SUMMARY OF REQUIREMENTS FOR THE PH.D. IN MOLECULAR AND CELL BIOLOGY

The Graduate Committee:
Bruce Goode (Chair)
Michael Marr
Piali Sengupta

Summary of requirements for advancing to candidacy in the Ph.D. program:
All MCB students must complete four lab rotations (nine weeks each), pass six lecture courses with a grade of B- or better, pass a qualifying exam (“First Year Examination”) at the end of the first year, defend a thesis research proposition (“Inside”) at the end of the second year, TA two courses (usually during the second year), and select a thesis lab by mutual agreement with a faculty member by the end of the first year. In addition, graduate students must register for and attend the following courses/seminars: Responsible Conduct of Science in the first year (Cont 300b, a not-for-credit course), the Graduate Student Research Seminar every semester (Biol 350D, a not-for-credit course), and a Journal Club every semester. Students must also register for their advisor’s section of Biol 401D (Dissertation Research) in the second year and all subsequent years.

Courses: There are three required/mandatory courses for all MCB Ph.D. students: Biol 103b (Mechanisms of Cell Function), Biol 105b (Molecular Biology) and Biol 200a (Proseminar). The remaining three courses must have catalogue numbers of 100 or above (signifying graduate-level) and be listed or cross-listed in the Molecular and Cell Biology section of the Brandeis Bulletin (http://www.brandeis.edu/registrar/bulletin/index.html). These classes can be selected from a number of topic areas including molecular biology, neuroscience, genetics, cell biology, developmental biology, immunology, and structural biology. Courses not listed under the MCB program in the Brandeis Bulletin must be approved by the graduate committee. Transfer credits may be applied towards no more than two courses, and are decided on a case-by-case basis upon written petition to the Chair of the Graduate Committee. In no case will transfer credit be applied to the three mandatory courses.

Rotations: All first year students are required to register for the research rotations (Biol 300a,b). Every student is required to complete four rotations of nine weeks each (in four different laboratories) during the academic year (specific dates below). In the event that a student is completing only one rotation in a given term (fall, spring, or summer), the student should register for the half-credit rotations course, Biol301a,b. The choice of laboratory is made jointly by the student and the faculty member in whose lab the rotation is to take place. Students may choose from Life Sciences faculty, which includes faculty from the Departments of Biology, Biochemistry, Chemistry, Psychology, Computer Science, and Physics. During orientation week, we will ask you to list your top choices for rotations (after the three-night faculty bazaar). We will then assign students to a first rotation, doing our best to give everyone their first or second choice. The remaining three rotations are the responsibility of the student to arrange with the
appropriate faculty member ahead of time. We recommend that you arrange rotations at least a few weeks prior to the end of the previous rotation to ensure that you can get a spot. By the end of each rotation, the student submits a written rotation report. One electronic copy should be sent to the program administrator in the Division of Science Graduate Affairs Office and one provided to the laboratory head in which the rotation was done.

### Rotation Schedule:

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<th>Start</th>
<th>End</th>
<th>Written Report Due</th>
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<tr>
<td>1st</td>
<td>Mon. 9/1/14</td>
<td>Fri. 10/24/14</td>
<td>Mon. 10/27/14</td>
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<td>2nd</td>
<td>Mon. 10/27/14</td>
<td>Fri. 12/19/14</td>
<td>Mon. 12/22/14</td>
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<td>3rd</td>
<td>Mon. 01/05/15</td>
<td>Fri. 03/06/15</td>
<td>Mon. 03/09/15</td>
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<td>4th</td>
<td>Mon. 03/09/15</td>
<td>Fri. 05/08/15</td>
<td>Mon. 05/11/15</td>
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### Selection of a Thesis lab:
Students are not permitted to approach faculty about joining a lab until Tuesday April 28th, 2015 and should make every attempt to complete the selection process by Friday May 8th, 2015. Students will begin work in their new thesis lab immediately following the end of the fourth rotation. The graduate committee reiterates that students should not ask for a commitment from a faculty member – nor can a faculty member promise a spot in their lab – until April 28th. This policy protects the rights of all first year students in the Life Sciences and creates a level playing field independent of the order in which rotations are performed. It is taken very seriously by the Graduate Committees of all of the Life Sciences programs.

