



MCB The Molecular and
Cellular Biology
Graduate Program
DARTMOUTH

Program Rules and Regulations

(2021-2022)

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Acronyms used within this document:

MCB	Molecular and Cellular Biology Program
AC	Advisory Committee
GC	Graduate Committee
QE	Qualifying Exam
GRAD	Guarini School of Graduate and Advanced Studies
RIP	Research in Progress seminar
TA	Teaching Assignment
BIOC	Biochemistry and Cellular Biology
BIOL	Biological Sciences
CANB	Cancer Biology
GENE	Molecular and Systems Biology (formerly Genetics)
MICR	Microbiology & Immunology

Molecular and Cellular Biology Graduate Program at Dartmouth

Overview and Statement of Purpose

The primary goal of the Molecular and Cellular Biology (MCB) Graduate Program at Dartmouth is the training of students to be highly qualified for productive careers in research and teaching in molecular and cellular biology. Only students who intend to pursue the Ph.D. degree full-time are accepted into the program. The program of study begins with research rotations, a set of required courses, and advanced electives. Training culminates in the production of a publishable thesis based on original research in the student's chosen field of investigation. Each student is required to work on the thesis under the supervision of a Thesis Advisor, and this association will determine, to a large extent, the nature of the student's individual course of study. The guidelines that follow have been adopted by the MCB Program faculty to ensure that each student completing the graduate program will have acquired the necessary skills and knowledge to be effective in research and teaching in their chosen discipline within the MCB Program.

All students are expected to adhere to the Honor Principle and the Student Code of Conduct as described in the Dartmouth Graduate Student Handbook.

I. ADVISING AND RESEARCH REQUIREMENTS – FIRST YEAR

A. Research Requirements for First Year Graduate Students

Note, the term ‘first year student’ is used to describe a student entering the program. Under no circumstances may a first-year student begin satisfying the requirements described in this document prior to the Fall term of their first year in the program.

In September preceding the start of the Fall term, entering MCB students will meet individually with a faculty member of the MCB Graduate Committee. This Graduate Committee faculty member will serve as mentor for the student prior to the student joining a thesis lab. The purpose of this initial meeting is to inform the students of program expectations and regulations and to advise them on the process of selection of laboratories for research rotations, courses, etc.

During their first year in the program, graduate students are required to conduct three research rotations under the supervision of three different faculty members; each rotation will correspond approximately with Dartmouth College’s Fall, Winter and Spring term schedule (i.e. approximately two and a half to three months, covering the periods Sept-Nov, Dec-Feb, Mar-May). Students are strongly encouraged to read papers by faculty whose research is of particular interest to them and to contact those faculty members during the summer to discuss the possibility of a Fall term rotation. Upon arrival on campus in August, each student needs to meet with faculty members to identify four to five rotation lab choices, which will be submitted to the MCB office in rank order of preference. The Graduate Committee will then match students with their Fall term research rotation advisor making every effort to give students and faculty their first choice. The Graduate Committee will perform this function using the following considerations:

Students may perform research rotations only in laboratories of faculty who have made it clear to the Graduate Committee that they have the appropriate research grant funds or departmental resources at their disposal to fund the costs of the rotation (expendable supplies and potential thesis research). The Graduate Committee will solicit information from each faculty member in the program regarding their interests in sponsoring rotation students and be guided by this faculty input when assigning rotations.

Realizing that ideas, impressions, attitudes, and expectations change with time, the Graduate Committee recognizes that only the first (i.e. the Fall term) rotation is to be arranged prior to the beginning of the Fall term. The second and third rotations (Winter and Spring terms) will be arranged (and assigned by the Graduate Committee) during the final weeks of the preceding term using procedures identical to those employed for the choosing of Fall term rotations. At the end of each rotation, the rotation advisor will submit a grade of Credit (CR) or No Credit (NC). A grade of NC for research rotation is given only if there are serious deficiencies in student

performance and requires approval of the Graduate Committee.

It should be emphasized that neither the student nor the faculty member is to regard any of the three research rotations as permanent. Indeed, students are required to perform three such rotations before finally deciding on a Thesis Advisor from among the three rotation lab advisors. Students and faculty are not to arrange the choice of their thesis lab until the last two weeks of the third rotation; the precise time when it is appropriate to discuss permanent arrangements will be announced to students and faculty by the Graduate Committee. Once the thesis lab arrangements are announced, students and faculty will be asked to sign and submit a letter of agreement, to the Graduate Committee confirming the match and the program designation (letter will be sent by the MCB Office to the student). The final assignment of a student to a thesis lab requires the approval of the Graduate Committee.

B. Thesis Advisor and the Advisory Committee

By the end of the Spring term of the first year of graduate study (approximately June 1), each student must have arranged with a member of the MCB faculty (from among the three formal research rotation advisors) to serve as Thesis Advisor and research sponsor. Students not able to find a suitable or willing advisor from among MCB Program faculty at the end of their research rotations will be separated from the program.

Choice of a Thesis Advisor may be delayed by up to one term under special circumstances in which a student petitions the Graduate Committee for a fourth research rotation; in this case the fourth research rotation will occur during the summer of the student's first year in the program.

The Thesis Advisor plus at least two other faculty members, chosen by the student in consultation with the Thesis Advisor and with their agreement, will become the student's Advisory Committee (AC). The Advisory Committee members first serve on the student's Qualifying Exam Committee and then continue to serve on the student's Thesis Advisory Committee. The student's Thesis Advisor will serve as AC Chair. Normally, the AC will be composed of MCB faculty members. However, where appropriate, non-MCB faculty members may join the AC as long as at least one MCB faculty member besides the Thesis advisor serves on the AC. The committee should be assembled to avoid potential or perceived conflicts of interest between faculty members or between faculty members and the graduate student. Such conflicts may include personal or financial relationships. Final approval by the Graduate Committee of the composition of the AC is required, as are any subsequent changes in the composition of the AC. The composition of the AC must be approved prior to the student's Qualifying Exam.

C. Functions of the Advisory Committee

The purpose and duties of the AC are to:

1. Meet with the student at least once yearly to assess progress.
2. Attend the student's annual research-in-progress seminar (RIP). The AC should meet soon after the student's RIP.
3. Advise the student on research direction, course selection, etc. Advise the student on course requirements and to select, with the student, an academic program and timetable suitable for the student's chosen interests.
4. Review and sign a brief annual report written by the student summarizing the progress and performance in the program. The report form should include an evaluation of the student's progress in developing a thesis research project that meets the criteria outlined in Section II.E. below, and should describe any concerns about the student's trajectory. This will serve as part of the formal record of the student's graduate education.
5. Ensure that the student develops the ability to communicate ideas and knowledge to others in seminar-style presentations. This will normally be accomplished through experiences gained in courses, journal clubs, Research-In-Progress seminars, lab meetings, etc.
6. Provide advice concerning the time and subject of the qualifying examination, following procedures specified by the Program.
7. Mediate disputes between student and Thesis Advisor. In the event that either the student or the Thesis Advisor desires to end the student-advisor relationship, then the AC must play an active role, particularly if the decision is not a mutual one between the student and Thesis Advisor.

It is the responsibility of the student to inform the AC about the dates of their Research In Progress seminars (RIP), to schedule meetings with the AC, at least once annually and to provide a document summarizing progress and goals for faculty to sign (template available from the MCB Office) that confirms that the committee has met. The student should come to the meeting with an outline of research progress to date and future plans. Once approved by the AC, this outline should be signed by the student and all members of the AC and submitted to the MCB Office as a report of the annual meeting. The report is due no later than June 30 of each year (defined as the period from July 1 to June 30) in which the student is enrolled for research credit (197-199 or 297-299) in any term.

In the event that the meeting report is not filed, the stipend increase that is granted to the student upon successful completion of the qualifying exam will be withheld in increments of \$100 a month from July 1 through November 30. In addition, the student will be placed in unsatisfactory standing and the GRAD will be notified. The qualifier increase will be restored upon the filing of the report, but the student will forfeit the raise for the months (or parts thereof) during which the report is late. If no report is filed by December 1 of the year it is due, the student will be separated from the MCB Program.

If either the Thesis Advisor or student wants to end the relationship, then the following must occur:

1. The reasons for the action must be stated in writing.
2. The AC must be made aware of the issues.
3. The student and/or Thesis Advisor must be given an opportunity to rectify the problems.
4. The conditions that must be met to rectify the problem should be approved by the AC and communicated in writing to the student and to the Graduate Committee.

D. Composition and Functions of the Graduate Committee

MCB Graduate Committee is comprised of 10 faculty members appointed by the chairs of the five component programs (2 per program). From these 10 members, the Department chairs will select a Chair and a Vice-Chair to lead the Graduate Committee. Each Chair will begin as Vice-Chair while working with the current Chair for one year (July 1 through June 30). The Vice-Chair will then take over the position of Chair for a two-year term with a final year as Vice-Chair following the two-year term as Chair. The terms for both positions are staggered to provide coverage at all times for the Graduate Committee. Both the Chair and Vice-Chair positions will rotate among the five component programs.

