



*This is 2001-2003 School of Medicine,  
Duluth Catalog for the  
University of Minnesota.*

## **School of Medicine, Duluth**

<b>University of Minnesota Mission Statement .....</b>	<b>2</b>
<b>Introduction .....</b>	<b>2</b>
<b>History .....</b>	<b>5</b>
<b>Philosophy .....</b>	<b>5</b>
<b>Administration .....</b>	<b>6</b>
<b>Faculty .....</b>	<b>6</b>
<b>Graduate Programs .....</b>	<b>6</b>
<b>American Indian Programs .....</b>	<b>6</b>
<b>Facilities .....</b>	<b>7</b>
<b>UMD Library .....</b>	<b>7</b>
<b>Learning Resources Center .....</b>	<b>8</b>
<b>UMD Health Services .....</b>	<b>8</b>
<b>Housing .....</b>	<b>8</b>
<b>Student Government .....</b>	<b>8</b>
<b>Recreational Activities .....</b>	<b>8</b>
<b>Duluth .....</b>	<b>9</b>
<b>Admission and Financial Considerations .....</b>	<b>10</b>
<b>Admission .....</b>	<b>11</b>
<b>Residence and Reciprocity .....</b>	<b>14</b>
<b>Tuition and Fees .....</b>	<b>14</b>
<b>Student Employment .....</b>	<b>15</b>
<b>Scholarships and Loans .....</b>	<b>15</b>
<b>Minnesota Medical Foundation .....</b>	<b>15</b>

### University of Minnesota Mission Statement

The University of Minnesota, founded in the belief that all people are enriched by understanding, is dedicated to the advancement of learning and the search for truth; to the sharing of this knowledge through education for a diverse community; and to the application of this knowledge to benefit the people of the state, the nation, and the world.

The University's mission, carried out on multiple campuses and throughout the state, is threefold:

#### Research and Discovery

Generate and preserve knowledge, understanding, and creativity by conducting high-quality research, scholarship, and artistic activity that benefit students, scholars, and communities across the state, the nation, and the world.

#### Teaching and Learning

Share that knowledge, understanding, and creativity by providing a broad range of educational programs in a strong and diverse community of learners and teachers, and prepare graduate, professional, and undergraduate students, as well as non-degree-seeking students interested in continuing education and lifelong learning, for active roles in a multiracial and multicultural world.

#### Outreach and Public Service

Extend, apply, and exchange knowledge between the University and society by applying scholarly expertise to community problems, by helping organizations and individuals respond to their changing environments, and by making the knowledge and resources created and preserved at the University accessible to the citizens of the state, the nation, and the world.

In all of its activities, the University strives to sustain an open exchange of ideas in an environment that embodies the values of academic freedom, responsibility, integrity, and cooperation; that provides an atmosphere of mutual respect, free from racism, sexism, and other forms of prejudice and intolerance; that assists individuals, institutions, and communities in responding to a continuously changing world; that is conscious of and responsive to the needs of the many communities it is committed to serving; that creates and supports partnerships within the University, with other educational systems and institutions, and with communities to achieve common goals; and that inspires, sets high expectations for, and empowers the individuals within its community.

This biennial catalog, the basic guide to the School of Medicine at the Duluth campus of the University of Minnesota, should be kept handy for repeated reference. For more information on policies, procedures, and requirements, contact the Office of the Dean, 113 School of Medicine (726-7571); the Office of Admissions, 180 School of Medicine (726-8511); or the Office of Student Affairs, 174 School of Medicine (726-8873). The area code for Duluth is 218; the zip code, 55812.

**Catalog Use**—The information in this catalog and other University catalogs, publications, or announcements is subject to change without notice. University offices can provide current information about possible changes.

This publication is available in alternative formats upon request. Please contact the Access Center, 138 Kirby Plaza (218-726-8727 voice or 218-726-7380 TDD).

This catalog also is available in electronic format on the Internet and may be accessed via the Web at <[www.catalogs.umn.edu](http://www.catalogs.umn.edu)>.

**Equal Opportunity**—The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.

In adhering to this policy, the University abides by the Minnesota Human Rights Act, Minnesota Statute Ch. 363; by the Federal Civil Rights Act, 42 U.S.C. 2000e; by the requirements of Title IX of the Education Amendments of 1972; by Sections 503 and 504 of the Rehabilitation Act of 1973; by the Americans With Disabilities Act of 1990; by Executive Order 11246, as amended; by 38

U.S.C. 2012, the Vietnam Era Veterans Readjustment Assistance Act of 1972, as amended; and by other applicable statutes and regulations relating to equality of opportunity.

Inquiries regarding compliance may be directed to Deborah Petersen-Perlman, Director, Affirmative Action, University of Minnesota, Duluth, 255 Darland Administration Building, 10 University Drive, Duluth, MN 55812-2496 (218-726-6827) or Julie Sweitzer, Director, Office of Equal Opportunity and Affirmative Action, University of Minnesota, 419 Morrill Hall, 100 Church Street S.E., Minneapolis, MN 55455-0134 (612-624-9547).

**Access to Student Educational Records**—In accordance with regents' policy on access to student records, information about a student generally may not be released to a third party without the student's permission. (Exceptions under the law include state and federal educational and financial aid institutions.) The policy also permits students to review their educational records and to challenge the contents of those records.

Some student information—name, address, electronic (e-mail) address, telephone number, dates of enrollment and enrollment status (full time, part time, not enrolled, withdrawn and date of withdrawal), college and class, major, adviser, academic awards and honors received, and degrees earned—is considered public or directory information. Students may prevent the release of public information only during their terms of enrollment. To do so, they must notify the records office on their campus.

Students have the right to review their educational records. The regents' policy, including a directory of student records, is available for review at the Registrar's Office. Questions may be directed to the Registrar, 21 Campus Center Administration Building (218-726-8000).

**Immunization**—Students born after 1956 who take more than one University class are required under Minnesota law to submit an Immunization Record form.

The form, which is sent along with the official University acceptance letter, must be filled out and returned to the Office of Student Affairs within 45 days after the beginning of the first term of enrollment in order for students to continue registering for classes at the University. Complete instructions accompany the form.

**Extracurricular Events**—No extracurricular events requiring student participation may be scheduled from the beginning of study day to the end of finals week. Exceptions to this policy may be granted by the Senate Committee on Educational Policy. The Senate advises all faculty that any exemption granted pursuant to this policy shall be honored and that students who are unable to complete course requirements during finals week shall be provided an alternative and timely opportunity to do so.

**Smoke-Free Campus Policy**—Smoking is prohibited in all indoor facilities, including faculty and staff offices and the Kirby Student Center cafeteria.

**General Information**



Established in 1851 by an act of the Minnesota territorial legislature, the University of Minnesota is an autonomous body governed by a Board of Regents that enacts laws regulating the institution, controls expenditures, and acts on all staff changes.

The Board of Regents is composed of 12 members appointed by the state legislature. The president is the University's chief executive officer, serves as *ex officio* to the Board of Regents, and is directly responsible to that board.

The University of Minnesota, Duluth (UMD) became a coordinate campus of the University of Minnesota by legislative act on July 1, 1947. It is administered by a chancellor who reports directly to the president of the University. The School of Medicine is unique in that while it is one of seven colleges on the Duluth campus, it also serves as one of the eight units of and reports to the Office of the Senior Vice President for Health Sciences for the Academic Health Center, which is based on the Minneapolis campus.

## History

The first classes in medicine at the University began in 1888 when three of the four private or proprietary medical schools located in Minneapolis and St. Paul offered their charters and resources to the state. In accepting this offer, the regents assumed responsibility on behalf of the people of the state of Minnesota for medical education. In 1908 the remaining proprietary school was incorporated into the University of Minnesota Medical School, which continued until 1972 as the only medical school in Minnesota.

The inception and development of a school of medicine on the Duluth campus of the University of Minnesota can be traced back to 1966, when a group of concerned citizens and physicians organized themselves in Duluth under the leadership of S.H. Boyer, M.D. This group, the Northern Minnesota Council for Medical Education, was fully aware of the need for adequate health care facilities and personnel in northern Minnesota and Wisconsin. As a result of its strategic location, the Duluth-Superior area was championed as the site for future development of an area health science education center.

In response to the activities of the Northern Minnesota Council for Medical Education, the University of Minnesota Board of Regents published a statement on medical education in April 1968 proposing the establishment of a school of medicine in Duluth. In January 1969, a special advisory panel of medical school deans and medical economists recommended overwhelmingly that Duluth be the site for a second medical school in Minnesota.

As a result of the panel's recommendation, the legislature in May 1969 appropriated funds to establish a basic science program for a medical curriculum at the Duluth campus of the University of Minnesota to increase the number of students choosing a career in family practice with a commitment to serve in a rural community. Then University president Malcolm Moos appointed an Ad Hoc Committee on Medical Education at the Duluth campus. Subsequently, the Carnegie Commission on Higher Education identified the Duluth-Superior area as one of nine regions in the United States where university health science centers should be established.

In the fall of 1970, Robert E. Carter, M.D. was appointed the first school's dean. The first class had twenty-four students who enrolled in September 1972.

The UMD School of Medicine is accredited by the Liaison Committee on Medical Education as a freestanding, two-year medical school.

## Philosophy

A two-year curriculum of basic medical and clinical sciences is offered with principal clinical emphasis on rural family medicine and its interrelationships with other medical specialties. Under arrangements with the University of Minnesota Medical School in Minneapolis, all students who successfully complete the two-year program at Duluth are accepted for transfer to the Medical School in Minneapolis to complete their M.D. degree requirements.