### Journal Clubs:
Every student is required to register for and attend one Journal Club. Students supported by a specific Training Grant must choose from Journal Clubs approved by the Director of that Training Grant. For example, students on the Genetics Training Grant must attend Molecular Genetics Journal Club. In their first year, the students should go to the journal club(s) attended by the labs in which they are rotating. Under these circumstances, pick one to register for and don’t worry about any mismatch between what you register for and what you attend. Students are not required to present an article until their second year.

**Journal Clubs: (See course listings for times)**

- Molecular Genetics: Biol 305
- Neurobiology: Nbio 306
- Computational Neuroscience: Nbio340

### Wednesday Colloquia series:
All students are required to attend the regular Wednesday Joint Biology/Neuroscience Colloquia at 4:00 pm.
Graduate Student Research Seminars (Biol 350):
All students are required to register for and attend Friday “Pizza Talks” (Biol 350), which are held at 12:30 PM. All MCB (and Neuro) students present their thesis work annually starting in their third year.

Chemical and Safety Trainings:
All students must complete the appropriate chemical and safety trainings before they may begin in the lab. Some of this can be completed on-line prior to your arrival to campus via the “Safety Training Link” found on Brandeis’ Department of Environmental Health and Safety website. More information about these requirements will be explained during Orientation. Any MCB student undergoing animal research is also required to attend training on animal care and use.

TIMELINE OF EVENTS:

First Year

Courses: Students in their first semester (Fall 2014) will register for Rotations (Biol 300a), a Journal Club (as listed above), the Graduate Student Research Seminar (Biol 350a), and two lecture courses – Biol 105b (Molecular Biology) and Biol 200a (Proseminar).

Students in their second semester (Spring 2015) will register for Rotations (Biol 300b), a Journal Club (as listed above), the Graduate Student Research Seminar (Biol 350d) and Mechanisms of Cell Function (Biol 103b). A second elective course is normally selected from the list of graduate courses (catalogue number of 100 or above) in the Molecular and Cell Biology section of the Brandeis Bulletin. In addition, the student must register for and attend the seminar in Responsible Conduct of Science (Cont 300b) usually offered in the Spring term, which is a not-for-credit course.

Graduate Student Research Seminars (BIOL350):
All students are required to register for and attend “Pizza Talks” each Friday at 12:30 PM. Students do not present until their third year.

Journal Clubs:
Every student is required to register for and attend one Journal Club. Students supported by a Training Grant must choose from Journal Clubs approved by the Director of the Training Grant. Students typically make their first presentations in their second year.

Wednesday Colloquia series:
All students are required to attend the regular Wednesday Joint Biology/Neuroscience Colloquia at 4:00 pm.
**First Year Examination:**

MCB students will submit and defend a research proposition at the end of the first year in the program. The length and formatting requirements of the First Year Examination are similar to a 12-page NIH grant proposal (R21/R01), and will be explained in detail in BIOL 200a (Proseminar).

The subject will be chosen from among the four topics covered by the student’s rotations. A one-page pre-proposal with an abstract and “specific aims” of the proposal must be submitted to the Graduate Committee by 5 pm on Friday, **March 27th, 2015**. Following approval by the Graduate Committee (by March 30th, 2015), completed papers are due by **April 17th, 2015**. The Committee will evaluate the choice of subject and will assign a committee of three faculty members who will evaluate the written proposal and conduct an oral examination. The defenses will be held during the weeks of **May 13-24, 2015**, unless there are faculty conflicts. The proposition itself should be presented in the form of a chalk talk (i.e. PowerPoint presentations will not be permitted). Requests for exceptions to this schedule must be submitted in writing to the Graduate Committee and are only granted under extraordinary circumstances.

First Year Examination evaluation forms (available from the graduate affairs office) must be brought to the exam by the student, where they are completed by each member of the examining committee. After the exam, a committee member will return them to the graduate affairs office. If revisions to the written exam or a re-defense are required, a second set of evaluations forms must be submitted indicating acceptance of the revision/re-defense and turned into the graduate affairs office. Students who fail their First Year Examination may be placed on probation for one year. Contact Michael Marr with further questions about the First Year Examination (**mmarr@brandeis.edu**).