There are also five student representatives to the Graduate Committee who are chosen by student vote. Generally, one student from each program will serve one-year terms as reps. MCB tries to balance student representation with one from each program and two from each campus. The reps attend every meeting, help review applications, and are indispensable during recruiting.

GC faculty representatives will recuse themselves from GC votes regarding their own students (academic issues, move to Masters track, research performance, etc.). The faculty member/advisor can be present to answer questions and provide background information if appropriate. Should the faculty member/advisor in question be the Chair of the GC, then the Vice-Chair of the GC will preside over the discussion and subsequent vote. The Vice-Chair would then communicate the outcome of the meeting to the student.

The functions and responsibilities of the Graduate Committee are:

1. Oversee the student application process, review applications, develop an interview list, conduct interviews of prospective students, and recommend applicants for acceptance to the Dean of GRAD.
2. GC faculty will serve as mentors to first year students. The mentor is in essence a pre-thesis advisor who assists with picking research rotations, helps with core course issues/questions, selection of electives, journal clubs, etc. The first meeting between the student and mentor is mandatory and scheduled by the MCB Office. Subsequent meetings are at the discretion of

the student and mentor.

3. Approve the composition of each student's AC and approve changes (if any) in the composition of these committees.
4. Serve as an arbitrator for disputes, when required and warranted by the circumstances, should differences arise among members of a student's AC or between a student and one or more members of the student's AC, including the Thesis Advisor.
5. Approve assignment of students as teaching assistants to various courses, as required, in consultation with the Chair of Biological Sciences and/or faculty teaching these courses.
6. Inform appropriate Program faculty (Thesis Advisor, AC, etc.) when a student is in jeopardy of being separated from the Program (see Section I.C.).
7. Oversee the conduct of the Program, ensure that all the rules agreed to by the program faculty (i.e. those contained in this document) are followed, and determine that each student has specific plans for meeting the requirements of the Program and is successfully making progress toward the Ph.D. degree.
8. Maintain a list of courses that have been approved (by the MCB GC) as appropriate for fulfilling the requirements for elective courses. Faculty wishing to have a new course approved should submit a description of the course to the MCB Office outlining the content, approach, and how students will be evaluated.

E. Transfer Students and Students Holding an Advanced Degree

In some instances, exceptions to the rules outlined in this document may be made for students entering the MCB Program with an advanced degree (e.g. M.A., M.S.) in molecular and cellular biology (or another appropriate area) or with substantial laboratory research and/or graduate level course experience from another graduate program. In some cases, students may receive a reduction in the requirements for the degree outlined in this document. Such modifications in the requirements will be decided on a case-by-case basis by the GC as the need arises and will be clearly documented by appropriate written documentation that becomes part of the student's formal record of participation in the MCB Program. However, one rule that cannot be waived by the GC is the rule governing three research rotations. Note that students who transfer with a Thesis Advisor who comes to Dartmouth with a new appointment in one of the component programs of the MCB Program are not required to complete three research rotations, as long as they remain in the Thesis Advisor's laboratory. Students who transfer under these circumstances sometimes receive their Ph.D.'s from the prior institution and follow its requirements. However, such students may apply for transfer to the MCB Program. In these cases, the GC will decide whether the student can be admitted to the MCB Program, and which MCB requirements they will need to fulfill. Candidates for the Ph.D. degree are required to spend a minimum of either six terms or two academic years in residence in the Program.

F. Departure of Advisor from Dartmouth

There are four distinct options for students should their advisor leave Dartmouth to join another institution. In all circumstances, the student and Thesis Advisor are required to notify the MCB Graduate Committee in writing PRIOR to the move with their decisions.

1. The student may choose to remain in the MCB Program, and transfer to a new lab at Dartmouth. This option requires the naming of a new Thesis Advisor from among the MCB faculty. It is up to the student and new advisor if they would like the outgoing advisor to serve on the student's Advisory Committee.
2. The student may choose to continue to work with the outgoing advisor but remain in the MCB Program and work in Hanover. In that case, a new MCB Thesis Advisor must be named with the original advisor remaining a member of the student's Advisory Committee, attending RIPs, committee meetings, qualifying exam, etc.
3. The third option is that the student would move with the outgoing advisor to the new institution while remaining an MCB student. The student will be required to name a new MCB Dartmouth-based Thesis Advisor, to enroll in graduate research at Dartmouth each term, and to meet all program requirements while studying off-site. The student will be required to return to campus for his/her annual RIP and Advisory Committee meeting with both advisors and complete all course requirements. Also required is the fulfillment of the journal club attendance during Fall, Winter and Spring terms. If the new institution does not have journal clubs or will not allow the MCB student to attend, then the student must petition the MCB Graduate Committee prior to the move to request a waiver of this requirement. Should the move off campus occur prior to the student's completion of the teaching assignment, that requirement may be waived upon the approval of the MCB Graduate Committee.
4. Option four is that the student withdraws from the MCB Program to follow the lab of the outgoing advisor and join the new institution's graduate program.

II. PROGRAM REQUIREMENTS FOR THE PH.D.

There are eight major requirements for the Ph.D. degree: (1) Research rotations, (2) courses, (3) one term of teaching, (4) successful completion of the qualifying exam, (5) attendance at program functions, (6) written thesis, (7) thesis seminar and defense, and (8) submission of final thesis. When the research rotations, three-term core course, and qualifying exam have been completed satisfactorily, the student will be advanced to candidacy for the Ph.D. degree. Students can be advanced to candidacy with some elective coursework outstanding. Specific details relating to these requirements are described below and in the following section. Failure to fulfill these requirements as specified may place a student in unsatisfactory standing, as defined by the GRAD Student Handbook (located on GRAD website, Graduate Registrar) and may lead to separation from the program.

A. Required Research Rotations

Each first-year student is required to perform three research rotations in three different laboratories during the first year in the Program. Rotation assignments will be made by the MCB GC based on ranked choices submitted by both students and faculty. Each rotation will last approximately three months. Grading for the rotations will be “CT” or “NC”.

A list of Rotation and Term dates are distributed to first year students during orientation. The timeline includes start and end dates for rotations, when students may begin talking with faculty about a rotation, date for submitting ranked list to the MCB office. This timeline is also sent to all faculty at the start of the Fall term. Students are required to talk with at least 4 faculty with whom they would like to do a research rotation.

Students send a ranked list of those faculty to the MCB Office. Faculty also send a ranked list of students they will take for rotation that term. The MCB Graduate Committee will finalize the matches and then send an email to MCB with the rotation list. If a student fails to match with a lab for a rotation, the MCB Office will work with the student and faculty to find a suitable match.

In May, students and faculty will begin talks to determine thesis labs matches. Lists from students and faculty will be sent to the MCB Office by the specified deadline and the Graduate Committee will confirm each match and then email all with the final matches. Once the thesis lab matches are confirmed, students will be asked to complete the thesis lab agreement form which requires student and advisor signatures before returning to the MCB Office.

We ask that students and faculty NOT begin rotation or thesis lab matches before the specified dates each term. Everyone should have a fair chance to match to the lab of their choice.

1. Additional Research Rotations

- a) Additional rotations may be completed if a first year student does not match with their three rotation labs.
- b) A senior student in a thesis lab may also seek a fourth rotation under special circumstances associated with their thesis lab (conflicts, research going in new direction away from lab focus, funding, etc.).
- c) A fourth rotation may be of shorter duration than standard rotations – for example, 6 weeks instead of 12 - at the discretion of the Graduate Committee.
- d) Additional rotations need Graduate Committee approval and the faculty member must state that s/he has the funding to support student should the student join the lab for thesis research.

2. Rotations with Non-MCB Faculty

During the second and third rotations, students may rotate with any faculty member that is a member of MCB or comparable Ph.D. Programs at Dartmouth. In the event that a student admitted into a comparable Ph.D. program chooses to pursue their thesis research with a faculty member in the MCB Program, the student and advisor will write a letter to the MCB Graduate Committee informing them that the student requests transfer to MCB. If approved, the student will join the MCB Program and be required to fulfill all requirements of MCB students (e.g. one term of teaching, six terms of courses, journal clubs, annual RIPs, qualifying exam, etc.) as outlined in these Rules and Regulations.

MCB students who join the lab of a faculty member with dual membership (membership in both MCB and other comparable Ph.D. program) will remain a MCB student and be bound by the requirements of the MCB Program.

B. Course and Grade Requirements

Graduate students are required to perform satisfactorily in ten separate areas in which they receive grades. Every student is required to participate in three research rotations, an approved ethics course, and a three-term core introductory course sequence during their first year. After joining a thesis lab, students are required to enroll in a research course every term that corresponds to their Ph.D. program (BIOL, BIOC, CANB, GENE, MICR) and the number of units required to bring their enrolled unit total to 3 (x99 = 3 units, x98 = 2 units, x97 = 1 unit, where x = 1 for pre-qual students and x = 2 for post-Qual students). In addition, each student must earn four additional course credits prior to graduation. One of these four required courses must be a teaching course, assigned by the GC, normally in the student's second year in the Program, which fulfills the one-term teaching requirement. The remaining three MCB approved elective courses should be chosen in consultation with the student's AC.