The mission of the School of Medicine Duluth is to increase the number of family medicine and other primary care physicians who practice in rural Minnesota and American Indian communities and to advance knowledge in biomedical sciences and rural and American Indian health by providing high quality

## General Information

academic and clinical education and distinguished research programs for professional, graduate, and undergraduate students.

The medical education objectives are accomplished by using many family medicine practitioners, as well as other primary care physicians, as preceptors and instructors throughout the two years of the program. These role models illustrate, both through their instruction and example, the delivery of medical care in rural communities and how that care integrates with medical services offered in urban settings. The rural preceptorship program in family medicine is specifically designed to meet these goals and to augment the supply of family physicians in the rural regions of Minnesota.

## Administration

The University of Minnesota Academic Health Center is organized under the Office of the Senior Vice President for Health Sciences. Each of the various Academic Health Center units in Minneapolis, as well as the UMD School of Medicine, is headed by a dean. The administrative center for the UMD School of Medicine is located in 133 School of Medicine (218-726-7571).

## Faculty

The teaching staff includes 40 full-time basic and clinical sciences faculty. The entire faculty constitutes the governing body responsible for policy making. The school's Educational Policy Committee includes student representatives. The responsibility for selecting each year's entering class is delegated to the Committee on Admissions, whose members are chosen from the School of Medicine faculty, the other UMD faculties, community physicians, and non-physician representatives from the region.

The part-time and voluntary clinical sciences faculty consists of more than 300 area physicians representing all the major medical specialties. Their close interrelationship with the full-time faculty in presenting the curriculum ensures a practical as well as academic approach to training family physicians. With exposure to patients beginning the first semester, students become proficient in

taking accurate medical histories and performing physical examinations under expert guidance. In addition, students spend ample time learning sciences basic to medicine.

## Graduate Programs

The UMD School of Medicine faculty is actively involved in training graduate students. Programs leading to the doctor of philosophy degree are offered under the aegis of the corresponding programs on the Twin Cities campus and the University of Minnesota Graduate School in the following areas: biochemistry, molecular biology and biophysics; microbiology, immunology, and molecular pathobiology; cellular and integrative physiology; pharmacology; and toxicology. Cooperative programs at the master's degree level are offered by these same departments. The School of Medicine faculty also participates in the graduate education of students in the Departments of Psychology, Sociology-Anthropology, Biology, and Chemistry on the UMD campus. Information about graduate programs at the UMD School of Medicine may be obtained by contacting the appropriate program at the UMD School of Medicine, 1035 University Drive, Duluth, MN 55812-2487.

The School of Medicine is one of four cosponsors of the Family Practice Residency Program that is based at the Duluth Family Practice Center. Together, the Miller-Dwan Medical Center, St. Luke's Hospital, St. Mary's Medical Center, and the School of Medicine compose the Duluth Graduate Medical Education Council, Inc. For information on the residency program, write to Tom Day, M.D., Director, Duluth Family Practice Center, 330 North Eighth Avenue East, Duluth, MN 55805.

## American Indian Programs

The Center of American Indian and Minority Health at the UMD School of Medicine offers three programs for American Indian students considering career possibilities in medicine and other health care professions.

The *Center of Excellence for American Indian Medical Education* addresses the problem of the poor health of American Indians. The Center provides culturally sensitive



medical education for Indians, prepares Indian physicians for practice in Indian communities, educates non-Indian health care providers and medical educators about Indian health issues, and increases knowledge about Indian health and disease. The Center also provides a junior faculty development program for the University of Minnesota Medical School, School of Nursing, and School of Public Health and conducts research regarding Indian health.

Funded by the Division of Health Professions Diversity, Bureau of Health Professions, Health Resources and Services Administration, Department of Health and Human Services (HRSA), HRSA/5D34-MBO3016.

The *Indians Into Medicine (INMED)* program's goal is to increase the number of Indian health professionals practicing in Indian communities. The target area includes Minnesota, Wisconsin, Michigan, and Iowa. The program provides a variety of opportunities for Indian students from the grade school level to the health professional school level.

Funded by U.S. Department of Health and Human Services, Public Health Service, and Indian Health Service, ISD000949.

*Native Americans into Medicine (NAM)* enables disadvantaged undergraduates to better assess their motivation for studying medicine. Aspects of anatomy, physiology, physical diagnosis, and other medically related subjects as well as math and science enrichment are offered during the six-week summer portion of the program.

Federally funded since 1973 by the Health Careers Opportunity Program, Division of Health Professions Diversity, Bureau of Health Professions, Health Resources and Services Administration, Department of Health and Human Services (HRSA), 5 D18 HP02951.

Admission to the above programs is separate from admission to the UMD School of Medicine. Participation in these programs does not guarantee acceptance to the School of Medicine. For more information on any of these programs, contact Johanna Clevenger, M.D., Director, Center of American Indian and Minority Health, University of Minnesota Duluth, 182 School of Medicine, 1035 University Drive, Duluth, MN 55812-2487 (218-726-7235).

## Facilities

The UMD School of Medicine moved into a new facility in March 1979. In 1997, an addition to this facility was opened that added student small group learning space, expanded faculty research laboratory facilities, administrative space for Admissions and Student Affairs personnel, and an expanded Learning Resource Center. The School of Medicine is fully contained in this building, which includes classrooms, teaching laboratories, student study and lounge areas, faculty and staff offices, and labs and animal facilities.

The School of Medicine in Duluth has established affiliation agreements with St. Luke's Hospital and Miller-Dwan and St. Mary's Duluth Clinic Health System. These hospitals and clinical facilities provide medical students with access to an extremely diverse patient population from the northern regions of Minnesota, Wisconsin, and Michigan.

## UMD Library

In August 2000 all contents from the Health Science Library were transferred to the new UMD Library building. The health sciences collection has been strengthened considerably by the addition of full-text electronic resources that enable students and faculty to access library materials from their office, home, or lab. If students prefer studying in the library they will find a beautiful and functional building containing nearly 300 new computers, 20 state-of-the-art group study rooms for private study, and carrels equipped with connections for laptop computers.

Reference service, database training and searching, and library instruction are available from the life sciences librarian, Tom Connell (L 268; 218-726-7896; [connellt@d.umn.edu](mailto:connellt@d.umn.edu)). If the life sciences librarian is not available, assistance can be found at the reference desk on the second floor of the library (218-726-8100). The reference desk is open September through May, 9:00 a.m. to 9:00 p.m., Monday through Thursday, and 9:00 a.m. to 5:00 p.m. on Friday. It is also open on weekends.

The library's books, journals, videos, and other materials can be located by searching the online library catalog, available on the Web at [www.d.umn.edu/lib](http://www.d.umn.edu/lib). The catalog presents the location and status of an item, whether, for example, a book is checked out or on the shelf.

## General Information

Search options enable patrons to search health sciences materials exclusively. Items not owned by the library may be requested, free of charge, by submitting an interlibrary loan request.

Electronic sources of health sciences information are accessed from the library's electronic resources Web site. Patrons will find a select list of indexes and databases that focus on medicine. Medline, the world's premier index of medical research is located here as is MD Consult, a full-content database covering all aspects of current clinical information. MD Consult provides instant access to 35 clinical reference books, 52 medical journals, 600 clinical practice guidelines and more. Additional databases provide complete access to 1100 Elsevier Science journals and 300 Wiley publications.

For additional information, visit the library Web site at <[www.d.umn.edu/lib](http://www.d.umn.edu/lib)>. To arrange a tour of the new library or for an overview of library services contact Tom Connell, life sciences librarian (L 268; 218-726-7896; [connell@t.d.umn.edu](mailto:connell@t.d.umn.edu)).

## Learning Resources Center

The Learning Resource Center (LRC) is a computer and multimedia instructional facility serving the School of Medicine. The center provides access to electronic instructional materials and references as well as software for general use. LRC computers are connected to a local file server network, the University-wide network, and the Internet. Access to LRC computer and audiovisual materials is limited to School of Medicine students, faculty, and staff, 24 hours a day.

## UMD Health Services

UMD Health Services, located at 815 East University Circle, provides complete outpatient medical care for students. All professional services are prepaid by the student health services fee, and commonly used medications are available at cost. Laboratory and X-ray services are available at the clinic. After-hours medical emergencies are handled at the emergency rooms of St. Luke's and St. Mary's

Hospitals; charges for these are the responsibility of students and/or their health insurers. Student health insurance is available at reasonable rates. Individual and group psychological counseling is also available. Special groups for adult children of alcoholics, stress management, smoking cessation, and self-esteem meet weekly. Chemical abuse information, assessment, and counseling is also available.

## Housing

For housing information, contact the Housing Office, University of Minnesota Duluth, 149 Lake Superior Hall, 2404 Oakland Avenue, Duluth, MN 55812-1107 (218-726-8178).

## Student Government

Medical students elect student representatives who serve on faculty committees with voting privileges. Due to the small class size, a close student-faculty relationship exists, and all students are encouraged to contribute ideas for the development of the school. This is especially beneficial, because all the administrative officers of the School of Medicine are also members of the teaching faculty.

Medical students have representatives to national organizations (Association of American Medical Colleges, American Medical Student Association) and are encouraged to participate in all-campus activities and government.

## Recreational Activities

All University recreational facilities are open to medical students, including the Kirby Student Center and physical education facilities. Medical students participate in the UMD intramural program and other informal recreational activities.



