping with modern educational principles and changing demands on the psychiatric profession, this department has created a residency program which permits considerable flexibility, and which emphasizes a project-oriented and problem-solving approach tailored to individual needs whenever possible. Our didactic program consists of a core curriculum including lectures, seminars, rounds and tutorials, as well as individual and group supervision. The first phase of the clinical program consists of four months of internal medicine or pediatrics, and 12 months of inpatient psychiatry. The second phase includes three months of clinical neurology, three months of child psychiatry, and ten months on the hospital's Outpatient and Consultation/Liaison Services. In addition, residents spend ap-

proximately one-half day per week in community psychiatry where they function as consultants (with faculty supervision) to various community agencies. The third phase of the program consists of four months of supervisory experience in the outpatient clinic and on inpatient wards and 12 months of elective time. Additional experience in medicine, family practice, or pediatrics may be arranged in the second or third phase.

Throughout the clinical training experience, each resident is assigned patients for intensive individual and group psychotherapy, with appropriate supervision provided by senior staff members and consultants. The team approach to psychiatric care receives special emphasis. Under supervision, the resident also evaluates and treats patients on general medical, surgical, pediatric and other wards who present emotional or mental problems to their ward physicians. The resident also assists in consultation to state and local agencies and institutions, courts and prisons. A portion of this time may be spent at affiliated state hospitals working with patients suffering from acute psychotic reactions and chronic disorders.

In the fourth year, a variety of electives is offered for varying amounts of time. Electives include: child psychiatry, alcoholism and drug abuse, forensic psychiatry, geriatric psychiatry, marital and family therapy, hypnosis, treatment of sexual disorders, student mental health, inpatient service (ward administration), community psychiatry, psychosomatic medicine, neurosciences, psychiatry in family practice, mental retardation, psychophysiology, advanced psychotherapy, psychiatric applications of clinical psychology, biochemistry, pharmacology and others.

In addition to acquiring basic knowledge and clinical skills, the psychiatric resident should develop scientific curiosity and critical inquiry into existing or newly-formulated concepts and methods. In order to acquire new skills and demonstrate scientific acumen, all general psychiatry residents are expected to engage in a project and present it in a formal paper which must meet the approval of the Education Committee before a certificate of completion of training is issued. The project may involve research, a critical review of the literature or some other creative endeavor approved by the Education Committee.

Special fifth-year academic fellowships in advanced clinical psychiatry, community

psychiatry, research or a variety of other subspecialty areas also are offered.

The Department of Psychiatry also has developed, as a portion of the residency program, an optional program of academic work leading to a Master of Science degree in community mental health and behavioral science, mediated through the medical school's Department of Family and Community Medicine.

Other combined programs leading to advanced degrees in relevant basic science or psychological science areas may be similarly arranged on an individual basis.

Teaching. All members of the Department of Psychiatry participate in educational activities, as well as in the clinical and research programs. Organized instruction (including individual tuition), seminars and clinical conferences in psychiatry, psychopathology, psychotherapy, psychology, neuroanatomy, neurophysiology, neuropathology, neuroradiology and the behavioral sciences are provided by members of the department and Health Sciences Center staff and by guest instructors and lecturers.

Appointments Available. Four first-year residency positions are offered. Service generally begins on July 1 or January 1, but the program allows exceptions to these starting dates. Candidates must meet standard prerequisites for admission to residency pro-

The UMC Burn Unit is the only specially equipped burn treatment center between Kansas City and St. Louis.

grams, and those with prior residency training will be considered for admission to advanced standing. Residency positions are open both to men and women (with special scheduling arrangements available during the second and later years for women residents who are also homemakers) and to selected graduates of foreign medical schools who have met requirements of the ECFMG and the Immigration and Nationality Act.

As members of the academic staff, residents are eligible for insurance (including medical coverage for the entire family at a nominal cost) and other benefits.

For additional information, write Kenneth E. Callen, M.D., Director of Psychiatric Education.

Child Psychiatry

The child psychiatry program uses facilities of the Mid-Missouri Mental Health Center and the University Health Sciences Center.

A close working relationship, with provisions for mutual consultation and training, is maintained with the Department of Child Health.

Community mental health programs offer residents supervised experience with welfare agencies; juvenile courts; nursery, public and correctional schools; and mental retardation facilities. As a part of the School of Medicine and the total University, the program has access to academic psychology, special education, reading clinics, sociology, bioengineering and computer services.

Staff. The teaching staff includes seven full-time child psychiatrists, eight social workers with master's degrees, two Ph.D.'s in psychology, two certified speech pathologists, one child development specialist, five special education teachers, five guidance counselors, occupational and recreational therapists, and a full complement of nurses and psychiatric aides.

Program. Supervised experience is provided in the evaluation and treatment of emotionally disturbed children, ages six through 16. Similar experience with preschool children is provided through the Child Development Unit. The advanced fellow does consultation for a variety of community agencies and participates in the medical student teaching program. Regular conferences, staffings, grand rounds, seminars and colloquia occupy a significant portion of the resident's training experience. Participation in research programs, worked out on an individual basis, is encouraged.

The child psychiatry section is eclectic in orientation and uses and teaches all standard treatment modalities. The bio-psycho-social interrelations of mental illness are stressed.

Four residency positions are offered. Candidates must meet the same standards outlined in the general psychiatry program. Special arrangements can be made for part-time training.

Additional information may be secured from John F. Simonds, M.D., Director of Child Psychiatry Residency Training, or James L. Chapel, M.D., Chief, Section of Child Psychiatry.

Radiology

The Department of Radiology is divided

into three major divisions, each of which offers residency training: diagnostic radiology, radiation therapy and nuclear medicine.

The Diagnostic Radiology residency program accepts applicants at either the PGY-1 or PGY-2 level, and correspondingly offers four-year or three-year residency training programs. Included in the diagnostic radiology rotation are four preceptorships in the first year in the basic fundamentals of radiology: bone radiology, chest radiology, gastrointestinal radiology, and genitourinary radiology.

The second year is devoted to subspecialty training including pediatric radiology, ultrasonography, visceral and peripheral angiography and neuroradiology training. CT scanning is included as a separate rotation. In addition, two months on nuclear medicine are provided in either the second or third years.

The third year of diagnostic radiology for those residents who entered at the PGY-2 level consists of three to six months of electives and the remaining is diagnostic "rounding out" or completion of training in areas where needed as designated by the faculty. For those entering as a PGY-1, additional training in regular diagnostic radiology, re-emphasizing strengths in the basics and the subspecialties is carried out during the third year. The fourth year for those individuals entering as a PGY-1 consists of three to six months of electives and additional experience in general radiology.

