



Sackler School of
Graduate Biomedical Sciences

Graduate Program in Genetics

Program Guide
2018 - 2019

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The requirements described in these guidelines may be amended or altered by the Graduate Program. Note that Sackler-wide policies supersede program specific policies.

Welcome and Key Program Contacts

Welcome to the Graduate Program in Genetics. This Program Guide provides key information and guidelines on the requirements of the program. It supplements information contained in the Sackler School Catalog (<https://sackler.tufts.edu/studentLife/sacklerCatalogs>), which has the official degree requirements and course listings, and the Sackler School Handbook (<https://sackler.tufts.edu/studentLife/sacklerStudentHandbook>), which contains important information about topics such as the Sackler academic and registration policies, professional conduct guidelines, financial matters, and information about student benefits, services, and resources.

This Guide includes a listing of other graduate students in the program and contact information for faculty, staff, and students. You can find information about the research interests and publications of the faculty, as well as up-to-date schedules of seminars, journal clubs and research reports on our website (<https://sackler.tufts.edu/academics/genetics>). We would greatly appreciate any feedback from you to help us make this Guide more useful.

There are several people who can serve as valuable resources during your PhD training and are always willing to discuss any issues or concerns about the program, or direct you to the appropriate office. They are listed below, along with information on how to contact them.

| Name & Position | Location | Phone | Email |
|--------------------------------------------------------------------------------|-----------------|--------------|------------------------------------------------------------------------------------|
| Rajendra Kumar-Singh, Program Director | S. Cove 702 | 3767 | rajendra.kumar-singh@tufts.edu |
| Karl Munger, Student Advisor & Qualifying Exam Advisor, Boston Campus | Jaharis 607 | 0306 | karl.munger@tufts.edu |
| Mary Ann Handel Qualifying Exam Advisor, JAX Campus | Snell 4400 | 6778 | maryann.handel@jax.org |
| Diana Pierce, Program Coordinator | Stearns 514 | 6836 | diana.pierce@tufts.edu |
| Karl Munger Director of Admissions | Jaharis 607 | 0306 | karl.munger@tufts.edu |
| Ashlee Junier, Graduate Student Council Representative | Jaharis 425 | 6803 | Ashlee.Junier@tufts.edu |
| Aidan Burn, Graduate Student Council Representative | Jaharis 401 | 6526 | aidan.burn@tufts.edu |

The Program Director is elected by the graduate program faculty to administer the educational mission of the graduate program. The Program Director represents the interests of the program on the Sackler School's Executive Council where policy matters concerning the School's programs are discussed and enacted.

The Student Advisor serves as a mentor to the first year students, including providing specific advice on selecting appropriate sites for laboratory rotations, choosing elective courses, and identifying laboratories for thesis work.

The Qualifying Exam Advisor guides the student through the Qualifying Exam process providing advice on topic selection and approaches to constructing the written proposal and oral presentation.

The Program Coordinator assists the Program Director in the functioning of the program as needed, as well as helps students schedule rooms, complete forms, plan events, and manage program requirements.

The Admissions Director is responsible for recruiting high quality program candidates, identifying candidates for interview from the applicant pool, arranging for interviews of these candidates with program faculty, and selecting the best candidates (with input from the faculty) to be given placement offers.

Graduate Student Council Representatives. Two representatives are elected by the students to serve as the program's representatives to the Sackler Graduate Student Council (GSC). The GSC organizes activities, including the Annual Sackler Relays, and the GSC Officers are ad hoc members of the Sackler School Executive Council.

Curriculum Overview

Required Courses

Students complete a series of required didactic courses designed to provide a strong knowledge base for their research. The Sackler School Catalog for the year in which students were admitted lists these required courses (<https://sackler.tufts.edu/studentLife/sacklerCatalogs>). In addition, the Catalog contains course descriptions and progression plans for the first and second years.

Elective Courses

Students are required to complete elective courses in addition to the required courses. Elective courses must be approved by the thesis advisor and the Program Director and should be used to explore students' interests and further their understanding of their thesis research fields. Students choose these courses from the list of electives in the Sackler School Catalog. Courses may be chosen from any Sackler program or from other schools that allow cross-registration.

Journal Club

The overall goals of the Journal Club (JC) are to advance the student's skills in critically evaluating scientific literature and improve the student's presentation skills. Students may choose to present JC topics that they are familiar with, or they may wish to gain important experience by choosing topics that are new to them. Students should consult with their mentors when choosing a topic for presentation.

Attendance in JC is required and students who do not attend regularly will receive a warning; continued absence will result in a failing grade. PhD students must register each semester for 4 years and MD/PhD students for 3 years.

Graduate Seminar

The goal of attending the Graduate Seminars is to improve the student's appreciation for how research progress is obtained and to raise awareness of recent advances in the

field. All students must register each semester for graduate seminar except for those students who have registered for PhD Degree Only.

Research Presentations

Students must present an annual report of their research, except those students who have received permission to defend their theses. The Student Research Presentation schedule is provided to students at the beginning of each academic year and will also be posted on the Sackler calendar. Research Presentations are attended by students, faculty, and other interested members of the Program. All students are required to attend these meetings.