## Duluth

Duluth is located on the westernmost shore of Lake Superior and shares its harbor with Superior, Wisconsin, forming the head of the Great Lakes-St. Lawrence Seaway system. Duluth is the gateway to America's largest wilderness reserve and many of Minnesota's most scenic vacation areas. The Spirit Mountain ski area, within the city limits of Duluth, is one of the country's most well-equipped recreational facilities. Close to Duluth are the Boundary Waters Canoe Area Wilderness (part of the Superior National Forest), many major ski areas, and excellent hunting and fishing sites. The varied climate provides opportunity

for participation in a broad range of outdoor sports. In addition, indoor facilities for sporting activities in Duluth include ice rinks, swimming pools, and gymnasiums. Musical and dramatic performances and art exhibits are offered by the Duluth Symphony Orchestra, Tweed Museum of Art, Duluth Playhouse (the nation's oldest community theater), Duluth Art Institute, Minnesota Ballet, and Junior Symphony. Much of Duluth's cultural entertainment is presented in the city's Entertainment and Convention Center. The wide range of cultural activities and achievements adds another dimension to Duluth's importance as a regional center in northern Minnesota.





# Admission

The UMD School of Medicine considers applicants who are legal residents of Minnesota; Ashland, Bayfield, Burnett, Douglas, Iron, Price, Sawyer, and Washburn counties in Wisconsin; and the Canadian province of Manitoba who wish to become family practice or other primary care physicians in a rural setting. Applicants from other states, except for underrepresented minorities, are not considered for admission. Transfer students also are not admitted. Applicants must be U.S. citizens or have permanent resident status and must have completed all requirements for a baccalaureate degree by the time of possible matriculation.

In evaluating applicants, the Committee on Admissions (COA) considers the entire academic record, the results of the Medical College Admissions Test (MCAT), supplemental information provided by the applicant, letters of evaluation, and personal interviews. Applicants also are evaluated on factors such as motivation, interpersonal sensitivity, breadth of interests, and attitudinal characteristics considered essential for medical practice. Two of the most significant qualifications for applicants are a demonstrated capacity for excellence in scholarship in an academic discipline of their own choice, and personal and background traits that indicate a high potential for becoming a family practice physician or other primary care specialist in a small town/rural setting.

## Required Courses

Applicants must complete the following before matriculation.

- One quarter or one semester of biochemistry
- Two quarters or two semesters of general biology (with labs)
- Three quarters or two semesters of general physics (with labs)
- Two quarters or two semesters of general chemistry (with labs)
- Two quarters or two semesters of organic chemistry (with labs)
- Three quarters or two semesters of English composition or a combination of courses with a considerable writing component
- Mathematics through calculus or an upper division statistics course

- Three quarters or two semesters of humanities, including at least one upper division course
- Three quarters or two semesters of behavioral sciences, including at least one upper division course.

Beyond these requirements, applicants are strongly encouraged to broaden their education by taking courses in nonscience areas that will provide intellectual stimulation and challenge.

## Application Procedures

The UMD School of Medicine follows the recommended application procedures of the Association of American Medical Colleges (AAMC). These procedures are detailed in the most recent *Medical School Admission Requirements*, published annually in April by the AAMC. Anyone interested in attending medical school should consult this book because it contains useful information about all U.S. medical schools. It is available in most college libraries and counseling offices. For a personal copy, send \$30 (which includes shipping and handling) to AAMC, 2450 N Street NW, Washington, DC 20037.

The AAMC sponsors the American Medical College Application Service (AMCAS), a centralized application processing service for applicants to participating U.S. medical schools. Like the other participating schools, the School of Medicine is completely autonomous in reaching its own admissions decisions. All applicants must follow the steps listed below as closely as possible. Reapplicants must submit a new application each year.

1. Take the Medical College Admissions Test (MCAT). If test scores are older than three years, the MCAT must be retaken.

The MCAT has subtests in four sections: biological sciences, physical sciences, verbal reasoning, and a writing sample. Your scores are automatically sent to all schools you designate on your AMCAS application.
2. Begin the AMCAS application process online at [www.aamc.org/students/amcas/start.htm](http://www.aamc.org/students/amcas/start.htm).
3. Ask each U.S. college and university you attended to forward official transcripts of your coursework directly to AMCAS. Until AMCAS receives both your application and all required official transcripts, no processing will occur. AMCAS must *receive* the transcripts no later than two weeks after the November 15 application deadline.

## Admission and Financial Considerations

4. Submit your completed application to AMCAS, as soon as possible after June 1 but no later than November 15.
5. When the application has been received from AMCAS, residency requirements are reviewed. Screening for residency constitutes a preliminary review process that also includes evaluation of the applicant's GPA and MCAT scores. After this preliminary screening, supplemental information is requested.

Return your completed *supplemental information form* within one month after receiving it (otherwise your application will not be considered further), along with the \$75 application fee. This form, of major importance in the evaluation process, expands on the information in your AMCAS application. You are asked to provide a brief residential history and answer a set of open-ended questions on special experiences, attitudes, and values. The questions require introspection and self-knowledge and are intended to provide a greater understanding of your motivation and life experiences to the COA.

Return your completed *prerequisite coursework form*. Because course names vary greatly by college, this form helps determine which requirements you may have met. If you are accepted to and decide to attend the School of Medicine, it is also your responsibility to send final transcripts of your college work as soon as they are available.

Clear and brief answers to the supplemental information form questions are appreciated. If you are reapplying, substantial improvement in areas considered weaknesses on the previous application is recommended.

Letters of evaluation from faculty and other persons who know you well are to be forwarded to the Office of Admissions by your evaluators *after* they have been requested.

### Evaluation Process

The UMD School of Medicine's COA thoroughly evaluates the information in your AMCAS application and all supplemental materials. If the evaluation is favorable, you are invited to come to the School of Medicine for two personal interviews, each with a COA member. All appointments for interviews are made by the Office of Admissions, 180 School of Medicine (218-726-8511), and scheduling them is not your responsibility.

Applications are considered ready for final review by the COA after both interviews are completed. The COA then decides to place applicants into one of three categories:

*Accepted* applicants are offered a place in the incoming class as soon as possible.

*Acceptable* applicants form a group of candidates that will be rank-ordered for an alternate list at the end of the admissions cycle, normally in mid-April. As withdrawals from previous acceptances occur, applicants on the alternate list are offered a place in the incoming class.

Applicants in the *Not Accepted* category receive a letter to that effect as soon as possible.

### Deferred Acceptance

Any accepted applicant may request, by June 1, to defer matriculation for one academic year only. Reasons need not be specified. After June 1, deferrals are granted at the discretion of the associate dean for admissions or her representative. Each person selecting deferral must reapply through the Delayed Matriculation Process, designating only the UMD School of Medicine.

### Early Decision Program

The UMD School of Medicine participates in the Early Decision Program (EDP), which is operated by AMCAS and requires interested applicants to

1. apply to only one U.S. medical school. AMCAS must receive the application and all official transcripts by August 1. The MCAT must be taken before the application is submitted to AMCAS .
2. provide the school with required supplemental information by September 1.
3. attend that school if offered a place there under EDP.

EDP allows applicants to receive a prompt admission decision from the school by October 1; be reconsidered, *if the COA elects*, in the regular applicant pool if not accepted under EDP; and arrange to apply to additional schools if not accepted under EDP.

### Technical Standards for Admission

The M.D. is a broad degree affirming general knowledge in all fields of medicine and the basic skills required to practice it. Technical standards provide reasonable assurance that candidates can complete the entire course of study and participate fully in all aspects of

medical training. Patient safety is a major factor in establishing requirements for physical, cognitive, and emotional capabilities of candidates for admission and graduation.

The following technical standards are a prerequisite for admission to and graduation from the University of Minnesota Medical School. All applicants and graduates must meet all prescribed technical standards, with or without reasonable accommodations.

**1. Physical Requirements**—After reasonable training and experience, candidates must be able to

- perform anatomic dissections of the human cadaver.
- observe demonstrations and perform experiments, including, but not limited to, operations on living animals (e.g., in physiology courses).
- study microorganisms and tissues in normal and pathologic states, including manipulations necessary for such studies (e.g., streaking a bacterial plate and transferring bacteria aseptically from one test to another). Observation of gross and microscopic structures requires vision and touch and is enhanced by the sense of smell.
- perform a complete physical examination, including observation, palpation, and percussion and auscultation, using instruments, including, but not limited to, a stethoscope, ophthalmoscope, otoscope, and sphygmomanometer.
- perform clinical procedures, including, but not limited to, pelvic examination, digital rectal examination, drawing blood from veins and arteries and giving intravenous injections, basic cardiopulmonary life support, spinal puncture, and simple obstetrical procedures.
- perform basic laboratory tests using a calculator and computer, read an EKG, and interpret some common imaging tests.
- move in the clinical setting so as to act quickly in emergencies.

**2. Communication**—This includes speech and writing. Candidates must be able to

- communicate in English with, receive communication from, and observe patients to elicit information; describe changes in mood, activity, and posture; and perceive nonverbal affective and gestural communication.
- obtain a medical history in a timely fashion from a variety of patients and communicate effectively, efficiently, and sensitively with all members of the health-care team, other professionals, patients, and their families.
- understand common medical records, laboratory reports, and pharmacological prescriptions.