The MCB approved list of course offerings can be found on the MCB website. Approved elective courses normally meet for a complete term (about ten weeks) either three times per week for 65 minutes each or twice per week for 100 minutes each or once per week for approximately 3 hours. Thus, a full-term course meets for about 25-30 contact hours per term and counts for one course credit of the required three course credits. Courses completed with a grade of No Credit (NC) will not count toward the three-course requirement.

Grading Process

1. MCB research course and journal clubs are graded on a CT (credit), NC (No Credit) scale. MCB core and elective courses are graded on a HP (High Pass), P (Pass), LP (Low Pass), NC (No Credit) scale. Core classes are required of all first-year students. Fall-term core and

Winter-term core are scheduled for the entire term. Students will receive a grade for each term's core course. Spring- term core is divided into three sections consisting of course modules. Each Spring module will be graded individually resulting in three grades for the Spring term. First year students are required to complete three modules – one module in each 1/3 of the term - resulting in three grades for the Spring term core.

2. Grades of "LP" or "NC" in rotation research, journal club, thesis research, teaching or elective course work, (collectively referred to as 'course' or 'courses' below) have serious consequences, as follows:

One grade of "LP" or "NC" in any term in any course results in the student immediately being placed on probation. For the Spring term core course, a LP in two modules is equivalent to a LP for the term and a NC in one module is equivalent to a NC for the term. Once placed on probation, any one of the following three conditions will constitute grounds for immediate separation from the MCB Program:

- a. A grade of "NC" earned in any course in any subsequent term.
- b. A grade of "LP" or "NC" in any term of the core course.
- c. An aggregate total of two additional "LPs" earned in any subsequent courses.

Course Credit

1. Courses that are not pre-approved: If a student wishes to take a course for elective credit that is not on the approved list or is offered at another institution, the student must petition the MCB GC and obtain approval before the course begins. If the student fails to obtain approval prior to enrolling in the course, elective credit will not be given.
2. Courses with modified content: Some approved electives change topics from year to year. In order to receive course credit for taking the course more than once, the student must receive pre-approval from the GC by presenting documentation demonstrating that the course topics are different with little or no overlap of content.
3. Internships: There are two course listings available to students considering an internship or training with an off-campus institution will need to petition the MCB GC for pre-approval.

MICR295 is a one credit elective course that still requires the student to enroll in research and journal club. Stipend support will continue to be covered by the student's Thesis Advisor when the student enrolls in MICR295.

The MICR128 course is a full time 3 credit course available only to students in their years 4+ and are at least 6 months from graduation. For both courses, the student must provide information about the internship or training with a specific timeline and its relevance to their

research. The student's advisor should provide an email request to the Chair of MCB with specific details about the opportunity. The MICR128 internship may be paid or unpaid by the host enterprise **or** by Dartmouth stipend, depending on arrangement with their Thesis Advisor

4. Transfer students: Students who transfer from another graduate program may seek approval of courses that were taken at that institution. Such approval will proceed on a case-by-case basis, but approval must be sought within one year of matriculation into the MCB Program.
5. First year students with prior MS degree: Students with advanced degrees from other U.S. institutions may petition MCB for transfer of up to three course credits from the previous advanced degree. Each petitioned course must in some way parallel an existing approved MCB course. A syllabus for the petitioned course should be provided along with information on the existing MCB course for which the student wants credit. The petition must be received by the MCB Office within one year of completing the outside course or of entering the MCB Program at Dartmouth. The petition will be reviewed by the MCB GC on a case-by-case basis.
6. Program specific requirements: Some programs within MCB may set additional course requirements, either by requiring specific courses or by requiring the student to select electives from a list that is a subset of the list approved by the GC. In addition, the AC can recommend that a student take more than the minimum required number of courses to provide that student with an academic background appropriate for pursuing research in the student's chosen area of investigation. For example, a student using NMR spectroscopy may require a more extensive background in chemistry than is provided by the minimal course requirements. If such courses are to count towards the three required courses, they must be from the approved course list, or the student and advisor must petition the GC that the course be approved. In all instances where additional courses are suggested, the proper procedure to obtain elective credit will be for the AC to make a recommendation to the GC, which will have the final authority in this area.
7. Concurrent degrees: Students interested in enrolling in a Master's Program offered at Dartmouth, to run concurrently with their Ph.D. degree studies, must meet certain requirements and receive approval from their Thesis Advisor, Advisory Committee and the MCB Graduate Committee prior to enrolling in the Master's Program. All MCB Program requirements (including three approved elective courses) must be successfully completed before such a request will be considered. Additional courses, after completion of MCB courses and Program requirements, must be approved by the student's Thesis Advisor and Advisory Committee prior to enrollment. The student will be required to complete the Request for Enrollment in Second Degree Program at Dartmouth form (available from the

MCB Office) and have their Thesis Advisor and Advisory Committee members sign the form. This completed form must be conveyed to the MCB Office for consideration by the MCB GC.

C. Seminar, Research in Progress (RIP), and Journal Club Attendance

Attendance at the following three program functions is required of all MCB graduate students:

1. Students will attend MCB Program seminars such as RIP and departmental seminars. In addition, first year and new transfer MCB students are required to register for Biology 271 - "Research in Progress Colloquium" in the Spring term of their first year in MCB and attend at least 60% RIP seminars. This course is designed to monitor attendance at RIP seminars throughout the first year of graduate school.
2. Students in their third year and beyond are required to present a RIP seminar each year (defined as the period from July 1 to June 30) in which the student is enrolled for research credit in two or more terms. The order of presentation will be decided by the GC but normally, presentations will begin in the Fall with students who have been in the program for the longest period. Reciprocal, mutually agreeable exchanges in RIP assignments each year can be made by any pair or group of graduate students with approval of the Thesis Advisors and the MCB Office. In the year in which the student expects to defend his/her thesis and receive the Ph.D., the student must still present a RIP seminar unless the name of the outside examiner and the defense date have been sent to the MCB Office before August 15.
3. Participation in one of the journal club series approved by the GC is also required during the Fall, Winter, and Spring terms. Participation is not required during the term in which a student's Ph.D. defense is scheduled, provided the student notifies the MCB Office of the date of the defense and the name of the external examiner prior to the withdrawal deadline for the course. Choice of a journal club to attend will be made by the student, but some faculty may require students to attend an appropriate journal club during a student's research rotation in their lab, and students who have chosen a thesis lab may be required to attend specific journal club(s) as specified by their Thesis Advisor or AC. It is expected that students, beginning in their second year, will present at least one oral presentation per year in a journal club.

D. Qualifying Exam

Students will begin to write a Qualifying Exam Proposal as early as possible during their 2nd year. The proposal will outline the student's intended dissertation research plan and be written in cooperation with the Thesis Advisor. Specific details about the procedure for writing the

dissertation proposal are provided in the following section. Briefly, the format must follow that of the current NIH format for F30 or F31 applications. The qualifying exam proposal will contain 2-3 aims that address the central questions driving the student's thesis research. At least one aim should be an original conception of the student rather than an aim previously formulated in the thesis lab. The novelty of the student's original aim may be in the hypothesis tested, molecular mechanism evaluated and/or technical approach. The written proposal must be approved by the Thesis Advisor and submitted to the QE by June 1 (between the student's 2nd and 3rd years) but will not be formally assessed by the QE committee nor feedback given on the written proposal.

In parallel, the student will independently conceive of and write a brief abstract describing a Mock Research Idea. The mock research idea must be novel and cannot be based on any project currently being conducted in the student's lab. Hypothesis-based questions, unbiased screening studies, or innovative technique development ideas relevant to molecular and cellular biology are all acceptable. The abstract should include background, significance, a brief description of the idea, and any relevant references. The abstract should be as concise as possible; details should be explained during the oral examination.

The entire qualifying examination (assuming no second attempts) must be completed by October 1st in the Fall of the 3rd year at the latest, and must adhere to the following schedule:

1. The student and Thesis Advisor will select two members of the QE committee, at least one of whom must be a member of the MCB program, no later than March 1 of the student's 2nd year. These two members, after an initial reading of the dissertation proposal, will then recruit a third QE committee member. The original two members of the QE committee will continue to form the student's Thesis Advisory Committee throughout their dissertation studies.
2. The written dissertation proposal and mock research idea abstract will be simultaneously distributed to the QE committee no later than June 1. No formal assessment, revision or approval of either document is required from the QE. Rather the dissertation proposal and mock research idea will provide topics to be discussed and probed during the oral examination.
3. The student is responsible for scheduling the oral examination meeting. The oral part of the qual exam must be completed no later than October 1 of the student's 3rd year.
4. A majority decision of the QE committee members is required for a student to pass the exam. If the student does not pass the exam, he or she will have one opportunity to retake the exam within 4 weeks, unless there is a unanimous vote of QE committee members not to offer a

retake.