Included in the third and fourth years is rotation through the Ellis Fischel State Cancer Hospital Diagnostic Radiology Department, under supervision of the chairman; and opportunities to participate in research in computer applications within radiology are available.

The Mid-America Bone Diagnostic Center and Tumor Registry has existed in this department since 1971 under the sponsorship of the American College of Radiology. It is one of only three such registries in the United States and is a center of excellence for bone tumor and other bone disease diagnostic studies by X-ray method. Outstanding teaching in this area is provided by virtue of the great variety of case material available.

The Radiation Therapy residency program is certified for four years and provides eligibility to the American Board of Radiology therapy examination for certification. These four years of training include three years of training in radiology plus a year of internship or a year in another specialty or

within radiology itself. A fifth year of training can be arranged to meet special needs and desires on an individual basis.

A Nuclear Medicine residency program has been approved for certification by the American Board of Nuclear Medicine. A fourth year in Radiology designated as Nuclear Radiology is an established and certified program which provides eligibility for the certification examination of the American Board of Radiology in Nuclear Radiology. Training is available in *in vivo* imaging as well as in *in vitro* analysis if desired. Therapy with radionuclides is also included in the program.

Application for radiology residency positions should be addressed to Carroll R. Markivee, M.D., Chairman, Department of Radiology.

Surgery

Each division of surgery has an established, approved resident training program. Residents may be admitted into the plastic surgery training program after three or four years of general surgery residency and into the cardiothoracic training program after completion of a general surgery residency. Residents advance into the other surgical training programs after completing a one- to two-year period designed to enhance their knowledge of surgical physiology and basic surgical skills. Thirteen first-year surgical residents are accepted each year. The residency training programs are tailored within the guidelines established by the respective residency boards, and each resident is encouraged to spend additional time in labo-



ratory investigation and clinical fellowships.

Facilities available to the Department of Surgery include 150 adult beds and 20 children's beds in the UMC Hospital, surgical outpatient clinics, operating suites and recovery room, intensive care units, burn unit, emergency suite, animal quarters and animal operating suite, research laboratories, and comparable facilities (including 158 surgical beds) in the Harry S. Truman Memorial Veterans Hospital.

Members of the full-time staff share the responsibilities of teaching rounds, conferences, lectures and outpatient consultations. Research is being conducted on cardiovascular surgery, vascular physiology, burn metabolism, renal physiology, gas-trophysiology, neurophysiology, trace metal metabolism, parenteral nutrition, obesity, bladder physiology, thromboembolic disorders, oncology and transplantation.

General Surgery

General surgery offers a five-year residency training program. Satisfactory completion of the program enables the individual to apply for examination by the American Board of Surgery. The major portion of the training is obtained in the UMC Hospital and in the adjacent Veterans Administration Hospital.

The first two years of the program are designed to provide basic experience in the field of surgery, irrespective of ultimate career goals (and are recommended as initial steps for all surgical training programs). During the first two years, residents are assigned to the general surgery service and may also spend time on other surgical specialties, surgical pathology and anesthesiology. The final three clinical years are devoted to expanding the surgical resident's knowledge and skills as they relate to general surgical problems. Additional time may be spent in the surgical research laboratories or in the basic science laboratories.

The resident staff, with help from the full-time faculty, is responsible for the clinical management of all surgical patients. Daily rounds, grand rounds, mortality and morbidity conferences, resident clinical and basic science seminars, and other appropriate clinical and research conferences—all of which promote an active teaching program—are held at regular intervals. Throughout their training program, the residents assume increasing operative responsibilities, which culminate in a rich experi-

ence with a wide variety of surgical conditions during the chief resident year. For additional information, contact: Donald Silver, M.D., Chairman, Department of Surgery.

Cardiothoracic Surgery

The approved residency program in cardiothoracic surgery at UMC offers a balanced clinical experience in general thoracic surgery and cardiac surgery including open heart procedures in children and adults. The resident rotates at both junior and senior levels of responsibility through the University Hospital and Veterans Hospital. Selected residents are allowed an additional year over the standard two-year program to pursue investigational interests and obtain additional clinical exposure. Residents are encouraged to pursue clinical research and are given the opportunity to participate in the teaching of medical students, nurses and paramedical personnel.

Applicants to the program must be eligible for examination by the American Board of Surgery. One or two residents are selected each year.

Direct inquiries for additional details to: Jack Curtis, M.D., Chief of Cardiothoracic Surgery.

Neurological Surgery

The Division of Neurological Surgery offers an accredited five-year training program. Applicants should have had at least one postgraduate year of general surgery training. Upon completion of the program, the candidate is eligible for certification by the American Board of Neurological Surgery.

Applications and inquiries should be directed to: Clark Watts, M.D., Chief of Neurological Surgery.

Orthopaedic Surgery

The University of Missouri-Columbia offers an approved residency program in orthopaedic surgery which leads to board certification. Two applicants are accepted into the program each July.

The program includes children's orthopaedics, adult orthopaedics, fractures, reconstructive orthopaedic surgery, and instruction in the basic sciences. One year of general surgery or a comparable year of training is required for the orthopaedic residency program. For further details write: Dr. William C. Allen, Chief of Orthopaedic Surgery.

Otolaryngology

The Division of Otolaryngology offers an approved program leading to board certification. Two years of general surgery training are required in addition to the three years of training in otolaryngology.

A broad surgical experience in all aspects of otolaryngology, including head and neck lesions and maxillofacial trauma, is provided. Weekly conferences cover pathology, radiology and associated basic science topics. Residents rotate between the University Hospital and the adjacent Veterans Administration Hospital.

Address correspondence to: Donald J. Joseph, M.D., Chief of Otolaryngology.

Plastic Surgery

The Division of Plastic and Reconstructive Surgery offers a fully accredited two-year training program. Applicants must have had a minimum of three years of training in surgery, with the third year at a senior resident level (as required by the American Board of Plastic Surgery). Sufficient general surgery training to meet the requirements of the American Board of Surgery is desired.

The training program offers experience in congenital deformities, maxillofacial trauma, head and neck cancer, hand, burns, and cosmetic surgery. Conferences on general plastic surgery, hand, cleft lip and palate, burns, and head and neck cancer are held regularly. A microvascular laboratory is fully staffed and actively engaged in research. It is also available for basic microsurgical training. Clinical and basic research in the areas of cleft deformity, burns, wound

problems and microvascular surgery is encouraged. Two residents a year are accepted for a two year residency.

Applications should be directed to: Charles L. Puckett, M.D., Chief of Plastic Surgery.

Urology

The approved residency program in urology at the UMC Health Sciences Center complex provides training and experience at the contiguous University and Veterans Administration hospitals.

