

Department of Microbiology & Immunology

2023-2024 Graduate Student Handbook

We hope that your graduate training will be stimulating, your research fruitful, and your overall experience with colleagues and friends at Stanford enjoyable. This handbook is meant to be a guide for the requirements, both academic and administrative, that you will need to accomplish on your way to a Ph.D. Be advised that requirements are subject to change in future years, however you will follow the requirements based upon your matriculation year. The handbook works in conjunction with the *Stanford Bulletin*, which will guide you throughout your time at Stanford.

We realize that the SARS-CoV-2 pandemic still continues to impact life, both on and off campus. We have attempted to make adjustments in this handbook in accordance with existing rules and regulations. However, please note that University policies are dynamic and evolving, and these updates may be incomplete or become outdated. When possible, we have left the original language and plan, with a notation indicating pandemic-relevant changes (e.g., virtual seminars and classes). Retention of the original language is to enable a smooth transition back to normalcy once that is possible. As a program and department, we are committed to creating a communicative and nurturing environment that promotes kindness, diversity, equity, and inclusion. Please join us in embracing these principles, which we believe can help us meet the challenges of the coming year.

When questions arise, use the resources available in the department: Jan Carette (Director of the Graduate Program), Heather Ginther (Student Services Officer), your rotation and thesis lab advisors, and your best resource, your fellow students.

Welcome to Stanford!

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Student Honor Code and Fundamental Standard

The sections below about Stanford University's Honor Code and Fundamental Standard are from the Office of Community Standards' home page <https://communitystandards.stanford.edu/> .

Honor Code

The Honor Code is the university's statement on academic integrity written by students in 1921. It articulates university expectations of students and faculty in establishing and maintaining the highest standards in academic work.

1. The Honor Code is an undertaking of the students, individually and collectively:
 - A. that they will not give or receive aid in examinations; that they will not give or receive unpermitted aid in class work, in the preparation of reports, or in any other work that is to be used by the instructor as the basis of grading;
 - B. That they will do their share and take an active part in seeing to it that others as well as themselves uphold the spirit and letter of the Honor Code.
2. The faculty on its part manifests its confidence in the honor of its students by refraining from proctoring examinations and from taking unusual and unreasonable precautions to prevent the forms of dishonesty mentioned above. The faculty will also avoid, as far as practicable, academic procedures that create temptations to violate the Honor Code.
3. While the faculty alone has the right and obligation to set academic requirements, the students and faculty will work together to establish optimal conditions for honorable academic work.

Violations of the Honor Code

Examples of conduct that have been regarded as being in violation of the Honor Code include:

- Copying from another's examination paper or allowing another to copy from one's own paper
- Unpermitted collaboration
- Plagiarism
- Revising and resubmitting a quiz or exam for regrading, without the instructor's knowledge and consent
- Giving or receiving unpermitted aid on a take-home examination
- Representing as one's own work the work of another
- Giving or receiving aid on an academic assignment under circumstances in which a reasonable person should have known that such aid was not permitted

Sanctions for Violating the Honor Code

In recent years, most student disciplinary cases have involved Honor Code violations; of these, the most frequent arise when a student submits another's work as their own, or gives or receives unpermitted aid. The standard sanction for a first offense includes a one-quarter suspension from the University and 40 hours of community service. In addition, most faculty members issue a "No Pass" or "No Credit" for the course in which the violation occurred. The standard sanction for multiple violations (e.g. cheating more than once in the same course) is a three-quarter suspension and 40 or more hours of community service.

Fundamental Standard

The Fundamental Standard has set the standard of conduct for students at Stanford since it was articulated in 1896. It states:

Students at Stanford are expected to show both within and without the university such respect for order, morality, personal honor and the rights of others as is demanded of good citizens. Failure to do this will be sufficient cause for removal from the university.

Understanding the Fundamental Standard

The Fundamental Standard is an aspirational statement of Stanford's ideal of civic and moral community. Although the spirit of the Fundamental Standard remains unchanged since 1896, these aspirational learning goals for all Stanford students elaborate its basic values today:

1. Students are expected to respect and uphold the rights and dignity of others regardless of race, color, national or ethnic origin, sex, age, disability, religion, sexual orientation, gender identity, or socio-economic status.
2. Students are expected to uphold the integrity of the university as a community of scholars in which free speech is available to all and intellectual honesty is demanded of all.
3. Students are expected to respect university policies as well as state and federal law.
4. For the purposes of clarity, students should be aware that they may be subject to discipline at Stanford University for acts of misconduct including:
 - Violation of university policy
 - Violation of a specific university directive
 - Violation of an applicable law
 - Physical assault
 - Theft of property or services
 - Threats
 - Hazing
 - Hate crimes
 - Alcohol- and drug-related violations, including driving under the influence
 - Intentional or reckless property damage
 - Seeking a university benefit to which a student is not entitled
 - Falsifying a document
 - Impersonating another
 - Computer violations
 - Knowingly or recklessly exposing others to significant danger

Sanctions for Violating the Fundamental Standard

There is no standard sanction that applies to violations of the Fundamental Standard. Infractions have led to sanctions ranging from formal warning and community service to expulsion. In each case, the nature and seriousness of the offense, the motivation underlying the offense and precedent in similar cases are considered.

M&I Accessibility & Inclusion

The Department of Microbiology & Immunology is committed to ensuring that the department is a safe, accessible and inclusive environment for learning. If, at any point during your time at Stanford, you experience limitations or you feel that your learning is impacted by a disability or chronic illness, we will work with you to ensure that you will be able to receive accommodations.