**3. Intellectual-Conceptual, Integrative, and Quantitative Abilities**—Candidates must be able to

- assimilate information presented in formal lectures, small group discussions, and individual teaching and clinical settings.
- measure, calculate, reason, analyze, and synthesize information across modalities, understand three-dimensional spatial relationships among structures and logical sequential relationships among events, and form and test hypotheses for effective and timely problem solving in diagnosing and treating patients.

**4. Behavioral and Social Attributes**—Certain characteristics are especially important in the clinical years, including attendance, integrity, honesty, conscientiousness in work, good knowledge of patients, and teamwork. Candidates must

- accept responsibility for learning.
- exercise good judgment.
- promptly complete all responsibilities necessary for sensitive and effective relationships with patients and others.
- be able to tolerate physically taxing workloads, function effectively under stress, adapt to changing environments, and be flexible.



## Admission and Financial Considerations

**5. Safety**—The University must consider the safety and welfare of patients and others. Should a candidate have a condition that would place patients or others at significant risk, that condition may be the basis for denial of admission or expulsion from the school.

**6. Evaluations**—The University may require candidates to undergo an occupational skills evaluation at the school's expense to determine if they meet the technical standards listed above.

Applicants or medical students with disabilities may contact the associate dean for admissions and student affairs (218-726-8511).

### Advanced Standing

The School of Medicine selects applicants only for the first year of medical studies.

### Minorities

The University of Minnesota is committed to providing equal opportunities to students from minority groups and from educationally disadvantaged backgrounds. In accord with the regents' statement of January 12, 1979, the School of Medicine encourages members of underrepresented minority groups to seek admission to the School of Medicine.

### Immunization Requirements

Minnesota law requires all students born after 1956 and registered for more than one class during a full academic term to show proof of immunization received against measles, rubella, mumps, diphtheria, and tetanus. The statement must include month and year of each immunization. All Minnesota state colleges and universities are covered by this law. The most recent recommendation of the Advisory Committee on Immunization Practices is that college students receive two doses of MMR (measles, mumps, rubella) and have a DT (diphtheria, tetanus) booster during the ten years before first registering at the University. Proof of immunization is not required if the student submits a statement signed by a physician showing that

- for medical reasons, the student did not receive an immunization; *or*
- the student has experienced the natural disease against which the immunization protects; *or*

- a laboratory has confirmed the presence of adequate immunity; *or*
- the student submits a notarized statement that the student has not been immunized as required because of the student's conscientiously held beliefs.

## Residence and Reciprocity

**Residence**—Because the University is a state institution, Minnesota residents pay lower tuition than nonresidents and, in many programs, receive priority consideration for admission. To qualify for resident status, students must reside in Minnesota for at least one calendar year before the first day of class attendance. For more information, contact the Resident Classification and Reciprocity Office Chair, 139 Darland Administration Building, 10 University Drive, Duluth, MN 55812 (218-726-7849).

**Reciprocity**—The University has reciprocity agreements with North Dakota, South Dakota, Wisconsin, and Manitoba. If you are a resident of any of these states or this province, you may qualify for reciprocity tuition rates, which are lower than nonresident tuition rates and, in some cases, comparable to resident rates. There are some exceptions: Wisconsin students enrolled in the School of Dentistry, Medical School, College of Veterinary Medicine, or School of Medicine, Duluth are not eligible for reciprocity. For more information, contact the Resident Classification and Reciprocity Office Chair, 139 Darland Administration Building, 10 University Drive, Duluth, MN 55812 (218-726-7849).

## Tuition and Fees

UMD medical students attend three semesters their first year and two semesters their second year. For the 2001-2002 academic year, resident tuition at the UMD School of Medicine is \$7,205.00 per term; nonresident tuition is \$13,385.39 per term. In addition, all students must pay a service fee of approximately \$252 per term. All fees are subject to change.



Students must purchase books, instruments, and other necessary equipment. Textbooks cost about \$1,300 the first year and are available at the UMD Bookstore, 175 Kirby Student Center. Ophthalmoscopes, otoscopes, white coats, laboratory coats for gross anatomy, and other necessary items are purchased in the first year of medical school and cost about \$600.

Optional hospital insurance is available. For the 2001-2002 academic year, the annual individual rate (including summer) is \$631, plus \$1,755 for spouses and \$1,169 for all children. Details about this coverage are described in a brochure available in 184 Darland Administration Building or UMD Health Services.

## Student Employment

Medical students are strongly discouraged from engaging in work outside their medical school studies. Prospective students should carefully scrutinize their projected financial needs through the years of medical school and make appropriate arrangements to meet these needs through the help of parents, personal savings, and loans. Medical school is demanding and it is to the student's disadvantage to diminish this critical and important experience with outside commitments.

## Scholarships and Loans

Financial aid is available in the form of regional scholarships, federal loans to students in the health professions, special loan funds, and designated prizes. With few exceptions, students must be accepted for admission and be regularly enrolled to qualify for these funds. Most financial assistance is administered by the University's Office of Student Financial Aid or by the Minnesota Medical

Foundation (see below). Sources of financial aid are limited and generally available only to those who demonstrate financial need.

## Minnesota Medical Foundation

The Minnesota Medical Foundation (MMF) is a nonprofit organization operating in support of the University's medical schools. The foundation receives and distributes gifts and grants to be used for various purposes by the School of Medicine and is itself supported by gifts from its members and friends. MMF offices, 200 Oak Street S.E., Suite 300, Minneapolis campus (612-625-1440), are supervised by Brad Choate, executive director and chief executive officer.

MMF's scholarship aid for students is administered under a policy of reciprocal giving and is based solely on need. Students selected for MMF scholarship aid pledge to repay their scholarships to perpetuate the fund for the benefit of future medical students.

The foundation also administers several student loan funds. The Emergency Loan Fund provides cash loans, available on short notice, for up to 90 days, with no interest or carrying charges. A medical student loan program is sponsored by family practitioners from northern Minnesota and Wisconsin. The foundation's long-term loan programs allow a student five years to repay after completing medical school.





*This is 2001-2003 School of Medicine,  
Duluth Catalog for the  
University of Minnesota.*

Curriculum ..... 16  
Overview ..... 17  
Grades and Progress ..... 17  
Courses and Symbols ..... 18  
Anatomy and Cell Biology (Anat) ..... 18  
Behavioral Sciences (BhSc) ..... 18  
Biochemistry and Molecular Biology (MdBc) ..... 19  
Family Medicine (FMed) ..... 20  
Interdisciplinary (Med) ..... 22  
Medical and Molecular Physiology (Phsl) ..... 23  
Medical Microbiology and Immunology (MicB) ..... 24  
Pathology and Laboratory Medicine (Path) ..... 25  
Pharmacology (Phcl) ..... 25  
Toxicology (Txcl) ..... 26  
Duluth Campus Map ..... 27  
University Regents ..... 28  
University Administrators ..... 28  
UMD Administrators ..... 28  
UMD School of Medicine Administrators ..... 28  
Index ..... 29



## Overview

The UMD School of Medicine curriculum originally was developed by the faculty in consultation with members of the University of Minnesota's Medical School in Minneapolis, practicing physicians in the community, and curricular consultants from many other medical schools. Over the years, the curriculum has evolved into a strong academic and clinical program with continued input from practicing physicians and faculty.

During the two years of study, students are exposed to the various basic, behavioral, and clinical sciences to prepare them for continuing their studies in Minneapolis. Transfer to the Medical School in Minneapolis is guaranteed upon successful completion of the program in Duluth.

The first-year curriculum includes presentations in applied anatomy, clinical pathology conferences, and coursework in the clinical and behavioral sciences, in addition to the following integrated courses: principles of basic medical science, histopathology, hematopoiesis and host defenses, dermatology and the musculoskeletal system, and the nervous system. This coursework is correlated with the appropriate clinical examples and incorporates the latest features of computerized and laser disk instruction.

During the second year, clinical material is again correlated with the basic science presentations in the following integrated courses: the gastrointestinal hepatobiliary system, respiratory medicine, fluids and electrolytes, the cardiovascular system, the endocrine and reproductive systems, and integrated clinical medicine. Additional courses in the behavioral sciences are offered in the second year (behavioral medicine, medical social psychology, and psycho-social-spiritual aspects of life-threatening illness) as well as ongoing clinical pathology conferences. During this year, the student spends more time in clinical settings and receives more intensive instruction in clinical medicine.

During both years of study, students participate in the Family Practice Preceptorship Program. In the first year, each student is assigned to a family practitioner within the immediate geographic area and is introduced to medicine as practiced in its actual setting. The preceptorship during the second year involves the student with physicians who practice in nonurban areas of northern Minnesota and Wisconsin.

The combination of classroom and clinical experiences throughout the two years enables students to acquire the necessary knowledge of the scientific basis for medical practice while at the same time reinforcing this knowledge by active participation in patient care. Students are assured of adequate preparation for continuing their studies.

## Grades and Progress

Examinations and other forms of evaluation of student performance are administered by the various departments and, in some cases, by interdepartmental teaching teams. Grades are reported as O (outstanding), E (excellent), S (satisfactory), I (incomplete), or N (no credit), and appear as such on the official University transcript.

The Scholastic Standing Committee of the School Assembly is charged with the responsibility of monitoring each student's performance while enrolled. Academic probation is one mechanism used by the faculty to signal that a student's standing in the School of Medicine is in jeopardy. In circumstances where the development of clinical skills, the acquisition of knowledge, or personal conduct in a clinical setting is inconsistent with a student's potential capability as a physician, the Scholastic Standing Committee may recommend dismissal of the student to the School Assembly.

