LEADERSHIP
Kevin Behrens, M.D.
Dean of the School of Medicine
Robert M. Heaney, M.D.
Senior Associate Dean for Clinical Affairs
Joel C. Eisenberg, Ph.D.
Associate Dean for Research
Julie K. Gammack, M.D.
Associate Dean
Paul J. Hauptman, M.D.
Assistant Dean
Chad S. Miller, M.D., FACP, FHM
Associate Dean
Michael T. Railey, M.D.
Associate Dean
Gregory S. Smith, Ph.D.
Assistant Dean
L. James Willmore, M.D.
Associate Dean
Gary Whitworth
Associate Dean
John R. Martin, III, Ph.D.
Graduate Program Director and Director, Center for Anatomical Science and Education
Enrico Di Cera, M.D.
Biochemistry and Molecular Biology Chairperson
F. David Schneider, M.D.
Medical Family Therapy Chairperson
William S. M. Wold, Ph.D.
Molecular Microbiology & Immunology Chairperson
Carole Vogler, M.D.,
Pathology Chairperson
Thomas P. Burris, Ph.D.
Pharmacology and Physiological Science Chairperson

DESCRIPTION
Saint Louis University School of Medicine has a long tradition of excellence in teaching, research and patient care. Established in 1836, the school has the distinction of awarding the first medical degree west of the Mississippi River.

Today, about 550 faculty members, 700 medical students and 550 residents in 48 graduate medical education programs, including residencies, subspecialty residencies and fellowships, call Saint Louis University home.

The school is a leading center of research in five key areas: cancer, infectious disease, liver disease, aging and brain disorders, and heart/lung disease.

ACCREDITATION
The Saint Louis University School of Medicine is fully accredited by the Liaison Committee on Medical Education (LCME), the accrediting body for medical education in the United States.

Both the M.A. and Ph.D. majors in the Medical Family Therapy Program at Saint Louis University are accredited by the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE) of the American Association for Marriage and Family Therapy (AAMFT), 112 S. Alfred Street, Alexandria, VA 22314, 703.838.9808.
ANATOMY

LEADERSHIP
John R. Martin, III, Ph.D.
Graduate Program Director and Director, Center for Anatomical Science and Education
Patty Anderson
Anatomy Graduate Program Coordinator

OVERVIEW
Offered through Saint Louis University's Center for Anatomical Science and Education, the graduate programs in anatomy can assist in M.D. or Ph.D. postdoctoral training and to stimulate interest in research. Students will advance the frontiers of their knowledge and technical expertise through active participation in a variety of research projects.

CASE has been an established academic center providing expert anatomical education for more than 100 years. Graduate students in perform research projects by working with a faculty mentor whose research interests match their own. Doctoral students are expected to publish and present a minimum of two research projects. The program also offers a concentration in neurobiology for Ph.D. students that can help prepare students for a career in neuroscience-related areas.

Faculty
Michael Ariel, Ph.D.
Daniel T. Daly, D.C., Ph.D
Craig Lawson, M.D., Ph.D.
Joshua W. Little, D.C., Ph.D.
John R. Martin III, Ph.D.
Yun Tan, M.D., Ph.D.
MariaTeresa A. Tersigni-Tarrant, Ph.D., D-ABFA
Paul A. Young, Ph.D., Emeritus

MEDICAL ANATOMY AND PHYSIOLOGY

PREPARATORY
Program Highlights
MAPP offers students the opportunity to learn from a diverse team of faculty, clinicians and scientists dedicated to teaching, training, and advising students. Students will experience hands-on training in gross anatomy and neuroanatomy laboratories in an academic center that has been providing expert anatomical education for more than 100 years.

Curriculum Overview
The doctoral degree in anatomy provides training in clinical human anatomy and independent research for individuals seeking a career in teaching and research at the medical school or university level. Dissertation research is related to the center's current research focus including examining clinically relevant topics in neurobiology, pathology, and/or biological structure and function. A concentration in neurobiology provides training for students preparing for academic or professional careers in neuroscience-related areas. A total of 48 credits (36 credits of coursework and 12 credits of dissertation research) are required for graduation.

Fieldwork and Research Opportunities
Graduate students perform research projects by working with a faculty mentor whose research interests match their own. Doctoral students are expected to publish and present a minimum of two research projects.

The center's faculty are engaged in multidisciplinary research of biological structure and function ranging from ultrastructural to gross anatomical levels, with a major interest in clinically relevant anatomy and neurobiology. Other research interests include cell biology and pathobiology. Facilities are available for autoradiography, electrophysiology, gel electrophoresis, immunoblotting, immunostaining (immunocytochemistry, immunohistochemistry, immunofluorescence), high-performance liquid chromatography, in situ hybridization, microsurgery, stereotaxic neurosurgery, microinjections and animal behavioral assays. The center is also equipped to perform optical imaging, including bright field, phase contrast and fluorescence microscopy.

Careers
The program gives students the opportunity explore career interests in the biomedical sciences while also giving students a head start in pursuing an advanced degree. Many students go on to medical school are qualified to be tutors and teaching assistants in advanced anatomical science courses.

Admission Requirements
Applicants are admitted on a competitive basis and must have a bachelor degree from an accredited college or university in the United States with a minimum overall GPA of 3.0 or science GPA of 2.8.

Applicants must also have either a minimum combined MCAT score of 495 or a GRE general test score at the 40th percentile.

Application Requirements
+ Application form and fee
+ Transcript(s)
+ Three letters of recommendation
+ GRE or GMAT scores

Requirements for International Students
+ A completed Declaration of Financial Support packet with all accompanying documents
+ TOEFL or PTE Academic score
+ Check the English Proficiency Policy page for specific TOEFL and PTE score requirements.

Students may also visit the international prospects,
applicants and students page for more information about international application requirements.

Application Deadline
Students must submit the application by Aug. 1.

Review Process
A committee examines and reviews the applicant and application wholly.

Scholarships and Financial Aid
For more information, visit the student financial services office online at finaid.slu.edu.

Program Requirements

Required Courses (24 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ANAT 5000 Human Gross Anatomy</td>
<td>8</td>
</tr>
<tr>
<td>ANAT 5100 Human Histology and Ultrastructure</td>
<td>5</td>
</tr>
<tr>
<td>ANAT 5200 Human Embryology</td>
<td>2</td>
</tr>
<tr>
<td>ANAT 5300 Human Systems Neurobiology</td>
<td>5</td>
</tr>
<tr>
<td>ANAT 5400 Human Systems Physiology</td>
<td>4</td>
</tr>
</tbody>
</table>

TOTAL CREDITS: 24

Continuation Standards
Students must maintain a cumulative GPA of 3.00 in all required graduate/professional courses.

MASTER OF SCIENCE IN ANATOMY

Program Highlights
Teaching faculty and mentors are drawn from a select group of scientists and clinicians at the Saint Louis University School of Medicine. The faculty are united by their extensive experience and teaching and training young scientists, medical students and physicians-in-training.

Students receive training from a diverse team of award-winning clinical anatomists dedicated to teaching and training.

Students have the opportunity for research projects with a dedicated scientific support staff to assist them.

Many students present their research at local and national scientific conferences.

Curriculum Overview
There are two options for a master's degree in anatomy: thesis and project.

The thesis option provides advanced training in anatomy for individuals interested in teaching fundamental courses in anatomy and serves as an introduction to biomedical research. It is also appropriate for those whose main interests are in related fields such as medicine or the allied health professions. A total of 30 credits, including six credits of thesis research, are required for graduation.

The project option provides training in anatomy with a capstone project and is appropriate for students who want to fulfill a professional aspiration to teach human anatomy structure and function. It is also appropriate for students who are undecided about a career in the health professions and want to improve their academic background before applying to professional schools such as medicine, dentistry or allied health professions. A total of 30 credits is necessary to complete the degree.

Fieldwork and Research Opportunities
Graduate students perform research projects by working with a faculty mentor whose research interests match their own. Doctoral students are expected to publish and present a minimum of two research projects.

The center's faculty are engaged in multidisciplinary research of biological structure and function ranging from ultrastructural to gross anatomical levels, with a major interest in clinically relevant anatomy and neurobiology. Other research interests include cell biology and pathobiology. Facilities are available for autoradiography, electrophysiology, gel electrophoresis, immunoblotting, immunostaining (immunocytochemistry, immunohistochemistry, immunofluorescence), high-performance liquid chromatography, in situ hybridization, microsurgery, stereotaxic neurosurgery, microinjections and animal behavioral assays. The center is also equipped to perform optical imaging, including bright field, phase contrast and fluorescence microscopy.

Careers
Possible careers for graduates with a degree in anatomy include medical doctor, allied health professional and university professor.

Admission Requirements
Applicants are admitted on a competitive basis and must have a B.S. or B.A. degree from an accredited U.S. college or university with a minimum overall GPA of 3.0 and/or science GPA of 2.8. In addition, applicants must have either a minimum combined MCAT score of 495 or a GRE general test score at the 40th percentile.

Application Requirements
+ Application form and fee
+ Transcript(s)
+ Three letters of recommendation
+ GRE G scores (GRE S optional)
+ Résumé
+ Interview
+ Professional goal statement

Requirements for International Students
+ A completed Declaration of Financial Support packet with all accompanying documents
+ TOEFL or PTE Academic score
+ Check the English Proficiency Policy page for specific TOEFL and PTE score requirements.
Students may also visit the international prospects, applicants and students page for more information about international application requirements.