Requirements for the Master of Science Degree

A student in good standing in the doctoral program who is unable to complete the requirements for the PhD degree may be allowed to write and defend a Master's thesis. Permission to submit a Master's thesis must be obtained in advance from the Program faculty and will only be granted if compelling reasons for leaving the PhD program are provided and if specific guidelines are followed and specific criteria are met. Master's Degree Requirements can be found in the Sackler School Handbook (<https://sackler.tufts.edu/studentLife/sacklerStudentHandbook>).

A Master's candidate may only begin writing the thesis after obtaining explicit permission to do so from the thesis advisory committee. The student's thesis must describe original research carried out by the candidate under the supervision of a faculty member, and must form a coherent body of work of publishable quality, even though the scope of the work may not permit publication. The Master's thesis should be presented in the same format as a PhD thesis, as required by the Sackler School. The suitability of the Master's thesis will be determined by the thesis advisory committee after an oral defense of the thesis by the candidate and is subject to ratification by the faculty of the Sackler School.

Laboratory Rotations

Purpose

Laboratory rotations are designed to acquaint students with some of the research projects of current interest in the program, to allow students to assess the suitability of a particular lab for their thesis research, and to allow faculty members to assess the suitability of individual students for work in their labs. A minimum of four lab rotations must be completed during the first academic year.

Rotation Matching Process

Students choose rotations based on their interests and the willingness of the rotation mentor to accept a student. Students are strongly encouraged to choose rotations that expose them to areas of research with which they are not already familiar.

The Sackler School Laboratory Rotation Policy is published in the Handbook (<https://sackler.tufts.edu/studentLife/sacklerStudentHandbook>) and the dates for laboratory rotations are posted on the Sackler website in the Academic Calendar (<https://sackler.tufts.edu/studentLife>).

Several weeks before rotations begin the Sackler School Dean's Office will email students a list of available faculty laboratories. This email contains a link to a survey in which students are to enter their first, second, and third choices for rotations. The Program

Student Advisors meet with students to discuss their possible matches. Information regarding the research areas of program faculty members can be found at the Sackler School website (<https://sackler.tufts.edu/facultyResearch/faculty>). In addition, students should meet with potential mentors during the last three weeks of the immediately prior rotation, but no commitment can be made about whether or not the student may rotate in a lab before all rotation matches are announced. Students should share their interests and mentors discuss the possible projects available in the lab. All students will be notified of their matches simultaneously by their Student Advisors.

Each rotation is evaluated by the rotation mentor. Grades are given for each rotation. When multiple rotations are completed in one semester, the grades are averaged to obtain the grade for the Laboratory Rotations course. If only one rotation is completed in a semester, the grade for that rotation is reported as the grade for the course.

First-year students enrolled in the Mammalian Genetics Program at the Jackson Laboratory (JAX) in Bar Harbor, ME complete their first laboratory rotation at JAX during the first summer, before the start of the fall semester. During the fall semester, while GENE-JAX students are conducting coursework in Boston, they participate in the rotation that runs from mid-September to mid-November. They do not participate in the rotation that begins in mid-November. GENE-JAX students return to Bar Harbor for the spring semester at the start of the new year where they complete two more 10-week rotations at JAX. The GENE-JAX Program Adviser works with students and faculty to confirm rotation matches and finalize placements in thesis labs. GENE-JAX students will begin in their thesis labs at the same time as first-year Sackler students on the Boston Campus.

Qualifying Examination

Purpose

A Qualifying Examination is given to all doctoral candidates. The purpose of the examination is to determine whether a student: 1) has adequate general knowledge in research, 2) is able to formulate experiments and test biological hypotheses; 3) can critically analyze experimental results, 4) has the ability to communicate both orally and in writing; and 5) has creativity.

Timing of the Qualifying Exam

The Qualifying Examinations must be completed by the end of summer term of the first year for PhD students. MD/PhD students may take the exam earlier. In February of the first year, students meet with the Boston or JAX Qualifying Exam Advisor, as appropriate, to review the guidelines for the qualifying examination, address questions concerning the mechanics of the examination, and outline strategies for preparing the preliminary proposal. The exam topic must be submitted to the student's Qualifying Exam Advisor by April 15th of the first year.

The student will interact with the Qualifying Examination Committee to refine the topic and arrive at an acceptable outline of the proposal by May 31. The completed exam proposal must be submitted to members of the committee four weeks after the student has begun writing the exam.

The goal is to schedule all examinations before the middle of July. However, it may happen that a committee cannot meet during that time. Therefore, students should not make travel or other plans until the examination has been scheduled.

Selection of the Qualifying Exam Committee

The examining committee will consist of three members of the Genetics Faculty plus additional Tufts faculty who are experts in the field of the thesis topic. The Qualifying Exam Advisor, in consultation with the Program Director and the Student Advisor, will select the examining committee members, including the committee chair. The chair of the committee will be selected based on the topic chosen for the exam. The second committee member will be selected from the program faculty with whom the student rotated (excluding the thesis advisor). The third member will be selected from the faculty as a whole.