The two years of postgraduate education required by the American Board of Urology, prior to the three years of urology, are offered by the Department of Surgery, and are tailored to the requisites of the urology residency. Two appointments to the residency program are made each year.

The clinical services of urology offer a broad experience of gradually increasing responsibility for patient care and management. The surgical approach to all phases of genito-urinary disease, including renal transplantation, is under the direct supervision of a full-time staff, and a strong liaison is maintained with Nephrology and the Rusk Rehabilitation Center. Pediatric urology is a vigorous component of the clinical experience.

During the clinical years specific periods may be set aside for research activity in the urological laboratories. The completion of a basic or clinical research project is encouraged.

Applications should be directed to: Gilbert Ross, Jr., M.D., Chief of Urology.

Statement of Courses

School of Medicine Interdisciplinary Courses

- 205M **Social and Behavioral Sciences I** (3).
 206M **Social and Behavioral Sciences II** (2).
 207M **Social and Behavioral Sciences III** (2).
 208M **Social and Behavioral Sciences IV** (1).
 220M **Introduction to Clinical Medicine I** (1).
 221M **Introduction to Clinical Medicine II** (2).
 222M **Introduction to Clinical Medicine III** (3).

Anatomy

- 202 **Elementary Anatomy** (5). Prerequisite: 5 hours biological science or equivalent. f, w.
 205M **Medical Gross Anatomy** (8). f.
 206M **Medical Developmental Anatomy** (2). f.
 207M **Medical Histology** (4). w.
 208M **Medical Neuroanatomy** (3). w.
 300 **Problems** (cr. arr.)
 301 **Human Gross Anatomy** (8). Prerequisites: 202, comparative anatomy or equivalent, instructor's consent. f.
 303 **Human Developmental Anatomy** (2). Prerequisites: vertebrate embryology & instructor's consent. f.
 304 **Human Histology and Organology** (4). Prerequisites: 10 hours of biology & instructor's consent. w.
 305 **Anatomy of the Human Nervous System** (3). Prerequisites: 202, comparative anatomy or equivalent, & instructor's consent. w.
 306 **Autonomic Nervous System** (2). Prerequisite: same as 305. w.
 308 **Hematopoietic Organs** (2). Prerequisites: basic histology & instructor's consent. w.
 312 **Biology of the Endocrine Organs of Man I** (2). Prerequisites: advanced standing in biological sciences, instructor's consent. f.
 313 **Biology of the Endocrine Organs of Man II** (2). Prerequisites: 312, instructor's consent. w.
 405 **Mammalian Reproduction** (3). Prerequisites: graduate standing in one of animal, biologic, medical, or veterinary sciences; instructor's consent; Biochemistry 304 or equivalent. f.
 410 **Seminar** (1). f, w.
 450 **Research** (cr. arr.)
 490 **Research** (cr. arr.)

Anesthesiology

Anesthesiology Elective (10). Junior and Senior Students. The goals are to provide students (a) an understanding of certain truths associated with the anesthetic state (e.g., the inability of a person to protect himself from the environment; concomitant and common depression of systems of the body other than the nervous system); (b) an opportunity to learn to think and react quickly and correctly in times of stress; (c) to develop knowledge and skills at maintaining artificial ventilation and circulation; (d) to develop technical skills (e.g., insertion of endotracheal catheters, intravenous infusions); (e) to understand some of the rationale in the choice of an anesthetic agent or technique; (f) to relate the morbidity and mortality of anesthesia to surgical patients; (g) to inform students of the functions of anesthesiologists in the care of nonsurgical patients (e.g., respiratory therapy, pain problems); and (h) to attract students to the speciality of anesthesiology. Eight-week periods are preferred

although four-week electives are available. Actual participation in anesthetic evaluation and administration for surgical procedures is combined with close individual supervision. Arrange electives with the department chairman.

Biochemistry

- 10 **Biochemistry, the Field and the Profession** (1).
 110 **Introductory Biological Chemistry** (3). Prerequisites: 5 hours general chemistry. f.
 193 **General Biochemistry** (3). Prerequisites: Chemistry 1; Chemistry 210-211, or Chemistry 205; sophomore standing. f, w.
 195 **General Biochemistry Laboratory** (2). Prerequisites: same as 139, f, w.
 206 **Medical Biochemistry** (9). Prerequisite: 8 hours general chemistry, 5 hours organic chemistry. Some quantitative chemistry recommended. f.
 270 **Biochemistry** (3). Prerequisites: one year inorganic chemistry, 5 credits organic chemistry with laboratory. Quantitative analysis recommended. f.
 272 **Biochemistry** (3). Prerequisite: 270. w.
 274 **Biochemistry Laboratory** (3). Prerequisites: 270 & 272 concurrently. f, w.
 299 **Seminar** (1). Prerequisites: senior standing, a minimum of 10 hours chemistry including a biochemistry course with laboratory.
 300 **Problems** (1-3).
 304 **General Biochemistry Lectures** (5). Prerequisites: organic chemistry & quantitative chemistry & biology. f.
 310 **Trace Analysis** (3). (same as Chemistry 310). Prerequisite: quantitative analysis. w.
 311 **Interpretation of Molecular Spectra** (3). Prerequisites: organic chemistry and instructor's consent. f.
 375 **Topics in Biochemistry** (cr. arr.) Prerequisites: general biochemistry; others as specified by instructor each semester course is offered. Section: a. Biochemical genetics b. Physical biochemistry c. Enzymology.
 400 **Problems** (1-6).
 401 **Plant Biochemistry** (3). Prerequisite: 272 or 320-322 or 304 or instructor consent. alt. f. odd yrs.
 403 **Topics in Biochemistry** (2-3). Prerequisites: general biochemistry, others as specified by instructor each semester course is offered.
 520 **Seminar** (1). f, w.
 412 **Biochemistry of Hormones** (3). Prerequisite: 272 or instructor's consent. alt. w. even yrs.
 413 **Reproductive Biology Seminar** (1) (same as Animal Husbandry 413). Open to qualified students of graduate standing in the field of reproductive biology. f, w.
 422 **Analytical Biochemistry—Chromatography** (2). Prerequisite: graduate standing or instructor's consent. f.
 423 **Analytical Biochemistry—Multiple Automatic Microanalysis** (1). Prerequisite: graduate standing or instructor's consent. f.
 424 **Analytical Biochemistry—Mass Spectrometry** (2). Prerequisites: two courses in organic chemistry, one course in physics, & instructor's consent. w.
 450 **Research** (2-8).
 461 **Advanced Carbohydrate Metabolism and Biological Oxidations** (2). Prerequisite: 304 or equivalent. alt. w. odd yrs.
 462 **Advanced Metabolism: Proteins and Nucleic Acids** (2). Prerequisite: 304 or equivalent. alt. f. odd yrs.
 463 **Advanced Lipid Metabolism** (2). Prerequisite: 304 or equivalent. f.