5. Students should enroll in GENE100 during the summer of their second year in order to receive a grade for their qualifying exam no matter which term they defend. A grade of HP, P, LP or NC is decided by the QE committee members and communicated to the MCB Chair.
6. The MCB Chair, in cooperation with the Thesis Advisor and Department Chair, will determine whether reasons for delay beyond October 1st are acceptable.

Written Proposal Guidelines

The qualifying exam proposal should explain the questions that the student intends to pursue within the next three to four years of graduate training. The proposal should contain 2-3 specific aims (including one original aim), and rigorously and critically defend the rationale and choice of approach. The proposal is written by the student (in cooperation with the Thesis Advisor) and should conform to the current format for the specific aims and research strategy components of an NIH F30 or F31 pre-doctoral fellowship application. The student may include preliminary data (appropriately attributed if generated by other workers), but the student may not copy text from any other sources (violation of this rule would be considered plagiarism). The Thesis Advisor should not directly write any portion of the text. The Thesis Advisor is expected to suggest potential avenues for research and provide feedback on grantsmanship for most of the proposal except for the one original specific aim, which must be conceived and written by the student without any input from the Thesis Advisor. This original specific aim should be clearly marked as such in the final document.

The dissertation proposal may be either hypothesis-based or needs/discovery-based, and should clearly describe:

1. The overarching questions that will be addressed and the reason why this is an important question to answer
2. The central hypothesis or needs/discovery goal
3. The specific aims and how they will test/address the central hypothesis
4. The necessary background information for each aim, the rationale, experimental approaches, outcomes (both consistent and inconsistent with the hypothesis), interpretation (including controls), and pitfalls
5. The impact of the research: how will completion of the project change the way scientists look at this area of biology or open new areas of biology.

Oral Examination Guidelines

At the oral examination, the student will present a private, prepared seminar to their QE Committee on their proposed dissertation work (~ 10 slides or 15 minutes total).

The student will be assessed for whether they have thought deeply about the dissertation project and taken intellectual ownership for it. The student will be asked many questions about any aspect of the proposal. For example:

1. What is the justification for choosing the proposed central hypothesis/ over alternative explanations?
2. How familiar is the student with the background literature and the broader context of the field of study?
3. Why were particular experiments chosen? How will they be carried out? Which controls will be required? How would particular hypothetical outcomes be interpreted? Are there alternative experimental approaches that might address any gaps.
4. If one specific aim cannot be experimentally resolved, will progress be blocked on the other aim(s)?
5. Is the student aware of related areas of scientific inquiry?
6. Is the student capable of thinking critically and creatively in responding to hypothetical outcomes or unfamiliar experimental concepts?
7. Being prepared to successfully answer these questions will require tremendous amounts of reading and synthetic thinking during the preparation of the proposal, but more importantly, throughout the entire period of time working in their lab.

The student may also be asked to briefly explain and/or illustrate the significance and principle of their Mock Research Idea without prepared slides, as in a chalk talk (~5 minutes). A model may be drawn on the board. Again, students will be assessed for their ability to think critically and rigorously when answering experimental and theoretical questions related to their Mock Research Idea.

It is recommended that the entire Oral Examination be completed in less than 3 hours, although the QE committee may decide to extend it if necessary.

E. Thesis and Thesis Defense

For the Ph.D. degree, the student shall show competence in original research and shall prepare a doctoral dissertation containing the results of their independent studies. The thesis should present a coherent investigation of an original scientific research question at a level of rigor suitable for publication in a peer-reviewed academic journal. It should also include a thorough and critical analysis of the published literature in the field, and of the methodological and theoretical background of the work. Before beginning to prepare the thesis, the student must obtain

approval from the AC. As students begin preparation for the thesis defense, they must contact their program office (Biology, Biochemistry & Cell Biology, Cancer Biology, Microbiology & Immunology, Molecular & Systems Biology). This is essential to help ensure that the student and program work together to follow all graduate school policies so that the student will be able to graduate on their projected date. Students are advised to visit the GRAD website for information about thesis preparation and formatting (<http://graduate.dartmouth.edu>). Upon completion of a thesis approved for defense by the Thesis Advisor, the Thesis Advisor in conjunction with the student will assemble a Thesis Exam Committee and obtain the approval of the composition of this committee from the GRAD (Guarini School for Graduate and Advanced Studies), which has final authority over the membership requirements.

The Thesis Exam Committee will consist of a minimum of three full-time Dartmouth faculty members of which a minimum of two must be from the MCB Program (including the Thesis Advisor) as well as an external member with a faculty-equivalent research appointment outside of Dartmouth. The external member may participate in meetings in person or via video conference. The Thesis Exam Committee will usually be the student's AC plus a fourth person who is usually a scientist that is not a member of the Dartmouth College faculty. If one member of the AC is not a MCB faculty member, they can serve on the Thesis Exam Committee only with the approval of the GRAD. It is imperative that the student inform the GRAD in sufficient time to allow for approval of the composition of the Thesis Exam Committee. The student must inform their program office of the composition of the Thesis Exam Committee and of the expected date of the defense.

Students must give each member of the Thesis Exam Committee a copy of the thesis at least two weeks before the date scheduled for the defense. Students planning to participate in the formal GRAD or Dartmouth College June graduation exercises should be aware that both the GRAD and the programs set deadlines regarding the submission, examination, and approval of theses. Typically, these deadlines occur during the month of May. It is each student's responsibility to work with their program office to ensure they meet these deadlines to participate in commencement. Students must contact their program office with date, time, and location of their thesis defense seminar for distribution of public seminar notices. If any member of the examination committee finds that the submitted thesis is inadequate, that member must immediately communicate their concerns to the Thesis Advisor and the other members of the examining committee, which may cancel the thesis defense as late as 48 hours before the scheduled time of the defense. Concerns from the outside examiner may be communicated up to 72 hours prior to the scheduled defense to allow the committee time to meet the 48-hour deadline.

Following a publicly announced and delivered seminar on the thesis material, the doctoral candidate will defend the dissertation privately before the Thesis Exam Committee. The Thesis

Advisor is responsible for promptly notifying the MCB Office of the outcome of the defense. Should this committee find the thesis itself or the student's understanding of the thesis subject area insufficient for the conferral of the Ph.D. degree, the student shall be informed of the deficiencies and the areas that require modification. The thesis may be revised, and the thesis defense may be repeated once, and insofar as possible, the composition of the examining committee shall remain unchanged. The exam committee will determine an appropriate deadline for the revised thesis to be submitted. If a student fails to satisfy the concerns of the Thesis Exam Committee after a second attempt, the student will be immediately separated from the Program.

The student thesis can be approved provisionally, pending corrections and minor modifications recommended by the examining committee. Normally, the student's advisor will monitor these changes and upon satisfactory completion of them, permit the student to submit the finalized thesis to the GRAD. The final thesis must be received by the GRAD before a student will be awarded a Ph.D. degree.

III. TEACHING BY GRADUATE STUDENTS

A. Teaching Assignments (TA) and Senior Student TA Fellowships

An essential element of graduate education at Dartmouth is the experience gained in teaching. Therefore, at least one term of teaching is required of all MCB students.

Evidence of the successful completion of this requirement will be indicated by the student having received a passing grade in Biology 169 (Supervised Teaching in Biology) or equivalent. This teaching requirement is normally completed by serving as teaching assistant for one term during the second year in the program. The nature of the term system at Dartmouth means that this obligation will normally be fulfilled in the Summer, Fall, Winter, or Spring term of the second year, depending on the course assigned, but may be completed later with the approval of the GC. When assisting in a course, a graduate student will be expected to devote about 200 hours per term to this responsibility, which includes time spent in the teaching laboratory or discussion sessions, grading papers, attending lectures, lab preparatory sessions, etc. Faculty member(s) in charge of a course cannot require that teaching assistant(s) contribute more than 200 hours per term. One term of teaching fulfills one of the seven courses required for the Ph.D. Under no circumstances may students opt out of this requirement by having their advisors use research grant funds, for example, to pay a substitute.

At the end of the first year, the Graduate Committee will distribute to the first-year students a list of courses requiring a TA. Students will submit a ranked list of TA preferences. Teaching assignments will be made by the Graduate Committee in consultation with the faculty teaching the courses, taking into account student preferences. Subsequent responsibility for detailing TA teaching obligations (including such matters as examination and report grading, preparation of materials for the laboratory, lab and discussion responsibilities, etc.) rests with the professor(s) in charge of the course. Note that opportunities can arise from time to time for more senior students who would like greater teaching experience to participate in more than the minimum one term requirement. However, this requires that adequate teaching positions are available to accommodate the interested student(s) and that the advisor agrees, in which case final approval of the arrangement by the Graduate Committee is required.