Our department acknowledges that disabilities, whether temporary or chronic, may impact your ability to perform at your highest academic potential. Our department works with the Office of Accessible Education (OAE) to ensure our students have access to necessary accommodations. We are dedicated to supporting you. More information about accessibility at Stanford can be found at <https://oae.stanford.edu>.

In addition to providing accommodations, the OAE and other groups dedicated to disability and accessibility advocacy often hold programs, such as resource fairs, guest lectures, and other learning opportunities to discuss how to make STEM environments, and your future career, more inclusive. We encourage our students to take part in these discussions. Some of these student groups include:

- The Disability Community Space (DisCo) aims to nurture an atmosphere where students can advocate for themselves and feel supported in a space that is built to empower and grow alongside its members. DisCO is located at 563 Salvatierra Walk. Join the listserv at disability-space@lists.stanford.edu to hear about upcoming events and programs.
- Stanford Disability Alliance provides a safe space for students with and without disabilities to join together in support and collective action.
- Graduate Coalition for Disability and Chronic/Mental Illness (GCDI), a graduate student-led group to advocate, support, and empower graduate students in the Biosciences with Disability and/or chronic/mental illness. Graduate members of the Disability community and allies are encouraged to join.

More organizations can be found at: <https://disability.stanford.edu/community/students/student-groups>

Program of Study

Curriculum

Prior to arriving on campus, students will be contacted with instructions from the SSO (Heather Ginther) for registering for their classes their first fall quarter. At the start of their first quarter, each new graduate student should contact the SSO for any assistance in enrolling in their required coursework for their first year. *Enrolling in courses before the quarter formally begins ensures that your quarterly paycheck will be dispersed promptly at the beginning of the quarter.*

At the start of their first quarter, each new graduate student may meet with Dr. Jan Carette, the current Graduate Program Director, if they desire guidance while charting the coursework needed to complete the requirements for a Ph.D. This is to ensure that all students have had appropriate undergraduate preparation for the program, and to identify gaps in basic science to be remedied during the initial period of graduate study. The required background coursework, which most individuals have already had when entering the program, is listed here:

- General Biology (2 quarters or 1 year)
- Organic Chemistry (2 quarters or 1 year)
- Organic Chemistry (2 quarters or 1 year)
- Physical Chemistry (1 quarter or 1 semester)
- Physics (2 quarters or 1 year)
- Biochemistry (1 quarter or 1 semester)
- Biostatistics (1 quarter or 1 semester)
- Advanced Genetics (1 quarter or 1 semester)
- Advanced Molecular Biology (1 quarter or 1 semester)
- Advanced Cell Biology (1 quarter or 1 semester)
- Microbiology, Virology or Immunology

If an enrolled student was unable to receive this course work prior to enrolling at Stanford, it is highly encouraged that they seek out an appropriate undergraduate course to fill their knowledge gap. It should be noted that an undergraduate course may be taken as credit/no credit or audited. Another option is to purchase a textbook using the department flex funding available to each student and refresh key concepts from undergraduate courses. First year graduate students should contact and work with the SSO to determine their best option in this case.

Gaps are filled by identifying Stanford courses given at the advanced undergraduate and graduate level by the Departments of Biological Sciences, Chemistry, Microbiology and Immunology, Cellular and Molecular Physiology, Genetics, Biochemistry, Cell Biology, Developmental Biology.

- The core course requirements for students entering this year are given below and in **Appendix I**. Typical entering students satisfy all of these requirements within their first three to six quarters (this usually means taking three courses per quarter, two to five hours per week each). Please check Explore Courses website for day, time, and room location.

Course requirements

Quarter Offered	Subject/ Course Number	Course Title	Units	Day(s)	Time(s)
Autumn	BIOS 200	Foundations in Experimental Biology	5 unit	M/W/F	10:30am-12:20pm
	MI 250	Frontiers in Microbiology & Immunology	1 unit	Tues	5:30-6:30pm
	MI 200 ^{1,2}	Cellular and Molecular Immunology: An Introductory Course	4 units	M/W/F	9:30am-10:20am
	MI 399	Graduate Research	4 unit	N/A	N/A
New	BIOS 217	Foundations of Statistics and Reproducible Research	2 unit	M/W/F	10:30am-12:20pm
Winter	BIOC 224 ¹	Advanced Cell Biology	3 unit	M/W	1:30pm-2:50pm
	IMMUNOL 201 ¹	Advanced Immunology I	3 units	M/W	1:30pm-2:50pm
	GENE 205 ^{1,3}	Advanced Genetics	3 units	T/TH	1:30pm-2:50pm
	MI 210	Advanced Pathogenesis of Bacteria, Viruses, and Eukaryotic Parasites	4 unit	T/TH	1:30-3:30pm
	MI 399	Graduate Research	3 unit	N/A	N/A
New	BIOS 216	The Practice of Reproducible Research	1 unit	M/W/F	10:30am-12:20pm
Spring	MI 215	Principles of Biological Technologies	3 unit	T/TH	1:30-3:00pm
	MED 255	The Responsible Conduct of Research	1 unit	Varies	Varies
	MI 399	Graduate Research	5 unit	N/A	N/A

¹For the Core requirement it is required to choose one of these four courses: MI 200, BIOC 224, IMMUNOL 201, GENE 205. Please see footnote 2 and 3 for timing when to take the course. Note that once the core requirements are fulfilled (one course) additional courses can be taken as elective.

