



## Molecular, Cellular, and Developmental Biology Training Group (MCDB)

Share this page:   **Lab Rotations in MCDB:**

During the summer prior to arrival, incoming graduate students are expected to generate a ranked list of laboratories in which they would like to rotate during the first semester. Students may learn about the research in MCDB labs by visiting the website and/or contacting professors by email. The ranked list should be communicated to the MCDB graduate coordinator via email by July 1. Rotation assignments will be made before students arrive in Lexington. For second semester rotations, students will provide another ranked list of their preferences near the end of the Fall semester. New assignments will be made by the end of the Fall semester. Typically students will begin the second rotation on January 1, but this should be done in coordination with both rotation advisors.

Usually, students will choose a faculty supervisor (major professor) by the end of the Spring semester of the first year. However, some students may elect a third rotation over the first summer. This is permissible, but must be discussed beforehand with potential rotation advisors and the MCDB graduate coordinator. It is expected that all students will be committed to a lab by the end of the first summer.

**Course Requirements:**

It is expected that entering students will have completed undergraduate courses in Biochemistry, Cell Biology, and Genetics. Students lacking this preparation will be advised by the MCDB graduate coordinator as to appropriate foundational courses that should be taken. All Ph.D. students in the MCDB Program are required to take the following graduate courses during their first four semesters, unless equivalents have been completed. Additional courses or specific electives may be required by the student's faculty advisor and/or advisory committee.

BIO 510 Recombinant DNA Lab (F)  
BIO 601 Special Topics (each Spring)  
IBS 603 Cell Biology (S)  
BIO 770 Graduate Student Orientation (1st semester only)  
BIO 770 Research Talks (each semester until completion of qualifying exam)

In addition to the required courses above, MCDB students are expected to choose at least two of the three following primary electives.

BIO 520 Bioinformatics (F) or PGY 617 Physiological Genomics (F)  
BIO 529 Developmental Biology (F) or BIO 638 Developmental Neurobiology (F, odd years)  
BIO 621 Advanced Genetic Analysis (S)  
Other Electives (18 credits total, including primary electives above)

**Recommended Course Sequence:**

Below is the recommended sequence of courses to be taken by students in the MCDB Program. This sequence completes all required courses in the first two years, prior to the qualifying exam. Courses with an asterisk are required, although previous equivalent graduate-level instruction may be substituted where appropriate. Contact the MCDB graduate coordinator for approval of prior course equivalents. Depending on the area of study, it may be desirable to make accommodations in schedule for courses that are offered infrequently. Requests for changes in the order of courses should be discussed with your advisor and the MCDB graduate coordinator.

**1st Year - Fall semester**

(4 credits) \*BIO 510 Recombinant DNA Lab  
(3 credits) \*IBS 520 Bioinformatics  
(1 credit) \*BIO 770 Department-wide Graduate Student Orientation (seminar)  
(1 credit) \*BIO 770 Research Talks (seminar)  
(1 credit) \*BIO 795 Research in Biology (rotation)  
Total credits = 10

**Spring Semester**

(3 credits) \*BIO 621 Advanced Genetics  
(3 credits) \*IBS 603 Cell Biology  
(1 credit) \*BIO 601 Sp. Topics in Mol. and Cell. Genetics (seminar)  
(1 credit) \*BIO 770 Research Talks (seminar)  
(1 credit) \*BIO 795 Research in Biology (rotation)

Total credits = 10

Establish your Doctoral Advisory Committee at the end of your first year.

Second Year

Remaining Required Courses and Elective Courses

- (1 credit) \*BIO 601 Special topics in Molecular and Cellular Genetics (Spring)
- (1 credit) \*BIO 770 Research Talks (Fall and Spring)
- (1 credit) \*BIO 795 Research in Biology (permanent lab) (Fall and Spring)

After Year Two, but before completion of qualifying exam:

- (1 credit) \*BIO 770 Research Talks (seminar)
- (1 credit) BIO 601 Sp. Topics in Mol, and Cell Genetics (seminar)(Spring only)
- BIO 795 (sign up for the # of credits needed to bring your total to 9)

Post-qualifying exam:

- (2 credits) BIO 767 Residency

Registration for other courses after the qualifying exam can be arranged with approval of the advisory committee and DGS. Note that additional credits could cost the student/mentor/department tuition fees.

#### **Electives:**

Below is a list of recommended and approved electives from which to choose. Other courses may fulfill the elective requirement, but as always, selection of courses must be done in consultation with your research supervisor and advisory committee.

*Course Number/Title (semester):*

- BIO 507 Biology of Sleep and Circadian Rhythms
- BIO 520 Bioinformatics (F) (also see above)
- BIO 529 Developmental Biology (F) (also see above)
- BIO 621 Advanced Genetic Analysis (S) (also see above)
- BIO 535 Neurobiology (S of odd years only)
- BIO 550 Advanced Comparative Physiology (periodically offered)
- CHE 550 Biological Chemistry I (F)
- STA 580 Biostatistics I (F/S)
- IBS 601 Biomolecules & Metabolism (F) or BIO 401G Biochemistry (F/S)
- IBS 602 Molecular Biology & Genetics (F)
- BCH 604 Structural Biology (F)
- BCH 610 Biochemistry of Lipids and Membranes (S)
- BCH 611 Biochemistry and Cell Biology of Nucleic Acids (F)
- BCH 612 Structure and Function of Proteins and Enzymes (S)
- BIO 615 (=MI 615) Molecular Biology (S)
- BIO 618 (=ANA 618) Molecular Neurobiology (F)
- BIO 621 Membrane Biophysics (periodically offered)
- BIO 638 Developmental Neurobiology (F of odd years only, also see above)
- BIO 650 Neurophysiology Lab [2 credits] (periodically offered)

#### **MCDB Qualifying Exam**

Students must complete at least 36 credit hours prior to the qualifying exam. This should coincide with the end of the fourth semester. By the end of the fourth semester, you should meet with your Advisory Committee to make arrangements for your qualifying exam. Typically, you will aim for one of the summer sessions (if you have support for tuition and fees) or before the sixth week of the following fall semester, although the qualifying exam may be taken during any scheduling class window, including Winter Intersession, with the approval of the advisory committee. To take the qualifying exam in summer, you must be enrolled in at least 3 credits for the four week session and 5 credits for the 8 week session. Plan to complete the exam before the end of the third week of the 8 week session. Enroll for 5 credits of BIO 769 for the eight week session. The BGP office will help you get this done. The qualifying exam procedures and format are discussed in detail elsewhere.