

**Advising Guidelines (2021)**  
**Department of Molecular, Cellular, and Developmental Biology**  
**Yale University**

This document is intended to provide an overview of guidelines for graduate students and advisers in the Department of Molecular, Cellular, and Developmental Biology.

**Timeline to Degree.** To establish an aligned set of transparent expectations and timelines for both MCDB graduate students and advisers, we provide an overview of the anticipated timeline and key milestones to the PhD degree in MCDB. Typically, MCDB graduate students complete their degree requirements with a PhD defense in approximately 5.5. Years. The main annual activities and milestones toward the degree are as follows:

- Year 1:
  - Matriculate into BBS track
  - Conduct rotations in a minimum of 3 labs
  - Complete coursework to fulfill the graduate school's course requirement of five courses with a high pass average and receiving a minimum of two honors
  - Select thesis lab to perform dissertation research
  - Join the MCDB graduate program
- Year 2:
  - Begin research in the area of your graduate research
  - Enroll in MCDB 940: grants writing course
  - Enroll in MCDB's research-in-progress (RIP) course
  - Assemble a thesis committee (see more details below)
  - Complete qualifying process in the Fall semester of 2nd year
  - Consider fulfilling one semester of the graduate school's teaching requirement in the second semester, provided the student has successfully completed the qualifying process
- Year 3:
  - Complete the teaching requirement
  - Conduct thesis research
  - Enroll in MCDB's research-in-progress (RIP) course
  - Hold annual committee meeting
- Years 4+:
  - Conduct thesis research
  - Publish primary and review articles
  - Hold annual committee meeting
  - Defend thesis, pending approval of thesis committee
- Establish deadlines for milestones towards the degree(s) in your program. Determine who is the ultimate authority on the Thesis Topic (student, adviser, dissertation committee, etc.) and how this decision is made.

**Thesis topic.** The thesis topic is jointly determined by the student and thesis adviser. The thesis topic is then presented to a thesis committee selected by the student with advice from the adviser. The committee provides feedback on the thesis topic, scope, timelines, and approves the topic.

**Expectations for the degree of PhD in MCDB.** A graduating student should have completed a substantive body of independent work, resulting in a scholarly thesis that makes a significant and original contribution to one's field. At the time of graduation, this work is expected to have resulted in a first-author primary research paper accepted for publication. Typically, a student's Ph.D. research will result in several papers, first-author as well as co-author, published in peer-reviewed journals. The thesis committee, in consultation with the student and adviser, will ultimately determine the student's eligibility for the thesis defense.

In preparation for a potential thesis defense within the upcoming year, the student should submit and discuss with their thesis committee an outline of the thesis, developed in consultation with their advisor. This should include a list of chapters with a brief description of the information to be contained in each. Publications and/or papers in preparation should be referenced.

**Primary Adviser(s).** A student has a primary adviser who supervises the dissertation. In cases where the research warrants it, students may be co-supervised by two advisers. The thesis committee meets with the student and adviser annually to receive progress reports - both written and oral. The committee provides feedback, advice, and ultimately assesses a student's progress and eligibility for a thesis defense.

**Responsibilities of the Student.** The student is responsible for conducting independent research in close collaboration and consultation with the adviser and established collaborators. The student is expected to complete the annual dissertation progress report (DPR). The student is expected to schedule annual committee meetings on time. This requirement involves the generation of an annual progress report to be distributed to the thesis committee a week in advance of the meeting. At the meeting, the student will present a research update and solicit feedback from the thesis committee.

**Responsibilities of the Adviser.** The adviser partners with the student in their graduate research project. This includes the design of experiments, interpretation and analysis of data, and the generation of papers for peer-reviewed publication. The adviser is also responsible for overseeing the research and obtaining funding to conduct the research. In addition to consulting on research, the adviser also assumes the important roles of providing opportunities for the student to present research at local and international meetings and offering career advice aligned with the interests and skill set of the student.

**Responsibilities of the Thesis Committee.** The thesis committee first typically convenes at the beginning of the student's second year during the qualifying process. The committee is charged to assess the student's ability and preparedness to conduct independent research. Upon completion of the qualifying process, committee members serve as additional advisers to

the student. Formally, this involves attending annual meetings to provide feedback and advice on research progress and direction. Informally, the student can meet individually with committee members to provide individualized feedback or advice on research or career goals.