The Boston and JAX Qualifying Exam Advisors will contact the potential committee members and determine their willingness to serve on the committee. Faculty may agree to serve or decline. The exam committee may not include the student's thesis advisor. The student is responsible for notifying the Program Coordinator that the exam committee has been formed and give her a list of the members.

Students may have their qualifying exam proposal pre-read by their committees. In order to do this, however, the proposal must be submitted by June 1. Keep in mind that the committees will only be able to make general statements about the credibility of the proposal. Also, students may have any willing member of the faculty review their proposals, but be warned that they can only give a personal opinion that may not coincide with the views of the exam committee.

Overview of the Qualifying Exam Process

For the Qualifying Examination, students are required to write and defend orally an original research proposal. The subject of the research proposal should not be the student's thesis topic but it may be a closely related topic not currently under investigation in the thesis lab or the focus of previous work experience.

Students are encouraged to discuss the scientific merits of their proposals with the faculty or anyone else in the scientific community. They should also feel free to ask for help in finding specific information, (e.g. if a student is considering using *C. elegans* as a model in a proposal, he or she would likely want to consult an expert in the field regarding the nuances of that system). Students should not ask faculty to actually suggest a proposal or to play any kind of active role in the development of their proposals. All too often, students who fail to talk sufficiently with faculty members have a difficult time with the exam.

Handing in the one-page Topic Proposal and the final Written Proposal on time is part of the requirement for an acceptable proposal. Not meeting the deadline is grounds for giving a failing grade.

Topic Proposal

Students should submit a one-page summary of the proposal to the Boston or JAX Qualifying Exam Advisor no later than April 15th. The proposal should consist of an abstract, specific aims, and brief paragraph describing the significance of the proposal. Students may have any willing member of the faculty check out their proposals, but be warned that faculty can only give a personal opinion that may not coincide with the views of the exam committee. When a student's proposal is found to be acceptable by the appropriate Qualifying Exam Advisor, it will be used to form the basis for the full-

length proposal, and for selection of the faculty to be on the student's Qualifying Examination Committee.

Extended Proposal

Students are allowed to submit a 3-5 page extended proposal to their Qualifying Exam Committee for feedback. The extended proposal should consist of an expansion of the specific aims as well as an outline for the experimental design. The extended proposal must be submitted a student's committee before May 15th, two weeks before the May 31 proposal deadline, to allow time for committee members to review and provide comments.

If rewriting is necessary, the revised proposal must be submitted within two weeks after such notification by the Committee. Students should be warned that the committees will only be able to make general statements about the credibility of the proposal.

After the Topic Proposal is approved, students have four weeks to complete the Written Proposals. Students should schedule their oral exams for one week after they submit the Written Proposal to their Committees.

Written Proposal

No more than four weeks after gaining approval of the Extended Proposal from the Qualifying Exam Committee, students must submit the written document to each committee member that follows the prescribed format described below.

The Qualifying Exam Committee will read the proposal and decide no later than 48 hours in advance whether an oral exam can take place at the previously designated time or whether the proposal should be rewritten according to the recommendations of the Committee before an oral exam is permitted. If rewriting is necessary, the revised proposal must be submitted within two weeks after such notification by the Committee. The final proposal must be submitted exactly one week prior to the oral defense.

Format of the Written Qualifying Exam

The format of the written proposal is based on an NIH grant application and should be as follows (typed, double spaced, page numbers, half inch margins and 11 point Arial, Helvetica or Times Roman):

1. Title page
2. Summary - 1 page
3. Specific Aims - 1 page
4. Background and Significance - no more than 3 pages
5. Experimental Design - no more than 6-10 pages

This should not involve an overly detailed description of technical details, but should emphasize the order of experimentation with potential pitfalls and alternative approaches, as well as an interpretation of the potential results. Methods should only be described in sufficient detail to provide convincing evidence that you appreciate the demands and difficulties of the proposed techniques. Do not exceed the page limits. All figures should fit within the page limits.

6. Bibliography

Evaluation of the Qualifying Exam

At the beginning of the Oral Defense, a student will be asked to leave the room for 5 to 10 minutes so that the attending faculty can discuss the order of questioning. The student will then be asked to give no longer than a 10-minute summary of the highlights of the proposal. There is no limit to the range of the topics to be included in the discussion. However, the student is not expected to know everything; rather be willing to give an opinion. "I don't know" is a valid answer. The format will be that of an informal scientific discussion. Faculty members are expressly requested not to attempt to "grill" or aggressively question students.

At the end of the exam the student will be requested to leave the room and wait outside during the discussion of the proposal. The student will be informed of the grade immediately upon the conclusion of this discussion.

The written and oral parts of the exam will be graded separately. Possible grades are Pass, Incomplete, and Fail.

- Pass: No additional work is required.
- Incomplete: Some aspect of the work is not satisfactory and needs to be redone or completed before passing.
- Fail: A failing grade carries with it a recommendation to the full faculty that the student not continue in the program.

If the written portion of the examination is in any way unsatisfactory, but the oral examination is acceptable, the student may be asked to rewrite portions, or all, of the proposal. The student has two weeks to complete the rewriting.

If the oral portion of the examination is unsatisfactory, this portion must be repeated within two weeks of the original oral examination or within one week of submission of a revised written proposal, if required by the Committee.