Application Deadlines
Students should apply by July 1 for fall admission.

Scholarships and Financial Aid
For more information, visit the student financial services office online at finaid.slu.edu.

Program Requirements

Required Courses (24 credits)

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<td>Human Gross Anatomy</td>
<td>8</td>
</tr>
<tr>
<td>ANAT 6100</td>
<td>Human Histology and Ultrastructure</td>
<td>6</td>
</tr>
<tr>
<td>ANAT 6200</td>
<td>Human Embryology</td>
<td>2</td>
</tr>
<tr>
<td>ANAT 6300</td>
<td>Human Systems Neurobiology</td>
<td>8</td>
</tr>
<tr>
<td>ANAT 6400</td>
<td>Human Systems Physiology</td>
<td>4</td>
</tr>
</tbody>
</table>

Project or Thesis Research (6 credits)

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<tr>
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<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>ANAT 5980</td>
<td>Master's Project</td>
<td>3</td>
</tr>
<tr>
<td>ANAT 5500</td>
<td>Advanced Dissections in Human Anatomy</td>
<td>3</td>
</tr>
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</table>

Thesis Option

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT 6980</td>
<td>Thesis Research</td>
<td>6</td>
</tr>
</tbody>
</table>

TOTAL CREDITS: 30

Thesis Option

The thesis option provides advanced training in anatomy and is a good option if students are interested in teaching fundamental courses in anatomy or if students are interested in related fields such as medicine or the allied health professions. It also serves as an introduction to biomedical research. A total of 30 credits, including six credits of thesis research, are required for graduation.

Qualifying Examination and Defense

Upon completion of the core curriculum and Basic Research Techniques in Anatomy, the student must register for 4-6 credits of Thesis Research. The thesis research project generally takes 2-3 academic semesters after the research proposal has been approved. Initially, the student must identify a research project under the guidance of a CASE faculty member.

An M.S. (thesis) committee will then be formed as the student prepares their research proposal. A three member M.S. (thesis) committee, chaired by the student's primary adviser, will be appointed by the director of the anatomy graduate program. The committee must include at least two members of the CASE anatomy graduate faculty. A third member of the committee can be appointed by the graduate program director if they are graduate faculty in other departments or at another university. It is the decision of the anatomy graduate program director to accept the adviser's recommendation and to identify the final member of the committee.

Once the proposal has been approved by the M.S. (thesis) committee, it is then submitted to the Office of Graduate Education. A thesis must be completed and approved by the faculty adviser and M.S. (thesis) committee. The thesis should follow the formatting guidelines issued by the Office of Graduate Education.

Completion of the thesis research project follows: writing of the thesis, application for advancement to candidacy and the thesis defense. It shall be the responsibility of the student to initiate candidacy by filling out a candidacy form through Office of Graduate Education. The completed form must be returned by the deadline stated in the graduate education calendar of deadlines. Once the completed candidacy form has been processed by the Office of Graduate Education, the thesis committee chair will receive a ballot for the oral defense of the thesis. The ballot is distributed to the other committee members by the thesis committee chair when they vote on the oral defense. Once the ballots are completed, signed and sealed, it is the committee chairperson's responsibility to deliver the ballots to the Office of Graduate Education immediately following the defense.

The defense of the thesis provides an opportunity for the student to formally present their findings to their committee, the faculty and students in CASE, and to any family member or anyone from the general public wishing to attend.

Two weeks before the thesis defense, an electronic and print announcement of the date, time, location and title of the defense will be publicized to all members of CASE. A final draft of the student's thesis must be made available in the anatomy conference room for faculty and students to review at least seven working days prior to the defense.

The defense of the thesis is two parts. First, the student will make an oral, PowerPoint presentation of no longer than 45 minutes duration where they present their research. Following the presentation, questions from the collective audience will be encouraged. Once all questions have been satisfactorily answered by the student, the audience is excused and the closed, or executive, part of the defense takes places with only the student and their committee present. The thesis committee can ask detailed questions and expect the student to demonstrate thorough knowledge of their project and related research. Questions on general topics in anatomy, unrelated to their research, may also be asked. Following all questioning, the student is excused from the room and the committee members, without discussion, complete the defense ballot.

Project Option

The project option is appropriate if students want to teach human anatomy structure and function, or if students are undecided about a career in the health professions and want to improve their academic background before applying to professional schools. It provides training in anatomy with a capstone project. A total of 30 credits is necessary to complete the...
Qualifying Examination and Defense

Upon completion of the core curriculum, the student must identify an independent study project under the guidance of a CASE faculty adviser for the required Master's Project (ANAT-5960, 2-4 credits) course.

The Master's Project course is intended to foster students' intellectual development by working independently with a faculty adviser and an M.S. (project) committee. It is hoped that a student will develop the capacity to plan and execute a project and will acquire competence and critical writing skills.

The M.S. (project) committee will be formed as the student prepares the project proposal. A three-member M.S. (project) committee, chaired by the student's primary adviser, will be recommended to the director of the anatomy graduate program for approval. The committee must include at least two members of the CASE anatomy graduate faculty.

The initial responsibility of the M.S. (project) committee is to determine the feasibility of the project and its proposal, and to permit the student to proceed only after such determination has been made. The committee and director of the anatomy graduate program shall sign off on the student's proposal and a copy should be kept in the student's file in the CASE office. The signing of this document signifies that the student has permission to proceed with the study as outlined in the proposal.

The M.S. (project) committee will meet regularly with the student and adviser and is responsible for reviewing the ongoing project and manuscript drafts, and to provide feedback in a timely manner.

A manuscript of the project, in the form of a treatise, must be completed and approved by the faculty adviser and M.S. (project) committee. The treatise is a critical analysis of the project and is expected to demonstrate mastery of the material using critical thinking skills. The manuscript should follow the formatting guidelines issued by the Office of Graduate Education.

As the project and manuscript near their completion, a tentative date to complete the oral examination will be scheduled, no less than two weeks in advance, by the faculty adviser and approved by the M.S. (project) committee. The last day to complete the final oral examination will be identified by the graduate education calendar of deadlines and will be strictly enforced.

Before the oral examination is officially scheduled to take place, the student's Master's Project course project must be completed and approved by the student's faculty adviser and M.S. (project) committee.

Two weeks before the thesis defense, an electronic and print announcement of the date, time, location and title of the defense will be publicized to all members of CASE. A final draft of the student's thesis must be made available in the anatomy conference room for faculty and students to review at least seven working days prior to the defense.

The oral examination will consist of a formal presentation of the student project to the M.S. (project) committee, the faculty and students in CASE, and to any family member or anyone from the general public wishing to attend. After the presentation, the committee will meet with the student privately to ask any questions relating to the project and manuscript, and of the student's knowledge of anatomy. After the private meeting, the student will be asked to leave the room as the committee votes on the oral examination performance by filling out the ballot issued by the Office of Graduate Education. Once the ballot is completed, signed and sealed it is the committee chairperson's responsibility to deliver the ballot to the Office of Graduate Education immediately following the oral examination.

Continuation Standards

Students must maintain a cumulative GPA of 3.00 in all required graduate/professional courses.

Doctor of Philosophy in Anatomy

Program Highlights

Teaching faculty and mentors are drawn from a select group of scientists and clinicians at the Saint Louis University School of Medicine. The faculty are united by their extensive experience and teaching and training young scientists, medical students and physicians-in-training.

Students receive training from a diverse team of award-winning clinical anatomists dedicated to teaching and training.

Students have the opportunity for research projects with a dedicated scientific support staff to assist them.

Many students present their research at local and national scientific conferences.

Curriculum Overview

The doctoral degree in anatomy provides training in clinical human anatomy and independent research for individuals seeking a career in teaching and research at the medical school or university level. Dissertation research is related to the center's current research focus including examining clinically relevant topics in neurobiology, pathology, and/or biological structure and function. A concentration in neurobiology provides training for students preparing for academic or professional careers in neuroscience-related areas. A total of 48 credits (36 credits of coursework and 12 credits of dissertation research) are required for graduation.

Fieldwork and Research Opportunities
Graduate students perform research projects by working with a faculty mentor whose research interests match their own. Doctoral students are expected to publish and present a minimum of two research projects.

The center's faculty are engaged in multidisciplinary research of biological structure and function ranging from ultrastructural to gross anatomical levels, with a major interest in clinically relevant anatomy and neurobiology. Other research interests include cell biology and pathobiology. Facilities are available for autoradiography, electrophysiology, gel electrophoresis, immunoblotting, immunostaining (immunocytochemistry, immunohistochemistry, immunofluorescence), high-performance liquid chromatography, in situ hybridization, microsurgery, stereotaxic neurosurgery, microinjections and animal behavioral assays. The center is also equipped to perform optical imaging, including bright field, phase contrast and fluorescence microscopy.

Careers
Possible careers for graduates with a degree in anatomy include medical doctor, allied health professional and university professor.

Admission Requirements
Applicants are admitted on a competitive basis and must have a B.S. or B.A. degree from an accredited U.S. college or university with a minimum overall GPA of 3.0 and/or science GPA of 2.8. In addition, applicants must have either a minimum combined MCAT score of 495 or a GRE general test score at the 40th percentile.

Application Requirements
+ Application form and fee
+ Transcript(s)
+ Three letters of recommendation
+ GRE Q scores (GRE S optional)
+ Résumé
+ Interview
+ Professional goal statement

Requirements for International Students
+ A completed Declaration of Financial Support packet with all accompanying documents
+ TOEFL or PTE Academic score
+ Check the English Proficiency Policy page for specific TOEFL and PTE score requirements. Students may also visit the international prospects, applicants and students page for more information about international application requirements.