## Courses and Symbols

Courses listed are required for first- and second-year medical students. Most required and elective medical courses are open to upper division undergraduate and graduate students through special arrangement if space is available and approval of the appropriate adviser(s) and course instructor(s) is obtained.

The following standard symbols are used throughout the course descriptions in lieu of footnotes.

- QP Quarter prerequisite.
- SP Semester prerequisite.
- DGS Director of Graduate Studies.
- # Approval of the instructor is required for registration.
- Δ Approval of the department offering the course is required for registration.

## Anatomy and Cell Biology (Anat)

### *Professor*

Arlen R. Severson, Ph.D., *head*

### *Associate Professor*

Stephen W. Downing, Ph.D.

Donna J. Forbes, Ph.D.

Jon M. Holy, Ph.D. (joint with Biochemistry and Molecular Biology)

Lillian A. Repesh, Ph.D.

### *Senior Research Associate*

Richard L. Leino, Ph.D.

Anatomy and cell biology deals with the structural basis of human medicine (from macrostructure to ultrastructure) and its correlation with function. Gross anatomy, embryology, histology, and neuroanatomy are taught as part of several integrated courses in the School of Medicine curriculum. Considerable emphasis is placed on basic-clinical science correlations throughout the study of the anatomical sciences. Anatomy and cell biology introduces the medical student to much of the basic language and anatomical concepts used in clinical practice.

## Behavioral Sciences (BhSc)

### *Professor*

Barbara A. Elliott, Ph.D. (joint with Family Medicine)

Frederic W. Hafferty, Ph.D.

### *Associate Professor*

James G. Boulger, Ph.D. (joint with Family Medicine)

Gary L. Davis, Ph.D., *head*

Robert Gibson, Ph.D., *emeritus*

Richard G. Hoffman, Ph.D.

### *Assistant Professor*

Mustafa N. al'Absi, Ph.D. (joint with Family Medicine)

### *Clinical Assistant Professor*

Steven J. Bauer, M.D.

Lisa Capell, M.D.

Fred T. Friedman, J.D.

Peter Miller, M.D.

Robert S. Nesheim, M.D.

Margaret M. Saracino, M.D.

Steven J. Sutherland, M.D.

David X. Swenson, Ph.D.

### *Clinical Instructor*

Benjamin Wolfe, M.A.

The offerings in this discipline provide an analysis of those facets of human behavior that bear most heavily on the practice of medicine. The courses encompass both the social science of medicine (e.g., analysis of the medical profession, the hospital as a social system, and the doctor-patient relationship) and social science in medicine (e.g., the impact of social attitudes on illness behavior, interviewing techniques, and the developmental process). In addition, the student is given a solid grounding in behavioral medicine and psychopathology.

## Required Courses—First Year

**BhSc 6211. Medical Sociology.** (2 cr; SP—Regis med student)

Advanced aspects of sociology and its application to areas of medical science. Emphasis on doctor-patient relationship, role of medicine in society, and institutionalization of medical care through hospitals, medical schools, and medical profession.

**BhSc 6230. Medical Psychology: Interviewing.** (1 cr; SP—Regis med student)

Psychological aspects of interviewing in health care settings; interpersonal communicative skills and problems; techniques of rapport building and history taking.

**BhSc 6652. Human Behavioral Development and Problems.** (4 cr; SP–Regis med student)

Human psychological development throughout life; normal cognitive, learning, social, and personality development; problems expressed during various stages of life in the family and other settings. Assessment/treatment described as relevant to practice of family medicine.

**BhSc 6701. Medical Ethics.** (2 cr; SP–Regis med student; cannot apply cr to Graduate School program)  
Basic concepts and skills of medical ethics, including core values, clinical issues, and case analysis.

**Required Courses—Second Year**

**BhSc 5591. Studies in Medical Behavioral Sciences.** (2 cr; SP–Regis med student, #)

Selectives on topics in general medical behavioral science, typically including social psychology of deviance, alternatives in health care delivery, family dynamics, and others.

**BhSc 6200. Behavioral Medicine.** (2 cr; SP–Regis med student)

Introduction to contemporary behavioral medicine. Interface of biological, psychological, and social factors in a range of health issues, including stress, substance abuse, chronic pain and illness, cardiovascular disease, obesity, and infectious diseases.

**BhSc 6260. Psycho-Social-Spiritual Aspects of Life-Threatening Illness.** (2 cr; SP–Regis med student)

Psychological, social, and spiritual coping of patients, families, and health care professionals as they experience life-threatening illnesses. Effective intervention strategies for health care professionals are emphasized. Post-death responses of families and care providers.

**Graduate Courses**

**BhSc 5491. Problems in Medical Behavioral Sciences.**

(1-6 cr; SP–Med or upper div or grad student, #; can apply no more than 6 cr to Graduate School program)  
Independent study on a tutorial, seminar, or lecture basis. Investigative work, lecture material, and/or appropriate reading and discussions designed according to interest and capabilities of individual student.

**Biochemistry and Molecular Biology (MdBc)**

*Professor*

Paul M. Anderson, Ph.D., *emeritus*  
Matthew T. Andrews, Ph.D. (joint with Biology)  
Lester R. Drewes, Ph.D., *head*  
Joseph R. Prohaska, Ph.D.  
Kendall B. Wallace, Ph.D.

*Associate Professor*

Subhash C. Bask, Ph.D., *adjunct*  
Jon M. Holy, Ph.D. (joint with Anatomy and Cell Biology)  
Thomas E. Huntley, Ph.D.

*Assistant Professor*

Annette L. Boman, Ph.D.  
Cecilia Giulivi, Ph.D. (joint with Chemistry)  
Arun Goyal, Ph.D. (joint with Biology)  
Merry Jo Oursler, Ph.D. (joint with Biology)

Courses with components in biochemistry and molecular biology (Med 6520, Med 6541, Med 6566, Med 6573, Med 6724) introduce students to the molecular basis of cell life processes. This includes an examination of the central molecules of life—DNA, RNA, and protein; methods for exploring protein and genes and the power of genomic technology; interplay between three-dimensional structure and biological activity (function); generation and storage of metabolic energy; biosynthesis of macromolecules; and transmission and expression of genetic information. Advanced courses cover biochemical aspects of endocrinology, nutrition, neurochemistry, and other topics related to specific tissues or organ systems. Those areas of biochemistry and molecular biology most closely related to the medical sciences and clinical medicine are emphasized.

An elective course in neurobiochemistry (MdBc 5501) expands on basic aspects of brain development, metabolism function, and mechanisms of memory.

**Graduate Courses**

**MdBc 5501. Neurobiochemistry.** (2 cr; QP–Chem 3311 or Chem 5337; SP–Chem 3322 or Chem 4342 or #)

Current concepts on anatomical and compositional properties of brain; membranes and transport; neurotransmission; receptors and signal transduction mechanisms; energy, carbohydrate, protein, lipid, and nucleic acid metabolism; development and diseases of the central nervous system.

## Curriculum

**MdBc 8151. Biochemistry Seminar.** (1 cr [max 4 cr]; SP–Biochem or Chem grad student or #)  
Current topics in biochemistry.

**MdBc 8294. Current Research Techniques.** (1-3 cr [max 4 cr]; SP–Biochem or Chem grad student or #)  
Research projects in biochemistry, each carried out in research lab of a faculty member.

**MdBc 8333. FTE: Master's.** (1 cr; SP–Master's student, adviser and director of graduate studies consent)

**MdBc 8444. FTE: Doctoral.** (1 cr; SP–Doctoral student, adviser and director of graduate studies consent)

**MdBc 8666. Doctoral Pre-Thesis Credits.** (1-18 cr; SP–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

**MdBc 8777. Thesis Credits: Master's.** (1-18 cr; SP–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

**MdBc 8888. Thesis Credits: Doctoral.** (1-18 cr; SP–Max 18 cr per semester or summer; 24 cr required)

## Family Medicine (FMed)

### *Departmental Faculty*

Jeffrey Adams, M.D., *interim head*

Joy Dorscher, M.D.

Barbara Elliott, Ph.D.

Alan Johns, M.D.

Glenn Nordehn, D.O.

Tim Van Wave, Ph.D.

Ruth Westra, D.O.

### *Joint Faculty Members with Behavioral Sciences*

Mustafa al' Absi, Ph.D.

James Boulger, Ph.D.

### *Duluth Family Practice Center Faculty*

Sheri Boril, M.D.

Thomas Day, M.D.

Ann Doberstein, M.D.

David Hutchinson, M.D.

Roger Waage, M.D.

### *Family Medicine Preceptor\**

Deborah Allert, M.D.

Anthony Amon, M.D.

Mary Amon, M.D.

Vicki Anderson, M.D.

Julie Andreotti, M.D.

Ann Barry, M.D.

Niles Batdorf, M.D.

Craig Benson, M.D.

Julie Benson, M.D.

Daniel Benzie, M.D.

Sue Benzie, M.D.

James Berlin, M.D.

Dale Berry, M.D.

Marc Bettich, M.D.

Marsha Beyer, M.D.

William Beyer, M.D.

Joseph Bianco, M.D.

Mary Bianco, M.D.

Barbara Bonkoski, M.D.

Robert Bosl, M.D.

Mark Boyce, M.D.

Shelly Breyen, M.D.

Rod Brown, M.D.

Gary Carlson, M.D.

Steven Carlson, M.D.

JoAnn Chalgren, M.D.

Robert Chalgren, M.D.

H. Chris Chapman, M.D.

Lee Cohen, M.D.