² If MI 200 is chosen as core course, it needs to be fulfilled in the **second year** as to not exceed 10 units in the Autumn quarter.

³ If GENE 205 is chosen as core course, it needs to be fulfilled in the **second year** as to avoid overlap with the MI 210 core course.

Students will register for MI 250: Frontiers in Microbiology and Immunology once in their first year and once in the second year for a total of 2 units. Even though students only enroll in MI 250 in the Fall term it is an entire year course. In the fourth year, students will need to complete a second ethics course, please see **Appendix II** for a list of approved courses.

Take one elective from the approved list, **Appendix III**. Prior approval from the student's adviser and department Graduate Program Director is required to use a course not from the elective list.

Students register for MI 399 Graduate Research as needed to maintain enrollment in 10 units each quarter, including summer, until they complete a minimum of 135 units and are eligible for TGR status.

Masters of Medicine Students and Medical Scientist Training Program (MSTP)

The Masters of Science in Medicine (MOM) is a master's degree program that provides PhD candidates with exposure to clinical medicine with a view to fostering translational research. The Medical Scientist Training Program (MSTP) provides funding and structure for a select group of incoming MD students to train in biomedical research with a view to attaining the PhD. MSTP students generally apply and are accepted to the MSTP program through the MD admissions process and sometimes do their PhD work in M&I.

Students who are in the MOM or MSTP program and M&I PhD program should work with their respective advisers to develop a program of study.

Graduate Advising Expectations

The Department of Microbiology and Immunology is committed to providing academic advising in support of graduate student scholarly and professional development. When most effective, this advising relationship entails collaborative and sustained engagement by both the adviser and the advisee. As a best practice, advising expectations should be periodically discussed and reviewed to ensure mutual understanding. Both the adviser and the advisee are expected to maintain professionalism and integrity.

Faculty advisers guide students in key areas such as selecting courses, designing and conducting research, developing of teaching pedagogy, navigating policies and degree requirements, and exploring academic opportunities and professional pathways.

Graduate students are active contributors to the advising relationship, proactively seeking academic and professional guidance and taking responsibility for informing themselves of policies and degree requirements for their graduate program.

Expectations of faculty advisors in Microbiology and Immunology:

- actively promote a diverse and inclusive work environment
- Serve as intellectual and professional mentors to their graduate students including regular meetings/interactions that focus on the student and student's project.
- provide knowledgeable support concerning the academic and non-academic policies that pertain to graduate students
- help to prepare students to be competitive for employment
- maintain a high level of professionalism and open dialogue in the relationship
- establish and collaboratively maintain expectations of the advisor/advisee relationship consistent with departmental standard

Additional details and resources can be found in the Guidelines for Advising Relationship between Faculty and Graduate Students, <https://gap.stanford.edu/handbooks/gap-handbook/chapter-3/subchapter-3/page-3-3-1>.

General Responsibilities of Faculty Advisors

The University requires that within each department or program minimum advising expectations be set for both advisor and advisee. Such minimum expectations must differentiate between master's and doctoral programs, and between different types of advisors (academic/program vs. research.) These department or program expectations must be distributed to faculty and graduate students on an annual basis at the start of each academic year and must be easily accessible on the web. Faculty are expected to affirm that they have received the advising expectations. Each faculty

member has the prerogative to augment the departmental advising expectations with their specific additional expectations, while remaining consistent with the departmental advising policies.

Residency Policy

A minimum of 135 units is required for receipt of the Ph.D. from Stanford. Transfer students may receive credit for up to 45 units of appropriate graduate study elsewhere, and at least 90 units must be completed at Stanford toward the Ph.D. Transfer credit can be discussed with the Director. Please see the 2021-22 Stanford Bulletin for more information regarding the University's transfer credit policy.

Students are required to enroll in a maximum of 10 units per quarter until they have completed minimum of 135 units for the Ph.D.

Grading Policy

All courses taken to complete the degree requirements must be taken for a letter grade and a "B+/-" or better must be obtained. M&I graduate students who earn a "C+/-" in a required course must retake the course. If the course is one of the required electives, then the student may either retake the course or choose another course with the equivalent number of units.

Registering for Classes

Students can fill out their study lists through AXESS. The Preliminary Study List is due by 5pm on the first day of classes. Late fees are assessed if students are not "at status" by the deadline date. At status means a student must have a study list with sufficient units for their status, whether full-time, 10 units, or approved special registration statuses. It is advisable to register early to avoid problems on the deadline date. Students receiving fellowship or training grant stipends will not receive their quarterly funding until they are at status.

All departments offer courses for formal or informal participation. Students will need to complete certain departmental courses; many others are offered that may be of interest. Students frequently take advantage of the opportunity to enroll in dance, music, language, and physical education classes as well as other bioscience courses. Students will need to request approval from their advisor before registering for any non-research related courses. Students can use the Stanford Bulletin Explore Course website, <https://explorecourses.stanford.edu/>, to find complete details of courses offered for the academic year.

Vacation

The Microbiology and Immunology Program recommends that all students be granted a minimum of two weeks of vacation each year. Students should communicate with their advisor in advance about time away from lab.

Rotations

All entering students complete a minimum of two and usually no more than four lab rotations; one rotation per academic quarter on a quarterly basis. The first rotation must be done in an M&I lab, but students are welcome to rotate outside the department in their later rotations.