Application Deadlines
Students should apply by March 1 for fall admission.

Scholarships and Financial Aid
For more information, visit the student financial services office online at finaid.slu.edu.

Program Requirements

Required Courses (29 credits)
ANAT 5000 Human Gross Anatomy 8
ANAT 5100 Human Histology and Ultrastructure 5
ANAT 5200 Human Embryology 2
ANAT 5300 Human Systems Neurobiology 5
ANAT 5400 Human Systems Physiology 4
ANAT 5440 Basic Research Techniques in Anatomy 0
BBS 5100 Ethics for Research Scientists 3
BST 5000 Principles of Biostatistics 0
ANAT 6900 Journal Club 10

Elective Courses (5-6 credits)
ANAT 6xxx 0

Dissertation Research (12 credits)
ANAT 6990 Dissertation Research 12

TOTAL CREDITS: 48

Neurobiology Concentration
For a concentration in Neurobiology, students must conduct dissertation research in neurobiology and are required to complete at least 7 hours from the following courses:
ANAT 6300 Advanced Systems Neurobiology
ANAT 6320 Developmental Neurobiology
ANAT 6670 Visual Neuroscience
PPY 5110 Advanced Topics in Pharmacological and Physiological Science 1
PATH 6010 Pathobiology

Non-Course Requirements
Qualifying Examination and Defense
After completing the core curriculum, Basic Research Techniques in Anatomy and Principles of Biostatistics, the student must prepare for and successfully pass the doctoral qualifying examination.

Doctoral Qualifying Examination
The qualifying exam is a written examination that is designed to test the student's fundamental knowledge of human structure and function, critical analysis and thinking, and design of an independent research proposal. An ad hoc exam committee will be constituted by the director of the anatomy graduate program and include five members of the graduate faculty, four of which shall be anatomists. The program director or associate director shall chair the committee. The written test shall occur over a five-day period (excluding weekends). The committee will request the faculty to submit questions on: material covered in any of the coursework completed by the student to date, research papers or reviews that will be provided to the student, and/or philosophical matters related to the history of anatomy and medicine or national or world events that impact medical education and biomedical research. The committee will review the submitted questions and questions will be selected or created by the committee to ensure the questions are fair and appropriate, that they test the student's knowledge base for areas of anatomy (gross anatomy, neuroanatomy, histology and embryology), and that they help evaluate the problem-solving skills of the student. Failing the qualifying exam will result in the student being recommended to being dropped
from the Ph.D. program. In this case, the director of the anatomy graduate program can elect to offer the failed student the option of completing a terminal master's degree.

Once the student has passed the doctoral qualifying examination, the student must register for Dissertation Research. A minimum of 12 credits are required for degree completion and typically occurs over 2-3 academic years. Initially, the student must identify a research project under the guidance of a faculty member. A Ph.D. dissertation committee will then be formed as the student prepares their research proposal.

A three-member Ph.D. dissertation committee, chaired by the student's primary adviser, will be appointed by the director of the anatomy graduate program. The committee must include at least two members of the anatomy graduate faculty. A third member of the committee can be appointed by the graduate program director if they are graduate faculty in other departments or at another university. It is the decision of the anatomy graduate program director to accept the adviser's recommendation and to identify the final member of the committee. Once the proposal has been approved by the Ph.D. dissertation committee it is then submitted to the Office of Graduate Education.

**Doctoral Oral Qualifying Examination**

The oral qualifying exam will be scheduled after the student has submitted a detailed dissertation research proposal, conducted preliminary experiments to substantiate the proposal and the dissertation advisory committee formed. The committee will consist of five members of the graduate faculty and will be approved by program director. The oral exam will be public and designed to test the student's fundamental knowledge of their proposed studies, background for the studies, and critical analysis and thinking.

Prior to the doctoral student's request for consideration for advancement to candidacy, submission of their research proposal, formation of their research committee, initiation of the major components of their proposed doctoral research project, and registration for any research credits, the student must have completed most of their required core or elective coursework and successfully passed their preliminary/written qualifying exam.

**Advancement to Candidacy**

Completion of the dissertation research project entails the following: writing of the thesis, application for advancement to candidacy and the dissertation defense. It shall be the responsibility of the student to initiate their candidacy by filling out a candidacy form through the Office of Graduate Education. The completed form must be returned by the deadline stated in the graduate education calendar of deadlines. Once the completed candidacy form has been processed by the Office of Graduate Education, the thesis committee chair will receive ballots for the oral defense of the thesis. The ballots are distributed to the other committee members by the thesis committee chair when they vote on the oral defense. Once the ballots are completed, signed and sealed, it is the committee chairperson's responsibility to deliver the ballots to the Office of Graduate Education immediately following the defense.

**Dissertation Defense**

The defense of the dissertation provides an opportunity for the student to formally present their findings to their committee, the faculty and students in CASE, and to any family member or anyone from the general public wishing to attend. Two weeks before the dissertation defense, an electronic and print announcement of the date, time, location and title of the defense will be publicized to all members of CASE. A final draft of the student's dissertation must be placed in the anatomy conference room for faculty and students to review at least seven working days prior to the defense. The dissertation defense is two parts. First, the student will make an oral, PowerPoint presentation of no longer than 45 minutes duration where they present their research. Following the presentation, questions from the collective audience will be encouraged. Once all questions have been satisfactorily answered by the student, the audience is excused and the closed, or executive, part of the defense takes place with only the student and their committee present. The dissertation committee can ask detailed questions and expect the student to demonstrate thorough knowledge of their project and related research. Questions on general topics in anatomy, unrelated to their research, may also be asked. Following all questioning, the student is excused from the room and the committee members, without discussion, complete the defense ballot.

**Continuation Standards**

Students must maintain a cumulative GPA of 3.00 in all required graduate/professional courses.
BIOMEDICAL SCIENCE

LEADERSHIP
Thomas P. Burris, Ph.D.
Pharmacology and Physiological Science Chairperson

Enrico Di Cera, M.D.
Biochemistry and Molecular Biology Chairperson

Willis K. Samson, Ph.D.,
Biomedical Science Graduate Program Director

Carole Vogler, M.D.,
Pathology Chairperson

William S. M. Wold, Ph.D.
Molecular Microbiology & Immunology Chairperson

OVERVIEW
In addition to contributing strongly to the first two years of the Doctor of Medicine degree curriculum, the pre-clinical, medical-science departments offer post-baccalaureate work leading to the Ph.D. degree. Five offerings, each affiliated with an individual department or center, are available; however, most students admitted for direct Ph.D.-degree study take a common, first-year core in the basic biomedical sciences. Furthermore, studies toward the Ph.D. degree in a medical-science field may be combined with the M.D.-degree curriculum, and the two degrees pursued concurrently by selected students. M.S. (Research or non-Research) and Ph.D. degrees are offered by the Center for Anatomical Science and Education. M.A. (Research or non-Research and Ph.D. degrees are offered by the Medical Family Therapy Program.

Approximately 70 faculty members in the programs of biochemistry and molecular biology, molecular microbiology and immunology, pharmacological and physiological sciences, pathology and the Institute for Molecular Virology provide an almost unlimited variety of research project choices for students. In recognition that successful graduates need a broad background in biomedical science and flexible skills, the first year also includes interdisciplinary lecture courses, small-group discussions and participation in a colloquium series where contemporary developments in the biomedical sciences are presented and discussed. Informed by their experiences in this first year, students then select a Ph.D. mentor in a specific program, such as biochemistry and molecular biology, and continue with their Ph.D. training in that specific program.

Admission to all Ph.D. degree programs in the biomedical sciences is by application to the Core Program in Basic Biomedical Science. This interdisciplinary offering is intended for all students who are interested in biomedical research and/or teaching careers. Its objectives are to provide students with a strong foundation in all aspects of basic biomedical science and the freedom to explore diverse research opportunities during the first year of training. The first-year curriculum combines lectures, small group discussion sessions, and seminars to develop self-confidence and familiarity with a breadth of biomedical science and technology that spans the disciplines of anatomical, biochemical, cellular, molecular, developmental, genetic, and physiological sciences. At the end of this integrated first-year program, students select a dissertation research topic and mentor, and enter into one of four departmental programs in the School of Medicine [Biochemistry and Molecular Biology; Molecular Microbiology and Immunology; Pathology; Pharmacology and Physiology]. The subsequent requirements for completion of the Ph.D. degree vary with the individual program and include specialized advanced courses and the performance of original research leading to completion of the dissertation.

Faculty
Yuna Ayala, Ph.D.
Ángel Baldán, Ph.D.
Yie-Hwa Chang, Ph.D.
Yoonsang Cho, Ph.D.
Garmine Cosola, Ph.D.
Enrico Di Cera, M.D.
Dale Dorsett, Ph.D.
Joel Eissenberg, Ph.D.
David A. Ford, Ph.D.
Susana Gonzalez, Ph.D.
Tomasz Heyduk, Ph.D.
Jung San Huang, Ph.D.
Claudette Klein, Ph.D.
Sergey Korolev, Ph.D.
Alireza Rezaie, Ph.D.
James Shoemaker, M.D., Ph.D.
Dorota Skowyra, Ph.D.
William S. Sly, M.D.
Alessandro Vindigni, Ph.D.
Mee-Ngan Yap, Ph.D.