**Choice of thesis lab:**

Students will choose their thesis lab by mutual agreement with a faculty member at the end of the first year **between April 28th and May 8th** and are expected to begin work on their thesis projects immediately following the end of the fourth rotation. Fifth rotations may be considered under unusual circumstances, but must be discussed with and approved by the Graduate Committee.

**Summer, between all years**

**Courses:** This and every summer, all students must register for Cont 250b (Summer Research). Failure to do so may impact their graduate student stipend pay.

**Thesis Research:**

Students will begin work on their thesis research immediately following their fourth rotation. They are expected to perform research through the summer. Vacations and other absences are must be approved by the student’s advisor.
Second Year

Courses: Generally students take one lecture course in the Fall and one in the Spring semester. These classes can be chosen from the list of graduate courses (catalogue number of 100 or above) in the Molecular and Cell Biology section of the Brandeis Bulletin (http://www.brandeis.edu/registrar/bulletin/index.html).

Teaching: Each student is required to serve as a teaching assistant (TA) for two semesters, typically both semesters of their second year in the program. Teaching assignments are made in the summer preceding the second year and will be emailed to students (usually in July).

Second year PhD students are expected to attend the Teaching Practicum for teaching fellows, which will be held in August 2015 (more details to be announced in July 2015).

Thesis Research:
Students will work on their thesis projects starting at the end of their first year, when they join their thesis lab, and continue until completion of their dissertation (ideally 5.5 years). Students must register for their advisor’s section of Biol 401d (Dissertation Research) each semester. Specific Ph.D. thesis requirements are set by the student’s advisor and the thesis committee (see below).

Graduate Student Research Seminars (BIOL350):
All students are required to register for and attend “Pizza Talks” which are held each Friday at 12:30 PM. Students do not present until their third year.

Journal Clubs:
Every student is required to register for and attend one Journal Club. Students supported by a Training Grant must choose from Journal Clubs approved by the Director of the Training Grant. Students typically make their first presentations this year.

Wednesday Colloquia series:
All students are required to attend the regular Wednesday Joint Biology/Neuroscience Colloquia at 4:00 pm.

Thesis Research Proposition (“Inside exam”):
Each second year student must defend a thesis research proposition (or “Inside exam”), held during the same time-period as the first year students defend their “First Year Examination.” For the 2014-2015 academic year, this will occur in the period of May 11-22, 2015. Written proposals should be emailed (as a PDF) to the committee members a minimum of one week before the defense date. Petitions for extensions must be submitted in writing to the Graduate Committee and are only granted under exceptional circumstances. The proposition itself should be presented in the form of a chalk talk (i.e. PowerPoint presentations are not permitted). Inside proposition evaluation forms (provided by the graduate affairs office) must be completed by each member of the
examining committee and returned to the graduate affairs office once the exam has ended. If revisions to the written exam or a re-defense are required, a second set of evaluations forms must be submitted indicating acceptance of the revision/re-defense and turned into the graduate affairs office.

After the exam is completed, the chair of the student’s examining committee should write and submit a brief written report of the student’s performance, which represents the consensus of the whole committee. This report should be distributed to the student, the student’s PI, the graduate program chair, and the graduate affairs office to be included in the student’s file.

The examining committee is composed of three faculty members and does not include the thesis supervisor. If requested, the thesis advisor may be present in the room during the exam as a witness (i.e. they must remain silent during the process and their input is strictly prohibited). Committee members should be selected by the student, but in close consultation with their thesis advisor. Two members of the examining committee plus the thesis advisor and a faculty member from a University other than Brandeis will compose the student’s final thesis committee. Please contact Piali Sengupta with questions regarding the Inside exam (sengupta@brandeis.edu).

THIRD and Continuing Years

Thesis Research:
Students by this time should be well into their thesis research projects. Students must register for their advisor’s section of Biol 401d (Dissertation Research) each semester.