464 Physical Biochemistry: Proteins, Enzymes, Nucleic Acids (2). Prerequisites: 320 or equivalent & physical chemistry & differential integral calculus. w.

465 Advanced Metabolism: Amino Acids (2) (same as Nutrition 465). Prerequisite: 304 or equivalent. alt. w. even yrs.

466 Regulation of Energy Metabolism (2). Prerequisite: 304 or 322 or equivalent. alt. w. odd yrs.

490 Research (cr. arr.)

Child Health

Pediatrics: Third Year (10). During the clinical years, an eight-week full-time clerkship is required. Students are assigned patients on the ward and newborn nursery and in the diagnostic outpatient clinics for independent history-taking, examination, and clinical and laboratory evaluation, followed by discussion with a member of the staff. In addition to general pediatric clinics, subspecialty clinics are held in the fields of prematurity, diabetes, endocrinology, nutrition, gastroenterology, hematology, allergy, cardiology, neurology, and rheumatology. Clinical experience is supplemented by participation in daily conferences, lectures and seminars.

Pediatrics, Elective (10). All fourth-year students are encouraged to spend elective time in pediatrics. During this period, there will be extensive exposure to everyday pediatric problems in the outpatient clinics, and a shorter period of intensive inpatient training, with increasing responsibility in both areas. Preceptorship with a practicing pediatrician, laboratory and clinical research, or a combination of these may also be arranged. These programs should not be confused with research fellowships which are available during the student's clinical years. Arrangements for such fellowships may be made through the department chairman.

Family & Community Medicine

300 Problems (1-3). Prerequisite: instructor's consent.

305 Introduction to Community Health Education (3). Prerequisite: senior standing.

315 Group Process in Community Health (2). Prerequisite: instructor's consent.

317 Planning for Change in Community Health (3). Prerequisite: senior standing & instructor's consent.

330 Statistical Aspects of Public Health (3). Prerequisite: concurrent registration in 420 or instructor's consent. f.

347 The Sociology of Community Health (3) (same as Rural Sociology 347, Sociology 347). Prerequisite: Sociology 1 & Rural Soc. 1.

350 Special Readings (1-3). Prerequisite: instructor's consent.

400 Problems (1-3). Prerequisite: graduate standing & instructor's consent.

410 Principles of Community Health Education (3). Prerequisite: f. graduate standing; w. senior standing & instructor's consent.

411 Methods in Community Health Education (3). Prerequisite: 410.

412 Planning for Change I (2). Prerequisite: graduate standing & instructor's consent.

415 Health Aspects of the Environment (3). Prerequisite: completion of 330 & 420, or equivalent, or instructor's consent.

420 Principles of Epidemiology (3). Prerequisite: concurrent registration in 330 or equivalent, or instructor's consent. f.

421 Advanced Epidemiology (3) (same as Veterinary Microbiology 421). Prerequisite: completion of 420 or instructor's consent, w.

422 Research and Evaluation in Community Health Education (3). 2.

431 Statistical Epidemiology (3). Prerequisite: completion of 330 & 420, or instructor's consent.

450 Research (cr. arr.)

490 Research (cr. arr.)

491 Field Experience in Community Health (cr. arr.) f,w,s.

492 Field Experience in Community Health Education (cr. arr.) Restricted to students specializing in Community Health Education. Prerequisite: consent of Community Health Education faculty.

Medicine

Medicine, Third Year (15). Students are assigned to medical wards for 12 weeks of intensive instruction in basic internal medicine. Emphasis is placed on developing the fundamental skills of history-taking, physical diagnosis, and case presentation. Attention is focused on learning the principles of clinical diagnosis and on developing a core knowledge of disordered physiology that constitutes representative diseases of the various organ systems. A thorough knowledge and understanding of all the patient's problems is stressed. Third-year students participate in daily patient-teaching rounds and a series of weekly conferences.

Elective Medicine (10). Opportunities exist for medical students at all levels after satisfactory completion of the first year. Elective and/or free time may be spent in any of several areas at the present time. They include: Cardiology; Dermatology; Endocrinology; Gastroenterology; Hematology and Oncology; Immunology and Rheumatology; Infectious Diseases; Nephrology; Pulmonary Medicine. The director of the respective division should be contacted for details of opportunities available.

Microbiology

205 Fundamentals of Medical and Public Health Microbiology (4). f.

301 Medical Microbiology (8). For graduate students & sophomore medical students. Prerequisite: organic chemistry; general bacteriology recommended. f.

302 Ecology and Epidemiology of Infectious Agents (cr. arr.) Prerequisite: 301 or equivalent. w.

303 Medical Parasitology (cr. arr.) Prerequisite: 301 or equivalent. w.

304 Immunology (3). Prerequisites: microbiology & organic chemistry or biochemistry. w.

305 Antibiotics (4). Prerequisite: general bacteriology. Recommended: advanced microbiology.

306 History of Microbiology (1). w.

307 Instrumental Methods in Medical Microbiology (2). Prerequisite: course in microbiology. w.

308 Microorganisms Indigenous to Man (3). Prerequisite: advanced course in microbiology. w.

309 Antisepsis, Disinfection and Sterilization (cr. arr.) Prerequisite: a course in microbiology. w.

310 Microbiology of the Environment (cr. arr.) Prerequisites: course in microbiology & in biochemistry. w.

314 Immunology Laboratory (1). Ordinarily taken concurrently with 304. Prerequisite: course in microbiology. w.

315 Bacterial and Viral Genetics (4). Prerequisites: course in microbiology & in biochemistry. w.

400 Problems (cr. arr.) Prerequisite: strong background in microbiology. f, w, s.

401 Advanced Medical Microbiology (cr. arr.) Prerequisite: 301 or equivalent. f.

402 Virology (4). Prerequisites: medical microbiology & biochemistry. w.

403 Advanced Microbiology (cr. arr.) Prerequisites: microbiology & chemistry. w.

404 Physiology of Pathogenic Organisms (cr. arr.) Prerequisites: general bacteriology & biochemistry. w.

405 Advanced Virology (4). Prerequisite: 402 or equivalent. w.

406 Medical Mycology (3). Prerequisite: medical microbiology. w.

407 Advanced Immunology (2). Prerequisite: 304. w.

410 Seminar (1). f, w.

490 Research (cr. arr.)

Neurology

Neurology—Second Year. Students are taught the principles of neurologic diagnosis as a part of the Introduction to Medicine course.