The final decision regarding dismissal from the program will be made by the full faculty following a review of the student's complete first year record. If the student is not dismissed at that time, the faculty will decide an appropriate course of action consistent with the program's requirement that a student pass the qualifying exam before beginning full-time thesis research. The final decision about passing on to the second year will be made at that faculty meeting. Failure to pass the Qualifying Exam will result in dismissal from the School.

Admission to PhD Candidacy

The final decision for admission of a student to PhD candidacy is based on the recommendation of the Genetics Faculty. This recommendation considers the qualifying examination result, the student's performances in courses and in the laboratory, as well as any other information that can be used to predict whether or not the student will be able to produce high quality thesis research. The Faculty will discuss and vote on the recommendation at a faculty meeting. A written evaluation will be provided to the student after this meeting.

Research, Career Planning, and Thesis

Selection of a Thesis Advisor

Students are matched with thesis mentors in May of their first year after completing their laboratory rotations. The centralized matching system is designed to maximize the chances that students are matched with one of their top choices. Starting in mid-April, students should begin to discuss with potential thesis advisors the range of research projects that may be open to a student. No such discussions should occur at any earlier time. At no time should a student expect, or faculty members provide, any guidance or commitment as to the likelihood that the student would be accepted into the lab. At this stage, all students are afforded an equal opportunity to discuss potential projects with all faculty members who have indicated a willingness to accept one or more students.

During a predetermined period in May, each student will submit a list of his/her first, second and third choices of thesis labs. The student advisor will make known to relevant faculty members the names of students who have listed the faculty member as a first choice. Each faculty member will then have the option to accept the student(s) or to decline. When more than one student asks to be accepted into the same lab and only one space is available, the faculty member has the option of choosing which student to accept. If a student is not accepted into his/her first lab choice, every effort will be made to assure that that student's second choice is successful. In summary, faculty members do not recruit students into their labs and students should not make commitments to faculty members or ask for commitments from faculty members except through the process described above.

MD/PhD students usually select a thesis advisor after completing two summer rotations during medical school and upon entering the program.

A student who chooses a faculty thesis mentor in a research lab that is not part of the Genetics Program must decide whether to switch graduate programs or stay within the Program. In the latter case, the student would be required to meet all the requirements of the Program, the thesis advisor would have to be approved by the Genetics Program Faculty, and the student's thesis project would have to be judged appropriate for a degree in Genetics.

Selection of the Thesis Advisory Committee

PhD students select their Thesis Advisory Committee early in the fall semester of their second graduate year, and MD/PhD students do so during their first graduate year. Students are responsible for holding their first TAC meeting before the end of this semester, preferably no later than December 1.

The thesis committee consists of three members of the Genetics Faculty (in addition to the mentor). The committee may also include faculty who do not belong to the Genetics Program if their expertise would be helpful in guiding the student's research. The expertise needed for the thesis project and the probability of forming good working relationships should be considered as the members of the committee are selected. The thesis advisor provides input on the committee makeup as he/she is most likely to know what expertise is necessary on the thesis committee.

The student should ask each member if she or he is willing to serve on the committee. Faculty members may decline if they feel they do not have adequate expertise, or if they have too many other commitments. Faculty agreeing to serve on a committee should

understand that they are expressing their willingness to work with the student and the advisor toward successful completion of the thesis on the project chosen by the student. Agreeing to serve on a committee is a serious commitment to both the student and the student's advisor, and faculty members should make every effort to attend all committee meetings. Faculty members should be aware that their role is advisory.

At the first meeting, the committee selects a chair (who may not be the thesis mentor). The chair is responsible for conducting the committee meeting and should guide the discussion of the meeting as necessary. The chair should also remind the committee of the goals set at the last meeting and make sure that progress toward these goals is described by the student. Also, the chair is responsible for seeing that a clear outline of the goals for the next period is presented.

At the beginning of each committee meeting, the committee, student, or advisor may request time to meet alone with the student or advisor to determine if there are special concerns that need to be addressed.

Career Planning

All research trainees must have an Individual Development Plan (IDP) to help them develop their career paths. Tufts has created two forms to assist students in identifying their career goals and the current activities they participate in to achieve them. These forms are available at <https://sackler.tufts.edu/studentLife/currentStudents/forms>.

- The IDP form is intended help students consider their career aspirations as well as the types of skills and attributes that may affect these aspirations and students' ability to attain their goals. It is not intended to predict or identify careers that match their skills. The document is for students' personal use only. Students are not required to share this document with anyone or provide anyone at Tufts with a copy of the completed document. Students may, however, choose to share the document with mentors who may suggest ways to improve skills that are appropriate to the career path(s) being considered. This document should be a living document and one that is updated as students advance in their training.
- The Training and Career Goals Progress Report form is designed to help students think about what they are learning and how to develop professionally. Students are asked to complete this form with a reflective assessment of their current progress and the plans for reaching both short- and long-term career goals. Note that some questions on the form may not apply depending on a student's stage of training. This annual progress report is designed to provide ongoing documentation of progress made towards career goals. Once a year, students complete this form and submit it to their thesis committees along with their research reports for discussion at a TAC meeting. It is the responsibility of thesis committees to provide advice on the resources that will help students achieve their goals at Tufts and beyond.