Graduate Student Research Seminars:
Each student, starting their third year in the program, must present an annual Friday research seminar to the Department (“Pizza Talk,” Biol 350). It is the student’s responsibility to remind their thesis committee ahead of time of the date, and make sure that they will attend the talk, as well as meet with the student very soon afterwards as a thesis committee (usually the same afternoon or the following week). All students must register and attend these seminars each semester, which are held on Fridays at 12:30 PM.

Journal Clubs:
Every student is required to register for and attend one Journal Club every semester. Students supported by a Training Grant must choose from Journal Clubs approved by the Director of the Training Grant.

Wednesday Colloquia series:
All students are required to attend the regular Wednesday Joint Biology/Neuroscience Colloquia at 4:00 pm.

Thesis Committee:
Once thesis work has begun, each student is required to meet at least once per year with his/her thesis committee. These meetings should be arranged in advance by the student,
and should occur very soon after the student’s Friday Research Seminar. After the thesis meeting, the committee will submit a report summarizing the student’s progress, identifying possible problems, and any recommendations. It is the student’s responsibility to bring the appropriate forms to the meeting; the forms are obtained from the graduate affairs office. Graduating students are required to have these yearly reports in their files in order to remain in good standing with the program. It is the student’s responsibility to make sure that the report is signed by committee members and hand-delivered to the program administrator in the Division of Science Graduate Affairs Office right after the annual thesis committee meeting.

In the event that a student's MCB research advisor leaves for another university or is on a non-resident leave of absence for more than one year, his/her graduate students must have another MCB faculty member as a second mentor. This mentor shall meet with the student no less than once a month and will ensure that a thesis review committee meeting will be held around the time of the student's “pizza talk.”

**Thesis requirements:**
Specific Ph.D. thesis requirements are set by the student’s advisor and the thesis committee. As a rough guideline, a Ph.D. student should have one first-author paper accepted or published in a quality journal at the time of their thesis defense, and ideally another publication (e.g. a middle author paper, or additional first author paper in the works).

**Thesis Seminar:**
Upon completion of their dissertation work, students are required to give a public seminar on their research, followed immediately by a private thesis defense (student and thesis committee only). Each member of the thesis committee must be present at the talk and the defense

**TRANSITION FROM MS TO PHD PROGRAM:**
Students who have earned a MS at another institution will be admitted as normal first-year students. Students in a Brandeis life sciences MS program who apply to and are accepted into our MCB PhD program may be transitioned into the program and considered as second year PhD students. These students must complete the same requirements as students who enter directly as PhD students, with the following alterations to their timeline:

**Matriculation date:**
MS students will enter the PhD program immediately after their MS year and matriculate as PhD students that summer, typically with a start date of July 1st. The start of stipend payments will coincide with their matriculation date. Any exceptions to this timeline must be discussed with and approved by the graduate committee.
Courses:
Courses taken during the MS year may count towards the PhD course requirement, if they qualify as such a course (to be approved by the graduate chair). These students are expected to complete the remaining classes in their first year as a PhD student, but no later than the end of their second year.

Graduate Student Research Seminars (BIOL350):
As with all PhD students, students who transition to the PhD program from the MS program are required to register for and attend “Pizza Talks”. Students do not present until their third year in the MCB program (the second year as a PhD student).

Journal Clubs:
Every student is required to register for and attend one Journal Club, which must be or include Bio305. Students supported by a Training Grant must choose from Journal Clubs approved by the Director of the Training Grant. Students typically make their first presentations in their third year in the MCB program (the second year as a PhD student).

Rotations, Teaching, and Selection of Thesis Lab:
The timeline for completion of rotations and teaching assistantships and for choosing their thesis lab will depend on the extent of independent lab work carried out by the student during their Master’s year.

If the student has rotated in at least one laboratory during the MS year, he/she will be expected to complete two additional one-month rotations during the summer after the MS is awarded (typically one in July, one in August), after which the student will select a thesis lab. He/she would typically TA in both semesters of the first year in the PhD program (i.e. as a normal second year PhD student).