It is advisable for students to select their first rotation with a laboratory pursuing research in an area closest to their initial interest. During subsequent rotations the first-year graduate student may continue in the same interest area or may go on to other areas that become of interest after s/he is

exposed to various research projects in another laboratory. Through consultations with individual faculty, midway through the first quarter the student chooses a program faculty member to work with for their second, third and possibly fourth rotation projects. Because there is great breadth of opportunity in research training, and because of the many labs with related interests, the student's performance during rotations will be evaluated by faculty. Your lab rotation advisor will submit a Lab Rotation Assessment in the GST database at the end of the rotation. During the year, the student may continue to attend group meeting for any lab in which s/he has rotated.

Students who rotate in laboratories outside of the department and who subsequently choose to do their thesis work in these laboratories will either transfer into the relevant program or remain in the Microbiology and Immunology program. The latter route would be appropriate when the thesis work falls within the overall disciplines of microbiology and immunology. In such cases, the program maintains involvement with such students by requiring a co-advisor in the same scientific discipline.

Decisions will be made about the lab in which the student will do their thesis work sometime on or after **April 1** of the first year, assuming the student feels s/he has enough information to make a decision. Neither students nor faculty may make commitments as to which lab a given student will do their thesis work in before April 1. This is to ensure that only mature decisions are made and that everyone is able to utilize the rotation system to acquire all the information necessary to make this very important choice. In making the decision, students should talk to the faculty member concerned. The Biosciences website, <https://biosciences.stanford.edu/current-students/incoming-new-students/choosing-rotations-and-a-thesis-lab/>, has information about choosing your rotation and thesis labs.

Seminar Programs and Journal Clubs

Fall Quarter Faculty Talks.

Microbiology and Immunology faculty will make presentations at Thursday evening seminars for new graduate students throughout the Fall quarter to explain the general aspects of their research areas. Each of the Biosciences programs offers a similar seminar series and students are encouraged to attend as many of these other seminars as they would like.

Wednesday Seminar Series. – *May be virtual or in-person, please watch for email announcements

External. The external program invites well-known, cutting-edge investigators from both inside and outside the university to visit the department for the day on a Wednesday. The speakers are chosen through discussions between graduate students, postdocs and a faculty advisor early each summer. Invitees give a seminar on their recent work, followed by a departmental lunch with students (*Note that this may be scheduled to be a virtual zoom gathering rather than the typical in-person lunch format). They also meet individually with faculty and specific labs through the day. This seminar program serves several purposes, including keeping graduate students abreast of the most important work going on in their fields and giving them important opportunities to meet and talk with distinguished scientists.

Internal. On Wednesdays when no external speaker is scheduled, the Wednesday Seminar is presented by individual labs within the department. A senior graduate student or post doc is chosen by her or his lab to present a half-hour talk on the current research. All senior graduate students are required to talk either at the Wednesday Seminar series or in a comparable format (Cellular & Molecular Biology Symposium, select meetings, etc.) periodically.

Journal Club. First- and second-year graduate students are required to participate in the M&I Journal Club (MI 250) held on Tuesday evening immediately preceding a Wednesday external seminar.

Each invited speaker is asked to suggest one of her or his published articles for discussion at the journal club meeting. The paper is presented by a first- or second-year graduate student, and the faculty member whose laboratory is hosting the speaker will serve as a resource during this presentation.

To facilitate the journal club discussion, the presenter is asked to prepare a list of 2-3 experiments that s/he might propose should be done next to further the work of the visitor. These should not be the very obvious immediate next experiments, but a little more ambitious in terms of where the project should go in the immediate timeframe. They certainly can be the product of group discussion at the journal club. The presenter should at least toss a few ideas out to start the discussion. Of course, some of your ideas may turn out to have been done when you hear the seminar itself; in such cases, the challenge will be to think on the fly and adjust your suggestions between the seminar and meeting with the speaker. Each presenter should also incorporate a discussion of how well the manuscript reflects the different principles of rigorous and reproducible research.

Students are required to attend both the internal and external departmental seminar presentations, and should, therefore, be able to deal with questions relating to those talks. Students are also expected to be up-to-date on modern developments within the fields of microbiology and immunology, i.e., they should stay current with recent publications within the more relevant journals.

Other seminars available. The departments in the Stanford Medical School, Biology and Chemistry in the School of Humanities, and several Interdepartmental Programs each have their own training and research programs including advanced courses, seminars, and journal clubs. Integration with these other departments is done through attendance at seminars and courses as well as through interdisciplinary meetings held in many subject areas. Events that are open to the general public are listed on the Biosciences events calendars, <https://biosciences.stanford.edu/events/>.

Departmental Scientific Conference

Each year, the department holds a scientific conference at which faculty and students present their recent research. One to two members of each lab speak at the conference. This allows entering students to become familiar with the wide range of biological systems offered in the program while remaining close to one area that they may continue studying for their thesis research. At this departmental conference, fourth year students are required to give a presentation. At least once during their graduate careers, typically in the third year, all students are required to present a poster at the conference.

Teaching Assistantships

Teaching is an integral part of the graduate program training experience. All graduate students, regardless of support source, are required to be a teaching assistant (TA) for one course. The TAship is usually completed during the second or third year of training, however is strongly

encouraged to be done in a student's second year.

Rising second year students will be contacted in **May of their first year** by the departments Student Services Officer (SSO) in order to sign up for a specific M&I course they wish to TA for. Please note that only select M&I courses require TA's so students will only be able to choose from the list provided by the departments SSO. Students are required to complete the TA form prior to the start of the quarter of the TAship. If needed, the Graduate Program Director will assign students to TA courses based on requests from the faculty and the student's expertise if spaces are not filled.