DOCTOR OF PHILOSOPHY IN BIOCHEMISTRY AND MOLECULAR BIOLOGY

Program Highlights
The department of biochemistry and molecular biology is a member of the graduate program in biomedical sciences at Saint Louis University's School of Medicine. Each year, 10-15 highly qualified candidates with bachelor's degrees are accepted into this multidisciplinary Ph.D. program. To assist students in deciding which area of biomedical research is right for them, the program provides students with opportunities for exploring research in as many as five diverse disciplines during the first year of graduate training.

Curriculum Overview
Courses during the first year of study focus on the basic biochemical, molecular, cellular and organismal
aspects of the biomedical sciences. This prepares students for more intensive, individualized instruction in biochemistry and molecular biology.

**Careers**
The program prepares students to be technically skilled and thoughtful scientists who can seek diverse careers in industry, government or as university professors.

**Admission Requirements**
Students should possess an above-average GPA, sufficient GRE scores and sufficient TOEFL scores (for international students).

Equivalent of an undergraduate major in chemistry, biology or a related subject

**Application Requirements**
+ Application form and fee
+ Transcript(s)
+ Three letters of recommendation
+ GRE G scores (GRE S optional)
+ Résumé
+ Interview
+ Professional goal statement

**Requirements for International Students**
+ A completed Declaration of Financial Support packet with all accompanying documents
+ TOEFL or PTE Academic score
+ Check the English Proficiency Policy page for specific TOEFL and PTE score requirements.
 Students may also visit the international prospects, applicants and students page for more information about international application requirements.

**Assistantship Application Deadline**
Students who want to be considered for an assistantship must submit the application by Feb. 1.

**Review Process**
Screening of applicants begins the December preceding the academic year of enrollment. During the months of February, March and April, highly qualified candidates are invited to come to St. Louis for interviews and to acquaint themselves with the area, the University and the graduate program in biomedical sciences.

Offers of admission into the program are generally made shortly after the interviews are complete. Acceptance of the offer of admission into the program by the applicant is expected no later than April 15. Late applications are considered on a space-available basis.

**Scholarships and Financial Aid**
For more information, visit the student financial services office online at finaid.slu.edu.

**Program Requirements**

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**Basic Biomedical Science Courses (29 credits)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBS 5010</td>
<td>Basic Biomedical Science I</td>
<td>5</td>
</tr>
<tr>
<td>BBS 5020</td>
<td>Special Topics in Basic Biomedical Science I</td>
<td>4</td>
</tr>
<tr>
<td>BBS 5030</td>
<td>Basic Biomedical Science II</td>
<td>5</td>
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<tr>
<td>BBS 5040</td>
<td>Special Topics in Basic Biomedical Science II</td>
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</tr>
<tr>
<td>BBS 5100</td>
<td>Responsible Conduct in Research</td>
<td>0</td>
</tr>
<tr>
<td>BBS 5920</td>
<td>Basic Biomedical Science Colloquium</td>
<td>2</td>
</tr>
<tr>
<td>BBS 5930</td>
<td>Introduction to Basic Biomedical Research</td>
<td>4</td>
</tr>
<tr>
<td>BCHM 6280</td>
<td>Intro to Genomics and Bioinformatics</td>
<td>2</td>
</tr>
<tr>
<td>ORES 5200</td>
<td>Introduction to Biostatistics in Biomedical Sciences</td>
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</tbody>
</table>

**Biochemistry and Molecular Biology Courses (11)**

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCHM 6230</td>
<td>Macromolecules: Structure, Function, and Interactions</td>
<td>3</td>
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<tr>
<td>BCHM 6240</td>
<td>Molecular Basis of Human Disease</td>
<td>3</td>
</tr>
<tr>
<td>BCHM 6250</td>
<td>Preparation and Evaluation of Scientific Research Proposal</td>
<td>3</td>
</tr>
<tr>
<td>BCHM 6920</td>
<td>Biochemistry and Molecular Biology Colloquium</td>
<td>1</td>
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</tbody>
</table>

**Dissertation Research (12 credits)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCHM 6990</td>
<td>Dissertation Research</td>
<td>12</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS: 52**

Additional coursework in chemistry or biology may be required at the discretion of the Department Chairperson or Graduate Program Director. Program may include courses in one of the fields of preclinical medicine as electives.

**Non-Course Requirements**
All students are expected to participate in the Biochemistry and Molecular Biology Journal Club throughout the program.

**Continuation Standards**
Students must maintain a cumulative GPA of 3.00 in all required graduate/professional courses.

**Doctor of Philosophy in Molecular Microbiology & Immunology**

**Program Highlights**
The department of molecular microbiology and immunology (MMI) offers a graduate program in molecular and cellular virology and immunology leading to a Ph.D. degree. The goal of the program is to graduate exceptionally well-trained researchers who are prepared for a career in academic science or biotechnology. Research in the MMI doctoral program is diversified. Areas of research emphasis include cell and molecular biology, virology and immunology.

The state-of-the-art research laboratories are located in the Dolsie Research Center and basic science departments in the Saint Louis University School of Medicine.

The primary and secondary faculty in molecular microbiology and immunology department have strong independent research programs funded by the government, research foundations and industry. The faculty serve on national peer-review panels and journal editorial boards and often are invited to
present research at other institutions. Their research is published in highly visible scientific journals.

**Curriculum Overview**

Graduate instruction in the MMI program includes:

- Advanced coursework
- Training in scientific writing and oral presentation skills
- Training in teaching skills for students interested in an academic career
- Performance of original biomedical research leading to scholarly publications and the Ph.D. dissertation

Each Ph.D. candidate will have at least one primary mentor within the department with whom he or she will conduct dissertation research.

Students with a bachelor's degree may enroll in the doctoral program following completion of a year-long basic biomedical sciences core program. This one-year program provides a strong foundation for subsequent specialization in microbiology and/or immunology and allows students to rotate through various laboratories in the Medical Center before choosing a specific field of study.

**Careers**

Graduates with a degree in molecular microbiology and immunology are prepared for diverse careers in industry, government or academia.

**Admission Requirements**

A Bachelor of Science, Bachelor of Arts, Master of Science, Master of Arts or doctoral degree is required, including coursework in the biological sciences, organic chemistry and mathematics.

**Application Requirements**

- Application form and fee
- Transcript(s)
- Three letters of recommendation
- GRE scores
- Curriculum vitae
- Interview
- Professional goal statement

**Requirements for International Students**

- A completed Declaration of Financial Support packet with all accompanying documents
- TOEFL or PTE Academic score
- Check the English Proficiency Policy page for specific TOEFL and PTE score requirements.

Students may also visit the international prospects, applicants and students page for more information about international application requirements.

**Application Deadline**

Students should apply by Feb. 1.

**Review Process**

A committee examines and reviews the applicant and application wholly.

**Scholarships and Financial Aid**

For more information, visit the student financial services office online at finaid.slu.edu.

**Program Requirements**

**Basic Biomedical Science Courses (29 credits)**

- BBS 5010 Basic Biomedical Science I 6
- BBS 5020 Special Topics in Basic Biomedical Science I 4
- BBS 5030 Basic Biomedical Science II 5
- BBS 5040 Special Topics in Basic Biomedical Science II 4
- BBS 5100 Responsible Conduct in Research 0
- BBS 5920 Basic Biomedical Science Colloquium 2
- BBS 5970 Introduction to Basic Biomedical Research 4
- BCHM 6280 Intro to Genomics and Bioinformatics 2
- ORES 5200 Introduction to Biostatistics in Biomedical Sciences 3

**Biochemistry and Molecular Biology Courses (10)**

- MB 6350 Virology 3
- MB 6650 Basic Immunobiology 3
- MB 6900 Microbiology Journal Club 2
- MB 6920 Microbiology Colloquium 2

**Dissertation Research (12 credits)**

MB 6990 Dissertation Research 12

**TOTAL CREDITS: 51**

**Non-Course Requirements**

Students are required to submit a grant proposal to an outside agency for extramural research and/or stipend support within six months of successfully passing the Candidacy Examination. Funding of the external grant application is not required for successful completion of the Ph.D. degree. Students must also publish at least 1 peer-reviewed scholarly article reporting results of original research.

**Continuation Standards**

Students must maintain a cumulative GPA of 3.00 in all required graduate/professional courses.

**Doctor of Philosophy in Pathology**

**Program Highlights**

The Department of Pathology actively integrates research into the mechanisms of diseases at the genetic, molecular, and cellular levels with clinical activities. While ensuring an increasing understanding of human diseases, this provides the foundation for further developments in diagnosis and therapy. To support these fundamental activities, the faculty provide extensive research and training opportunities to graduate students and medical trainees.

**Curriculum Overview**

All students interested in the Ph.D. program in pathology must enroll through the core graduate program in biomedical sciences. This one-year program provides a strong basic foundation in biomedical sciences and allows students to rotate
through four formal laboratory rotations in the Medical Center before choosing a specific field of study.

After the first year, students will choose a mentor and specify a department from one of five, distinct Ph.D. programs for further work toward a Ph.D. degree. The Ph.D. degree requires 36 credits of coursework and 12 credits toward the successful completion and defense of an original research dissertation.

Courses required for a Ph.D. degree in pathology include the core basic biomedical sciences coursework, which covers topics in biochemistry, molecular and cellular biology, pathology, genetics, pharmacology, microbiology, immunology and neurobiology. Students will also take courses in pathobiology; and research colloquia. Coursework includes lectures, small group problem-solving sessions, student presentations and hands-on experience. Additional elective courses, which may be taken from other departments or from other universities in the area, are selected in collaboration with a departmental adviser.