Students who have taken only the project lab during the Brandeis MS will be expected to carry out two one-month rotations in the summer and two additional nine-week rotations in the Fall, following which the student would select a thesis lab. The student would typically TA once in the second semester of their first PhD year and TA again one semester of the following year.

While rotating, the student will register for the research rotation course (Biol 300). The choice of laboratory rotations is made jointly by the student, the chair of the graduate program, and the faculty member in whose lab the rotation is to take place. It is the responsibility of the student to arrange with the appropriate faculty member ahead of time. Students may choose from MCB program Life Sciences faculty, which includes faculty in the Departments of Biology, Biochemistry, and Chemistry.

At the end of each rotation, the student will submit a written rotation report. One electronic copy should be sent to the program administrator in the Division of Science Graduate Affairs Office and one should be provided to the laboratory head in which the rotation was done. In exceptional circumstances, students may be granted permission (from the graduate chair) to complete an additional rotation before joining a lab.
**First Year Examination:**

Students who apply to our PhD program in their MS year are expected to complete their First Year Examination in January of their second year in the program (their first year as a PhD student). All guidelines and requirements are the same as for students who enter the program directly as PhD students.

**Thesis Research Proposition (“Inside exam”):**

MS-> PhD students must complete their inside exam in May of their second year in the program (their first year as a PhD student), at the same time as all other PhD students taking their first year and inside exams. For the 2014-2015 academic year, this will occur in the period of **May 11-22, 2015**. Extensions to this time frame must be approved by the Graduate Committee. All guidelines and requirements are the same as for students who enter the program directly as PhD students.

**QUESTIONS:**

If you have questions you can contact a member of the graduate committee:

- Bruce Goode ([goode@brandeis.edu](mailto:goode@brandeis.edu)) - Chair
- Michael Marr ([mmarr@brandeis.edu](mailto:mmarr@brandeis.edu))
- Piali Sengupta ([sengupta@brandeis.edu](mailto:sengupta@brandeis.edu))

You may also contact our program administrators in the Division of Science Graduate Affairs Office:

- Jennifer LeBlanc ([Jenniferleblanc@brandeis.edu](mailto:Jenniferleblanc@brandeis.edu))
- Maryanna Aldrich ([maldrich@brandeis.edu](mailto:maldrich@brandeis.edu))
- Catherine Broderick ([cbroderi@brandeis.edu](mailto:cbroderi@brandeis.edu))

The following senior graduate students have also agreed to answer questions:

- Anuja Mehta    abutala@brandeis.edu
- Adam Johnston  abj@brandeis.edu
EVALUATION OF GRADUATE STUDENT PERFORMANCE
IN THE MOLECULAR AND CELL BIOLOGY PROGRAM

YEAR 1:  The students must complete their formal courses with a grade of B- or better. Each of four required lab rotations is evaluated by the supervising faculty member, who then submits a brief written report on the student’s performance to be included in the student’s permanent file. The written lab reports are reviewed by the rotation adviser and by the graduate committee. Students must also successfully write and defend the First Year Examination at the end of the first year, and have secured a thesis lab by mutual agreement with the faculty mentor. First Year Examination committee members will evaluate the student’s performance and submit a written evaluation to the graduate affairs office. The Grad Committee evaluates the progress of each student at the end of the first year. Students that perform below the minimum expectations outlined above will be placed on probation. In cases where the performance is exceedingly low they will not be re-admitted for the second year.

Students on probation must pass all of their elective courses with a grade of B or better and pass the inside exam. In addition, they must adequately perform their teaching duties and make acceptable progress on their thesis work. The student’s standing in the program will be reassessed at the end of their second year and if they have not displayed satisfactory progress they will be dismissed from the program.

YEAR 2:  Grades in formal courses must be B- or better. Students submit their thesis research proposal (inside proposal) in writing. A panel of three faculty members (not including the thesis adviser) are selected by the student for the oral defense of the inside proposal. Those committee members evaluate the student’s performance and submit a written evaluation to the graduate affairs office using a form provided by the program administrator. Two of those faculty members are typically retained for subsequent service and, along with the thesis advisor, comprise the thesis committee until the student graduates. The Grad Committee evaluates the progress of each student at the end of the second year. Continuation in the program is decided based on successfully defense of the First Year exam and Inside exam, a grade in all six courses of B- or better, satisfactory teaching performance, and progress in thesis research. Students that perform below the minimum expectations as outlined above may not be re-admitted for the third year. Students are expected to have all course and teaching requirements fulfilled before the start of their third year; exceptions should be discussed with the Graduate Committee.