Neurology—Fourth Year. A four-week clerkship in medical and surgical neurology is required of all fourth year students. Students are assigned as clinical clerks to the service and participate in clinical and teaching functions of the Department of Neurology and the Division of Neurosurgery.

Neurology—Fourth Year. Students may choose a four-week elective in clinical neurology in which they participate in consultations rendered to other hospital services by Neurology and participate in all teaching conference activities of the Department.

Obstetrics & Gynecology

Obstetrics and Gynecology, Clinical Experience (10). Students are assigned to the clinical service in groups of varying size. Normal and complicated obstetrics and gynecology are taught by lecture, ward rounds, seminars, and attendance in clinics, wards, delivery rooms, and operating rooms. Weekly conferences with Radiotherapy and Pathology and seminars on maternal mortality, infertility, and gynecologic endocrinology are held twice weekly.

Obstetrics and Gynecology, Elective (10). Any student in the clinical elective period may make arrangement with the department to do special work on a subject of interest.

Ophthalmology

Ophthalmology, Second Year. Students are taught the principles of ophthalmoscopy as a part of the Introduction to Medicine course.

Ophthalmology, Third and Fourth Years. The ocular signs of systemic disease are taught to students as they rotate through the services of Medicine, Child Health (Pediatrics) and Neurology.

Ophthalmology Elective—Senior Students—8 weeks. Senior students who choose this elective are assigned to the service as junior residents, so that they may take part in all clinical and teaching functions of the Department.

Pathology

200 Basic Pathology (2). Prerequisite: 5 hrs. biological sciences or equivalent & 5 hrs. chemistry. f.

210M General and Clinical Pathology, Second Year (8). Prerequisite: first year Medical School or equivalent. f.

212M Systemic and Clinical Pathology, Second Year (8). Open only to medical students. Prerequisite: 210M or equivalent. w.

310 General Pathology (5). Prerequisites: Biochemistry 206, Physiology 250, Anatomy 301, 302, 304, 305 & instructor's consent. f.

311 General Pathology Laboratory (3). Prerequisites: Biochemistry 206, Physiology 250, Anatomy 301, 302, 304, 305, or the equivalents, & instructor's consent. f.

312 Advanced Pathology (5). Prerequisites: 310 & 311 or its equivalent & instructor's consent. w.

313 Advanced Pathology Laboratory (3). Prerequisites: 310 & 311 or its equivalent & instructor's consent. w.

404 Advanced Pathology (cr. arr.) Prerequisite: instructor's consent.

430 Comparative Pathology (3) (same as Plant Pathology 430, Veterinary Pathology 430).

491 Research (cr. arr.) Open only to properly qualified graduate students. (Background of advanced chemistry and mathematics required.) Prerequisite: instructor's consent.

Pathology Elective (10). Any medical student in the elective period may make special arrangements with the department to do research on a subject of interest.

Pharmacology

204 Elements of Pharmacology (2). Prerequisite: Physiology 201 or equivalent. f.

320 Pharmacology (8). Prerequisite: 5 hours biochemistry & Physiology 305 or equivalent. w.

334 History of Pharmacology (1). Prerequisite: 320 or equivalent.

400 Problems (cr. arr.)

410 Seminar (1). f, w.

420 Pharmacological Methods of Analysis (2). Prerequisites: Biochemistry 304 or 320 and/or consent of instructor. f.

438 Pharmacodynamics of Behavior Drugs (2). Prerequisite: 320 or equivalent. f.

450 Research (cr. arr.)

490 Research (cr. arr.)

Physical Medicine & Rehabilitation

Physical Medicine and Rehabilitation (5). Each medical student is provided a four-week clinical clerkship to develop an overall concept of restorative care and the principles of rehabilitation. Experience is gained in working with the allied health professions in the delivery of comprehensive health care.

Research in Physical Medicine and Rehabilitation (10). Original research requiring formal research report.

Clinical Fellowship in Physical Medicine and Rehabilitation (10). Eight-week experience in the clinical practice of Rehabilitation Medicine for selected students. Prerequisite: clinical clerkship in Physical Medicine & Rehabilitation.

Physiology

201 Elements of Physiology (5). Prerequisite: 5 hours general zoology or equivalent.

208 Human Physiology (4). Course primarily for nurses, Prerequisites: 201 & Anatomy 201 or equivalents & department chairman's consent.

250 Medical Physiology (8). Medical students only. w.

303 Physiology of Environmental Stress (2). Prerequisites: 201, 5 hours chemistry & 5 hours physics or equivalents. w.

305 Mammalian Physiology (6-10). Prerequisite: instructor's consent. w.

325 Medical Neurophysiology (3). Prerequisite: 201 or 250 or Veterinary Anatomy-Physiology 420 and instructor's consent. alt. f. odd years.

335 Systems Analysis of Physiological Processes (3). Prerequisite: 201 or an equivalent college-level biology course.

400 Problems (cr. arr.)

410 Seminar (1). f,w.

418 Advanced Mammalian Physiology (3). Prerequisite: instructor's consent. w.

430 Cardiovascular Physiology (2). Prerequisites: 305 or Veterinary Anatomy-Physiology 220V & Veterinary Anatomy-Physiology 221V or equivalent. alt. f. odd yrs.

439 Renal Physiology (2). Prerequisites: 305, Veterinary Anatomy-Physiology 220V & Veterinary Anatomy-Physiology 221V or equivalent. alt. f. even yrs.

445 Microcirculatory Control Mechanisms (2). Prerequisite: 305 or Veterinary Anatomy-Physiology 420, or Biological Sciences 270. alt. w. even yrs.

450 Research (cr. arr.)

490 Research (cr. arr.) f,w,s.

Psychiatry

Psychiatry, Third and Fourth Years (Clinical Clerkship)

(10). Experience in the clinical study and care of psychiatrically disordered adults and children. Under supervision, students participate with increasing responsibility in selected activities of the psychiatric inpatient, outpatient, and liaison and consultative services, including work in other departments of the hospital and in affiliated public mental hospitals and community mental health agencies. Students have the opportunity to plan a portion of the clerkship core program in accordance with their own interests. Eight weeks full time during the third or fourth year; required of all medical students.

Psychiatry Elective (Third and Fourth Years) (10). Special work in Department of Psychiatry on a subject of the student's choice, during the elective and free periods in the junior or senior year. Such work may include experience in additional clinical clerkship service, or preceptorship under practicing psychiatrists in psychiatric hospitals or clinics or community mental health services, or laboratory or clinical research, or a combination of these. Joint programs with other clinical or basic science departments can be arranged. Open to all students in third and fourth years. Subject to approval of department chairman and staff members who will supervise student's work.

Radiology

152 Treatment Planning (5).

201M Radiology (1).