If the student elects to do a second teaching assistantship, s/he must have the advisor's permission to do so, at least one quarter before the course begins.

TAs will need to attend TA orientations that are offered by the Vice Provost's Office for Teaching and Learning. The VPTL website has information about orientation sessions offered in autumn, winter, and spring quarters as well as TA resources, <https://vptl.stanford.edu/faculty-staff-student-instructors/student-instructors-postdocs>.

Terminal Graduate Registration (TGR)

Doctoral students are eligible for TGR status when they have

- been admitted to candidacy
- completed all required courses and degree requirements other than the University oral exam and dissertation
- completed 135 units
- submitted a Doctoral Dissertation Reading Committee form

TGR students may enroll in up to 3 units of course work per quarter at the TGR tuition rate. The additional courses cannot be applied toward degree requirements since all degree requirements must be complete in order to earn TGR status. This is a good opportunity to take that golf class or another course for your personal enrichment.

The Student Services Officer will contact students when they are approaching TGR eligibility. Students should then register for TGR Dissertation, MI 802 through AXESS. Do not sign up for TGR Project, MI 801, which is the Master's Project Thesis.

TGR grading is as follows: "S" for satisfactory progress, "N-" for unsatisfactory progress, and "P" for a final grade when everything has been finished. A hold on registration is placed for a student who receives an "N-" grade for more than two consecutive quarters. If a student withdraws by the deadline date specified by the Time Schedule, a "W" will appear on his/her transcript. A failing grade is "NP". Further registration following a grade of NP is contingent upon approval from the advisor, the department, and graduate program office.

Satisfactory Degree Progress

Students who are not making satisfactory degree progress will be placed on probation and will meet with the Director and Student Services Officer to discuss the factors involved and steps that can be taken to improve their situation. A copy of the results of this meeting will be kept in the student's file. Unsatisfactory degree progress can include grades below "B" in formal coursework, N- or NP grades in graduate research, or substandard performance in other department

requirements (including, but not limited to, attendance at journal club, failure to have consistent committee meetings, and performance of teaching assistantships).

In the event of a second quarter of unsatisfactory degree progress, the department steering committee may elect to dismiss a student. Procedures for the dismissal of students, and for the appeal process, can be found in the Stanford Bulletin.

Qualifying Examination

Each student will write a formal research proposal that aligns with their intended thesis project (“on-topic” qualifying exam). In the autumn quarter of the second year, each student orally defends this proposal to a faculty committee.

The on-topic quals means that you will write a proposal based on the actual project that you will be working on during your graduate work at Stanford. The proposal aims should be crafted with the help of the student’s PhD advisor focused on the intended thesis work. Neither another student’s thesis work nor a previously written proposal from the PhD advisor should be used as the basis of a proposal. The Qualifying Exam is intended to give the student an opportunity to carry out the first three stages of a research effort: the creation of an idea, the justification of that idea in terms of significance and feasibility, and the design of an experimental approach. The scope of the project should be appropriate for a single trainee who will devote 4-5 years to its successful outcome.

General Goals

The goals of the exam are for the student to develop:

- a broad knowledge and understanding of the field
- a historical perspective, and identification of seminal contributions
- an ability to identify key, experimentally tractable questions in the field
- a knowledge of experimental procedures
- critical judgment in the evaluation of data and results
- new approaches and experiments
- an ability to draw conclusions from proposed experiments and to propose alternatives.

Before the student starts on a proposal in earnest, they must work with their advisor to create a Specific Aims page, which will be submitted to the Graduate Program Director by **September 1st during summer quarter of the first year**. Students should consult their advisors well in advance of this date and do sufficient background reading to ensure that the chosen topic and aims are of interest, experimentally accessible, and offer appropriate training opportunities in microbiology and/or immunology. Attending seminars, course work, and general reading over the first year should provide the scientific foundation necessary for crafting these aims. For the Specific Aims page, please follow the NIH guideline, with which your PIs should be very familiar with. A good starting point for crafting the one-page (single spaced) specific aims is: <https://www.biosciencewriters.com/NIH-Grant-Applications-The-Anatomy-of-a-Specific-Aims-Page.aspx>

Format

The format of the 10-page double-spaced research proposal should follow that of an NIH grant proposal (including Abstract, Specific Aims, Background, Preliminary Results [where appropriate], Experimental Design, and References [with titles]). Proposals should include reasonable detail in the experimental design section where the planned methods are described. In many cases, the preliminary results section will be relatively sparse and may include one or two key pieces of data from other members of your lab and/or the literature, if properly cited and agreed upon by your advisor. You are encouraged to include your own results obtained during your rotation or initial work after joining the lab. The written proposal must be submitted to the Graduate Program Director no later than **October 1st during the student's second year.**

The oral defense is an opportunity to explain and defend the proposal, and is usually completed between **November 1st and December 15th of the second year of study.** Typically, the defense will be scheduled within 2-3 weeks submission of the proposal. Remember that your committee has read the proposal, so use your presentation time to supplement the written proposal with additional ideas and directions, to seek feedback from your committee.

September 1st is the deadline to send the Specific Aims page to Jan Carette the Director of Graduate Studies (DGS), please cc the SSO Heather Ginther.

October 1st is the deadline to send the names of the people that make up the qualifying examination committee to Monica Cryan (please cc the Director of Graduate Studies (DGS) and Heather).