IDPs have proven so valuable that NIH has mandated that every trainee that it supports have one. Students can learn about IDPs at this very valuable site, <http://myidp.sciencecareers.org/>. They may also talk with their mentors, Student Advisors, the Program Directors, or Associate Dean about career planning, in addition to their Thesis Advisory Committee.

Thesis Advisory Committee Meetings and Assessment of Research Progress

Genetics students are responsible for holding their first Thesis Advisory Committee (TAC) meeting before the end of the fall semester of their second graduate year. MD/PhD students must hold their first TAC meeting in the fall semester of their first graduate year.

Subsequently, two meetings a year, one in the fall semester and one in the spring semester, will be necessary for satisfactory performance in the graduate research course. Failure to hold meetings in a timely fashion will result in an Incomplete grade for research for the semester which will become a failing grade if not completed by the end of subsequent term.

Students should summarize their research progress and plans on the most up to date TAC Evaluation form on the Sackler website (<https://sackler.tufts.edu/studentLife/currentStudents/forms>). After the Committee meeting, the TAC Chair enters the Committee's assessment on the Thesis Advisory Committee Evaluation form and assigns a grade for Graduate Research. The form is signed by all members and an electronic copy is sent to the Sackler Registrar who records the grade on the student's transcript.

It is recommended that one of the meetings occurs after the student's research presentation in the Student Workshop. Common mistakes made in preparing reports include lack of figure legends and page numbers, descriptions of experiments which are incomprehensible, failure to remind readers of important background material or provide diagrams that summarize what is known about the process being studied, failure to describe the rationale for experiments or changes in direction, and not distributing the report in a timely fashion.

First Thesis Advisory Committee

In consultation with the thesis advisor, the student should prepare a detailed written description of the thesis research proposal that is distributed to the Thesis Advisory Committee members at least three working days before the first meeting. The proposal may be single-spaced. It should contain the following parts:

1. Title Page: Include date and location of the Thesis Advisory Committee meeting.
2. Summary (½ - 1 page): This is a short prelude to the Specific Aims. It should include introductory statements that (a) highlight the importance of the work, (b) distill the current knowledge into a few sentences and set the scene for what you propose to do, and (c) explain the knowledge gap that your work will address. In addition, you should clearly state your long-term goal, your short-term objective, and the hypothesis that you will be testing. This section should then lead into the Specific Aims.
3. Specific Aims (½ - 1 page): The Specific Aims (generally not more than four) explain how you will test your central hypothesis. Give each Aim a header and follow with an explanation of the specific problem, a brief description of the approach, and a brief description of the expected outcome. Conclude the Specific Aims with a paragraph that (a) emphasizes any ways your approach is innovative or uniquely suited to address the problem and (b) explains what will be possible after this research is completed that is not possible now.

4. Background (1-2 pages): This should summarize information in the field that is important for the committee to know in order to evaluate your proposal. This is a good place to include models and diagrams.
5. Significance (1/2 page): Expand upon why other people should care about this work.
6. Preliminary Data (if available): Include a discussion of how this data supports the proposed work.
7. Experimental Design (2-4 pages): This section should emphasize the order in which the experiments are to be conducted with pitfalls and branch points clearly identified. The general approaches to be used should be stated but detailed methodology should not be given unless the experiments involve major departures from techniques that are commonly used.
8. Concluding Paragraph: Restate what you hope to accomplish, why it is important, and how it will advance the field. Reiterate key points about the significance and potential of your proposed research.
9. References: Include titles and a full author list.

The committee decides if the proposed thesis project is a suitable basis for a doctoral degree. The committee may suggest alterations before accepting a proposal.

End of the Third Year Thesis Advisory Committee Meeting

At the end of the third year of research, the student submits a more complete report and the committee decides whether or not the current project has the potential to be a successful thesis.

The student progress report for the end of third laboratory year committee meeting should start with an Introduction that highlights the significance of the thesis research and clearly states the hypothesis that is being tested and the Specific Aims of the project. The guidelines for this section are the same as those described for the Thesis Proposal above. The Introduction should be followed by a clear and concise summary of the work completed so far, the remaining goals of the project, and how this work will be organized into a thesis. The experiments that are projected to fulfill the remaining goals should be outlined briefly.

The committee will rigorously evaluate the overall progress in achieving the goals of the thesis project and the likelihood that remaining goals can be achieved. In the case of a positive evaluation, the committee will be acknowledging that, barring unforeseen developments, it is confident that the project will lead to successful completion of the thesis research.

In the case of a negative evaluation, the committee chair will draft a report detailing the committee's objections to the project. The student and advisor will have one month to respond in writing to the evaluation. The following responses are possible: 1) the student and advisor disagree with the committee and have decided to proceed with the project and have formed a new or altered committee to guide the work, 2) the student and the advisor have decided to pursue a different project and interact with the same or a different thesis committee as appropriate, or 3) student has decided not to pursue the project and requests to change laboratories. The faculty will be apprised of the outcome of the evaluation at the final faculty meeting of the academic year.