227 Radioisotopes in Medicine and Biology (4). Prerequisites: Chemistry 11 & Physics 11 & instructor's consent. f.

328 Introductory Radiation Biology (3) (same as Biological Sciences 328, Nuclear Engineering 328, Veterinary Medicine & Surgery 328). Prerequisite: junior standing sciences/engineering; one course in biological sciences & physics/chemistry; or instructor's consent.

400 Problems in Radiological Science (1-3).

410 Seminar (1).

Radiology Block. One-week assignment to department for practical experience on radiotherapy ward and in clinical radiotherapy practice, with optional time in diagnostic radiology.

Radiology Elective (10). A four-week elective assignment to the Diagnostic Section of the Department of Radiology to provide a clinical experience in the principles of radiographic examination and interpretation. Elective experiences are also provided in radiation therapy and nuclear medicine.

A second four-week elective is available to students who excel during the initial four-week period.

Subspecialty training, a research project or special emphasis in any area within radiology are offered on an individual basis after consultation with the course director, Dr. Clive Levine. The second four-week elective is intended for individuals who are seriously considering a career in radiology.

Elective experience is also available separately in Radiation Therapy and Nuclear Medicine.

Surgery

Surgical Clerkship. This twelve-week clerkship in the surgical sciences exposes students to surgical physiology and anatomy and to the principles of diagnosis and the treatment of common surgical disorders. Students are an integral part of the surgical team and participate in the preoperative examination and evaluation of the patients, assist in the surgical procedures, and aid in the post-operative management. Clinical responsibilities are increased in proportion to the student's knowledge and ability. Teaching rounds are supplemented by lectures, seminars and conferences.

Surgical Electives. Each of the divisions of surgery offers electives in clinical and investigational surgery. These electives offer the student an opportunity to obtain in-depth experience in an area of interest or an area related to career goals. Students contemplating a surgical career are encouraged to take surgical electives in the area of their interest.

Faculty

Anatomy

William R. Goodge, Interim Chairman, Assoc. Prof. Ph.D., Washington (Seattle)

J. Harry Cutts, Prof. Ph.D., Western Ontario

James A. Green, Prof. Ph.D., Illinois

Edward W. Lowrance, Prof. Emeritus. Ph.D., Stanford

Milton D. Overholser, Prof. Emeritus. Ph.D., M.D., New York

Herbert E. Brown, Assoc. Prof. Ph.D., Utah

John D. Decker, Assoc. Prof. Ph.D., New York Upstate

William J. Krause, Assoc. Prof. Ph.D., Missouri-Columbia

Barrie D. Smith, Assoc. Prof. Ph.D., Iowa

Gary B. Dunkerley, Asst. Prof. Ph.D., Texas (Medical Branch-Galveston)

Anesthesiology

G. W. N. Eggers, Jr., Chairman, Prof. M.D., Texas

Kenneth K. Keown, Prof. M.D., Hahnemann

Hedayatollah Elyassi, Assoc. Prof. M.D., Tehran (Iran)

R. Louise Lowry, Assoc. Prof. M.D., Missouri-Columbia

E. Scott McCord, Assoc. Prof. M.D., Missouri-Columbia

James F. Whitacre, Instr., Supervisor of Respiratory Therapy. M.S., Rochester

William A. Markel, Instr. B.S., Missouri-Columbia

Michael W. Prewitt, Instr. B.S., Missouri-Columbia

Russell D. Shelden, Clin. Assoc. Prof. M.D., Washington (St. Louis)

James O. Aleya, Clin. Asst. Prof. M.D., Kansas

Bruce J. Gordon, Clin. Instr. M.D., Northwestern

Ira Hubbell, Clin. Instr. M.D., Missouri-Columbia

Biochemistry

James L. Gaylor, Chairman, Prof. Ph.D., Wisconsin

William D. Noteboom, Associate Chairman, Assoc. Prof. Ph.D., Illinois

Eric G. Brunngraber, Prof. Ph.D., Wisconsin

Benedict J. Campbell, Prof. Ph.D., Northwestern

Milton S. Feather, Prof. Ph.D., Purdue

George B. Garner, Prof. Ph.D., Missouri-Columbia

Charles W. Gehrke, Prof., Ph.D., Ohio State

Thomas D. Luckey, Prof. Ph.D., Wisconsin

Arlene P. Martin, Prof. Ph.D., Rochester

Dennis T. Mayer, Emeritus Prof., Ph.D., Missouri-Columbia

Merle E. Muhrer, Emeritus Prof., Ph.D., Missouri-Columbia

Boyd L. O'Dell, Prof. Ph.D., Missouri-Columbia

Edward E. Pickett, Prof. Ph.D., Ohio State

Marie L. Vorbeck, Prof. Ph.D., Cornell

Arnold A. White, Prof. Ph.D., Georgetown

Robert L. Wixom, Prof. Ph.D., Illinois

John M. Franz, Assoc. Prof. Ph.D., Iowa

Camillo A. Ghiron, Assoc. Prof. Ph.D., Utah

Russell L. Larson, Assoc. Prof. Ph.D., Illinois

Ezio A. Moscatelli, Assoc. Prof. Ph.D., Illinois

Beryl J. Ortwerth, Assoc. Prof. Ph.D., Missouri-Columbia

Douglas D. Randall, Assoc. Prof. Ph.D., Michigan State

David B. Shear, Assoc. Prof. Ph.D., Brandeis

Albert Y. Sun, Assoc. Prof. Ph.D., Oregon

Grace Y. Sun, Assoc. Prof. Ph.D., Oregon

Wynn A. Volkert, Assoc. Prof. Ph.D., Missouri-Columbia

Warren L. Zahler, Assoc. Prof. Ph.D., Wisconsin

Creighton N. Cornell, Asst. Prof. D.V.M., Missouri-Columbia

David W. Emerich, Asst. Prof. Ph.D., Wisconsin

Ingming Jeng, Asst. Prof. Ph.D., California-Berkeley

Takeshi Kagawa, Asst. Prof. Ph.D., California-Santa Cruz

Joseph C. Polacco, Asst. Prof. Ph.D., Duke

Jeffrey Robbins, Asst. Prof. Ph.D., Connecticut

Francis J. Schmidt, Asst. Prof. Ph.D., Wisconsin

Judy D. Wall, Asst. Prof. Ph.D., Duke

James H. Wysche, Asst. Prof. Ph.D., Johns Hopkins

Charles A. Huibregtse, Instr. Ph.D., North Dakota

School of Medicine Administration & Support Staff

Barbara S. Uehling, Ph.D., Chancellor

Charles C. Lobeck, M.D., Dean, School of Medicine

Brent M. Parker, M.D., Associate Dean, School of

Medicine; Chief of Staff, University Hospital

Herbert S. Goldberg, Ph.D., Associate Dean, School of Medicine; Director, School of Health Related Professions