Starting in the second year, students present their research progress yearly at Topics in Pathology, the departmental research colloquium. A written preliminary and oral examination is taken at the end of the second year, which focuses primarily on the proposed area of thesis research.

Fieldwork and Research Opportunities
Pathology graduate students have opportunities and exposure to technical skills and research expertise through research collaborations. The pathology faculty maintain with colleagues in the academic and industrial community. As both a basic science and clinical department, the pathology faculty have diverse interests and expertise, from the bench to the bedside. The department stresses close interactions among students, their mentors and the graduate steering committee to foster intellectual and scientific growth.

Careers
Graduates of the pathology program are technically skilled and thoughtful scientists prepared for successful research careers in academics, industry, medicine or government.

Admission Requirements
An undergraduate degree in biology, chemistry or a related subject; advanced biology coursework is recommended.

Application Requirements
+ Application form and fee
+ Transcript(s)
+ Three letters of recommendation
+ GRE G score (GRE S score optional)
+ Résumé
+ Interview
+ Professional goal statement

Requirements for International Students
+ A completed Declaration of Financial Support package with all accompanying documents
+ TOEFL or PTE Academic score
+ Check the English Proficiency Policy page for specific TOEFL and PTE score requirements. Students may also visit the international prospects, applicants and students page for more information about international application requirements.

Assistantship Application Deadline
Students who want to be considered for an assistantship must submit the application by Feb. 1.

Review Process
A committee examines and reviews the applicant and application wholly.

Scholarships and Financial Aid
For more information, visit the student financial services office online at finaid.slu.edu.

Program Requirements

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<tr>
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<tbody>
<tr>
<td>PATH 5010 Pathobiology</td>
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<tr>
<td>PATH 5360 Introduction to Microscopy Techniques</td>
</tr>
<tr>
<td>PATH 6800 Molecular Pathobiology Journal Club</td>
</tr>
<tr>
<td>PATH 6920 Pathology Research Colloquium</td>
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<tr>
<td>MB 6990 Dissertation Research</td>
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</tbody>
</table>

**TOTAL CREDITS: 51**

Students are required to submit a grant proposal to an outside agency for extramural research and/or stipend support within six months of successfully passing the Candidacy Examination. Funding of the external grant application is not required for successful completion of the Ph.D. degree. Students must also publish at least 1 peer-reviewed scholarly article reporting results of their original research.

Continuation Standards
Students must maintain a cumulative GPA of 3.00 in all required graduate/professional courses.

**DOCTOR OF PHILOSOPHY IN PHARMACOLOGY AND PHYSIOLOGICAL SCIENCE**

Program Highlights
The program in the Department of Pharmacological and Physiological Science is designed to prepare students for a career in research and teaching in this area of biomedical science. The program combines formal coursework, advanced seminars, lab rotations and in-depth training in one of the laboratories of the Faculty. The Faculty available as mentors have diversified backgrounds in the fields of biochemistry, molecular biology, nuclear receptors, neuroscience, pharmacology and physiology. Major areas for research specialization include neurotransmitter biochemistry, physiology and pharmacology; molecular biochemistry and molecular pharmacology of neurotransmitter, autacoid, neurohormone and hormone receptors and their signaling mechanisms; electrophysiology; neurochemistry; cardiovascular control mechanisms; molecular cellular and endocrine control mechanisms, neuropharmacology, and pharmacology of drugs of abuse.

The comprehensive program in pharmacological and physiological science is designed to help students develop laboratory research competence, including proficiency in quantitative methods of biology, physiology and pharmacology.

All classes have morning schedules, leaving the afternoons and evenings free for research. Coursework is followed by a preliminary examination that takes the form of the specific aims and research strategies sections of an NIH R01 application. Students will then complete two to three years of graduate work devoted almost exclusively to research related to the dissertation project. Successful completion of a written thesis, and public and private oral defenses are required for graduation. The program is completed in five years, on average.

Entering the Program

Students in good academic standing enter the graduate program in pharmacological and physiological science after completing one year in the core basic biomedical sciences program. In exceptional cases, students are directly admitted without completing the core curriculum. These students typically possess an advanced degree (i.e. Master of Science) and often have workplace experience. In August of each year, newly admitted students start a year of didactic training (20 credits) weighted towards advanced topics in pharmacology and physiology.

Curriculum Overview

Students pursuing graduate studies in pharmacological and physiological science will have a unique opportunity to teach during training. The undergraduate course called "Drugs We Use and Abuse" is administered and taught entirely by graduate students to about 75 undergraduate students.

The course consists of 35 lectures per year, plus discussion sessions. Typically, each graduate student the program is responsible for three or four lectures on a variety of subjects. These student-teachers may apply for evaluation by the Reinert Center for Transformative Teaching and Learning to receive an independent review of their performance and advice on how to improve their teaching skills.

Fieldwork and Research Opportunities

Research training is offered with particular emphasis on cellular communication and disease exerted through the endocrine, cardiovascular and nervous systems as well as developmental biology. The broad objectives of the research programs are to:

- Investigate the mechanisms and action of receptors and intracellular signal transduction systems at the cellular and molecular level.
- Understand how various drugs perturb these systems at both the level of the cell and the level of the whole animal.
- Discover and develop new chemical probes to investigate biological systems.
- Gain a better understanding of the pathophysiological mechanisms involved in disrupting cellular communications.
- Strict attention is given to the integration of advances made with simplified systems (genes, enzyme or receptor) into more complex systems (cell, organ and organism). This approach affords the development of an appreciation of drug action from an effect on a gene, receptor or enzyme to the therapeutic use of a drug to treat human disease.

Careers

Graduates of the program are technically skilled and thoughtful scientists prepared for successful research careers in academics, industry, medicine or government.

Admission Requirements

Successful applicants possess an above-average GPA, sufficient GRE scores and sufficient TOEFL score (for international students).

Application Requirements

+ Application form and fee
+ Transcript(s)
+ Three letters of recommendation
+ GRE G scores (GRE S optional)
+ Résumé
+ Interview
+ Professional goal statement

Requirements for International Students

+ A completed Declaration of Financial Support packet with all accompanying documents
+ TOEFL or PTE Academic score
+ Check the English Proficiency Policy page for specific TOEFL and PTE score requirements.
Students may also visit the international prospects, applicants and students page for more information about international application requirements.

**Application Deadline**
Students must submit the application by Feb. 1.

**Review Process**
A committee examines and reviews the applicant and application wholly.

**Scholarships and Financial Aid**
For more information, visit the student financial services office online at finaid.slu.edu.

**Program Requirements**

**Basic Biomedical Science Courses (29 credits)**
- BBS 5010 Basic Biomedical Science I 5
- BBS 5020 Special Topics in Basic Biomedical Science I 4
- BBS 5030 Basic Biomedical Science II 5
- BBS 5040 Special Topics in Basic Biomedical Science II 4
- BBS 5100 Responsible Conduct in Research 0
- BCHM 6280 Intro to Genomics and Bioinformatics 2
- ORES 5200 Introduction to Biostatistics in Biomedical Sciences 3

**Biochemistry and Molecular Biology Courses (7)**
- PPY 5110 Introduction to Pharmacology 1
- PPY 5120 Systems Physiology and Pharmacology I 2
- PPY 5130 Systems Physiology and Pharmacology II 3
- PPY 5140 Fundamentals of Effective Grant Construction 1

**Dissertation Research (12 credits)**
- MB 6990 Dissertation Research 12

**TOTAL CREDITS: 48**

**Non-Course Requirements**
Competency in statistics; knowledge of ethical conduct of research and rotation through research laboratories during the first year.

Credits in preparation for preliminary examinations total 36 minimum if degree pursued directly from the baccalaureate.

**Continuation Standards**
Students must maintain a cumulative GPA of 3.00 in all required graduate/professional courses.

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**DOCTOR OF PHILOSOPHY & DOCTOR OF MEDICINE DUAL DEGREE**

**Admission Requirements**
Students must meet the admission requirements and be admitted into both degree programs according to the processes of each of the participating academic units in order to pursue a dual degree program. Individuals may apply to the Ph.D. degree program concurrently with application to medical school or following admission to the School of Medicine; however, admission to the dual degree program is contingent upon admission to both the Ph.D. and the M.D. degree programs.

**Program Requirements**
The biochemistry and molecular biology department also offers an M.D./Ph.D. program. Application is competitive, and a limited number of positions are available. The program offers financial support in the form of full tuition remission for both the M.D. and the Ph.D. Trainees typically complete the first two years of medical school before undertaking the Ph.D. portion. After completion of the Ph.D. dissertation, trainees return to complete the final years of medical school.