It is important to note that a positive committee evaluation at the end of the third laboratory year does not guarantee a degree. In addition, it is extremely important to understand that a negative evaluation at this point does not rule out the possibility that the student can successfully complete the dissertation with the project in which the committee does not have confidence. The goal of a negative evaluation is to send a clear danger warning about the project to the student and the advisor.

Final Thesis Advisory Committee Meeting

The Thesis Advisory Committee determines when a student has completed sufficient work to prepare their thesis. When a student has reached this point in their training, and obtained approval to finish up final experiments and work on writing the thesis on a full time basis, s/he is excused from some program activities, including seminars, workshop, journal club, and the retreat.

To obtain permission to defend the thesis, a student, after consultation with the advisor, must present the thesis committee with the following information.

- Outline of the thesis Results Section. The outline should be organized in chapters, delineate the major findings, highlight their significance, and be accompanied by a list of figures and tables.
- An abstract. The abstract of the thesis work should be approximately 250 words.
- A list of remaining experiments. If any experiments remain to be completed, these should be described and a timeline for their anticipated conclusion should be given.
- Choice of outside examiner. The student also needs to inform the committee as to the choice of outside examiner.

Usually the student only seeks permission to defend when all or nearly all experiments considered necessary for the thesis have been completed. It is anticipated that very little bench work will remain once the committee gives permission and that no experiments critical to an acceptable thesis will remain to be completed.

The student and advisor should make every effort to reach an agreement concerning the material to be in the thesis prior to the committee meeting. In the event that the student and the advisor are not in full agreement concerning the thesis content, the work remaining, or a schedule for experimentation or writing, these issues should be laid out clearly for the committee to evaluate.

Upon evaluation of the outline and the timetable, the committee will decide whether to grant permission to defend. In granting permission, the committee is not guaranteeing the degree but merely stating that they feel the body of work presented to them is sufficient for the thesis.

All committee members, including the thesis advisor, must be present at meetings where permission to defend is considered. It is important to note that permission is a formality in that many students elect to write large sections of their thesis before their final committee meeting. Often this is to the student's benefit because it expedites the process of preparing the thesis. The defense date must be set within three months of receiving permission.

Selecting an Outside Reviewer

A student, after consultation with the advisor, should propose an individual as an outside examiner at the final committee meeting. If the student is uncertain about the

willingness or availability of the first choice, several names may be proposed. The committee can approve all or some of the choices and offer additional suggestions.

Either the student or the advisor may make the initial contact with the outside examiner. Once a person has agreed to serve on the committee, the outside examiner will be contacted by the chair of the committee concerning the mechanics of the defense procedures. If a person from outside the Boston area is identified as an outside examiner and you wish to seek support for travel/lodging for this individual, prior approval by the Program Director is required. Any costs for an out of town outside examiner are the responsibility of the thesis advisor, not the Genetics Program.

The student should provide the outside examiner with a copy of the thesis outline and any papers or manuscripts that have been submitted once the individual has agreed to read the thesis. The student should also be prepared to go over this material with the outside examiner if requested to do so.

Thesis Format and Defense

When a student receives permission to defend, he/she should make an appointment to meet with the Associate Dean. Students will receive instructions on all aspects of the process used to complete the degree, thesis formatting guidelines and information about Commencement Ceremonies at Tufts University.

To complete their graduate studies, students must write a thesis and defend their research in an oral examination. Students who completed their thesis research at The Jackson Laboratory may decide if they would rather hold their defenses at JAX or on the Boston Campus.

Students distribute their theses to their Thesis Defense Committee members approximately two weeks before their scheduled defense. The chair of the thesis committee will contact all committee members, including the outside examiner, 48-72 hours prior to the defense to determine if the thesis is generally acceptable to the committee.

The oral defense will consist of a public presentation of approximately 45-60 minutes, followed by a closed discussion period with the committee and outside examiner.

During the deliberations of the thesis examination committee, the committee should determine what revisions need to be made to the thesis document and the amount of time needed to complete those particular revisions. The Sackler School Time from Thesis Defense to Completion Policy, governing thesis revisions and continued receipt of a stipend, is in the Student Handbook (<https://sackler.tufts.edu/studentLife/sacklerStudentHandbook>).

Genetics Student Presentation Schedule

Combined Biochemistry, CMDB, CMP and Genetics Student Presentations are held on Thursdays at 12:00 pm in Jaharis 508 according to the schedule listed below.