Jeff Copeman, M.D.

Thomas Cunningham, M.D.

Bryan DeLage, M.D.

Jenny Delfs, M.D.

Kurt Devine, M.D.

Martin Devine, M.D.

Lynne Didrickson, M.D.

Joy Dorscher, M.D.

Peter Dunphy, M.D.

Robert Dybvig, M.D.

Thomas Edwards, M.D.

Gretchen Ehresmann, M.D.

John Eikens, M.D.

Nancy English, M.D.

Deborah Erickson, M.D.

John Fedje-Johnston, M.D.

David Freeman, M.D.

Daniel Fuglestad, M.D.

Lauren Fuller, M.D.

Scott Gerling, M.D.

Daron Gersch, M.D.

Craig Gilbertson, M.D.

David Goodwin, M.D.

Monica Goodwin, M.D.

Mark Gray, M.D.

Douglas Griffin, M.D.

Donald Grossbach, M.D.

Kathryn Halverson, M.D.

Wade Hanson, M.D.

James Harrison, M.D.

Burton Haugen, M.D.

Joel Haugen, M.D.

Thomas Haus, M.D.

Howard Hays, M.D.

Michael Heck, M.D.

Burton Helleloid, M.D.

Richard Helvig, M.D.

Barbara Hemenway, M.D.

Paul Hendrickson, M.D.

Victoria Heren, M.D.



Michael Hieb, M.D.  
 Steven Hietala, M.D.  
 Timothy Hinton, M.D.  
 Timothy Hogan, M.D.  
 Steve Honebrink, M.D.  
 Patricia Hook, M.D.  
 Jean Hoyer, M.D.  
 Brenda Hurtt, M.D.  
 Lisa Huwe, M.D.  
 John Ipsen, M.D.  
 Sarah Israelson, M.D.  
 Anthony Jaspers, M.D.  
 Jim Jessen, M.D.  
 Michael Johnson, M.D.  
 Ronald Johnson, M.D.  
 Terry Johnson, M.D.  
 Timothy Johnson, M.D.  
 Howard Josephs, M.D.  
 Phillip Kaupa, M.D.  
 Gary Kennedy, M.D.  
 David Kirby, M.D.  
 Terry Klemek, M.D.  
 Jay Knaak, M.D.  
 Francille Knowles, M.D.  
 Terence Knowles, M.D.  
 Bruce Knudsen, M.D.  
 A.A. Koeller, M.D.  
 Gerald Konrad, M.D.  
 Heidi Korstad, M.D.  
 Julianne Koski, M.D.  
 Kathryn Kramer, M.D.  
 Tim LaMaster, M.D.  
 Aaron Larson, M.D.  
 Barry Larson, M.D.  
 Richard Larson, M.D.  
 Lawrence Lemaster, M.D.  
 Michael Liebe, M.D.  
 Roger Lindholm, M.D.  
 Steve Long, M.D.  
 Herman Louters, M.D.  
 Helle Lukk, M.D.  
 Lori Lynner, M.D.  
 Lynn MacLean, M.D.  
 Heidi Malling, M.D.  
 Tim Malling, M.D.  
 John McCue, M.D.  
 Shawn McMahon, M.D.  
 Gregory McNamara, M.D.  
 John Merchlewitz, M.D.  
 Michael Mollen, M.D.  
 Lyle Munneke, M.D.  
 Sarah Nelson, M.D.  
 Michael Neudecker, M.D.  
 Dean Nissen, M.D.  
 Ingrid Nisswandt, M.D.  
 Margaret O'Connor, M.D.  
 Craig Oien, M.D.  
 Nancy Olsen, M.D.  
 Alan Olson, M.D.  
 Rodney Olson, M.D.  
 James O'Reilly, M.D.  
 Tom Osborne, M.D.  
 John Oujiri, M.D.  
 Daniel Palmquist, M.D.  
 Nancy Peltola, M.D.  
 Bradley Peterson, M.D.  
 Dennis Peterson, M.D.  
 Gary Peterson, M.D.  
 Randy Peterson, M.D.  
 Thomas Peterson, M.D.  
 Brian Pfeifer, M.D.  
 Steven Phillipson, M.D.  
 Robert Pierpont, M.D.  
 Diane Pittman, M.D.  
 Lisa Prusak, M.D.  
 Ricard Puumala, M.D.  
 Beth Riesgraf, M.D.  
 James Rogers, M.D.  
 Jerry Rogers, M.D.  
 Bonnie Rohr, M.D.  
 Edward Rosenbaum, M.D.  
 George Rounds, M.D.  
 Jon Rudberg, M.D.  
 Susan Rudberg, M.D.  
 Richard Rysavy, M.D.  
 Scott Rysdahl, M.D.  
 David Saarinen, M.D.  
 Mary Salter, M.D.  
 Michael Saunders, M.D.  
 Charles Schotzko, M.D.  
 Malcolm Scott, M.D.  
 Jeff Scrivener, M.D.  
 Robert Sellers, M.D.  
 Carl Sjoding, M.D.  
 Gary Skrien, M.D.  
 Harvey Smith, M.D.  
 Keith Stelter, M.D.  
 Gary Stelzer, M.D.  
 Jon Stephenson, M.D.  
 Kevin Stiles, M.D.  
 Lynn Stottler, M.D.  
 Sandra Stover, M.D.  
 Deborah Strand, M.D.  
 David Strobel, M.D.  
 Patrick Sura, M.D.  
 Christine Swensen, M.D.  
 Paul Terrill, M.D.  
 Kim Thompson, M.D.  
 Knute Thorsgard, M.D.  
 Lorraine Turner, M.D.

Arne Vainio, M.D.  
Paul Van Pernis, M.D.  
Jeri Vergeldt, M.D.  
Charles Vergona, M.D.  
Arden Virnig, M.D.  
Douglas Watkins, M.D.  
Kris Wegerson, M.D.  
Robert Westin, M.D.  
Chris Whiting, M.D.  
Ron Wiisanen, M.D.  
Terrence Witt, M.D.  
John Wood, M.D.  
Teresa Wrobbel, M.D.  
Matthew Yelle, M.D.

The department offers coursework in basic, supportive, and applied areas. Students should be able to competently take a complete history and perform a complete physical examination by the end of their first year. Diagnostic skills are strengthened throughout the second year, primarily through didactic lectures and clinical involvement with selected patients. The family practice preceptorship enables the student to assess practice characteristics of a number of family physicians in different locations.

### Required Courses—First Year

**FMed 6101. Family Medicine.** (2 cr; SP–Regis med student)  
Lectures and seminars on disease syndromes affecting human organ systems and on disease prevention with reference to health issues in epidemiology, environment, and public health; exposure to community preventive health and alternative medicine programs; provides basic foundation in current computer technology.

**FMed 6105. Physical Diagnosis.** (3 cr; SP–Regis med student)  
Medical history-taking and physical examination of patients emphasizing range of normal findings from the newborn to the elderly. Introduction to abnormal findings associated with major disease syndromes of human organ system.

**FMed 6121. Preceptorship I.** (1 cr; SP–Regis med student)  
Students spend periods with area physician in family medicine observing problems encountered in this type of practice and methods by which health care is delivered.

**FMed 6122. Preceptorship II.** (2 cr; SP–Regis med student)  
Students spend periods with area physician in family medicine observing problems encountered in this type of practice and methods by which health care is delivered.

**FMed 6501. Clinical Pathology Conferences I.** (1 cr; SP–Regis med student)  
Applying knowledge gained in pathology and laboratory medicine to an unknown clinical case in order to work through a differential diagnosis.

### Required Courses—Second Year

**FMed 6441. Clinical Rounds and Clerkship I.** (2 cr; SP–Regis med student)  
Clinical practicum, hospital based, covering core material in family practice, internal medicine, obstetrics, pediatrics, surgery. Patient work-ups with discussion by preceptor.

**FMed 6442. Clinical Rounds and Clerkship II.** (2 cr; SP–Regis med student)  
Clinical practicum, hospital based, covering core material in family practice, internal medicine, obstetrics, pediatrics, surgery. Patient work-ups with discussion by preceptor.

**FMed 6461. Preceptorship III.** (1 cr; SP–Regis med student)  
Students spend periods of time with a physician in family practice in rural/small communities of Minnesota and Wisconsin observing methods by which health care is delivered.

**FMed 6462. Preceptorship IV.** (2 cr; SP–Regis med student)  
Students spend periods of time with a physician in family practice in rural/small communities of Minnesota and Wisconsin observing methods by which health care is delivered.

**FMed 6502. Clinical Pathology Conferences II.** (1 cr; SP–Regis med student)  
Applying knowledge gained in pathology and laboratory medicine to an unknown clinical case in order to work through a differential diagnosis.

### Undergraduate and Graduate Courses

**FMed 5591. Independent Study.** (1-8 cr [max 12 cr]; QP–A; SP–A)  
Intensive, independent study project of student's interest in medical research, interdisciplinary fellowship, preceptorship in rural health care delivery, or another medical area approved by Department of Family Medicine.

### Additional Courses—Residents

**FMed 7100. Clinical Family Medicine.** (5-15 cr [max 90 cr]; SP–A; cannot apply cr to Graduate School program)  
Supervised care of patients of all ages emphasizing continuous, primary, preventive, acute, and chronic care in all general diagnostic categories.

