MOLECULAR MICROBIOLOGY AND IMMUNOLOGY, PH.D.

The Department of Molecular Microbiology and Immunology (MMI) at Saint Louis University's School of Medicine offers a Ph.D. program in molecular and cellular virology and immunology. The program prepares graduates for impactful careers in academic research, biotechnology, and related biomedical fields through rigorous scientific training and immersive laboratory experience.

MMI faculty lead innovative research programs spanning molecular and cellular biology, virology, immunology, and host–pathogen interactions. Students train in a collaborative, research-intensive environment within SLU's state-of-the-art laboratories located in the Doisy Research Center and the School of Medicine's basic science facilities. Faculty maintain strong extramural funding from federal agencies, foundations and industry; actively contribute to national peer-review and editorial leadership; and publish in high-impact scientific journals.

Curriculum Overview

The MMI Ph.D. curriculum integrates rigorous academic preparation with immersive research training. Graduate instruction includes:

- Advanced coursework in molecular microbiology, immunology and related biomedical disciplines
- Structured training in scientific writing and oral presentation
- Original, hypothesis-driven research culminating in peer-reviewed publications and the doctoral dissertation

Each doctoral student conducts dissertation research under the guidance of a primary faculty mentor within the department, supported by a collaborative mentoring environment.

Students entering with a bachelor's degree complete a common, yearlong basic biomedical sciences curriculum. This interdisciplinary first year provides foundational training and includes laboratory rotations across the medical school, allowing students to explore diverse research areas before selecting a dissertation mentor and specializing in microbiology and/or immunology.

Careers

Graduates of the molecular microbiology and immunology Ph.D. program are prepared for leadership roles in academic research, biotechnology, pharmaceutical development, and government laboratories. Through rigorous scientific training and publication-driven research, students develop the expertise to investigate infectious diseases, immune system function, host-pathogen interactions, vaccine development, and translational immunology.

Our alumni pursue careers as faculty members at research-intensive institutions, scientists in biotechnology and pharmaceutical companies, and leaders in emerging biomedical and translational research sectors. The program's strong emphasis on experimental rigor, scientific communication, and interdisciplinary collaboration equips graduates to contribute meaningfully to scientific discovery and innovation in both academic and applied settings.

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. Most students enter the program following one year in the core program in the basic biomedical sciences, although direct application to the program is possible for applicants with an advanced degree.

Application Requirements

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

Requirements for International Students

All Saint Louis University admission policies and requirements for domestic students apply to international students. International students applying to SLU must also meet the following additional requirements:

- Demonstrate English language proficiency (https://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/)
- Academic records must include an English translation. Unofficial copies may be accepted in some cases for initial admission review, however official copies must be received prior to enrollment. Course-by-course transcript evaluations are accepted.

Students must submit financial documents to be issued an I-20 for their F-1 visa application. Proof of financial support must include:

- A letter of financial support from the person(s) or sponsoring agency funding the student's time at Saint Louis University
- A letter from the sponsor's bank verifying that the funds are available and will be so for the duration of the student's study at the University

Application Deadline

Students should apply by Feb. 1.

Review Process

A committee examines and reviews the applicant and application wholly.

Tuition

Tuition	Cost Per Credit
Graduate Tuition	$1,450

**Students on a graduate assistantship receive a full tuition waiver.

Additional charges may apply. Other resources are listed below:

Information on Tuition and Fees (https://catalog.slu.edu/academic-policies/student-financial-services/tuition/)

Miscellaneous Fees (https://catalog.slu.edu/academic-policies/student-financial-services/fees/)

Information on Summer Tuition (https://catalog.slu.edu/academic-policies/student-financial-services/tuition-summer-current/)

Scholarships and Financial Aid

For priority consideration for graduate assistantship, apply by Feb. 1.

For more information, visit the Office of Student Financial Services (https://www.slu.edu/financial-aid/).

Learning Outcomes

1. **Demonstrate advanced knowledge** of molecular microbiology, immunology and related biomedical sciences.
2. **Critically evaluate and synthesize** primary scientific literature, assessing experimental design, methodological rigor, data interpretation and scientific significance.
3. **Formulate innovative, testable research questions** and develop rigorous, falsifiable hypotheses addressing significant problems in microbiology and immunology.
4. **Design, execute and interpret** sophisticated experimental approaches using appropriate controls, quantitative methods and emerging technologies.
5. **Integrate multidisciplinary approaches** to investigate complex biological systems relevant to infection, immunity and disease.
6. **Communicate scientific findings effectively** in written, oral and visual formats to both specialized and broader scientific audiences.
7. **Demonstrate ethical leadership and professionalism** by applying principles of responsible conduct of research, collaboration, mentorship and scientific integrity.
8. **Prepare for independent scientific careers** in academia, industry, government or related sectors through grant writing and professional development experiences.

Requirements

Code	Title	Credits
Basic Biomedical Science Courses		
BBS 5010	Basic Biomedical Science I	5
BBS 5020	Special Topics in Basic Biomedical Sciences I	4
BBS 5030	Basic Biomedical Science II	5
BBS 5040	Special Topics in Basic Biomedical Sciences II	4
BBS 5100	Ethics for Research Scientists	0
BBS 5920	Basic Biomedical Sciences Colloquium	2
BBS 5970	Research Topics in Biomedical Sciences (taken over multiple semesters)	4
BCHM 6280	Intro to Genomics and Bioinformatics	2
Molecular Microbiology and Immunology Courses		
MB 6350	Virology	3
MB 6650	Basic Immunobiology	3
MB 6900	Microbiology Journal Club	1
MB 6920	Microbiology Colloquium	1
Dissertation Research		
MB 6990	Dissertation Research (taken over multiple semesters, 12hrs total)	0-6
Total Credits		**46**

Non-Course Requirements

Students are required to write a mock grant proposal for extramural research and/or stipend support that will be internally reviewed. Students must also publish at least one peer-reviewed scholarly article reporting the results of original research.

Continuation Standards

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