

# Cell, Molecular and Structural Biology (CMSB)- M.S., Ph.D.

For information, contact:  
Chair of CMSB Admission Committee  
Department of Biology  
212 Pearson Hall, 513-529-3100  
<http://www.cas.MiamiOH.edu/cmsb/>

Cell, Molecular and Structural Biology is a multi-disciplinary program that seeks to identify and understand the molecules that collectively form the basis of all life.

## Program Requirements: Master of Science

(minimum of 30 credit hours)

Code	Title	Credit Hours
<b>Areas of Study</b>		
Select one course from two of the three following areas: <sup>1</sup>		6-7
Biochemistry:		
CHM 532	Fundamentals of Biochemistry	
Cell Biology:		
BIO 571	Molecular Physiology	
BIO/MBI 606	Advanced Cell Biology	
MBI 515	Immunology Principles and Practice	
Molecular Biology:		
BIO 544	Molecular Biology	
BIO/MBI 605	Advanced Molecular Biology	
<b>Structural Biology</b>		
Select one of the following:		2-4
BIO 581	Theory of Electron Microscopy	
BIO 582	Scanning Electron Microscopy Laboratory	
BIO 583	Transmission Electron Microscopy Laboratory	
BIO 566	Bioinformatics Computing Skills	
BIO/MBI 585	Bioinformatics Principles	
CHM 740	Topics in Organic and Biochemistry	
CHM 760	Selected Topics in Inorganic and Analytical Chemistry	
CHM 770	Topics in Physical Chemistry	
<b>Seminar Requirements</b>		
BIO/CHM/MBI 650	Seminar in Molecular Biology <sup>2</sup>	1
BIO 601	Seminar for Graduate Students	1
<b>Additional Courses</b>		
CHM/BIO/MBI 700	Research for Master's Thesis	1-12
Electives (minimum of 5 credit hours) as determined by the student's committee to meet required hours.		5

<sup>1</sup> One course must be at the 600 level.

<sup>2</sup> One semester for M.S., three semesters for Ph.D.

To achieve the minimum 30 credit hours required for the M.S., additional course work appropriate to student's area of interest will be determined by student's dissertation/thesis committee in accordance with Graduate School requirements.

## Program Requirements: Doctor of Philosophy

Code	Title	Credit Hours
<b>Areas of Study</b>		
Select one course from two of the three following areas: <sup>1</sup>		6-7
Biochemistry:		
CHM 532	Fundamentals of Biochemistry	
Cell Biology:		
BIO 571	Molecular Physiology	
BIO/MBI 606	Advanced Cell Biology	
MBI 515	Immunology Principles and Practice	
Molecular Biology:		
BIO 544	Molecular Biology	
BIO/MBI 605	Advanced Molecular Biology	
<b>Structural Biology</b>		
Select one of the following:		2-4
BIO 581	Theory of Electron Microscopy	
BIO 582	Scanning Electron Microscopy Laboratory	
BIO 583	Transmission Electron Microscopy Laboratory	
BIO 566	Bioinformatics Computing Skills	
BIO/MBI 585	Bioinformatics Principles	
CHM 740	Topics in Organic and Biochemistry	
CHM 760	Selected Topics in Inorganic and Analytical Chemistry	
CHM 770	Topics in Physical Chemistry	
<b>Seminar Requirements</b>		
BIO/CHM/MBI 650	Seminar in Molecular Biology <sup>2</sup>	1,1,1
BIO 601	Seminar for Graduate Students	1

<sup>1</sup> One course must be at the 600 level.

<sup>2</sup> One semester for M.S., three semesters for Ph.D.

To achieve the minimum additional 60 credit hours required for the Ph.D., additional course work appropriate to student's area of interest will be determined by student's dissertation/thesis committee in accordance with Graduate School requirements.

## Dissertation/Thesis Committee

The student, in consultation with his/her advisor, will set up a thesis committee (M.S.) by the end of the spring semester in the program or a dissertation committee (Ph.D.) by the end of the third semester in the program. These committees must be approved by the CMSB Director and the Graduate School.

M.S. Thesis Committee: Advisor and two other faculty members participating in the CMSB Program (total = 3).

Ph.D. Dissertation Committee: Advisor, at least three other faculty members from the CMSB Program, plus one additional faculty member who is not from the student's host department to serve as the Graduate School representative (total = 5).

## **Comprehensive Examination**

M.S. - none

Ph.D. - written grant proposal on topic not related to dissertation work followed by oral defense of the proposal. Both written and oral components of the exam must be passed. The comprehensive examination should be completed by the end of the fifth semester in residence.

## **Thesis or Dissertation Proposal**

Each student will present and defend a thesis or dissertation proposal to his/her thesis or dissertation committee. This should be done by the end of the third semester (M.S. students) or the end of the sixth semester (Ph.D. students) in residence.

## **Other Requirements**

CMSB students will be expected to participate in pedagogy training prior to assuming their teaching duties. Students teaching Chemistry laboratories will attend training offered by the Department of Chemistry and Biochemistry. Students teaching BIO 115/BIO 116 MBI 115/MBI 116 laboratories will attend pedagogy training offered by one of the biological sciences departments. The CMSB Director, in consultation with participating departmental Graduate Advisory Committees, will assign CMSB students to appropriate departmental pedagogy training. CMSB students will also be expected to serve on CMSB and host department committees and otherwise participate in activities required of graduate students from the host department.

This structure will provide the necessary flexibility for an interdisciplinary program. The dissertation committee will be responsible for helping the student select courses that will appropriately train the student in the broad area of Cell, Molecular, and Structural Biology, with the specialization required for their particular research area. The committee will also administer the comprehensive examination for Ph.D. students, give guidance for thesis or dissertation research, and will be responsible for conducting the thesis or dissertation defense.