## Interdisciplinary (Med)

### Required Courses—First Year

**Med 6301. Medical Epidemiology and Biometrics.** (2 cr; SP–Regis med student; cannot apply cr to Graduate School program)

Basic elements of biostatistics, including descriptive and inferential statistics, study design, probability statistics, and ordering and interpreting diagnostic tests. Topics in clinical epidemiology and epidemiologic methods.

**Med 6505. Applied Anatomy.** (7 cr; SP–Regis med student)  
Adult gross structure taught using regional approach with strong emphasis on functional and clinical applications. Basic-clinical science correlation conferences held frequently to emphasize applied anatomy of a region.

**Med 6510. Histopathology.** (6 cr; SP–Regis med student)

Integrated course correlating normal structure and function of cells, tissues, and organs of the body with examples of pathological changes that take place within these cells, tissues, and organs during disease processes.

**Med 6520. Principles of Basic Medical Science.** (9 cr; SP–Regis med student)

Introduction to cellular homeostatic principles and mechanisms associated with normal and abnormal structure and function. Basic science principles of integrative medical sciences. Interdisciplinary sessions emphasize fundamental concepts of biochemistry, molecular biology, anatomy, microbiology, physiology, and pharmacology.

**Med 6541. Hematopoiesis and Host Defenses.** (9 cr; SP–Regis med student)

Introduction to principles of human immunology and hematology. Basic science principles, including pharmacology and pathology together with clinical aspects of innate and acquired immunity within context of hemato-lympho-reticular system.

**Med 6573. Nervous System.** (13 cr; SP–Regis med student)

Interdisciplinary study of human nervous system, including consideration of eye and ear. Basic sciences of anatomy, behavioral science, biochemistry, microbiology, pathology, pharmacology, and physiology correlated with clinical material.

**Med 6788. Dermatology and Musculoskeletal System.** (4 cr; SP–Regis med student)

Interdisciplinary study of integument and musculoskeletal system. Basic sciences of anatomy, microbiology, pathology, pharmacology, and physiology correlated with clinical material.

### Required Courses—Second Year

**Med 6566. Cardiovascular System.** (7 cr; SP–Regis med student)

Integrated comprehensive overview of cardiovascular system. Anatomical, biochemical, physiological, pathological, and pharmacologic aspects of heart, blood vessels, and blood, including histology, embryology, anatomy, gross and microscopic pathology, as well as clinical features, diagnosis, and pharmacological therapy.

**Med 6724. Gastrointestinal Hepatobiliary System.** (6 cr; SP–Regis med student)

Interdisciplinary integrative course discusses fundamental concepts of anatomy, physiology, nutrition, pathology, clinical medicine, and microbiology as they relate to issues of gastrointestinal and hepatobiliary system.

**Med 6728. Respiratory System.** (5 cr; SP–Regis med student)

Maintenance and regulation of human internal environment by the respiratory system. Histology of upper airways and lungs; respiratory gas exchange; introduction to respiratory component of acid-base balance. Integrative lab covering cardiovascular-respiratory adjustments to exercise.

**Med 6746. Fluids and Electrolytes.** (4 cr; SP–Regis med student)

Introduction to principles and mechanisms associated with human renal and genitourinary function in health and disease. Integrates anatomical, physiological, pharmacological, pathological, immunological, and basic clinical aspects of renal and genitourinary systems in context of fluid and electrolyte homeostasis.

**Med 6762. Endocrine and Reproductive System.** (10 cr; SP–Regis med student)

Structure and function of endocrine and reproductive systems. Essential background for understanding findings of clinical medicine related to endocrine regulation of reproduction and homeostasis.

**Med 6773. Integrated Clinical Medicine.** (6 cr; SP–Regis med student)

Integration of basic, clinical, and behavioral science principles to understand the human body and its integrative function and psychosocial responses, especially in multisystem conditions. Emphasizing evidence-based medicine principles, health issues are explored over the life cycle from pediatrics to geriatrics.

### Undergraduate and Graduate Courses

**Med 3998. Human Biology and Behavior Topics.** (1-10 cr [max 12 cr]; SP–#)

Advanced undergraduate or graduate students can study in depth normal human biology and behavior. During the academic year, students may elect to enroll in one or several subtopics. No basic science clinical correlation.

**Med 6023. Seminars in Indian Health.** (1-2 cr; SP–Regis med student)

Current issues impacting health of Indian people. Causes of morbidity and mortality, including social, cultural, and economic issues. Discussion focuses on solutions to problems in context of Indian communities.

## Medical and Molecular Physiology (Phsl)

*Professor*

Lloyd Beck, Ph.D., *emeritus*  
Lois J. Heller, Ph.D.

*Associate Professor*

Edwin W. Haller, Ph.D.  
John Keener, Ph.D., *adjunct*  
David E. Mohrman, Ph.D.  
Edward K. Stauffer, Ph.D.  
Lorentz E. Wittmers, Jr., M.D., Ph.D., *acting head*

*Assistant Professor*

Janet L Fitzakerley, Ph.D. (joint with Pharmacology)  
Irina Haller, Ph.D., *adjunct*

*Clinical Associate Professor*

Harold Hofstrand, M.D.

Physiology is the science that studies the principles governing the functions of biological systems such as the nervous, cardiovascular, renal, respiratory, and endocrine systems. A number of course hours are devoted to demonstrating the applicability of physiology to various clinical disciplines through integrative sessions that emphasize basic physiologic principles.

## Undergraduate and Graduate Courses

**Phsl 3011. General Physiology.** (5 cr; QP–Biol 1012, Chem 1101 or #; SP–Biol 1761, Chem 1102 or #)

Lab and/or lecture demonstrations illustrate key aspects of function and mechanisms of action of major organ systems. Primarily for students preparing for nursing, dental hygiene, pre-professional programs, communication disorders, life science teaching, majors in natural sciences.

**Phsl 5211. Literature Seminar.** (1-2 cr; QP-5927 or #)

Oral presentation of written literature review and research data reflecting student's research interests and thesis research results.

**Phsl 5292. Readings in Physiology.** (1-3 cr; SP-#)

Topics in physiology selected for each student; written reviews prepared and discussed.

**Phsl 5294. Research in Physiology.** (1-15 cr; SP-#)

Introduction and use of lab techniques and equipment used for research in various subspecialties of physiology, including neurophysiology, cardiovascular physiology, endocrinology, respiratory and transport process, electrophysiology, and renal physiology.

**Phsl 5601. Physiology of Organ Systems I.** (3 cr; QP-3011, [Biol 3154 or Biol 3245], [Chem 3311 or Chem 5336] or #; SP-3011, [Biol 2101 or Biol 2201], [Chem 3322 or Chem 4341] or #)

Survey of physiologic functions and interrelationships of organ systems in mammals (musculoskeletal, cardiovascular, renal, respiratory, nervous, endocrine, and reproductive). Framework for understanding physiological processes, allowing students to integrate knowledge gained at molecular level with functions of whole organism.

**Phsl 5602. Physiology of Organ Systems II.** (2 cr; QP-5601 or #; SP-5601 or #)

Advanced study of organ system functions in context of interaction of organism with environment.

**Phsl 8401. Physiology of Aging.** (2 cr; SP-5601, #)

In-depth study of several theories concerning physiological processes that appear to set the limits of maximum human life span.

**Phsl 8405. Muscle Physiology.** (2 cr; SP-5601, #)

In-depth review and discussion of physiological processes involved in muscle contraction from subcellular events to neural-controlled function of whole muscle (skeletal, cardiac, and smooth muscle).

**Phsl 8415. Topics in Endocrinology.** (2 cr; SP-5601, #)

Selected topics of current endocrine research interest examined in depth; historical background, questions posed by current research, and implications of current research for future development in the area.

**Phsl 8441. Transport Processes.** (2 cr; SP-5601, #)

In-depth, quantitative approach to transport processes in biological systems.

## Medical Microbiology and Immunology (MicB)

### Professor

Arthur G. Johnson, Ph.D., *emeritus*

Richard J. Ziegler, Ph.D.

### Associate Professor

Benjamin L. Clarke, Ph.D.

Omelan A. Lukasewycz, Ph.D., *acting head*

### Assistant Professor

Lucia P. Barker, Ph.D.

M. Kent Froberg, M.D. (joint with Pathology and Laboratory Medicine)

Louise B. Hawley, Ph.D.

Merry Jo Oursler, Ph.D., *adjunct*

Medical microbiology and immunology components of courses familiarize students with concepts basic to understanding infectious diseases and their management. Characteristics of important pathogenic members of the microbial world—bacteria, viruses, fungi, and parasites—are discussed, with emphasis on communicability, invasive properties, toxigenicity, and lab identification. The multifaceted immune response of the host to infectious agents is defined and characterized. In addition, the aberrant response of the immune system resulting in allergic and pathological reactions is addressed.

## Graduate Courses

**MicB 5545. Immunobiology.** (3 cr; QP–Biol 2101 or #; SP-#)

The immune system and the cells and molecules which work in concert to keep us free from disease and aberrations resulting in immune disorders.

**MicB 5591. Problems in Medical Microbiology and Immunology.** (1-4 cr [max 8 cr]; SP–Open to med students or qualified upper div and grad students with #)

Independent study on tutorial basis. Emphasis on basic and clinical microbiology problems under study at UMD School of Medicine, including immunology. Investigative work and appropriate reading arranged with tutorials consistent with interests and capabilities of individual students.

**MicB 8333. FTE: Master's.** (1 cr; SP–Master's student, adviser and director of graduate studies consent)

**MicB 8444. FTE: Doctoral.** (1 cr; SP–Doctoral student, adviser and director of graduate studies consent)

**MicB 8554. Advanced Immunology and Immunobiology.** (2 cr; SP-5545 or #)

Detailed study of mechanisms involved in immunologic defense. Emphasis on concepts and current literature.

