MASTER OF SCIENCE IN MOLECULAR AND CELL BIOLOGY

Program Contact: Alexandre de Lencastre (Alexandre.deLencastre@qu.edu) 203-582-5024

The College of Arts and Sciences offers a Master of Science in Molecular and Cell Biology program for both part-time and full-time students. Through the graduate program, the mission of the Department of Biological Sciences is to prepare students for employment in research fields available in pharmaceutical companies, universities and hospitals as well as to provide an excellent foundation for students intending to pursue studies in professional health care fields and doctoral programs. To achieve this goal, the program provides the students with highly specialized lecture and laboratory courses relevant in this rapidly growing field.

MS in Molecular and Cell Biology Program of Study

The 34 credits required for the Master of Science in Molecular and Cell Biology include five courses (20 credits) in the science core, elective courses chosen in consultation with the program director and a thesis or non-thesis option (the non-thesis option requires the successful completion of a comprehensive examination; the thesis option requires 2 additional credits, for a total of 36 credits). Students must maintain a minimum cumulative GPA of 3.0 to remain in the MCB program. A minimum grade of C is required in all graduate courses.

Curriculum

Code	Title	Credits
Core Curriculum		
BIO 515	Advanced Biochemistry	4
BIO 568	Molecular and Cell Biology	4
BIO 571	Molecular Genetics	4
BIO 605	DNA Methods Laboratory	4
BIO 606	Protein Methods Laboratory	4
Thesis or Non-Thesis Option		
Select one of the options		14-16
Total Credits		**34-36**

Thesis Option

Code	Title	Credits
Core Curriculum Requirements		20
BIO 649	Independent Research	2
BIO 650	Thesis I in Molecular and Cell Biology	4
BIO 651	Thesis II in Molecular and Cell Biology	4
Graduate electives		6
Total Credits		**36**

Non-Thesis Option

Code	Title	Credits
Core Curriculum Requirements		20
BIO 675	Comp Exam in Molecular and Cell Biology	2
Graduate electives		12
Total Credits		**34**

Graduate Elective Courses

Code	Title	Credits
BIO 505	Writing and Science	3
BIO 521	Stem Cell Biology	3
BIO 562	Bioinformatics	3
BIO 589	Molecular and Cell Neurobiology	3
BIO 649	Independent Research	2
BIO 650	Thesis I in Molecular and Cell Biology	4
BIO 651	Thesis II in Molecular and Cell Biology	4
BIO 675	Comp Exam in Molecular and Cell Biology	2
BIO 688	Independent Study	1-4
BIO 689	Independent Study	1-4
BMS 510	Biostatistics	3
BMS 517	Human Embryology	3
BMS 518	Pathophysiology	3
BMS 522	Immunology	3
BMS 526	Epidemiology	3
BMS 527	Pharmacology	3
BMS 532 & 532L	Histology and Lab and Histology Lab	4
BMS 564	Fundamentals of Oncology	4
BMS 565	Leukemia	3
BMS 569	Antimicrobial Therapy	3
BMS 570	Virology	4
BMS 572	Pathogenic Microbiology (with lab)	4
BMS 573	Mycology	3
BMS 576	Drug Discovery and Development	3
BMS 578	Cellular Basis of Neurobiological Disorders	3
BMS 579	Molecular Pathology	3
BMS 583	Forensic Pathology	3
BMS 595	Transplantation Immunology	3
BMS 599	Biomarkers	3
PA 515	Human Physiology	4

MS Thesis

The MS thesis option involves original laboratory research performed under the guidance of a thesis committee and the director of the molecular and cell biology program. The thesis committee evaluates a student's progress by approving the research project and subsequently advising the student whenever the need arises.

Comprehensive Examination

The written comprehensive exam (BIO 675) is a requirement of the non-thesis option for the MS in Molecular and Cell Biology. Students must demonstrate both breadth and depth of knowledge by illustrating a command of the subject matter obtained from individual courses into unified concepts, which link the student's own specialization to other fields of study. Completion of a minimum of four of the five core curriculum courses is required to register for the comprehensive examination. A minimum grade of a B- is required to pass the comprehensive examination. Students must meet with the program director before registering for the comprehensive exam.

Student Learning Outcomes

Upon completion of a Master of Science in Molecular and Cell Biology (MCB), students will demonstrate the following competencies:

1. **Foundational Knowledge**: Understand fundamental concepts in molecular genetics, cell biology and biochemistry and apply their knowledge to new findings in the field of molecular and cell biology.
2. **Application and Analysis**: Employ modern laboratory techniques used in DNA and protein research and interpret experimental data.
3. **Scientific Knowledge**: Analyze, synthesize and discuss primary scientific literature from peer-reviewed journals in the field.
4. **Communication Excellence**: Present scientific content to an audience in a professional manner.
5. **Advanced Knowledge**: Author scientific critiques and/or reviews in a manner consistent with the standards of professional scientific writing.

Admission

Applicants who have a bachelor's degree in a biological, medical or scientific field are eligible for admission to the Master of Science in Molecular and Cell Biology program. Applications may be obtained from the Office of Graduate Admissions (http://www.qu.edu/gradadmission/) and are accepted for fall or spring enrollment. A complete application consists of the following:

- application form and fee
- a letter of intent including a detailed autobiography of personal, professional and educational achievements
- two letters of recommendation (at least one letter should be from a science faculty member)
- official transcripts of all undergraduate and graduate work completed

A cumulative undergraduate GPA of 3.0 is preferred and undergraduate course work in biochemistry, microbiology, molecular biology and/or genetics is highly recommended. Although Graduate Record Examination (GRE) scores are not required, the scores can provide another indication of a student's academic readiness. Applicants should refer to the Graduate Admission Requirements (http://catalog.qu.edu/graduate-studies/#admissionstext) found in this catalog.