YEAR 3+:  Each student presents a research talk in the Friday “Pizza Talks” sometime during each year. The student’s thesis committee meets following the talk to evaluate the student’s progress and submits a brief written report to the program administrator in the Division of Science Graduate Affairs Office. Students are required to hold
at least one thesis committee meeting per year to remain in good standing with the program, but meetings can be held more frequently at the discretion of the student and thesis committee.

**THESIS:** The student submits the completed thesis, gives a seminar, and is examined by a panel consisting of at least three faculty members. The thesis committee must contain one faculty member from outside the university and the thesis advisor.
GRADUATE TEACHING ASSISTANTS
IN MOLECULAR AND CELL BIOLOGY

ASSIGNMENTS

Over the course of the graduate program, usually in the second year, each Ph.D. student is required to serve as a teaching assistant in TWO courses or labs.

Teaching assistant (TA) assignments are decided on by an interdepartmental graduate committee based on faculty request, course enrollment, training grant requirements, and graduate student experience. For the 2014-15 academic year, the faculty member in charge of TA assignments in the MCB and Neurobiology programs is Prof. Bruce Goode (goode@brandeis.edu).

In all cases, an attempt will be made to inform graduate teaching assistants of their assignments during the summer prior to the commencement of teaching responsibilities. In cases of unexpected enrollment shifts, cancellations or additions of courses, or inequities in work load, assignments may be changed with short notice. If there is a likelihood that such a change will be made, the TA Committee will notify those teaching assistants as soon as possible to permit ample preparation time.

RESPONSIBILITIES

When the assignment is made or at the beginning of the term, graduate teaching assistants and faculty members will discuss course requirements, attendance policies, and the range of graduate responsibilities (in class, outside the classroom, administrative duties, technical assistance, e.g., running a projector, etc.).

In order to encourage an open, cooperative relationship between the graduate teaching assistant and faculty member, meetings will be held on a regular basis to discuss the progress of the course.

The TA and faculty member will consult each other on any problem arising in the course as soon as possible so that the faculty member and graduate student can cooperate in addressing it.

If TAs are to grade undergraduate papers or exams, the faculty member and TA will discuss the number of assignments, grading procedures and standards (letter grade/pass, fail/comments only, grading in pencil, and expectations for student writing ability), and an expected range of grades.

TAs may be required to hold at least two weekly office hours, usually in the evenings.

TAs are seldom asked to tutor students requiring additional help. If tutoring is expected and one hour/week is insufficient to address difficulties in the course, the graduate
student will refer the problem to the professor and, if necessary (and agreed upon), to the appropriate agency on campus for additional assistance.

Faculty members will advise TAs on policies for academic honesty and sexual harassment at the beginning of the term. At this time, procedures for alerting the proper university officers and dealing with such matters will be agreed upon.

EVALUATION/OVERSIGHT/PROFESSIONAL DEVELOPMENT

TAs are encouraged to discuss teaching with the professor or with a member of the Graduate Committee.

TAs are expected to consult teaching materials available at the Office of the Dean of Arts and Sciences and to attend teaching seminars sponsored by the Graduate School.

Faculty should evaluate the TA’s performance and provide written comments documenting the teaching fellow’s experience and development over the course of the semester.

Every attempt should be made to resolve any difficulties experienced between a TA and faculty member. If such resolution is impossible, official grievances should be made per the stated procedures in the student handbook.

TAs are encouraged to document teaching experiences for future job searches. Faculty members should agree to provide letters of reference for teaching, which will be included in the student’s departmental file.

At the end of the semester, students enrolled in courses will complete a “TA evaluation report” where they will provide feedback of several aspects of their TA’s performance. After the course is completed, TAs can retrieve these reports from sage. A copy of this record will also be stored in the student’s file in the graduate affairs office.