Teaching assistants are expected to begin their duties no more than one week prior to the start of

a course, and they are required to be available until the final grades are submitted, normally 1 week after the exam period (no vacations during this period). If, because of illness or some other legitimate reason, teaching assistants are unable to meet their teaching obligations, they should inform the appropriate faculty member so that adequate replacements can be found.

At the end of the teaching term, the professor in charge will:

1. Report a grade (HP, P, LP, or NC) for the course Biology 169 (Supervised Teaching in Biology) to the Biology Office for the student(s) who completed the TA(s)
2. Submit to the Biology Office a brief paragraph for placement in the student's folder, describing the student's teaching skills, especially noting any extraordinary ability (or any deficiency) that formed a basis for the grade. Such reports form a portion of the student's permanent record and could be quoted in subsequent letters of recommendation for faculty positions, etc. In instances of serious deficiency, the GC can require that the teaching experience be repeated but note that this will occur without the expenditure of additional program funds.

Teaching Assistantship Funding

Information excerpted from FOA document and elaborated here

In their second year in the Program, students are expected to perform a single term as a teaching assistant (TA). Students do not receive payment for this teaching requirement and their stipend support remains the responsibility of their thesis advisor during this period.

1. Too Many Students vs. TA Slots:

If more students are available to serve as TA than are required, some students may be offered the option to defer their teaching responsibility to the following year. Stipend support expectations are not affected by deferrals.

2. Too Many Slots vs. Number of Students in Year Two:

In certain cases, the Program may offer senior students the opportunity to serve an additional term as a TA. In such cases, the Program may offer to provide stipend support for the student up to the level of 6 month's stipend. The stipend support will be used to offset support provided by the mentor, not to increase the student's stipend. In 2016, it was instituted that a bonus would also be given to each Sr. TA in the amount of \$2,000. The bonus is paid via timesheets submitted by the student for the requisite period to equal \$2,000.

3. Students Leaving Program Before End of Year Two:

Costs (stipend/insurance) incurred by students who leave or are separated from the Program

during their first year will be borne by the Program -- to the extent that Program resources permit -- by using funds that are surplus from other categories (recruitment, seminars, etc.) and/or by funds available to department chairs. In years when alternative Program resources are insufficient to meet the costs associated with students who leave the Program prior to the end of their second year, the balance of these costs not covered by Program funds will be distributed equally, on a per rotation basis, over the students remaining in the Program.

Teaching Assistantship Assignment Procedures:

Late May - MCB will contact the Chair of Biology with number of students available for TA'ing (Year One students, previous year's deferrals, transferees) and requesting a list of undergraduate and graduate courses in need of TAs. Biology will provide a course list that includes course number/title, course director, term(s) taught, number of TAs required. This list will be sent to the students at the end of their 1st year in the program. The students will provide a ranked list of preferences of which courses and terms they would prefer to TA.

MCB Office sends the Chair of Biological Sciences the list of students along with their preferences.

June – The Biological Sciences Chair will, after consultation with faculty, send the MCB Office a finalized list of the courses and the names of students assigned to each (noting which term when offered more than once per year). This list will need approval of the MCB Chair. Then it is sent to all TA'ing students and their advisors plus Program AAs for tracking purposes.

B. Core Course Mentoring Fellowship

Molecular and Cellular Biology Core Course Mentoring Fellows: Limited opportunities exist for current MCB graduate students at Dartmouth to work with incoming students to help support effective transition to graduate classroom life. Fellows will be selected by their course director.

Description:

Current MCB graduate students at Dartmouth who previously received a grade of HP in the MCB core class will work with incoming students to support the effective transition to graduate classroom life. We do this by matching incoming students identified by Core class faculty to current students who serve as their mentors.

Through this experience, and in consultation with course faculty, mentors will develop skills in:

1. Helping new students develop study skills to master classroom material.

2. Answering questions about Core class topics and materials.
3. Reviewing past class material and/or exams to ensure sufficient mastery of core MCB topics.

This is a one term fellowship and may be renewed at the request of the core class faculty coordinator and MCB chair.

IV. STUDENT POLICIES

A. Procedures in The Case of Potential Separation from the Program

If a student faces potential separation from the Program due to course grades or other reasons or is denied advancement to candidacy due to failure at two attempts of the qualifying exam or other reason, an Assessment Committee will be convened to review the student's overall record and the pending separation prior to final action. The Assessment Committee will consist of the student's Thesis Advisor, the student's AC (if one has been formed), or the thesis exam committee (if a thesis has been submitted and the thesis and the thesis defense attempted), and the faculty and student members of the MCB Graduate Committee. If all these members cannot be assembled for a meeting in a timely manner (generally within about two weeks of being notified of the pending action) a majority of the members will constitute the Assessment Committee. The chair of the Graduate Committee will serve as Chair of the Assessment Committee, unless the Chair is the student's Thesis Advisor. In such case, the Vice-Chair of the Graduate Committee will serve as Chair. Students or faculty members who feel they might have a conflict of interest that would compromise their ability to make a fair and impartial decision, should absent themselves from the Assessment Committee and associated meetings. The Assessment Committee will function as a democratic committee with a single vote for each faculty member present and the final decision will be arrived at by closed ballot votes. The student members of the MCB Graduate Committee will not vote.

The Assessment Committee will review the overall performance of the student with respect to whether the student is qualified for a productive scientific, or related, career and as to their potential capacity for achieving Ph.D. level of scientific development within a reasonable timeframe. They will also consider any extenuating circumstances brought to their attention by the student, Advisor, or other informed party that may have contributed to the poor performance. Information about extenuating circumstances should be brought to the attention of the Assessment Committee by the student, Advisor or other informed party. In extraordinary instances, the Assessment Committee may recommend an alternative course of action to that which would normally be stipulated by the MCB rules and regulations for the particular circumstances that prompted the review process. Such a recommendation requires a 2/3 majority vote of the Assessment Committee.

1. MCB Chair will notify current research advisor of scheduling of Special Assessment meeting by the Graduate Committee. Also, course directors for any sub-“P” courses.
2. MCB Office will set up Special Assessment meeting within two weeks (if possible) of determination of need. Two hours should be scheduled per meeting.
3. If the case involves a first year student, MCB Chair will contact and solicit information from core course directors, rotation faculty, any others pertinent to the case. Said people may be invited to attend the Special Assessment meeting but will not cast a vote on the final outcome of the case.
4. MCB Office will forward pertinent materials to the MCB Chair prior to the meeting. This will include academic standing, requirements completed, rotation evaluations, interview evaluations, original application, etc.

STUDENT APPEAL OF MCB GRADUATE COMMITTEE DECISION

Should a student decide to appeal the decision following a special assessment meeting, there is no formal appeal structure in place. The Graduate Studies Office will not review or override any decision an MCB Special Assessment Committee and would instruct the student to communicate with the Chair of MCB for any appeal.

Although we have not been involved in any legal appeal brought by a student, that is an option open to the student. Should this occur, the MCB Chair will consult with the Dean of Graduate Studies for guidance on how to proceed and who within Dartmouth/Geisel should be consulted regarding legal standing and procedures.

See excerpt below from GSO Student Handbook regarding appeals by students.

Appeals Board on Standing and Conduct for Graduate Students in Arts and Sciences Programs

1. **Membership.** The Appeals Board on Standing and Conduct for graduate students in Arts & Sciences programs shall consist of three students and four faculty members. The chair must be a faculty member and will be chosen by all members selected to serve on the Board. At least two of the faculty members (including the chair) must be from a graduate program or department.
2. **Election and Appointment.** When requested by the Dean, four faculty members will be selected by lot from members of the Council on Graduate Studies (excluding the Dean). The three student members from the Graduate Student Council will be selected by lot by the

Council on Graduate Studies. No student shall be eligible to succeed him or herself on the Board. The Chair will vote only in the case of a tie. In the event a member shall disqualify him or herself from the Board, a replacement shall be selected by lot from among all the remaining members of the group that individual represents on the Board.

3. **Jurisdiction.** The jurisdiction of the Appeals Board shall be appellate. It shall hear appeals by graduate students only after action has been taken by the Dean of Graduate Studies. In matters of conduct, its decisions will be final, though it must rehear a case if requested to do so by the President. In matters of academic standing, its findings will be advisory to the Dean of Graduate Studies and to the department or program involved.
4. **Conduct of Business.** The Appeals Board may adopt by majority vote such rules and procedures as are necessary for the conduct of its business. Decisions of the Appeals Board shall be determined by majority of the Board.
5. **Confidentiality.** Decisions of the Appeals Board may be made public, but in no instance shall the name of the student concerned be divulged. Reports, records, and the deliberations of the Appeals Board are not to be examined by or revealed to any person or persons other than College personnel authorized by the Dean of the Faculty. Records and reports shall be destroyed immediately after they have lost any reasonable usefulness. The privacy of the student is to be protected.
6. **Reports and Record Keeping.** The Secretary of the Council on Graduate Studies will be the recorder of the Appeals Board deliberations and will prepare reports at the request of College personnel authorized by the Dean of Faculty.