| DATE | SPEAKER |
|----------------------------|------------------------------------------------------------|
| September 20 | Andrew Shearer (Biochemistry) & Jess Davis-Knowlton (CMDB) |
| September 27 | Emily Michael (Biochemistry) & Jess Elman (CMDB) |
| | |
| October 4 | Kayla Gross (CMDB) & Jaymes Farrell (Genetics) |
| October 11 | Aaron Bernstein (CMP) & Nafis Hasan (CMDB) |
| October 18 | Matt Butnaru (Biochemistry) & Alex Fine (Genetics) |
| October 25 | Vera Gaun (CMDB) & Bethany Delcuze (CMP) |
| | |
| November 1 | Vanessa Yanez (CMDB) & Suray Sharma (Biochemistry) |
| November 8 | Rob Cerulli (CMDB) & Nicole Sjoblom (Biochemistry) |
| November 15 | Benjamin Brigham (CMDB) & Tate Tabtieng (Biochemistry) |
| November 22 | Thanksgiving |
| November 29 | Alan Yeo (CMDB) & Kate Foley (Gene/JAX) |
| | |
| December 7 | Michael Collins (CMDB) & Erion Lipo (Genetics) |
| December 14 | Daniel Fritz (CMDB) & Mike McLellan (Gene/JAX) |
| December 21 - January 4 | Holiday Break |
| | |
| January 10 | Craig Hanna (CMDB) & Hayley Muendlein (Genetics) |
| January 17 | Elizabeth Moss (CMDB) & Alex Stanton (Gene/JAX) |
| January 24 | Michael Hyde (CMDB) & Pragya Singh (CMDB) |
| January 31 | Judi Hollander (CMDB) & Candice Byers (Gene/JAX) |
| | |
| February 7 | Ramesh Govindan (CMDB) & Megan Gutwillig (Genetics) |
| February 14 | Kathy Nevola (CMDB) & Ashlee Junier (Genetics) |
| February 21 | Beth Porter (CMDB) & Youssof Mal (Genetics) |
| February 28 | Chris Schwake (CMDB) & Nick Tolman (Gene/JAX) |
| | |
| March 7 | Ashwini Sunkavalli (CMDB) & Uma Arora (Gene/JAX) |
| March 14 | Michael Thorsen (CMDB) & Aidan Burn (Genetics) |
| March 21 | Liang Yuan (CMDB) & Heather Gardner (Genetics) |
| March 28 | Matt Zunitch (CMDB) & Daniel Heller (Genetics) |
| | |
| April 4 | Brittany Ahlstedt (CMDB) & Sarah Heuer (Gene/JAX) |
| April 11 | Jackson Fatherree (CMDB) & Lauren Kuffler (Gene/JAX) |
| April 18 | Alex Hu (CMDB) & Salwa Mostafa (Genetics) |
| April 25 | Josh Man (CMDB) & Rebecca Brown (Genetics) |
| | |
| May 2 | Alice Meng (CMDB) & Benjamin Clauss (Gene/JAX) |
| May 9 | Rachel Ryner (CMDB) & Callan O'Connor (Gene/JAX) |
| May 16 | Logan Schwartz (Gene/JAX) |
| Late May | CMDB First Year Forum |
| | |

List of Genetics Graduate Student

Jackson Labs (JAX) phone numbers are preceded by 207-288-xxxx. Medford phone numbers begin with a "7."

| NAME | ADVISOR | PHONE |
|----------------------------|-----------------------|--------------|
| 1st YEAR | | |
| Rebecca Brown | | |
| Benjamin Clauss (Jax) | | |
| Julie Hisey MD/PhD | Sergei Mirkin | 617-627-4828 |
| Callan O'Connor (Jax) | | |
| Logan Schwartz (Jax) | | |
| 2nd YEAR | | |
| Uma Arora (Jax) | Beth Dumont | |
| Aidan Burn | John Coffin | 6-6526 |
| Heather Gardner | Cheryl London | |
| Daniel Heller MD/PhD | Claire Moore | 6-3645 |
| Sarah Heuer (Jax) | Catherine Kaczorowski | 207-288-6428 |
| Lauren Kuffler (Jax) | Greg Carter | 207-288-6280 |
| Salwa Mohd Mostafa | Claire Moore | 6-3645 |
| 3rd YEAR | | |
| Candice Byers (Jax) | Christopher Baker | 207-288-1123 |
| Megan Gutwillig | Cheryl London | |
| Ashlee Junier | Carol Kumamoto | 6-6803 |
| Youssof Mal | Charlotte Kuperwasser | 6-6544 |
| Nicholas Tolman (Jax) | Simon John | 207-288-6476 |
| 4th YEAR | | |
| Kate Foley (Jax) | Gareth Howell | 207-288-6238 |
| Erion Lipo | Ralph Isberg | 6-4092 |
| Micheal McLellan (Jax) | Nadia Rosenthal | |
| Hayley Muendlein | Sasha Poltorak | 6-3945 |
| Alexander Stanton (Jax) | Steven Munger | |
| 5th YEAR | | |
| Jaymes Farrell | Phil Hinds | 6-7446 |
| Alexander Fine (Jax) | Greg Carter | 207-288-6280 |
| 6th YEAR | | |
| Kevin Child | Jim Schwob | 6-2418 |
| Qiming Wang (Jax) | David Serreze | 207-288-6238 |

List of Genetics Program Faculty

*Not accepting new students. Jackson Labs (JAX) phone numbers are preceded by 207-288-(last 4 digits listed below). Medford phone numbers begin with a "7."