**Continuation Standards**
Students must maintain a cumulative GPA of 3.00 in all required graduate/professional courses.
MEDICINE

LEADERSHIP

Kevin Behrns, M.D.
Dean of the School of Medicine

Robert M. Heaney, M.D.
Senior Associate Dean for Clinical Affairs

Joel C. Eissenberg, Ph.D.
Associate Dean for Research

Julie K. Gammack, M.D.
Associate Dean

Paul J. Hauptman, M.D.
Assistant Dean

Chad S. Miller, M.D., FACP, FHM
Associate Dean

Michael T. Railey, M.D.
Associate Dean

Gregory S. Smith, Ph.D.
Assistant Dean

L. James Willmore, M.D.
Associate Dean

Gary Whitworth
Associate Dean

OVERVIEW

Saint Louis University's medical education is built around the academic and personal success of students with the goal is that every student will achieve:

+ Excellent performance on the U.S. Medical Licensing Examination (USMLE)
+ Success in matching into competitive residency programs across the country
+ Personal health and well-being
+ A passion for a medical specialty or related area

The School of Medicine has an excellent track record in each of the above areas. Students consistently perform above the national average on the USMLE Step 1 examination. Clinical training provides outstanding preparation for residency, and our students match each year at some of the strongest, most competitive programs in the country. Just as importantly, graduates from the School of Medicine are concerned for the sanctity of human life, have a commitment to dignity and respect in the provision of medical care to all patients and a devotion to social justice, especially regarding inequities in the availability of health care.

DOCTOR OF MEDICINE

Program Highlights

Medical school can be a stressful and dispiriting experience, but it doesn’t have to be. At Saint Louis University, we’ve made a number of changes to the curriculum that are consistent with the Jesuit tradition of educating the whole person — mind, body, heart and spirit — including:

Changing from a tiered grading system to pass/fail grading in the first two years.

Instituting longitudinal electives that span the first two years. On average, one full day every two weeks is set aside for electives.

Developing learning communities in service and advocacy, research, global health, wellness, and medical education.

Instituting a required resilience and mindfulness curriculum for first-year students.

Expanding extracurricular events to promote wellness. These curricular changes have resulted in substantially improved mental health of our students.

Curriculum Overview

Saint Louis University's medical school faculty teach both the science and the art of medicine. Every aspect of the curriculum encourages independent inquiry while introducing students to an array of skills necessary for a lifetime of critical evaluation and learning.

Throughout the four years, students will explore the basic and clinical sciences through small group activities, computer-based instruction, and case-based tutorials. The Clinical Skills Center lets students interact with trained standardized patients and practice selected clinical procedures on simulated models and mannequins before participating in the care of actual patients.

During third- and fourth-year clinical rotations, students will continue to develop diagnostic and treatment competencies in a variety of supervised inpatient and outpatient settings.

Careers

The School of Medicine graduates are well-prepared to practice medicine in a variety of settings. According to the Bureau of Labor, the median annual salary for physicians and surgeons in 2015 was $187,200.

Admission Requirements

Specific academic requirements include a minimum of 90 semester hours (135 quarter hours) in undergraduate arts and sciences courses. Virtually all accepted applicants complete a baccalaureate degree of at least 120 semester hours (180 quarter hours) from an accredited college or university. In all cases, the committee on admissions is more concerned with the quality of the applicant's education than with the number of hours or years of pre-medical training. Students who have received their education at a foreign school must complete at least one academic year of science course work in an accredited North University.
American college or university prior to making application.

Course requirements include (credit hours in parentheses):
+ General Biology or Zoology (8)*
+ Inorganic Chemistry (8)*
+ Organic Chemistry (8)*
+ Physics (8)*
+ English (6)
+ Other Humanities and Behavioral Sciences (12)
* A laboratory course is required in these sciences.

Apart from academic characteristics, the School of Medicine recognizes a responsibility to consider applicants as individuals, particularly in the evaluation of the breadth of their educational experience, their personality traits, maturity level, and appropriate motivation and commitment to a career in medicine.

Transfer Students
Saint Louis University School of Medicine accepts applications for transfer with advanced standing into the third year only from students currently enrolled and in good standing in allopathic medical schools located in the United States and accredited by the LCME. Applications from students enrolled in foreign medical schools will not be accepted.

The School of Medicine does not reserve any places for transfer students, and the number of places that become available through attrition is normally small. Preference will be given to applicants faced with extreme personal hardship necessitating transfer to the St. Louis area and to applicants whose spouses must relocate in this area.

The deadline for application with advanced standing is April 15. Applications must be supported by a letter from the student's present dean.

Personal interviews are required for all candidates. Applicants must perform well on Step 1 of the U.S. Medical Licensing Examination (USMLE). Applications from students who have failed coursework or have been terminated for any reason at another medical school will not be considered.

To be considered for admission at the Saint Louis University School of Medicine an application must include the following:

Application Requirements
Saint Louis University is one of many medical schools participating in the American Medical College Application Service (AMCAS), and students will complete an application there. The application will become available in the spring. The deadline for submission of materials to AMCAS is Dec. 15.

MCAT
All applicants to the Saint Louis University School of Medicine must take the Medical College Admission Test (MCAT) and submit the results of this test to the committee on admissions. The test must be completed by September 2018. The committee does not consider MCAT scores prior to 2013.

Application Fee
A service fee of $100 is charged to all applicants. An American Medical College Application Service (AMCAS) fee waiver may be available.

Photograph
A passport-size photograph is required. This .jpg photo will be uploaded into the application system.

Letters of Recommendation
If your school has a pre-medical advisory committee, a letter from the committee is sufficient. If your school does not have a committee, please request letters of evaluation from three of your college or university teachers. Be sure at least one of these individuals teaches science. Remember, an insightful and in-depth evaluation by someone who knows you in greater value than just a recapitulation of your academic work. Letters from others who know you, in addition to the basic recommendations, are welcome as well. It is the students responsibility to ensure that all necessary documents reach the committee on admissions. Please remember that your application is not complete until all letters of recommendation have been received.

Interview
Applicants are carefully selected for an interview with a member of the committee. The interview itinerary includes a luncheon with students and faculty, financial aid information and a tour of the School of Medicine.

Requirements for International Students
+ A completed Declaration of Financial Support packet with all accompanying documents
+ TOEFL or PTE Academic score
+ Check the English Proficiency Policy page for specific TOEFL and PTE score requirements.

Students may also visit the international prospects, applicants and students page for more information about international application requirements.

Application Deadlines
All required materials required for the committee on admissions should be submitted as early as possible.
+ AMCAS deadline for submission: Dec. 15, 2017
+ Saint Louis University Supplemental Application deadline: Jan. 15, 2018
+ Decision deadline for applicants holding multiple acceptances: April 30, 2018

Review Process
Communications of admission decisions will be sent via email. Every effort is made to be sure each applicant receives notification by April 30, 2018, whether that decision is accepted, not accepted or placement on the alternate list.
Correspondence
Saint Louis University encourages good communication. Please include your name as appears on your application and your AMCAS ID number in your correspondence. We encourage use of email, mail and fax.

Saint Louis University School of Medicine
Office of Admissions
1402 S. Grand Blvd.
St. Louis, MO 63104
Phone: 314-977-9870
Fax: 314-977-9825
Email: slumd@slu.edu

Scholarships and Financial Aid
For more information, visit the student financial services office online at finaid.slu.edu.

Accreditation
The Saint Louis University School of Medicine is fully accredited by the Liaison Committee on Medical Education (LCME), the accrediting body for medical education in the United States.

Program Requirements

**Year One (39 weeks)**

<table>
<thead>
<tr>
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<th>Title</th>
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<tr>
<td>A0100</td>
<td></td>
<td>Introduction to Clinical Anatomy</td>
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<td>M0101</td>
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<td>Clinical Interviewing</td>
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<td>APCS</td>
<td>0201</td>
<td>Applied Clinical Skills 2</td>
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<tr>
<td>BD</td>
<td>0201</td>
<td>Bedside Diagnosis</td>
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<tr>
<td>BMH</td>
<td>0200</td>
<td>Behavioral Medicine and Health</td>
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<tr>
<td>CMB</td>
<td>0100</td>
<td>Cell and Molecular Biology</td>
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<td>EPI</td>
<td>0100</td>
<td>Epidemiology and Biostatistics</td>
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<td>HCE</td>
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<td>MHR</td>
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<td>Microbes and Host Responses</td>
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<td>MIM</td>
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<td>Introduction to Medical Information Management</td>
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<td>NSCI</td>
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<td>Basic Clinical Neuroscience</td>
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<td>Introduction to Pathology</td>
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<tr>
<td>PHAR</td>
<td>0100</td>
<td>Principles of Pharmacology</td>
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**Year Two (37 weeks)**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>MED</td>
<td>0202</td>
<td>Clinical Diagnosis</td>
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<td>CARD</td>
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<td>Cardiovascular System</td>
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<td>Death and Dying</td>
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<tr>
<td>ENDR</td>
<td>0200</td>
<td>Endocrine and Reproductive System Module</td>
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<td>Renal-Urinary System Module</td>
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<td>RESP</td>
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<td>Respiratory System Module</td>
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<tr>
<td>SBJ</td>
<td>0200</td>
<td>Skin, Bone, and Joint Module</td>
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Special Study for Step #1 Exam

**Year Three (48 weeks)**

<table>
<thead>
<tr>
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<td>FCM</td>
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<tr>
<td>IM</td>
<td>0301</td>
<td>Internal Medicine</td>
</tr>
<tr>
<td>N</td>
<td>0301</td>
<td>Neurology</td>
</tr>
<tr>
<td>OB</td>
<td>0301</td>
<td>Obstetrics, Gynecology, and Women's Health</td>
</tr>
<tr>
<td>PED</td>
<td>0301</td>
<td>Pediatrics</td>
</tr>
<tr>
<td>PS</td>
<td>0301</td>
<td>Psychiatry</td>
</tr>
<tr>
<td>S</td>
<td>0301</td>
<td>Surgery</td>
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<td>Career Exploration</td>
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<tr>
<td>APCS</td>
<td>0300</td>
<td>Applied Clinical Skills</td>
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<td>FCM</td>
<td>0430</td>
<td>Interprofessional Health Education</td>
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<td>MD</td>
<td>0302</td>
<td>Compassion and Caring</td>
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**Year Two (44 weeks)**

<table>
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<tr>
<td>Ambulatory Internal Medicine</td>
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<tr>
<td>Emergency Medicine</td>
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<tr>
<td>Intramural/Extramural Electives</td>
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</table>
MEDICAL FAMILY THERAPY

LEADERSHIP
F. David Schneider, M.D.
Department Chairperson
Craig W. Smith, Ph.D.,
Director

OVERVIEW
The Medical Family Therapy Program in the Department of Family and Community Medicine is unique in training students to work with individuals, couples, and families through the life cycle, and to collaborate in other social contexts in which people live, learn, and work. In addition to working within traditional mental health settings, the program prepares professionals to work collaboratively with medical professionals in enhancing the psychological, social, emotional and physical well-being of those they serve. Doctoral and Master's degree students are trained within primary and specialty care medical settings within an integrative care model. Also, they receive training at the Center for Counseling and Family Therapy. The Center provides mental health services to the university and St. Louis communities on a sliding-scale fee basis.