**Responsibilities of the Director of Graduate Studies.** The Director of Graduate Studies (DGS) of MCDB is primarily responsible for general oversight of the graduate program. The DGS chairs and works closely with the graduate affairs committee (GAC), which is comprised of ~5 primary MCDB faculty members. The GAC is tasked with reviewing the graduate program and implement changes to enhance the education and training of graduate students in MCDB. The DGS also reports to the Chair and MCDB faculty with updates on graduate education at faculty meetings. Such updates typically include student progress, review of academic records to determine eligibility for degrees in MS or PhD, and nominations for the annual Spangler award recognizing top thesis project(s). The DGS is also responsible for attending the BBS executive committee to provide input from the Department of MCDB and relay updates from the BBS back to MCDB faculty. The DGS also serves to advise both students and advisers on requirements for the degree and serving as an intermediary, together with the Chair and Dean's office, to adjudicate any potential conflicts.

**Qualifying Process in MCDB.** Graduate students in MCDB are expected to complete the qualifying process by the end of the first semester of a student's second year. The process can be initiated in the summer before the Fall semester of year 2. The student, in consultation with their adviser, selects a thesis topic and assembles a thesis committee of four faculty: one of which is the student's advisor and two of whom are required to be MCDB faculty members. The qualifying process involves two key parts - 1. The pre-prospectus and 2. The prospectus (qualifying exam) - described below.

**The pre-prospectus.** The objective of this meeting is for the student to assemble their committee for the first time, introduce the committee to the proposed thesis research, and solicit the committee's feedback. The key outcome of this meeting is to align with the committee on the overarching research objectives and aims, identify 4-5 reading topics for the prospectus meeting, and approve the scheduling of the prospectus meeting. This meeting typically requires 45-60 minutes. The student will give a 15-20 minute oral presentation outlining the plans for dissertation research, including background information, any relevant results that the student has already obtained, the goals of the project, and the methods to be employed. The student answers questions from the committee. Guided by the 4-5 reading topics, the student will then be expected to read ~80 research papers (90% of which are primary research articles) in preparation for the prospectus meeting. One week prior to the pre-prospectus meeting, students should submit a brief, 2-page document in an NSF-GRFP style proposal to the committee and MCDB Graduate Registrar.

**The Prospectus (Qualifying Exam).** The Qualifying Exam must be held during the Fall semester of students' second year. Students are responsible for scheduling this meeting and should schedule 2-3 months in advance to ensure that the appropriate time is allocated for the entire committee. Consult with thesis committee members and have a confirmed date for the

exam by the end of September. Students are expected to notify the MCDB Graduate Registrar of the date and venue of the qualifying exam as soon as it is scheduled. The prospectus meeting should be scheduled for 2.5-3 hours (typically take 2 hours). The exam will test your knowledge of the background of your field (reading topics), your ability to pose a research question and hypothesis and propose a plan to conduct your research. In brief, the student should expect the following:

The student will begin with a brief (~20-25 minute) presentation, outlining the proposed research. Questions during and following the presentation should bear in mind that the purpose of the Qualifying Exam is to test the student's ability to:

- Identify interesting and important questions.
- Plan a project with well-defined goals and carefully considered experimental strategies.
- Anticipate potential problems and devise alternative approaches.
- Demonstrate a clear understanding of where the proposed research fits into the "big picture".
- Testing your knowledge of the assigned reading topics. Questions asked aim to test:
  - Knowledge of the "facts" of the field,
  - Understanding of the methods used to arrive at these conclusions, and
  - Ability to read the literature critically. It is the responsibility of the Committee Chair to Ensure that the student is questioned in each of the topic areas designated at the time of the Pre-Prospectus meeting.
- After the questioning period, the Chair will ask the student to leave the room while the Committee deliberates. The Chair of the Committee, in consultation with other Committee members, should fill out the evaluation form.

**Prospectus document:** One week prior to the Prospectus meeting, students should submit (1) a NIH F31-style proposal to the committee and MCDB Graduate Registrar and (2) list of reading topics. The 4-5 reading topics span 60-80 research papers that are most relevant to the proposed research and approved by committee

**Progressing to Candidacy.** The completion of the qualifying exam is one of the main milestones required to progress to candidacy for the degree of PhD. In addition to the qualifying exam, students need to be in good academic standing, which requires the completion of course requirements established by the graduate school.