Robert B. Smith, M.B.A., Director of University Hospital and Clinics

Jerry A. Royer, M.D., Associate Dean, School of Medicine

Rick A. Gaines, M.P.A., Assistant Dean, School of Medicine

Hazel Scott, Ph.D., Assistant Dean, School of Medicine

Kimberly McDaniel, M.S., Admissions/Records Coordinator

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 Joseph W. Lamberti, Assoc. Prof. M.D., Ottawa (Canada)
 Robert N. McCallum, Assoc. Prof. Ph.D., Missouri-Columbia

Walid O. Shekim, Assoc. Prof. M.D., American University, Beirut (Lebanon)
 John F. Simonds, Assoc. Prof. M.D., Georgetown
 Maarten Nieuwenhuizen, Clin. Assoc. Prof. M.D., Utrecht (The Netherlands)
 L. Michael Barron, Asst. Prof. M.S.S.W., Missouri-Columbia
 Niels C. Beck, Asst. Prof. Ph.D., Saint Louis
 Stewart C. Clark, Asst. Prof. M.D., British Columbia (Canada), Ph.D., Calgary (Canada)
 Anasseril E. Daniel, Asst. Prof. M.B., B. Surg., Trivandrum, Kerala (India)
 Louisa R. Danks, Asst. Prof. M.A., Carnegie Institute of Technology
 Ahmed D. Faheem, Asst. Prof. M.B., B. Surg., Jawaharlal Nehru, Aligarh Muslim (India)
 Robert G. Frank, Asst. Prof. Ph.D., New Mexico
 Gerald H. Heisler, Asst. Prof. Ph.D., Southern Illinois
 John F. Higdon, Asst. Prof. Ph.D., Southern Illinois
 Javad H. N. Kashani, Asst. Prof. M.D., Meshed (Iran)
 Kay H. Kline, Asst. Prof. Ph.D., Maryland
 Luke W. Lucas, Asst. Prof. M.D., Colorado
 Parviz Malek-Ahmadi, Asst. Prof. M.D., Tehran (Iran)
 Lawrence J. Siegel, Asst. Prof. Ph.D., Case-Western Reserve
 Hazel J. Scott, Asst. Prof. Ph.D., Southern Illinois
 Patricia M. Wright, Asst. Prof. M.S.S.W., Missouri-Columbia
 Zaki A. Ajans, Clin. Asst. Prof. M.D., American University, Beirut (Lebanon)
 Thomas J. Amolsch, Clin. Asst. Prof. Ph.D., Missouri-Columbia
 Del DeShazo, Clin. Asst. Prof. Ph.D., Kansas
 Robert E. Frazier, Clin. Asst. Prof. M.D., Missouri-Columbia
 Francis S. Gilbert, Clin. Asst. Prof. Ph.D., Purdue
 Suzanne B. Henry, Clin. Asst. Prof. M.D., Duke
 C. Dean Monroe, Clin. Asst. Prof. M.D., Kansas
 Jerry C. Parker, Clin. Asst. Prof. Ph.D., Missouri-Columbia
 Joel S. Ray, Clin. Asst. Prof. Ph.D., George Peabody
 Larry W. Aston, Instr. M.S.S.W., Missouri-Columbia
 Sharon K. Schneeberger, Instr. Ph.D., George Peabody
 Robert C. Berger, Clin. Instr. M.S.S.W., Kansas
 Franklin D. Bolander, Clin. Instr. M.S.S.W., Missouri-Columbia
 Dolores O. Richter, Clin. Instr. M.Ed., Southwestern State (Oklahoma)

Missouri Institute of Psychiatry (St. Louis)

James L. Hedlund, Prof. Ph.D., Iowa
 Tetsuo Fukuda, Clin. Prof. M.D., Kyoto (Japan)
 Leopold Hofstatter, Clin. Prof. M.D., Vienna (Austria)
 Necmettin Polvan, Visit. Prof. M.D., Istanbul (Turkey)
 Burtrum C. Schiele, Visit. Prof. M.D., Colorado
 Ivan W. Sletten, Clin. Prof. M.D., Wisconsin
 John Stern, Clin. Prof. Ph.D., Illinois
 Richard C. Evenson, Assoc. Prof. Ph.D., Loyola
 Helen E. Klein, Assoc. Prof. D.S.W., Washington (St. Louis)
 Duane Q. Hagen, Clin. Assoc. Prof. M.D., Saint Louis
 Sadashiv D. Parwatikar, Clin. Assoc. Prof. M.B., B.Surg., Osmania (India)
 Dong Won Cho, Asst. Prof. Ph.D., Washington (St. Louis)
 Aurora Amin, Clin. Asst. Prof. M.D., Buenos Aires (Argentina)
 Milton T. Fujita, Clin. Asst. Prof. M.D. Saint Louis
 Makram Girst, Visit Asst. Prof. M.D., Kitchener (Sudan); Ph.D., St. Mary's (England)
 Ludwig G. Heinemann, Clin. Asst. Prof. M.D., Bonn (Germany)

Jerold J. Kreisman, Clin. Asst. Prof. M.D., Cornell
 John B. Wood, Clin. Asst. Prof. Ph.D., Minnesota
 Fazle M. Yasin, Clin. Asst. Prof. M.B., B. Surg., Dow
 (Pakistan)
 Afaf El Mashhady, Clin. Instr. M.B., Ch.B., Cairo (Egypt)
 Ashok Mallya, Clin. Instr. M.B., B.Surg, Seth (India)
 Peter Moran, Clin. Instr. D.O., Kansas City College
 Shankararao N. Rao, Clin. Instr. M.B., B. Surg., Mysore
 (India)
 Jagdish C. Suri, Clin. Instr. M.B., B. Surg., Lucknow
 (India)
 M. Safwat Wahba, Clin. Instr. M.B., Ch.B., Cairo (Egypt)
 Leonard G. Davis, Rsrch. Assoc. Ph.D., Illinois