**MicB 8666. Doctoral Pre-Thesis Credits.** (1-18 cr; SP–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

**MicB 8777. Thesis Credits: Master's.** (1-18 cr; SP–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

**MicB 8888. Thesis Credits: Doctoral.** (1-18 cr; SP–Max 18 cr per semester or summer; 24 cr required)

## Pathology and Laboratory Medicine (Path)

### Professor

Arthur C. Aufderheide, M.D.

Patrick C. J. Ward, M.D., *head*

### Assistant Professor

M. Kent Froberg, M.D. (joint with Medical Microbiology and Immunology)

### Clinical Assistant Professor

Thomas C. Nelson, M.D.

Sarah T. B. Seidemann, M.D.

Patrick A. Twomey, M.D.

Daniel P. Vandersteen, M.D.

Geoffrey A. Witrak, M.D.

Human pathology is the study of anatomic changes in body tissues occurring in disease states. Correlation between anatomic changes and clinical signs and symptoms under disease conditions is emphasized. Special effort is made to integrate subject matter with the content of courses taught in other disciplines.

## Pharmacology (Phcl)

### Professor

Richard M. Eisenberg, Ph.D., *head*

Jean F. Regal, Ph.D.

George J. Trachte, Ph.D.

### Associate Professor

Edward T. Knych, Jr., Ph.D.

### Assistant Professor

Janet L. Fitzakerley, Ph.D. (joint with Medical and Molecular Physiology)

Pharmacology is the science concerned with the actions of drugs, chemicals, and other biologically active agents on biological processes. The sequence of courses in pharmacology deals with principles of drug action; prototype drugs and their congeners and how each of these drugs affects biochemical

and physiological processes; the manner and mechanism whereby drugs can ameliorate or correct pathological processes; clinical toxicology; and drugs used in emergency situations. Because drugs only alter existing biochemical, physiological, or pathological processes rather than produce *de novo* effects, an extensive knowledge of these related disciplines will normally be required as preparation for the study of pharmacology.

### Undergraduate and Graduate Courses

**Phcl 4001. Introduction to Pharmacology.** (2 cr; QP–Biol 1111, Chem 1110-1111-1112, Chem 3512-3513 or #; SP–Biol 1011, Chem 1151-1152, Chem 2521-2522 or #)

Elementary course in pharmacology. Actions and use of drugs in selected health conditions.

**Phcl 4094. Directed Research in Pharmacology I.** (1-10 cr [max 10 cr]; QP–Upper div sci major, #; SP–Upper div sci major, #)

**Phcl 5094. Directed Research in Pharmacology II.** (1-10 cr [max 10 cr]; QP–Grad student, #; SP–Grad student, #)

**Phcl 5201. Pharmacology I.** (6 cr; QP–Chem 5336, Chem 5337, Phsl 5601 or #; SP–Chem 4341-4342 or Phsl 5601 or #) Analysis of effects of pharmacologic agents on living systems; major classes of drugs; concepts of chemotherapy; characteristic pharmacologic agents, their reactions and therapeutic applications.

**Phcl 5202. Pharmacology II.** (5 cr; QP–5101 or #; SP–5201 or #)

Analysis of effects of pharmacologic agents on living systems; major classes of drugs; concepts of chemotherapy; characteristic pharmacologic agents, their reactions and therapeutic applications.

**Phcl 5204. Pharmacology Seminar.** (1 cr [max 4 cr]; QP–Grad student, #; SP–Grad student, #)

Presentation of selected research problems and current journal articles.

**Phcl 5410. Advanced Pharmacology.** (1 cr; QP–Phcl grad student or #; SP–Phcl grad student or #)

Comprehensive lectures and discussion of principles of drug disposition; drug receptor interactions; mechanism of action of selected drugs emphasizing current advances and methodologies.

**Phcl 8333. FTE: Master's.** (1 cr; SP–Master's student, adviser and director of graduate studies consent)

**Phcl 8444. FTE: Doctoral.** (1 cr; SP–Doctoral student, adviser and director of graduate studies consent)

**Phcl 8666. Doctoral Pre-Thesis Credits.** (1-18 cr; SP–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

**Phcl 8777. Thesis Credits: Master's.** (1-18 cr; SP–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

**Phcl 8888. Thesis Credits: Doctoral.** (1-18 cr; SP–Max 18 cr per semester or summer; 24 cr required)

# Toxicology (Txcl)

## *Graduate School*

**Txcl 5011. Principles of Toxicology.** (2 cr; SP–Grad txcl major or #; A-F only)

Introduction to fundamentals of poisoning in individuals and the environment, assessment of potential health hazards, and application of toxicology in various professional careers.

**Txcl 8012. Advanced Toxicology I.** (3 cr; QP–5214 or PubH 5261; SP–5011, Chem 4341 or #; A-F only)

Absorption, distribution, metabolism, and excretion of xenobiotics; toxicokinetics; mechanisms of toxicity or specific classes of chemical agents.

**Txcl 8013. Advanced Toxicology II.** (3 cr; QP–5214 or PubH 5261; SP–8012, Chem 4342, Phsl 5601 or #; A-F only)

Kinetic and dynamic determinants of target organ toxicity; pathological alterations in structure/function relationships for major target organ systems; mechanisms of mutagenesis, carcinogenesis, and teratogenesis.

**Txcl 8100. Investigative Toxicology.** (1 cr [max 2 cr]; QP–5214; SP–8013 or #; A-F only)

Evaluating toxicology research issues and literature.

**Txcl 8333. FTE: Master's.** (1 cr; SP–Master's student, adviser and DGS consent)

**Txcl 8444. FTE: Doctoral.** (1 cr; SP–Doctoral student, adviser and DGS consent)

**Txcl 8666. Doctoral Pre-Thesis Credits.** (1-18 cr; SP–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

**Txcl 8777. Thesis Credits: Master's.** (1-18 cr; SP–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

**Txcl 8888. Thesis Credits: Doctoral.** (1-18 cr; SP–Max 18 cr per semester or summer; 24 cr required)





## **University Regents**

Maureen K. Reed, Stillwater, Chair  
Robert S. Bergland, Roseau, Vice Chair  
Anthony R. Baraga, Side Lake  
Frank R. Berman, Edina  
Dallas Bohnsack, New Prague  
William E. Hogan II, Minnetonka  
Jean B. Keffeler, Minneapolis  
Richard McNamara, Edina  
David R. Metzen, Sunfish Lake  
H. Bryan Neel III, Rochester  
Michael O'Keefe, Minneapolis  
Lakeesha K. Ransom, Edina

## **University Administrators**

Mark Yudof, President  
Robert Bruininks, Executive Vice President and Provost  
Frank B. Cerra, Senior Vice President for Health Sciences  
Tonya Moten Brown, Vice President and Chief of Staff  
Carol Carrier, Vice President for Human Resources  
Sandra Gardebring, Vice President for University Relations  
Robert Jones, Vice President for Campus Life  
Eric Kruse, Vice President for University Services  
Christine Maziar, Vice President for Research and Dean of the Graduate School  
Charles Muscoplat, Vice President for Agricultural Policy  
Mark B. Rotenberg, General Counsel

## **UMD Administrators**

Kathryn A. Martin, Chancellor  
Vincent R. Magnuson, Vice Chancellor for Academic Administration  
Gregory R. Fox, Vice Chancellor for Finance and Operations  
Bruce L. Gildseth, Vice Chancellor for Academic Support and Student Life

## **UMD School of Medicine Administrators**

Richard J. Ziegler, Dean  
Lillian A. Repesh, Associate Dean for Admissions and Student Affairs  
Richard G. Hoffman, Assistant Dean for Education and Curriculum  
George J. Trachte, Assistant Dean for Research

**A**

Administration, UMD School of Medicine 6, 28  
 Administration, University 28  
 Admission 11  
 Advanced Standing 14  
 American Indian Programs 6  
 Anatomy and Cell Biology 18  
 Application Procedures 11

**B**

Behavioral Sciences 18  
 Biochemistry and Molecular Biology 19

**C**

Catalog Use 2  
 Course Symbols 18  
 Courses, Descriptions of 18  
 Courses, Required 11  
 Curriculum, Overview of 17

**D**

Deferred Acceptance 12  
 Duluth 9

**E**

Early Decision Program 12  
 Equal Opportunity 2  
 Evaluation Process 12  
 Extracurricular Events 3

**F**

Facilities 7  
 Faculty 6  
 Family Medicine 20

**G**

Grades 17  
 Graduate Programs 6

**H**

Health Services, UMD 8  
 History of School 5  
 Housing 8

**I**

Immunization 3, 14  
 Interdisciplinary 22

**L**

Learning Resources Center 8  
 Library, Health Science 7  
 Loans 15

**M**

Medical and Molecular Physiology 23  
 Medical Microbiology and Immunology 24  
 Minnesota Medical Foundation 15  
 Minorities 14

**P**

Pathology and Laboratory Medicine 25  
 Pharmacology 25  
 Philosophy of School 5  
 Progress, Academic 17

**R**

Records, Access to 3  
 Recreational Activities 8  
 Residency and Reciprocity 14

**S**

Scholarships 15  
 Student Employment 15  
 Student Government 8

**T**

Technical Standards 12  
 Toxicology 26  
 Tuition and Fees 14

**U**

UMD Health Services 8