B. Leave of Absence Guidelines and Return to MCB Program

A student requesting a Leave of Absence will submit the request to the MCB Chair in writing (email). The Chair will discuss the request with the student and the student's advisor (or the Grad Committee mentor for first year student) to determine action and timeline. If a leave of absence is deemed advisable, the Chair will petition the GC with the request noting the proposed timeline and requirements for return (if applicable). This may be done via email if the leave circumstances are straight forward. If not, a meeting of the GC may be called for discussion of the leave.

Items to discuss/consider:

1. Stipend support during the leave is suspended

2. Health insurance premiums become the responsibility of the student
3. If leave starts mid-term, withdrawal from courses is advised
4. During leave, student will not be enrolled but will remain a student (with active email)
5. Date for official beginning of leave
6. Date for notifying MCB Office of intentions to return to the program, request extension of leave, and/or withdraw from the program
7. Date for return to program
8. Meeting required with the MCB Chair upon return

Upon approval, the Chair of the GC will write a letter to the student (cc: GRAD Registrar, Thesis Advisor, MCB Office) stating the approval, timeline, special circumstances, and responsibility for health insurance costs (if enrolled in Dartmouth insurance plan) and stipend suspension during the leave of absence.

Consult OVIS immediately if the student requesting leave is an international students.

In the event the student wishes to complete an internship during the leave, the internship must not be related directly to the student's ongoing thesis research.

Leave of Absence - Return to Program

When a student, currently on Leave of Absence from MCB, indicates in writing that he/she is ready to return to the Program, the Chair should set up a date/time to meet with the student upon arrival on campus. The discussion should review the reason(s) for the Leave, then move on to the expectations and requirements of MCB for the student in rejoining his/her studies.

The meeting is also a way for the Chair to ascertain the student's state of mind and well-being regarding resumption of research and studies. Following the meeting, a letter will be sent to the student stating the expectations and requirements for the student's progress in the Program (cc: Gary Hutchins in GRAD and the MCB Office on letter).

C. MCB Student Grievance Policy

The committee-based process for guiding graduate student progress in MCB, while primarily designed to oversee scientific progress and direction, is also intended to guard against biased treatment of any individual. We have also established a grievance process consisting of multiple stages, to ensure that student grievances will be investigated fully and fairly, treated confidentially, and decided in a timely manner. With an effective oversight/grievance committee structure, few grievances or disputes will reach the stage where they require formal resolution. However, when departmental and informal resolution is not feasible or successful, the graduate

office is the next place to turn. A grievance may be handled as appropriate in the following stages:

1. When possible, speak directly to the person who bears responsibility for the complaint or who is the alleged cause of the complaint.
2. Speak to the Thesis Advisor and/or members of the Thesis Committee or AC.
3. Speak to the Chair of the MCB Graduate Program and/or the Chair of the department.
4. If a satisfactory resolution cannot be reached within the department or program, the aggrieved student may request a meeting with the Dean of GRAD to discuss the issue.
5. If the Dean, working together with the aggrieved student and appropriate faculty member(s), or representatives of the MCB Program is unable to reach a satisfactory resolution, the student can request in writing a formal hearing and ruling by the Deans and the Committee on Student Grievances. Formal hearings are conducted as described in the Guarini Student Handbook (see sections titled “Committee on Student Grievances” and “Formal Hearing” under Academic and Conduct Regulations).

Please note that allegations of scientific misconduct, violations of the academic honor principle, and certain issues of professional and personal conduct (sexual harassment, discrimination, and others described in the graduate handbook under code of conduct – non-academic regulations) must be reported to and handled by the Guarini Graduate Registrar.

D. Accommodations for Disabilities / Student Accessibility

Dartmouth is committed to providing support for all graduate students so that they may achieve their academic potential. Dartmouth encourages individuals with disabilities to apply for admission with the expectation that Dartmouth will provide reasonable access to all graduate programs. Graduate students with disabilities seeking admission to Dartmouth need not reveal any physical or perceptual disability during the application process, although students are free to do so. The Americans with Disabilities Act (ADA) as amended, building on Section 504 of the Rehabilitation Act of 1973, mandates that no qualified person with a disability shall, solely on the basis of disability, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity which receives or benefits from federal financial assistance. According to federal regulations, otherwise qualified students with documented disabilities are entitled to equal treatment and access at institutions of higher education. For information about disabilities and the resources available to students with disabilities at Dartmouth, contact Gary Hutchins, Assistant Dean of Graduate Studies.

Rights and Responsibilities

Qualified students with disabilities have a right to:

1. Full consideration in the admission and promotion processes.
2. Reasonable accommodation, when appropriate to insure equal access to graduate school curriculum, programs, and activities.
3. Respect for privacy in the dissemination of disability information.
4. Support from the Graduate Studies Office.
5. Non-discrimination by Dartmouth faculty and staff.

Qualified students with disabilities have a responsibility to:

1. Declare a disability, or suspected disability, in writing if seeking an accommodation.
2. Work with Dartmouth to request, implement, update, and/or modify any accommodations.
3. Request any accommodation in a timely manner.
4. Comply with Dartmouth policies and procedures regarding students with disabilities, as well as all other policies that apply to Dartmouth students.

Qualifications

Section 504 and the ADA require schools to consider reasonable accommodation for qualified students and when necessary to provide equal access to learning. "Reasonable" must be individually determined after a student requests accommodation.

To qualify for accommodation, a student must identify him/ herself to the Graduate Studies Office, declare the disability or suspected disability in writing, and request accommodation. It is also the student's responsibility to obtain a thorough written evaluation from an appropriate professional, documenting the presence, extent, and ramifications of the disability. In addition, the documentation should explain what specific types of accommodation the evaluator believes might be most helpful in offsetting the effects of the disability to an acceptable extent.

The student must obtain this evaluation at his/her own expense and arrange to have the evaluation form and all supporting documentation forwarded to the Graduate Studies Office. If an evaluation has already been conducted in the past, the Graduate Studies Office will determine if it is recent enough.

E. Residency Requirements

During any year in which they receive compensation from Dartmouth, regardless of the source of those funds, graduate students are committed by the terms of their agreement to be in residence for a period of twelve months commencing one week before Fall term registration. Vacation time will not exceed a total of one month per year (includes time taken during December/January holidays) and the time(s) should be mutually agreeable to the student and the Thesis Advisor.

During the summer term(s) students are expected to perform their thesis research and enroll in required courses as course availability and time permit. Students must obtain written permission from their Thesis Advisor and from the Chair of the Graduate Committee for any expected absences of greater than one month per year. In all cases, students traveling abroad are encouraged to inform the MCB Office of their departure and return dates before leaving, and also if visa or travel difficulties arise during the trip.

Students who are primary caregivers for a child may qualify for Dartmouth's GRAD Child Accommodation Policy (CAP) immediately following the birth or adoption of a child, as outlined on the GRAD website (<https://graduate.dartmouth.edu/policy/child-accommodation-policy>). In planning an accommodation, students are encouraged to consult with their Thesis Advisor, the MCB Office, and GRAD as soon as possible. If necessary to maintain full-time enrollment, MCB students shall enroll in UNSG299 for the term(s) during which their CAP-associated absence exceeds the allotted vacation time.

V. FACULTY POLICIES

A. New MCB Faculty Membership

(See MCB FOA for more detailed information.)

Faculty from any department at Dartmouth College, Geisel School of Medicine, or Thayer School of Engineering are eligible for consideration as training faculty to the MCB Program.

The criteria for faculty membership are as follows:

1. The individual's research and teaching interests must fall within the broad area of molecular and cellular biology.
2. The individual must establish and maintain an extramurally funded research program capable of supporting graduate students. This criterion will be assessed with respect to the individual's rank and experience.
3. The individual must participate in the teaching of Program graduate and ethics courses, sponsoring of research rotations, supervision of thesis students, service on Program committees, and routine attendance at Program functions (such as graduate student recruitment, seminars, RIPs, annual retreat etc.).
4. The faculty member must certify in writing to the Graduate Committee that he/she accepts these obligations to the Program and to MCB graduate students training in the laboratory.

Faculty application letter should also include:

- a. A brief description of his/her research and its alignment with MCB.
- b. A statement that s/he would be willing serve on administrative committees (e.g. MCB graduate committee, recruitment committee, retreat organization, etc.)

- c. A statement that s/he would be willing to teach in an MCB core or elective classes
 - d. Any course(s) that s/he plans to develop and/or teach to MCB students
5. The chair of the faculty's primary department must make the following Departmental commitment in writing:

The primary department will support (back-stop) any MCB graduate students under the applicant's supervision from departmental or other funds should s/he be unable to provide stipend support, health insurance and research support from his/her research grant(s).
 6. Prospective faculty whose primary appointment is not within one of the component MCB programs must seek an adjunct appointment within a component program; he/she must submit a letter of nomination from said program chair supporting their membership.
 7. Approval of the Graduate Committee and the five program chairs are required for participation in the MCB Program.

