

MS in Microbiology

Admission to the Microbiology program to pursue a M.S. degree is not an option, as students are accepted with the intent that they will fulfill the PhD requirements. Only under unforeseen circumstances such as illness, a change in academic interest, or other personal reason, is a student allowed to transfer to the M.S. degree.

The Molecular Pathogenesis and Therapeutic Graduate Program (MPT) was collaboratively designed by the Department of Molecular Microbiology & Immunology (MMI) and the Department of Veterinary Pathobiology (VPB). The MPT Program offers comprehensive graduate-level training, providing individualized training that is strongly oriented toward basic research in molecular and cellular biology, microbial pathogenesis, virology, immunology and host-parasite interactions.

Degree Requirements

Requirements are the same as for doctoral candidates, although successful completion of a comprehensive examination is not a requirement for the Master's candidate. Students opting for a M.S. degree, must complete a research project and write and defend a Master's thesis in front of their Master's committee. The Master's Committee should consist of at least three faculty members including the mentor. At least two of the faculty members should be from the Microbiology Graduate Program and at least one faculty member from outside of the advisor's primary department.

Credit Hour Requirements:

The Graduate School requires 30 hours of advanced study to be completed for the M.S. degree. A minimum of 15 hours of 8000-9000 level course work, not including MICROB 9085 Problems in Microbiology and MICROB 9090 Research in Microbiology. A maximum of four hours of MICROB 9087 Seminar in Microbiology can count toward this requirement. Graduate student full-time enrollment status is 9 credit hours for fall and spring, 4 credit hours for summer.

Required Courses for Graduate Students in Program

- **Fall semester, 1st year (all required):**
 - MICROB 8303 Fundamental Virology (3 credit hrs.)
 - MICROB 8304 Immunology (4 credit hrs.)
 - MICROB 8404 Foundations in Bacterial Pathogenesis (3 credit hrs.)
 - MICROB 8050 Graduate Student Survival Skills (1 credit hr.)
- **Three of the following courses** (only one of these may be an approved elective)
 - MICROB 9404 Advanced Bacterial Pathogenesis (4 credit hrs.; offered Spring of odd years only)
 - MICROB 9407 Advanced Immunology (4 credit hrs.; offered Spring semesters of even years only)
 - MICROB 9432 Molecular Biology II (4 credit hrs.; offered every Spring semester)
 - MICROB 9449 Infection and Immunity (4 credit hrs.; offered every Fall semester)
 - MICROB 9001 Topics in Microbiology (4 credit hrs.; every other Spring semester of odd years offering as Advanced Virology)
- Approved 8/9000 current literature-based elective (3-4 credit hrs.)
8000/9000-level electives: The DGS and the Curriculum Committee must approve these courses. They should also be approved by

the student's doctoral committee (examples of courses still needing approval are given below):

- V_PBIO 8436 Pathogenic Mechanisms in Veterinary Pathobiology (3 hours)
- BIO_SC 8320 Developmental Genetics (3 hours)
- BIO_SC 8440 Integrative Neuroscience I (3 hours)
- BIO_SC 8442 Integrative Neuroscience II (3 hours)
- MPP 9426 Transmembrane Signaling (4 hours)
- MPP 9435 Molecular Exercise Biology (3 hours)
- V_PBIO 8641 Introduction to Research Ethics (1 credit hr.; every Spring semester)
- MICROB 9087 Seminar in Microbiology (required to take this 4 times: 2nd-5th years) (1 credit hr.; every Spring semester)
- MICROB 9403 Advanced Medical Microbiology (credit for teaching) (2 credit hrs.; every semester)

Laboratory Rotations

All new graduate students admitted into the MPT Graduate program are required to complete three laboratory rotations starting in the Fall semester and concluding in mid-January before the Spring semester begins. Students will meet with the Director of Graduate Studies prior to each rotation to determine the appropriate laboratory and rotation advisor. Laboratory rotations expose graduate students to research activities within the Program and to the experimental laboratory environment in which they will evolve. Prior to finishing the third laboratory rotation the graduate student selects a mentor based on mutual agreement between the student and the mentor. Once the mentor has been selected, the student will perform his or her doctoral research under the guidance of the mentor in his/her laboratory.

Laboratory Rotation Schedule

The MPT Graduate Student Laboratory Rotation Program represents a vehicle to introduce the research laboratory to incoming students and to stimulate a direct interaction between students, faculty and other program personnel. The program is designed to expose students as quickly as possible to research activities within the Program and to the experimental laboratory environment in which they will evolve.

Laboratory rotations will approximately adhere to the following schedule*:

- Summer Research Experience** - Start of Summer semester (usually 1st Monday June 7th) - July 30th
- 1st Rotation - August 23rd - September 24th
- 2nd Rotation - September 27th - October 29th
- 3rd Rotation - November 1st - January 14th (this allows limited time off for holidays and final exams)

*These dates will change from year to year depending on the start date of the Fall semester and will be set by the Director of Graduate Studies

**With permission of Director of Graduate Studies, Executive Committee, and Department Chairs

Students who wish to enter the program early at the beginning of the summer semester preceding their first academic semester may do so, if financial resources are available.** However, this will be considered a "summer research experience" with one of the faculty members but not an official rotation. This summer research experience should begin no earlier than June 1 and no later than the first day of the Summer semester, and should end on August 15th. This student will still be required to perform three rotations with different faculty advisors, starting

in the fall. The student would then be able to select one of those advisors including the "summer research experience" advisor as his or her doctoral advisor. Students engaging in the "summer research experience" will register for 4 credit hrs. of MICROB 9085 (<http://catalog.missouri.edu/search/?P=MICROB%209085>) Problems (Rotations) for the summer semester and will need to be on campus by the beginning of the MU summer semester (usually first Monday in June).

Other duties

- Act as a teaching assistant (TA) in MICROB 2800 or MICROB 3200 for two semesters (to be completed during the first two years, but not during the Fall semester of the first year).
- Attend Program seminars (any invited speakers and student seminars) on Wednesdays at 1:15 pm usually in Monsanto Auditorium in the Bond LSC; attendance will be taken; enroll in MICROB 9087 Seminar in Microbiology for 1 credit hr. in the Spring semesters of years 2-5. **You will need to give a seminar during those years; course grade will be determined by attendance and your presentation.**
- **English-Language Proficiency Requirements for International Students**

Any graduate student who completed primary and secondary education (equivalent of K-12 in the U.S.) in a country where English is not the primary language is required by the state of Missouri law to be assessed for English language proficiency. The Speaking Proficiency English Assessment Kit (SPEAK) test is conducted through the Graduate School. International graduate students must receive a level 2 or higher on their language assessment to meet the requirements to TA. If they receive a score below 2 additional courses may be recommended for the student to increase their language skills before their English language is reassessed.

ONITA training is offered during the week preceding the Fall and Spring semester. The training is required for all new international graduate students before the first semester of teaching or assisting with teaching at MU.

Thesis

Students must complete a research project, write and defend a Master's thesis in front of their Master's committee and the program. The Master's Committee should consist of at least four faculty members including the mentor. At least three of the faculty members should be from the MPT Graduate Program and at least one faculty member should be from outside of the adviser's primary department.

Contact Information:

Department of Molecular Microbiology & Immunology
M616 Medical Sciences Building
Columbia, MO 65212

mmi@missouri.edu