The field of medical family therapy developed out of the intersection between marriage and family therapy and family medicine to help bridge the gap in care between both fields. Medical family therapists often seek a license to practice in marriage and family therapy offered by state licensing boards and is one of the five major mental health professions recognized by the U.S. federal government.

Medical family therapists are educated and trained as mental health professionals to assess, diagnose and treat individuals, families and couples including:
+ Mental disorders
+ Substance abuse
+ Coping with chronic illness
+ Family and couple conflict
+ Interpersonal and domestic violence
+ Trauma and adverse events
+ Grief and loss

Faculty
Craig W. Smith, Ph.D.
Katie Heiden-Rootes, Ph.D.
Dixie Meyer, Ph.D.
Nancy C. Morrison, Ph.D. (Emeritus)
Douglas Pettinelli, Ph.D.
Max Zubatsky, Ph.D.

MASTER OF ARTS IN FAMILY THERAPY

Program Highlights
The Master of Arts in family therapy is based on a systemic/relational view of individuals, couples and families. It fulfills the course and practicum requirements toward licensure in Missouri as a licensed marital and family therapist. A concentration in medical family therapy is also available.

Curriculum Overview
The program requires a minimum of 60 credit hours beyond a bachelor's degree. Prerequisites include 18 credit hours in the behavioral sciences. Program requirements include didactic courses, two semesters of practicum, three semesters of internship in a community setting and a minimum of 500 hours of direct clinical contact. The concentration in medical family therapy prepares students to function as part of an integrated care team in addressing the biopsychosocial needs of individuals and families.

The concentration in Medical Family Therapy prepares students to function as part of an integrated care team in addressing the biopsychosocial needs of individuals and families.

Fieldwork and Research Opportunities
Graduate students perform research projects by working with a faculty mentor whose research interests match their own. Doctoral students are expected to publish and present a minimum of two research projects.

The center's faculty are engaged in multidisciplinary research of biological structure and function ranging from ultrastructural to gross anatomical levels, with a major interest in clinically relevant anatomy and neurobiology. Other research interests include cell biology and pathobiology. Facilities are available for autoradiography, electrophysiology, gel electrophoresis, immunoblotting, immunostaining (immunocytochemistry, immunohistochemistry, immunofluorescence), high-performance liquid chromatography, in situ hybridization, microsurgery, stereotaxic neurosurgery, microinjections and animal behavioral assays. The center is also equipped to perform optical imaging, including bright field, phase contrast and fluorescence microscopy.

Careers
Possible careers in medical family therapy include:
+ Academic positions
+ Research positions
+ Clinical positions in medical and mental health centers
+ Private practice and consulting

Admission Requirements
A minimum of 18 credit hours of undergraduate coursework in the social sciences.

Application Requirements
+ Online application and fee
+ Transcript(s)
+ Three letters of recommendation
+ GRE scores
+ Résumé
+ Interview
+ Professional goal statement

Requirements for International Students
+ A completed Declaration of Financial Support packet with all accompanying documents
+ TOEFL or PTE Academic score
+ Check the English Proficiency Policy page for specific TOEFL and PTE score requirements.
Students may also visit the international prospects, applicants and students page for more information about international application requirements.

Application Deadline
Students should apply by Jan. 15. After applications are received, students may be invited to campus for group and individual interviews with program faculty. Interviews for the 2018-19 school year will be held Feb. 15 and Feb. 16, 2018.

Scholarships and Financial Aid
For more information, visit the student financial services office online at finaid.slu.edu.

Accreditation
Both the M.A. and Ph.D. majors in the Medical Family Therapy Program at Saint Louis University are accredited by the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE) of the American Association for Marriage and Family Therapy (AAMFT), 112 S. Alfred Street, Alexandria, VA 22314, 703.838.8808.

Program Requirements
Required Courses (24 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MFT 6210</td>
<td>Introduction to Family Therapy</td>
<td>3</td>
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<tr>
<td>MFT 6320</td>
<td>Group Counseling Theory and Practice</td>
<td>3</td>
</tr>
<tr>
<td>MFT 6360</td>
<td>Theory and Intervention in Human Sexuality</td>
<td>3</td>
</tr>
<tr>
<td>MFT 6410</td>
<td>Practicum in Family Therapy</td>
<td>6</td>
</tr>
<tr>
<td>MFT 6915</td>
<td>Internship in Family Therapy</td>
<td>9</td>
</tr>
<tr>
<td>MFT 6700</td>
<td>Human Growth and Development</td>
<td>3</td>
</tr>
<tr>
<td>MFT 6770</td>
<td>Foundations of Multicultural Counseling</td>
<td>3</td>
</tr>
<tr>
<td>MFT 6850</td>
<td>Ethical and Legal Issues in Family Therapy</td>
<td>3</td>
</tr>
<tr>
<td>MFT 6850</td>
<td>Diagnosis and Assessment in Family Therapy</td>
<td>3</td>
</tr>
<tr>
<td>MFT 6880</td>
<td>Foundations of Couple and Family Therapy</td>
<td>3</td>
</tr>
<tr>
<td>MFT 6880</td>
<td>Advanced Couple and Family Therapy</td>
<td>3</td>
</tr>
<tr>
<td>MFT 6880</td>
<td>Introduction to Family Studies</td>
<td>3</td>
</tr>
<tr>
<td>MFT 8700</td>
<td>Couple Interaction and Therapy</td>
<td>3</td>
</tr>
<tr>
<td>MFT 8710</td>
<td>Integrative and Evidence Based Models in Couple and Family Therapy</td>
<td>3</td>
</tr>
<tr>
<td>MFT 8760</td>
<td>Families, Health, and Illness</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>A post-baccalaureate level statistics course</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>A post-baccalaureate level research methods course</td>
<td>3</td>
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</tbody>
</table>

TOTAL CREDITS: 60

Medical Family Therapy Concentration
The M.A. concentration in medical family therapy prepares students to address the emotional and physical needs of individuals and families as part of an integrated care team. A portion of the internship is completed in a primary or specialty care setting working collaboratively with physicians and allied health professionals in delivering behavioral and mental health services to patients and their families.

Required courses in addition to required core courses are:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>MFT 6740</td>
<td>Theories and Models of Medical Family Therapy</td>
<td>3</td>
</tr>
<tr>
<td>MFT 6770</td>
<td>Behavioral Medicine and Integrative Care</td>
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</table>

Project Option
The project option is appropriate if students want to teach human anatomy structure and function, or if students are undecided about a career in the health professions and want to improve their academic background before applying to professional schools. It provides training in anatomy with a capstone project. A total of 30 credits is necessary to complete the degree.

Qualifying Examination and Defense
Upon completion of the core curriculum, the student must identify an independent study project under the guidance of a CASE faculty adviser for the required Master's Project (ANAT-6560, 2-4 credits) course.

The Master's Project course is intended to foster students' intellectual development by working independently with a faculty adviser and an M.S. (project) committee. It is hoped that a student will develop the capacity to plan and execute a project and will acquire competence and critical writing skills.

The M.S. (project) committee will be formed as the student prepares the project proposal. A three member M.S. (project) committee, chaired by the student's primary adviser, will be recommended to the director of the anatomy graduate program for approval. The committee must include at least two members of the CASE anatomy graduate faculty.

The initial responsibility of the M.S. (project) committee is to determine the feasibility of the project and its proposal, and to permit the student to proceed only after such determination has been made. The committee and director of the anatomy graduate program shall sign off on the student's proposal and a copy should be kept in the student's file in the CASE office. The signing of this document signifies that the student has permission to proceed with the study as outlined in the proposal.

The M.S. (project) committee will meet regularly with the student and adviser and is responsible for reviewing the ongoing project and manuscript drafts, and to provide feedback in a timely manner.

A manuscript of the project, in the form of a treatise, must be completed and approved by the faculty adviser and M.S. (project) committee. The treatise is a critical analysis of the project and is expected to demonstrate mastery of the material using critical thinking skills. The manuscript should follow the formatting guidelines issued by the Office of Graduate Education.

As the project and manuscript near their completion, a
tentative date to complete the oral examination will be scheduled, no less than two weeks in advance, by the faculty adviser and approved by the M.S. (project) committee. The last day to complete the final oral examination will be identified by the graduate education calendar of deadlines and will be strictly enforced.