MCB membership approval will be determined based on the criteria described in the MCB FOA (section 1) and the willingness of the faculty member to follow MCB rules and regulations in supervising MCB students.

Finally, because all of the graduate resources of the five component programs have been pooled to support MCB shared costs (including administration and recruiting), faculty whose primary appointments are in other departments may be asked to provide additional financial commitment from their primary department as a condition of continued membership. Financial arrangements will be decided on a case-by-case basis in consultation with the Chair of the host component program, the MCB Chair, and the Chair of the Department in which the individual holds his or her primary appointment.

Required Faculty Application Materials:

- Letter from prospective faculty stating interest in joining MCB Program and willingness to fulfill obligations of the MCB Program (see criterion 4 above).
- Letter from chair of primary department supporting MCB membership and commitment of financial support (backstop) of MCB students if needed.
- If joining as adjunct to one of five component MCB programs, then letter from program chair supporting faculty nomination.
- Current CV

B. MCB Faculty Participation

Being a member of the MCB faculty carries responsibilities such as attending program seminars, sponsoring research rotations, supervising thesis students, service on program committees, and helping with recruiting interviews during our recruiting season. Faculty participation is expected in one or more of the following committees:

Graduate Committee

This is the governing committee for the MCB program. Two faculty members from each of the five programs in MCB are appointed to the Graduate Committee each year by the respective chairs. Currently, five graduate students serve on the Graduate Committee as student representatives giving us representation across the five component programs as well as both campuses. Each summer, the MCB graduate students vote for students to serve on the Graduate Committee with the nominees approved by the MCB Chair.

The Chair and Vice-Chair of the Graduate Committee are chosen by the component program Chairs from current Graduate Committee faculty. Each Chair begins as Vice-Chair for one year before becoming Chair for a 2-year term with a final one-year term as Vice-Chair; a total of 4 years as Chair and Vice-Chair. The Vice-Chair and Chair roles rotate among the component programs.

Qualifier Committees

During their second year in the program, each student is required to successfully pass a qualifying exam. The Qualifying Exam is comprised of a written dissertation proposal and mock research idea developed by the student in collaboration with their Thesis Advisor and submitted by the student to their Qualifying Committee and the MCB office (see section II.D). However, one of the specific aims in the proposal must be an original idea of the student's and written without guidance of the thesis advisor.

A student's qualifier committee will be made up of two Dartmouth faculty chosen by the student and Thesis Advisor. These two members will then select a third member for the committee after reading the student's dissertation proposal and mock research idea. They will also appoint one of the committee members to serve as Chair. The original two members of the Qualifying Exam Committee will usually go on to form the student's Research Advisory Committee.

Advisory Committees

Research Advisory Committees are usually formed following the student's qualifying exam. The original two members of the qualifying exam committee will continue to serve on the student's Research Advisory Committee. There are exceptions to that rule with approval of the MCB Office. The student will meet with their Research Advisory Committee at least once per year, preferably just after the student's annual RIP. The student is responsible for coming to each meeting with an outline and then collecting committee member signatures on a report which is then submitted to the MCB Office.

Thesis Exam Committees

Composed of a student's Research Advisory Committee, Thesis Advisor and an outside

examiner, this committee requires approval from the Guarini Registrar's Office. Each student will work with the AA in his/her component program to complete necessary paperwork prior to the thesis defense.

Other Committees

Faculty serve on various committees throughout the year on a rotating basis for two years. The rotation is among the five programs within MCB with staggered terms so there is always a faculty member who served the year before and a new member. Faculty are asked to serve on various ad hoc committees throughout the year by the Chair of their program.

1. Annual Retreat Committee
2. Recruiting Weekend Committee
3. McCollum Colloquium Series Committee

Ethics Course Facilitator

MCB students participate in a faculty-guided Ethics Course, MICR700 during their first year. Faculty from among the five programs within MCB rotate in a staggered fashion to facilitate this course. Prior to facilitating, faculty may be required to attend ethics course training.

VI. APPENDICES

APPENDIX A

THE MASTERS PROGRAM

Normally, students are not accepted into the MCB Program if they indicate an initial interest in earning a master's degree at the time of their application to the program (i.e. we have no formal master's degree program). However, the MCB Program realizes that, once here, a student's career goals, expectations, and/or level of performance can change and therefore it might be in the student's best interest to leave the program and seek other alternatives. Accordingly, the program offers an opportunity to those students who have completed a body of acceptable work to write a thesis and thus leave the MCB Program with a Master's degree from Dartmouth College. The switch to the Masters track needs approval from the GC. Once approved, the requirements for the Master's degree are as outlined below. The judgment of whether or not the student has enough data to write an acceptable Master's thesis is made by the student's Advisory Committee in consultation with the respective Department and/or Graduate Program Chair.

1. **Courses:** Course requirements are the same as for the Ph.D., six courses total: three-term core course plus three MCB elective courses. Note: a course in research ethics, while useful, does not substitute for any of the six required courses.
2. **Lab Rotations:** three successfully completed lab rotations are required
3. **Teaching:** one term experience as a teaching assistant in the second year is required
4. **Qualifying Exam:** None Required
5. **Research In Progress (RIP) presentation:** Required
Students in their third year and beyond are required to present a RIP seminar each year (defined as the period from July 1 to June 30) in which the student is enrolled for research credit in two or more terms. In the year in which the student expects to defend his/her thesis and receive the Masters, the student must still present a RIP seminar unless the confirmed defense date has been sent to the MCB Office before August 15.
6. **Thesis:** Required
The Master's thesis should present a coherent investigation of an original scientific question. Both the topic and the experimental approach require approval by the Advisory Committee in consultation with the Department and/or Graduate Program Chair. Furthermore, the master's thesis will have the usual section components (introduction, materials and methods, results,

discussion, literature cited, figures, figure legends, tables, etc.) and should conform to the standards of scholarship generally required for publication in a peer-reviewed academic journal. See Section II.E.

7. **Oral Examination:** Required

The exam will be conducted by a committee of three Program faculty (or two program faculty plus one member from outside the Program, although an outside member on the committee is not required); the Thesis Exam Committee will usually be the same as the AC, although this is not a requirement. The composition of the Thesis Exam Committee and the date of the thesis exam must be approved by the Graduate Committee.

8. **Oral Presentation:** Optional, at the discretion of the Thesis Exam Committee

9. **Submission of final thesis** to the GRAD

APPENDIX B

M.D./Ph.D. Students

Prior to completing the second year of M.D. training in the Geisel School of Medicine, M.D./Ph.D. students are not formally affiliated with any graduate program. During the first two years, M.D./Ph.D. students will complete two summer research rotations. M.D./Ph.D. students will choose a thesis lab after the second rotation. Any M.D./Ph.D. student that chooses an MCB lab will become members of the MCB Program. After completion of the second-year medical boards at the end of Geisel School of Medicine year two, M.D./Ph.D. students will enter the thesis lab and begin working full time on the Ph.D.

There are nine program requirements for M.D./Ph.D. students to fulfill for a Ph.D.:

1. Two research rotations (completed before enrolling in the MCB Program)
2. Two graduate course electives selected from the MCB approved course list
3. Completion of an approved ethics course (does not count as an elective)
4. Successful completion of the MCB qualifying exam
5. Enrollment in journal club each term (Fall, Winter, Spring)
6. Annual Research In Progress (RIP) presentation
7. Attendance at program functions (RIP seminars, and program seminars and symposia)
8. A written thesis and a thesis seminar followed by a private thesis defense
9. Submission of final thesis to the GRAD

APPENDIX C

Course Development

Elective Requirements and Approval Process

Students and course directors may petition the MCB Graduate Committee for consideration of an existing course not currently on the MCB approved list. The goal would be to approve the course to count toward a student's program requirements.

MCB Office requires email requests from student and course director, syllabus of course for review, total number of hours per term and how performance will be assessed. If undergraduate course, how will the course be different for graduate students – more rigor. (See information from DCAL below.)

Student should note how this course will benefit his/her project and career, and its relevance to MCB (if considering for approval for all MCB).

All information is gathered and sent to Chair for approval before sending to the Graduate Cmte members for review and approval. (See Dartmouth Center for Advancement in Learning website for more information and syllabus template.)

Recommendations for Syllabus Contents

1. List learning goals or objectives for the course.
2. List course requirements, including
3. Required books, articles, readers and where these may be found (on reserve, online, purchase).
4. A schedule of topics, readings, and assignments for the course, including missed days and scheduled x-hours (students quickly assume that unless otherwise indicated x-hours will not be used, and they plan accordingly). Any anticipated missed class days should be made up during x-hours or at a specified time outside normal class hours (see Other Course Activities).
5. New or experimental courses, as well as advanced seminars, often work differently from regular courses. In such cases, instead of an explicit daily or weekly schedule, the syllabus should provide a description of how topics, readings, and assignments for the course will be determined during the term. This structure permits flexibility while still providing enough of a framework so that students are able to plan and organize their academic time effectively.
6. Statement on grading, due dates of assignments, exam dates, etc.
7. Course activities outside normal class hours, such as field trips, films, exams (see Other Course Activities).