November 1st is the deadline for the written proposal to be sent to Jan Carette the Director of Graduate Studies (DGS), please cc the SSO Heather Ginther.

November 1st to December 15th is when the oral defense of the proposal is due. Please make sure to send your proposal to the committee at least 2 weeks before the scheduled defense.

Recommended structure

The oral exam is 90 minutes and will follow the structure below:

1. Introduction. State the aims of the project (i.e., the hypothesis being tested and/or the question being asked), the reasons why you feel it is worthy of support from a scientific (and, perhaps, medical) view, and summarize any background information which you feel is critical to an appreciation of the subject.
2. Summarize the main experimental approaches for pursuing the aims and expected outcomes.
3. Give a very short discussion of where you see the line of inquiry leading in the future (i.e., beyond the three-year period).
4. Conclude with a brief recap of the most important features of your proposal.

The proposal should be ~35-45 minutes and you should expect to be interrupted with questions frequently throughout the presentation. An open question period will follow your presentation. You should be able to defend your choice of problem and approach to solving it as well as the technology selected; an extensive knowledge of the background literature and foundational principles for the proposal is essential.

The qualifying examination committee is composed of three faculty members from the department, but the advisor is not included at this stage; one of the three faculty members can be

from outside the department if their expertise would be valuable for the exam process. The Qualifying Exam form, **Appendix V**, will be used to record the results of the examination. If your topic is within the expertise of a departmental faculty member not on your committee, they may be asked to participate in this exam.

The committee evaluates the student's performance and gives one of three ratings: "pass unconditionally," "pass with the condition that some part of the proposal or oral defense be redone," "fail with the need to rewrite and re-defend the proposal." Where relevant, students must pass the proposal defense on the second try, in order to continue in the Program.

*Since the department has switched to an "on topic" structure, students are required to submit a follow-up thesis proposal **May 1st of second year** that is 10 pages and hones the qualifying exam proposal based on input from committee and additional preliminary data, which is expected to be generated in the interim. The committee membership can be changed here to meet thesis committee membership requirements (see below; must include an out-of-department faculty member and the student's advisor) and will be the student's thesis committee.

Because of course commitments specific to M.D. training, medical students are given the option of taking the qualifying examination in their second or third year.

What Reviewers Look For:

Some Suggestions and Hints on Writing a Good Application (based in part on "Grant writing [and getting]," by Roland Ciaranello -- courtesy of Cancer Biology Program):

1. A good problem. This can be the most important aspect of the grant. Reviewers like to see a clear, well-stated description of the problem being studied and why it is important.
2. A clear proposal. Reviewers react badly to having to figure out what you are trying to say or do. Reviewing grants takes a lot of time, so, whereas most reviewers are willing to spend this time to give you a fair review, they are not eager to waste their time. It's your job to be clear.
3. A clear direction to the work. Focus on what you are going to do and make sure it is logical and clear. Provide sufficient information and detail that the reviewer can track your methods and logic. Use topic headings freely.
4. A doable project. As much as possible, stay within your technical limits. Often, a well-written grant with a good idea is not funded because there is no demonstration that the P.I. could actually do the work, either because they haven't trained in the area, published anything on it, or have failed to provide information under the preliminary studies section that they can perform the techniques.
5. You know the literature. It is important to be familiar with the most recent literature in the field in which you are submitting a grant. It will be very damaging to the proposal if there are relevant important papers that you neglect in your application.

Finally, comments commonly heard during an IRG (Study Section) meetings:

"This grant has no new concepts. It will not expand our present knowledge."

"It shows a lack of imagination."

"This is just a data-gathering exercise. It is a fishing expedition."

"There is an inadequate attention to statistics. How will the data be analyzed?"

"This is 'method' and not 'hypothesis'-driven."

"How are the data to be interpreted in terms of the hypothesis?"

"There is no acknowledgement of the problems that may be met and how they may be handled."

"This proposal is way too ambitious, the applicants need to be realistic about the scope of work over a 3-4 year period"

Upon successful completion of the Qualifying Examination, graduate students are required to submit the Application for Candidacy for Doctoral Degree form to the Student Services Officer by the end of autumn quarter of your second year. This form is available from the Registrar's Office website, <https://stanford.app.box.com/v/appcanddoct>.

Research Proposal and Committee Meetings

General Philosophy

The faculty recognizes that students admitted to the Stanford Bioscience Program are among the best prepared and most motivated scientists-in-training throughout the world. We feel that students will best explore their creative potential and develop their intellectual and analytical skills through frequent collegial interactions with faculty. In this spirit, committee and proposal meetings are designed to allow an open and exciting exchange of scientific ideas and results. Through this, the student learns to develop, organize, and present his/her ideas and results while benefiting from the experience and insights of committee members. These meetings also provide an opportunity to identify areas for students to focus on as they develop as independent scientists.

Choosing a Committee

During Autumn Quarter of the second year, a thesis advisory committee is chosen by the student in consultation with her/ his advisor. A student's thesis committee must meet university and department guidelines. Please note the department's guidelines can be more specific than the university, <https://gap.stanford.edu/handbooks/gap-handbook/chapter-4/subchapter-8/page-4-8-1>.

The department requires a student's committee to be composed of four Stanford faculty members: three M&I faculty members and one faculty member outside of the department. The advisor is one of the four members and may be either one of the three M&I faculty members or the one out of department faculty member.

*Please note the discussion of potential chair(s) should be initiated by the student with the advisor a month or more before the planned defense date, and the student or advisor may send the request as mutually agreed upon.