**Communication.** We encourage students, advisers, committee members, and the DGS to establish clear communication of responsibilities and expectations between students and advisers.

**Communication between student-adviser.** Shortly after selection of a thesis lab, it is recommended that the students and adviser begin discussions to jointly determine the thesis topic. With the qualifying exam in the fall, it is helpful to begin to consider what might be the basis of the prospectus and the composition of the qualifying exam committee. Throughout the

Ph.D., frequent meetings (~weekly/bi-weekly - as determined by the adviser and student) are recommended to review research results and plans. Lab meetings, Research in Progress talks, and other research presentations provide an opportunity to assess progress and future directions with the adviser. The Dissertation Progress Report is submitted each spring and reviewed by the adviser. This typically occurs at around the same time as the thesis committee meeting and detailed information on the DPR is provided here:

<https://registrar.yale.edu/students/dissertation-progress-reports>. An Individual Development Plan is recommended on a roughly annual basis, and we encourage the student to discuss their IDP with their advisor. Students are encouraged to think about their career goals, how these goals can be achieved during their Ph.D. and how they can work with your mentor, DGS and graduate program to align expectations and meet these goals. It is recommended that students use myIDP (<http://myidp.sciencecareers.org/>) as a tool to design and follow their individual development plan. Students are encouraged to discuss this plan with their mentor every 6 months. Students should discuss this plan during every thesis committee meeting.

**Communication with Thesis Committee.** All students meet at least once per year with their thesis committee. This process includes preparing a written progress report and an oral presentation to the committee. MCDB has established practices for meetings between the student and thesis committee with opportunities for the committee to meet with the student independent of the adviser. Such practices provide an environment for the student to raise any concerns or issues with their progress, adviser, lab, program, etc. The committee also meets separately with the adviser to assess the student's progress and assess any concerns. MCDB has committee forms accessible on the MCDB website where the committee provides structured feedback on an array of topics that assess the student's research progress, skill development, and progress toward the PhD degree. This feedback can provide the basis for further dialogue between student and mentor on the dissertation project and the student's scientific development. **Students should meet with their adviser ahead of and after their thesis committee meeting to prepare for and follow-up on their committee meeting.**

### **What happens at a typical committee meeting?**

- Committee meets without the student to assess student progress or any concerns from the adviser.
- Committee meets with student without advisor to provide a protected environment for the student to update the committee on their progress or concerns.
- Student presents to committee and should anticipate a discussion focused meeting with a lot of questions and answers.
- Committee meets again without the student and completes evaluation form
- The evaluation form should be delivered to MCDB Graduate Registrar who will distribute the completed form to the student, Thesis Advisor, all Committee Members and the Director of Graduate Studies.
- All committee exam and meeting forms are accessible and completed electronically on MCDB graduate website

- Students should familiarize themselves with the two documents thesis committees use to evaluate student performance, progress, strengths and weaknesses:
  - [Qualifying exam](#)
  - [Annual committee meeting](#)

**Work-Life Balance Expectations.** Students and advisors are expected to work together to ensure a responsive and adaptable work environment that balances the student's responsibilities to fulfill requirements towards completion to degree while prioritizing their mental and physical well-being. This will be different for each student and advisor pair and may include determining appropriate and reasonable work hours and pre-determining vacation time. As a general rule, MCDB adheres to vacation time policies by Yale graduate school.

**Funding Structure.** Graduate students in MCDB are typically recruited from the BBS program where funding is typically provided by the BBS or graduate school in years 1-3, augmented by training grants. Beginning in year 4, advisers are expected to provide financial support (stipend and tuition) for the student through the duration of their graduate training. The MCDB department has also implemented additional training and modifications to the qualifying process to position MCDB graduate students to successfully compete for external fellowships. Below we provide resources and links for external funding opportunities:

- Yale [website](#) for graduate fellowship opportunities
- NIH F31 <https://grants.nih.gov/grants/guide/pa-files/PA-21-051.html>
- NSF GRFP <https://www.nsfgrfp.org/>
- DOE · <https://www.energy.gov/science/office-science-funding/office-science-funding-opportunities>
- DOD <https://cdmrp.army.mil/funding/>
- Ford Foundation: <https://www.fordfoundation.org/work/our-grants/>
- Hertz Foundation: <https://www.hertzfoundation.org/the-fellowship/apply-for-fellowship/>
- Soros Fellowships: [https://pdsoros-fellowships.fluidreview.com/prog/2022\\_application/](https://pdsoros-fellowships.fluidreview.com/prog/2022_application/)  
<https://www.pdsoros.org/apply>
- HHMI Gilliam <https://www.hhmi.org/science-education/programs/gilliam-fellowships-advanced-study>
- Yale-based
  - Annie Le Fellowship
  - Lo Graduate Fellowship for Excellence in Stem Cell Research  
<https://medicine.yale.edu/stemcell/education/lofellows/>

**Mediation.** Students and advisors are expected to make every effort to maintain a positive and productive working relationship, and to work together towards the graduation of the student. If students have concerns about the progress of their research, lab operations, personal interactions, or any other issues related to their studies, there are a number of mechanisms they can pursue. Students should always first consider discussing any concerns with their advisor. If this does not result in a satisfactory solution, or if a second opinion is desired, students are

encouraged to consult one or more of the members of their thesis committee. MCDB students are explicitly given the opportunity to consult their thesis committee (in the absence of their advisor) on any concerns or questions during their yearly committee meeting. At the request of the student this discussion can be kept confidential. At other times during the year, students are encouraged to contact their committee members individually, or to set up a meeting with the full committee. The committee members can - with permission of the student - mediate in the communication with the advisor, or recommend alternative solutions. If further advice is desirable students can contact the DGS for a confidential discussion of the issues at hand. If necessary, students can also invoke the help of the Associate Dean for Academic Support to mediate or suggest other mechanisms for student support. Similarly, advisors should always first communicate with the student when any concerns arise. Further advice and mediation can be provided by the DGS, or by the Associate Dean for Academic Support.

**Training Programs.** Students from different graduate tracks and programs (including but not limited to Chemistry, Physics, INP, and the BBS tracks MCGD and BQBS) choose to join a thesis lab in the MCDB Department. 1st year coursework as provisioned by the graduate tracks/program and the graduate school must be fulfilled to join the MCDB Department. There are no additional courses students have to fulfill for their first-year requirements outside of the courses required by their 1st year track/program. This flexibility is an important component of the MCDB graduate program, which seeks to attract students with diverse backgrounds and interests to broadly support high impact research in the biological sciences.

As part of their first-year requirements, students are expected to complete any track/program requirements in Ethics and Responsible Conduct of Research training as provisioned by the graduate track/program. Students that are part of the BBS program are required to take the BBS Refresher Session 2 in year 4. If students have been assigned to a Training Grant in years 2 and 3, they are required to attend ethics courses (usually in year 4) and participate in programmatic activities as required by the Training Grant Directors. Students are required to complete appropriate laboratory training courses through Environmental Health and Safety. These include initial training sessions, subsequent refresher courses as well as training courses on an as needed basis depending on experimental procedures

Students in their second year are required to enroll in the departmental Grant writing course, if offered. This course prepares students for their qualifying exam by providing guidelines and feedback for their written proposals in the form of NSF and NIH proposals. Students are encouraged to work with their advisors to craft proposals and submit proposals as part of applications to appropriate funding agencies.

All students who are in a MCDB Department lab (primary and secondary affiliation) are required to attend and present in MCDB Research in Progress Symposia until they graduate.

**Career Development / Job Market Advising.** Students and advisors are encouraged to meet on a yearly basis to discuss the student's long-term perspective, including career development and future employment goals. The advisor is expected to help the student explore their preferences and options to the best of their abilities through discussions and potentially referrals to other faculty and resources. In preparation for their yearly committee meeting, students fill out an Individual Development Plan (IDP), and discuss this with their thesis committee during the

meeting. At this time career options and student preferences will also be discussed, and desired further support will be determined on an individual basis. Students are further encouraged to use resources available from the Yale Office of Career Strategy and visit the yearly Life Science Career Fair to learn more about career options and the job application process.

**Publishing and Distributing.** These advising guidelines will be integrated into a revised MCDB handbook, which is accessible on the MCDB website. These guidelines will be reviewed annually by faculty and MCDB graduate student representatives.