Surgery

Donald Silver, Prof., Chairman, M.D., Duke
 William C. Allen, Prof.; Chief, Orthopaedic Surgery.
 M.D., Chicago
 Samuel P. W. Black, Prof. M.D., Johns Hopkins
 Paul O. Boyle, Assoc. Prof. D.D.S., Illinois
 Jack J. Curtis, Asst. Prof.; Chief, Cardiothoracic Surgery.
 M.D., Tennessee
 William E. Davis, Assoc. Prof. M.D., Missouri-Columbia
 A. Philip DePauw, Asst. Prof. M.D., Chicago
 Robert W. Gaines, Asst. Prof. M.D., Duke
 Barry J. Gainor, Asst. Prof. M.D., Albany
 Jerry Gold, Asst. Prof. Ph.D., Missouri-Columbia
 Marion C. Harper, Asst. Prof. M.D., Georgia
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 Columbia
 Floyd R. Barnhill, Clinical Asst. Prof. M.D., Tennessee
 Eugene Bricker, Clinical Prof. M.D., Washington (St.
 Louis)
 James E. Bumgarner, Clinical Asst. Prof. M.D., North-
 western
 Jordan W. Burkey, Clinical Asst. Prof. M.D., Kansas
 James H. Byland, Clinical Asst. Prof. D.D.S., Missouri-
 Kansas City
 John Byland, Clinical Asst. Prof. D.D.S., Washington (St.
 Louis)
 Daniel Campbell, Clinical Assoc. Prof. M.D., Tennessee
 Harry J. Cole, Clinical Asst. Prof. M.D., Washington (St.
 Louis)
 Luke J. Dlabal, Clinical Asst. Prof. M.D., Missouri-
 Columbia
 August W. Geise, Jr., Clinical Assoc. Prof. M.D., Wash-
 ington (St. Louis)
 Oscar Guerra, Asst. Prof. D.D.S., Texas-Houston
 Hugh S. Harris, Clinical Asst. Prof. M.D., Harvard
 Winston Harrison, Clinical Asst. Prof. M.D., Missouri-
 Columbia
 George L. Hawkins, Clinical Assoc. Prof. M.D., Columbia
 Sidney E. Jaynes, Clinical Asst. Prof. D.M.D., Louisville;
 M.S., Washington (St. Louis)
 William D. Johnston, Asst. Prof. M.D., Vanderbilt
 John J. Kendig, Clinical Asst. Prof. M.D., Washington (St.
 Louis)
 Robert King, Clinical Instructor M.D., Wayne State
 Charles Luetje, Clinical Asst. Prof. M.D., Missouri-
 Columbia
 José Marchosky, Clinical Instructor, M.D., U. of Puerto
 Rico
 George Mendelsohn, Clinical Instructor M.D., Harvard
 Ercell L. Miller, Clinical Assoc. Prof. D.D.S., Kansas City
 Jay L. Milne, Clinical Asst. Prof. M.D., Missouri-
 Columbia
 Joseph E. Montie, Clinical Assoc. Prof. M.D., Wayne State
 O. Gerald Orth, Clinical Instructor M.D., St. Louis
 Edwin M. Powell, Clinical Asst. Prof. M.D., Tennessee
 Ned D. Rodes, Clinical Assoc. Prof. M.D., Vanderbilt
 George E. Rouhac, Clinical Prof. M.D., Vanderbilt
 Garth S. Russell, Clinical Instructor M.D. Kansas
 Elmer J. Schewe, Clinical Assoc. Prof. M.D. Illinois
 Warren Sights, Clinical Assoc. Prof. M.D. Chicago
 James Thomas, Clinical Asst. Prof. M.D. Missouri-
 Columbia
 Robert Thomas, Clinical Instructor M.D. Missouri-
 Columbia
 Herbert Warren, Clinical Assoc. Prof. M.D. Virginia

University of Missouri-Columbia Calendar

Fall Semester

New Student Orientation and Registration
 Registration
 Classwork begins, 7:40 a.m.
 Labor Day Recess
 Preregistration (Winter) begins
 Preregistration (Winter) ends
 Thanksgiving Recess Begins
 Classwork resumes, 7:40 a.m.
 First Semester Classwork ends
 Stop Day
 Final Examinations begin
 First Semester closes

1980

Mon., Aug. 25
 Tues., Aug. 26
 Wed., Aug. 27
 Mon., Sept. 1
 Mon., Oct. 20
 Fri., Oct. 24
 12:40 p.m., Nov. 26
 Mon., Dec. 1
 Thurs., Dec. 11
 Fri., Dec. 12
 Sat., Dec. 13
 Sat., Dec. 20

1981

Mon., Aug. 24
 Tues., Aug. 25
 Wed., Aug. 26
 Mon., Sept. 7
 Close of day, Nov. 24
 Mon., Nov. 30
 Mon., Dec. 24
 Tues., Dec. 15
 Wed., Dec. 16
 Wed., Dec. 23

Winter Semester

New Student Orientation and Registration
 Registration
 Classwork begins, 7:40 a.m.
 Preregistration (Summer & Fall) begins
 Preregistration (Summer & Fall) ends
 Spring Recess begins, 12:40 p.m.
 Classwork resumes, 7:40 a.m.
 Second Semester Classwork ends
 Stop Day
 Final Examinations begin
 Second Semester closes
 Annual Commencement

1981

Thurs., Jan. 8
 Fri., Jan. 9
 Mon., Jan. 12
 Mon., March 16
 Fri., March 20
 Sat., March 21
 Mon., March 30
 Wed., April 29
 Thurs., April 30
 Fri., May 1
 Fri., May 8
 Sat., May 9

1982

Thurs., Jan. 14
 Fri., Jan. 15
 Mon., Jan. 18
 Close of day, March 12
 Mon., March 22
 Thurs., May 6
 Fri., May 7
 Sat., May 8
 Sat., May 15
 Sun., May 16

Summer Session (4-, 6- and 8-weeks)

Registration & Orientation
 All Sessions Begin, 7:40 a.m.
 First 4-week session ends
 Second 4-week session Registr. & Orienta.
 Second 4-week session begins
 Second 8-week session Registr. & Orienta.
 Second 8-week session begins
 First 6-week session ends
 Second 6-week session Registr. & Orienta.
 Second 6-week session begins
 Second 4-week session ends
 First 8-week session ends
 Independence Day Recess
 Third 4-week session Registra. & Orienta.
 Third 4-week session begins
 All sessions end
 Summer Commencement

1980

Mon., June 9
 Tues., June 10
 Thurs., July 3
 Mon., July 7
 Tues., July 8
 Fri., Aug. 1
 Fri., Aug. 1
 Fri., July 4
 Fri., Aug. 1

1981

Mon., May 11
 Tues., May 12
 Fri., June 5
 Mon., June 8
 Tues., June 9
 Mon., June 8
 Tues., June 9
 Fri., June 19
 Mon., June 22
 Tues., June 23
 Thurs., July 2
 Thurs., July 2
 Fri., July 3
 Mon., July 6
 Tues., July 7
 Fri., July 31
 Fri., July 31

Federal programs described in this bulletin are subject to complete modification with little prior notification. Some programs may be changed, while others may be discontinued entirely. There also may be new programs instituted. When questions develop, please contact the Student Financial Aids Office for official information.

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