The decision as to the composition of the committee is based on the criterion of who are most able to assist in the overall advancement of the student's training with particular attention to their

research direction, but its composition is subject to approval by the department. The university allows for up to five faculty members on a student's dissertation reading committee, but it is not advised that you have this many members. Students should recognize that scheduling complications may arise with a larger committee.

The faculty members are committed to direct and frequent interactions with, and mentoring of, all students within the department; such close interactions are often critical for obtaining the strongest reference letters possible at the close of one's graduate training. Nevertheless, there may be instances in which students would like to have a larger number of committee members from outside of Program and fewer from within the department. In such cases, the student should petition the Director of the Graduate Program, briefly explaining the underlying reasons.

Finally, students may invite to any committee or proposal meeting any Stanford faculty member whom they believe would enhance discussion and provide valuable feedback.

Once a student has decided on the members of their thesis committee, they must complete the Doctoral Dissertation Reading Committee Form and obtain all required signatures. The form can be found on the Registrar's Office website, <https://stanford.app.box.com/v/docdiss-reading-committee-form>. Please submit the completed form to the Student Services Officer by the end of summer quarter of the second year. A student's reading committee can be changed by submitting a Change of Reading Committee form found on the Registrar's Office website.

Research Proposal

A 10-page (double-spaced) research proposal that hones the qualifying exam proposal based on input from committee and additional preliminary data, which is expected to be generated in the interim, is submitted to their committee no later than **May 1st** of the second year. Students should plan on defending their proposal by the **end of spring quarter of the second year**.

Proposal Format

The aim of the proposal is for the student to describe and discuss his/her planned dissertation research. It cannot be emphasized too strongly that there is no expectation at this meeting for the inclusion of any initial data. Rather, the following is expected:

- A clear and compelling grasp of why the proposed research question is interesting and important.
- A thorough understanding of the literature that provides the background directly leading to the student's project and the literature pertinent to framing the dissertation question and carrying out the proposed research.
- A clear experimental plan, with contingencies, for carrying out the research. An estimated timeline should be presented.
- Generally, the student should have developed the intellectual skills required for him/her to carry out the research project in a thoughtful, well-directed, and logical manner.

The Written Proposal

The written proposal should follow the general format of an NIH grant: Specific Aims, Background and Significance, and Description of the proposed research. It should not be longer than 10 double-spaced pages. Students should consult with the Graduate Program Director for

additional information.

The Oral Presentation of Proposal

Proposal meetings will be scheduled for 90 minutes, and will include time for faculty consultation and post-meeting discussion. At the end of each meeting, the student and faculty committee members will decide together whether feedback will be given as a group or individually. Students are encouraged to take advantage of their committee members for direct responses following proposal and committee meetings, as well as any other time. It may be useful in these discussions to articulate clear goals for the upcoming year. Following the meeting, the student will submit a copy of the Record of Dissertation Committee Meeting form, **Appendix VI**, to the Student Services Officer.

How to Prepare

Starting as soon as you join a lab:

- Have frequent discussions with your advisor about your ideas and her/ his suggestions regarding the general area of your research and specific ideas for your project.
- Become familiar with other projects in the lab and how they relate to your project.
- Read at least four papers related to your research each week. If you need help, ask your advisor for suggested topics and papers. Over the months prior to the proposal presentation, this will provide initial depth and breadth in the dissertation research area and will provide the background necessary for the student to make critical decisions regarding his/her own project.

Students are not expected to be expert in all literature related to their dissertation work at the time of the proposal; this is the expectation for graduation and could not be accomplished in a 3-6 month period.

Dissertation Committee Meetings

After the oral proposal, **this committee will meet at least annually**, to receive a progress report from the student. Following each meeting, the student will submit a copy of the Record of Dissertation Committee Meeting form the Student Services Officer.

Beginning in the 4th year of study, the committee will meet twice annually. The first meeting of the fifth year will include a discussion of what additional experimental approaches are expected to be performed by the student prior to writing the thesis. In addition, postgraduate plans will be discussed.

The Student Services Officer will monitor and maintain the official records of thesis committee meetings. The primary responsibility of arranging meetings lies with the student, and the student maintains the responsibility to communicate information about his/her course schedule and other commitments rapidly to Student Services to facilitate scheduling if they need assistance.

In general:

- Proposal meetings will be scheduled for ninety minutes, and will include time for faculty consultation and post-meeting discussion. At the beginning of every meeting the

STUDENT leaves the room, so that the advisor can update the committee and can ask for advice if needed. At the end of a thesis committee meeting, the ADVISOR leaves the room and the student can talk freely to the committee. At the end all will touch base and discuss any issues together. Students are encouraged to take advantage of their committee members for direct responses following proposal and committee meetings, as well as any other time.

- At the end of each meeting, the faculty will discuss the student and faculty committee members will together decide whether feedback will be given as a group or individually. Students are encouraged to take advantage of their committee members for feedback directly following proposal and committee meetings as well as any other time. It may be useful in these discussions to articulate clear goals for the upcoming year.
- Students should treat these meetings much as they would a group meeting but presenting material over the past year.
- Students should hand out a 2-3 page outline or summary 1-2 days before the meeting.
- Students can request scheduling of an additional committee meeting at any time.
- It is the expectation of the faculty that the PhD project should be carried out and defended in five years or less under normal circumstances. **Students enrolling for a sixth year must petition to the Graduate Program Director with a timeline for graduation and a statement of post-graduation plans. This petition will be required for registration.**
- Any exceptions to the above timeline must be approved by the Program's Graduate Student Advisor.