| Name | Location | Phone | E-Mail |
|------------------------|-------------------------------------|--------------|------------------------------------------------------------------------------------------|
| Judith Blake | Bar Harbor, ME | 6248 | judith.blake@jax.org |
| Ewelina Bolcun-Filas | Bar Harbor, ME | 6983 | ewelina.bolcun-filas@jax.org |
| Bob Braun | Bar Harbor, ME | 6841 | bob.braun@jax.org |
| Peter Brodeur * | M&V 503 | 6730 | peter.brodeur@tufts.edu |
| Rachel Buchsbaum | 75 Kneeland, 12 th Fl | 9555 | rbuchsbaum@tuftsmedicalcenter.org |
| Peter Bullock | M&V 406 | 0447 | peter.bullock@tufts.edu |
| Carol Bult | Bar Harbor, ME | 6324 | carol.bult@jax.org |
| Robert Burgess | Bar Harbor, ME | 6706 | robert.burgess@jax.org |
| Gregory Carter | Bar Harbor, ME | 6025 | greg.carter@jax.org |
| Gary Churchill | Bar Harbor, ME | 6189 | gary.churchill@jax.org |
| Brent Cochran | Jaharis 708 | 0442 | brent.cochran@tufts.edu |
| John Coffin | Jaharis 409 | 6528 | john.coffin@tufts.edu |
| Gregory Cox | Bar Harbor, ME | 6502 | greg.cox@jax.org |
| Catherine Freudenreich | 200 Boston Ave | 7-4037 | catherine.freudenreich@tufts.edu |
| Mary Ann Handel | Bar Harbor, ME | 6778 | maryann.handel@jax.org |
| David Harrison | Bar Harbor, ME | 6357 | david.harrison@jax.org |
| Victor Hatini | Jaharis 3 rd Fl | 3493 | victor.hatini@tufts.edu |
| Philip Hinds | 75 Kneeland, 14 th Fl | 7947 | phinds@tuftsmedicalcenter.org |
| Gareth Howell | Bar Harbor, ME | 6572 | gareth.howell@jax.org |
| Gordon Huggins | Tupper, 7 th Fl | 2807 | ghuggins@tuftsmedicalcenter.org |
| John Iacomini | Jaharis 909 | 4014 | john.iacomini@tufts.edu |
| Thereza Imanishi-Kari* | Jaharis 814 | 6779 | thereza.imanishi-kari@tufts.edu |
| Ralph Isberg | Jaharis 423 | 3993 | ralph.isberg@tufts.edu |
| F. Rob Jackson | Stearns 329 | 6752 | rob.jackson@tufts.edu |
| Simon John | Bar Harbor, ME | 6496 | simon.john@jax.org |
| Alan Kopin | Tupper 7003 | 4834 | akopin@tuftsmedicalcenter.org |
| Ron Korstanje | Bar Harbor, ME | 6992 | Ron.korstanje@jax.org |
| Athan Kuliopulos | 75 Kneeland, 10 th Fl | 8482 | athan.kuliopulos@tufts.edu |
| Carol Kumamoto | Jaharis 429 | 0404 | carol.kumamoto@tufts.edu |
| Rajendra Kumar-Singh | South Cove 7 | 3767 | rajendra.kumar-singh@tufts.edu |
| Vivek Kumar | Bar Harbor, ME | 6917 | Vivek.kumar@jax.org |
| Charlotte Kuperwasser | Jaharis 9 | 2364 | charlotte.kuperwasser@tufts.edu |
| Cheryl London | 75 Kneeland | 7409 | Cheryl.london@tufts.edu |
| Michael Malamy | Stearns 504 | 6756 | michael.malamy@tufts.edu |
| Mitch McVey | 200 Boston Ave | 7-4196 | mitch.mcvey@tufts.edu |
| Sergei Mirkin | 200 Boston Ave | 7-4794 | sergei.mirkin@tufts.edu |
| Claire Moore | Jaharis 408 | 6935 | claire.moore@tufts.edu |
| Karl Munger | Jaharis 607 | 0306 | Karl.munger@tufts.edu |
| Steven Munger | Bar Harbor, ME | 1479 | Steven.munger@tufts.edu |
| Patsy Nishina | Bar Harbor, ME | 6383 | patsy.nishina@jax.org |
| Jose Ordovas | HNRC-711 | 556- 3102 | jose.ordovas@tufts.edu |

| | | | |
|---------------------|----------------------|--------|----------------------------------------------------------------------------------------|
| Alexander Poltorak | Jaharis 529 | 3596 | alexander.poltorak@tufts.edu |
| Derry Roopenian | Bar Harbor, ME | 6396 | derry.roopenian@jax.org |
| Brian Schaffhausen* | Stearns 704 | 6868 | brian.schaffhausen@tufts.edu |
| Jim Schwob | Jaharis 914 | 6626 | jim.schwob@tufts.edu |
| Donna Slonim | Halligan Hall | 7-2225 | donna.slonim@tufts.edu |
| Ana Soto | Jaharis 317 | 6954 | ana.soto@tufts.edu |
| Jennifer Trowbridge | Bar Harbor, ME | 6183 | jennifer.trowbridge@jax.org |
| Philip Tsuchlis | 75 Kneeland, 12th | 6100 | ptsichlis@tuftsmedicalcenter.org |
| Henry Wortis* | Jaharis 807 | 6718 | henry.wortis@tufts.edu |
| Amy Yee | Jaharis 614 | 6850 | amy.yee@tufts.edu |
| Pamela Yelick | M&V 8 | 2430 | pamela.yelick@tufts.edu |