8. Statement on attendance/absences (see Absences).
9. List course procedures, including
10. Office hours, contact information.
11. Homework policy, policy on revisions.
12. Policy for late work, make-up exams.
13. Disability policy about how students should seek accommodation in the course (see ORC, Access and Accommodation for Students with Disabilities).
14. Honor Principle statement and course policy on limits (if any) to collaborative work in fulfilling course requirements (see ORC, Academic Honor).

While many of the suggested aspects of the syllabus are dependent on the nature of the course and instruction, there are several aspects which are required by the ORC. In discussing the required texts for the course, faculty shall conform to the Higher Education Opportunity Act by providing textbook information at the time a student registers for a course, in particular the ISBN number and the retail price.

Journal Club Guidelines and Approval Process

A basic template for new/existing journal clubs when considering MCB student attendance. MCB students are required to enroll in and attend one journal club per term (except for summer term) during their time in the MCB Program. If a student attends a journal club which is not on the list of approved courses/clubs for MCB students, that journal club will not count toward their requirements.

1. At least one Dartmouth faculty member should be affiliated with the journal club and attend all of the meetings.
2. The journal club must have accountability structure in writing which is distributed to the attendees. Example: attendance at all meetings is required with one excused absence per term.
3. There also should be clear guidelines describing what happens if a student misses more than the allowed number of sessions. Each attendee should present at least once during each term, if time permits, and read all papers distributed prior to the next meeting date.
4. The journal club will hold meetings a minimum of 10 hours per term. This can be distributed in a number of ways, e.g. 1 hour every week or 2 hours every other week.
5. The journal club should be formally recognized by the College and carry a course number assigned by the Dartmouth Registrar.

Off-Campus Course Requirements and Approval

Some universities do not award transcripts for completion of summer courses (Woods Hole,

Cold Spring Harbor, etc.). Students may request credit for completing one of these courses by emailing the information to the MCB Office. Needed are the course syllabus, certificate of completion and justification for the course fitting in with and benefiting current research.

The request will need approval of the Chair of MCB. Student will enroll in independent study course within their lab's dept for the term of the off-campus course. This will allow us to show the course on the transcript.

Students are required to notify the MCB Office PRIOR to enrolling in an off-campus summer course if they wish to request credit.

Approved elective courses normally meet for a complete term (about ten weeks) either three times per week for 65 minutes each or twice per week for 100 minutes each or once per week for approximately 3 hours. Thus, a full-term course meets for about 25-30 contact hours per term and counts for one course credit of the required three course credits. Courses completed with a grade of No Credit (NC) will not count toward the three-course requirement.

If a student wishes to take an elective for credit that is not on the approved list or is offered at another institution, the student must request approval from the MCB Office before the course begins. If the student fails to obtain approval prior to enrolling in the course, elective credit will not be given.

Full time Internships - Guidelines and Requirements

MICR128 Course Title: Enterprise Experience Internship

Director: Current MCB Chair

Credits: 3 credits per term; maximum of 1 term

Terms offered: All

Grading: Credit/No Credit

Prerequisite: Must have completed all MCB Program and course requirements prior to enrolling. Senior students in their fourth year or beyond who are still conducting their research and are at least 6 months away from thesis defense will be eligible. Must have prior approval of Thesis Advisor, Advisory Committee and MCB Graduate Committee for internship

Description:

This course provides practical training experience through a full-time internship at an institution outside of the Dartmouth College campuses (Lebanon and Hanover). The goal of this course is to provide students with real-world, hands-on experience with existing enterprises through

internship during graduate school. Such experience will expose students to diverse career opportunities during graduate school, providing students with lead-time to focus and network in a field of interest prior to completion of their PhD. Multiple types of training (e.g., project management and business entrepreneurship skills needed in the pharmaceutical and biotechnology industries, teaching experience needed for a successful faculty position in liberal arts colleges) will be particularly valuable for students who go on to conduct NIH-funded research as well as benefit those students who do not follow the academic research career track. Approximately 30% of biomedical PhDs work in the biotech and pharmaceutical industries in research and non-research positions.

Examples of potential internship opportunities are:

1. Researcher in a biotechnology or pharmaceutical company
2. Business and marketing associate in a biotechnology or pharmaceutical company
3. Teacher/lecturer at an institution of higher education/college
4. Assistant at a patent law firm
5. Position in office of government policy and legislation
6. Position in office of public health policy

For this course, the student will propose and arrange a paid or unpaid internship in an existing enterprise (industry, government, or other) in consultation with their Thesis Advisor (primary mentor), Advisory Committee, and MCB Graduate Committee prior to enrollment. This process should happen in advance of the term of enrollment. Course enrollment is concurrent with the internship and should be for a period of one term. At the end of the internship, the student will make an oral presentation (with Powerpoint slides; approx. 20 minutes) to the MCB community that addresses the nature of the enterprise they were engaged in, the problem they were assigned, and the results and impact of their project. The purpose of the presentation is to share lessons learned from the internship experience with the MCB community. The presentation will be accompanied by a short but complete written report. Neither the presentation nor report should contain confidential information of the enterprise.

The Internship Proposal Form must be completed prior to committing to an internship, and must be signed by the student's Thesis Advisor and the Course Director. A letter from the Internship Supervisor at the proposed host enterprise must be sent to the Thesis Advisor and Course Director detailing the start/end dates of the internship, and the job function and roles of the intern.

This course is graded on a credit/no credit basis by the Course Director after completion of the written report and oral presentation. International students with visa sponsorship should consult with the Office of Visa and Immigration Services (OVIS) regarding eligibility, and review the appended information on F-1 Curricular Practical Training.

Financial matters: The internship may be paid or unpaid by the host enterprise or by Dartmouth stipend, depending on arrangement with their Thesis Advisor (as in cases where the internship is a collaboration that will benefit the Advisor's research). Internship at another academic institution to perform research is discouraged; the goal of this internship program is to expose students to career environments not found within Dartmouth. The Thesis Advisor cannot serve as or appoint the Internship Supervisor (such as in cases where the proposed internship would be hosted by a local company in which the Thesis Advisor has a stake/role).

Dartmouth-based health insurance benefits will be paid by the student's Thesis Advisor for the term.

APPENDIX D

DOCUMENT REVISION HISTORY

- 12/2/94 -- Document adopted by program Faculty
- 5/24/95 -- Revised to make clear rules on LP/NC and separation from the program (p2)
4/18/96 -- Revised to remove mention of the concept of mini-courses (p6)
- 4/22/96 -- Revised to correct minor errors in course listings in Appendix B (p16)
- 8/28/96 -- Revised to clarify role of major professor as Chair of AC, to clarify dates by which AC meeting reports should be filed (p3), to clarify date by which Qualifying Exam should be held (p8), and to clarify the format of the Qualifying Exam Written Proposal (p9-10).
- 2/11/97 -- Revised to add, as appendix C material, requirements for a terminal master's degree and to add, on page one, a definition of the term 'faculty' as used in this document.
- 5/26/97 -- Revised to clarify timing of qualifying exam (p7), the format of the qualifying exam (p9-10), the addition of new faculty (App. A), new courses (App. B), and correct page numbering errors in the Appendices.
- 8/21/97 -- Clarification of the procedure for completing the Qualifying Exam (p7-10). 9/4/97 -- A sentence about the Honor Code added to end of first paragraph on page 1. 8/11/99 -- Revised to correct minor errors in Appendix A and Appendix B
- 11/19/99 -- Revised to correct minor errors in Appendix A
- 12/14/99 -- Revised to clarify aspects of the annual AC Meeting Summary (p3), to update journal club listings (p7), and to update aspects of the Qualifying Exam (p7-10).
- 17 June 2000 -- New procedure for assessment committee review prior to final separation from program. Addition of Appendix E (MCB Qualifying Exam Progress Report).
- 7/3/01 -- Minor revisions to reflect additional Ph.D. programs within MCB.
- 7/24/02 -- Revisions in Section I.A. and Section II.B. to reflect change in core course to three terms and change in advance elective course requirements.
- 7/23/04 -- Revisions in Section II, subsection D to reflect changes in timeline and procedures

for qualifying examinations. Appendix E, F, G, and H added regarding qualifying exam procedures. Appendix I revised to reflect changes in qualifying exam procedures and timelines.

- 3/4/04 -- Revision of Thesis submission timeline.
- 7/26/05 -- Revision of Qualifying Examination Written Research Proposal section to clarify advisor's role. 7/14/06 -- Revision and clarification of qualifying examination section; addition of appendix for MD/PhD students.
- 4/23/07 -- Revision of Thesis and Thesis Defense section; clarification of procedures.
- 6/23/21 -- Revisions, reorganization and update of whole document