Before the oral examination is officially scheduled to take place, the student’s Master’s Project course project must be completed and approved by the student’s faculty adviser and M.S. (project) committee.

Two weeks before the thesis defense, an electronic and print announcement of the date, time, location and title of the defense will be publicized to all members of CASE. A final draft of the student’s thesis must be made available in the anatomy conference room for faculty and students to review at least seven working days prior to the defense.

The oral examination will consist of a formal presentation of the student project to the M.S. (project) committee, the faculty and students in CASE, and to any family member or anyone from the general public wishing to attend. After the presentation, the committee will meet with the student privately to ask any questions relating to the project and manuscript, and of the student’s knowledge of anatomy. After the private meeting, the student will be asked to leave the room as the committee votes on the oral examination performance by filling out the ballot issued by the Office of Graduate Education. Once the ballot is completed, signed and sealed it is the committee chairperson’s responsibility to deliver the ballot to the Office of Graduate Education immediately following the oral examination.

Continuation Standards
Students must maintain a cumulative GPA of 3.00 in all required graduate/professional courses.

Doctor of Philosophy in Medical Family Therapy

Program Highlights
The doctorate in medical family therapy prepares students to work within an integrated health care setting in collaboration with medical and mental health professionals. Coursework focuses on theory, practice and research in the field of couple and family therapy, with an emphasis on intervention in primary care medical settings and as adjunct health providers in specialty care.

Curriculum Overview
The doctoral program involves a minimum of 51 credit hours of coursework beyond the master’s degree, plus comprehensive examinations and original research culminating in the dissertation (12-plus credit hours). The Ph.D. has a clinical component in which students will be trained in both mental health and medical settings as part of an integrated care team of health professionals. Students are required to complete a nine- to 12-month internship.

Fieldwork and Research Opportunities
Graduate students perform research projects by working with a faculty mentor whose research interests match their own. Doctoral students are expected to publish and present a minimum of two research projects.

The center’s faculty are engaged in multidisciplinary research of biological structure and function ranging from ultrastructural to gross anatomical levels, with a major interest in clinically relevant anatomy and neurobiology. Other research interests include cell biology and pathobiology. Facilities are available for autoradiography, electrophysiology, gel electrophoresis, immunoblotting, immunostaining (immunocytochemistry, immunohistochemistry, immunofluorescence), high-performance liquid chromatography, in situ hybridization, microsurgery, stereotaxic neurosurgery, microinjections and animal behavioral assays. The center is also equipped to perform optical imaging, including bright field, phase contrast and fluorescence microscopy.

Careers
Possible careers in medical family therapy include:
+ Academic positions
+ Research positions
+ Clinical positions in medical and mental health centers
+ Private practice and consulting

Admission Requirements
A master’s degree with a marriage and family therapy program accredited by COAMFTE or a related mental health area with coursework equivalent to a COAMFTE accredited program.

Application Requirements
+ Online application and fee
+ Transcript(s)
+ Three letters of recommendation
+ GRE scores
+ Résumé
+ Interview
+ Professional goal statement
+ Scholarship sample (e.g., thesis, manuscript, journal article)

Requirements for International Students
+ A completed Declaration of Financial Support packet with all accompanying documents
+ TOEFL or PTE Academic score
+ Check the English Proficiency Policy page for specific TOEFL and PTE score requirements. Students may also visit the international prospects, applicants and students page for more information
about international application requirements.

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Program Requirements

Required Courses (51 credits)
- MFT 6500 The Neurobiology of Interpersonal Behavior (3 credits)
- MFT 5560 Advanced Couple and Family Therapy (3 credits)
- MFT 6990 Supervision in Family Therapy (3 credits)
- MFT 6720 Integrative Care Practicum (3 credits)
- MFT 6730 Research Practicum (3 credits)
- MFT 6740 Theories and Models of Medical Family Therapy (3 credits)
- MFT 6750 Supervision Practicum (3 credits)
- MFT 6760 Families, Health, and Illness (3 credits)
- MFT 6770 Behavioral Medicine and Integrative Care (3 credits)
- MFT 6820 The Self in Theory and Therapy (3 credits)
- MFT 6870 Clinical Supervision (3 credits)
- MFT 6970 Research Topics: Medical Family Therapy (3 credits)
- Research Courses (3 credits)
- Clinical Elective or additional Research Course (3 credits)

Dissertation Research (12 credits)
MFT 6990 Doctoral Dissertation (12 credits)

TOTAL CREDITS: 63

Neurobiology Concentration
For a concentration in Neurobiology, students must conduct dissertation research in neurobiology and are required to complete at least 7 hours from the following courses:
- ANAT 8300 Advanced Systems Neurobiology (3 credits)
- ANAT 8320 Developmental Neurobiology (3 credits)
- ANAT 6870 Visual Neuroscience (3 credits)
- PPHY 5110 Advanced Topics in Pharmacological and Physiological Science I (3 credits)
- PATH 5010 Pathobiology (3 credits)

Non-Course Requirements

Qualifying Examination and Defense
After completing the core curriculum, Basic Research Techniques in Anatomy and Principles of Biostatistics, the student must prepare for and successfully pass the doctoral qualifying examination.

Doctoral Qualifying Examination
The qualifying exam is a written examination that is
designed to test the student's fundamental knowledge of human structure and function, critical analysis and thinking, and design of an independent research proposal. An ad hoc exam committee will be constituted by the director of the anatomy graduate program and include five members of the graduate faculty, four of which shall be anatomists. The program director or associate director shall chair the committee. The written test shall occur over a five-day period (excluding weekends). The committee will request the faculty to submit questions on: material covered in any of the coursework completed by the student to date, research papers or reviews that will be provided to the student, and/or philosophical matters related to the history of anatomy and medicine or national or world events that impact medical education and biomedical research. The committee will review the submitted questions and questions will be selected or created by the committee to ensure the questions are fair and appropriate, that they test the student's knowledge base for areas of anatomy (gross anatomy, neuroanatomy, histology and embryology), and that they help evaluate the problem-solving skills of the student. Failing the qualifying exam will result in the student being recommended to being dropped from the Ph.D. program. In this case, the director of the anatomy graduate program can elect to offer the failed student the option of completing a terminal master's degree.

Once the student has passed the doctoral qualifying examination, the student must register for Dissertation Research. A minimum of 12 credits are required for degree completion and typically occurs over 2-3 academic years. Initially, the student must identify a research project under the guidance of a faculty member. A Ph.D. dissertation committee will then be formed as the student prepares their research proposal.

A three-member Ph.D. dissertation committee, chaired by the student's primary adviser, will be appointed by the director of the anatomy graduate program. The committee must include at least two members of the anatomy graduate faculty. A third member of the committee can be appointed by the graduate program director if they are graduate faculty in other departments or at another university. It is the decision of the anatomy graduate program director to accept the adviser's recommendation and to identify the final member of the committee. Once the proposal has been approved by the Ph.D. dissertation committee it is then submitted to the Office of Graduate Education.

Doctoral Oral Qualifying Examination
The oral qualifying exam will be scheduled after the student has submitted a detailed dissertation research proposal, conducted preliminary experiments to substantiate the proposal and the dissertation advisory committee formed. The committee will consist of five members of the graduate faculty and will be approved by program director. The oral exam will be public and designed to test the student's fundamental
knowledge of their proposed studies, background for the studies, and critical analysis and thinking.

Prior to the doctoral student's request for consideration for advancement to candidacy, submission of their research proposal, formation of their research committee, initiation of the major components of their proposed doctoral research project, and registration for any research credits, the student must have completed most of their required core or elective coursework and successfully passed their preliminary/written qualifying exam.

**Advancement to Candidacy**
Completion of the dissertation research project entails the following: writing of the thesis, application for advancement to candidacy and the dissertation defense. It shall be the responsibility of the student to initiate their candidacy by filling out a candidacy form through the Office of Graduate Education. The completed form must be returned by the deadline stated in the graduate education calendar of deadlines. Once the completed candidacy form has been processed by the Office of Graduate Education, the thesis committee chair will receive ballots for the oral defense of the thesis. The ballots are distributed to the other committee members by the thesis committee chair when they vote on the oral defense. Once the ballots are completed, signed and sealed, it is the committee chairperson's responsibility to deliver the ballots to the Office of Graduate Education immediately following the defense.

**Dissertation Defense**
The defense of the dissertation provides an opportunity for the student to formally present their findings to their committee, the faculty and students in CASE, and to any family member or anyone from the general public wishing to attend. Two weeks before the dissertation defense, an electronic and print announcement of the date, time, location and title of the defense will be publicized to all members of CASE. A final draft of the student's dissertation must be placed in the anatomy conference room for faculty and students to review at least seven working days prior to the defense. The dissertation defense is two parts. First, the student will make an oral, PowerPoint presentation of no longer than 45 minutes duration where they present their research. Following the presentation, questions from the collective audience will be encouraged. Once all questions have been satisfactorily answered by the student, the audience is excused and the closed, or executive, part of the defense takes place with only the student and their committee present. The dissertation committee can ask detailed questions and expect the student to demonstrate thorough knowledge of their project and related research. Questions on general topics in anatomy, unrelated to their research, may also be asked. Following all questioning, the student is excused from the room and the committee members, without discussion, complete the defense ballot.

**Continuation Standards**
Students must maintain a cumulative GPA of 3.00 in all required graduate/professional courses.