Upon successful completion of the Qualifying Examination and first committee meeting, graduate students will submit an **Application for Candidacy for Doctoral Degree** form to the Student Services Officer by the end of summer quarter of the second year. This form is available from the Registrar's Office website, <https://stanford.app.box.com/v/appcanddoct>.

Individual Development Plan and Annual Planning Meetings

In addition to committee meetings, you will meet with your advisor to complete an Individual Development Plan (IDP) and annual planning meeting. These meetings are intended to help you:

- **Take ownership** of your training and professional development.
- **Pause and reflect!** Amidst daily research activities, it is easy to lose sight of longer-term goals.
- **Think intentionally** about your short-, mid- and long-term training and development goals.
- **Identify and use resources** to help you achieve your goals.
- **Have open and direct dialogue** with your mentor(s).
- **Establish clear expectations/steps.**

The Committee on Graduate Admissions and Policy (CGAP) adopted a policy requiring all Biosciences PhD candidates and their mentors in the Schools of Medicine and H&S to create and discuss their Individual Development Plans (IDPs) on an annual basis.

Students and their advisors share responsibility for completing the IDP, as well as the consequences of not completing the IDP by the deadlines below. Failure to comply with IDP requirements will

- Negatively impact Stanford's ability to receive NIH funding; and
- Incur a hold on student registration that prevents stipends from being funded.

Key Deadlines

Action	First Year Students	All Other Students
Schedule a planning and mentoring meeting with your advisor	Within 30 days of joining your thesis lab	Before June 1
Download and complete the appropriate IDP Form. (Ideally, share the completed form with your advisor in advance.)	Before your meeting	Before your meeting
Hold your annual planning/ mentoring meeting with advisor	Within 30 days of joining your thesis lab	By August 1
Verify that you and your advisor met to discuss your IDP	Within 30 days of joining your thesis lab	By August 1

See <http://biosciences.stanford.edu/current/idp/> for more information and IDP forms, including extensive FAQs and resources for both faculty and students. Questions about the IDP can be directed to somcareers@stanford.edu.

University Oral Examination

After a student has advanced to candidacy, they are expected to complete and defend their dissertation within three years. The purpose of the university oral examination, also referred to as the dissertation defense, is to test the Ph.D. candidate's command of his/her field after completion of the written Ph.D. thesis. Oral examinations are announced in the *Campus Report*. A one-hour public seminar is presented by the student, followed by the private exam.

Some of the university policies regarding the dissertation defense are listed below and it is advised that you read all the policy found here, <https://stanford.app.box.com/v/doc-orals> and <http://gap.stanford.edu/4-7.html>.

- 1) The University Oral Examination Committee consists of at least five Stanford faculty members: four examiners and the committee chair from another department. The chair may not have a full or joint appointment in the adviser's or student's department, but may have a courtesy appointment in the department.

For students in M&I, the oral exam committee is made up of their dissertation reading committee plus the outside chair.

- 2) Students must be registered in and candidacy must be valid for the quarter the defense planned.
- 3) A doctoral reading committee list must be on file.
- 4) The University Chair signs the university oral examination form after the committee votes on the candidate's defense.

Submitting the Dissertation

The doctoral dissertation advisor, reading committee, and oral exam committee provide guidance and

details with regard to dissertation content and format. Also, general formatting and submission directions are published by the Stanford University Registrar at <https://registrar.stanford.edu/students/dissertation-and-thesis-submission>. All students should read these instructions thoroughly and contact the appropriate Registrar's Office staff or the Student Services Officer with any questions. Students should read the supplemental materials required for submission closely as it can be confusing.

After successfully completing the revisions recommended during the oral exam and obtaining the signatures of all dissertation reading committee members, the dissertation is ready for submission to the Office of the University Registrar.

Some important things to note:

1. Students may submit their electronic dissertation starting on the first day of the quarter, for which they have applied to graduate, through that quarter's submission deadline. Please see Stanford's Academic Calendar for the specific date.
2. Students must complete the 5 required steps in your eDissertation/eThesis center via Axxess before they can upload their dissertation electronically. These 5 required steps are:
 - Apply to Graduate online through Axxess by the appropriate deadline.
 - Submit one hard copy of an original signed signature page (acid-free paper) and title page (acid-free) to the Student Services Center, located on the 2nd floor of Tresidder Union.
 - Confirm the names of all reading committee members in Axxess, and designate a Final Reader.
 - Confirm your candidacy is valid through your degree conferral date.
 - Confirm completion of all required University Milestones.

When a student misses the submission deadline, she or he must register and submit their dissertation the following quarter. Students must be registered for the quarter in which they plan to submit their dissertation and graduate.

Students who have completed all course work, degree requirements, and residency requirements for and only has to defend and/or submit the dissertation may be eligible for a one-time, \$150, Graduation Quarter registration status. See the Graduation Quarter section in the Stanford Bulletin.

Student Services Expectations

Students are encouraged to participate in graduate student-lead groups such as Stanford Biosciences Students Association (SBSA), Advancing the Interest of Minority Scientists (BioAIMS), Graduate Student Council (GSC) and other student service groups to build their professional skill sets outside of the lab, network with peers outside of the department, and give back to their community.

Students are expected and required to participate in community-building within the department and to assist one another, as experience working as a part of a team is an integral part of our training program both within and outside of the lab. Through these experiences students will gain marketable skills such as: professional communication, budgeting, collaboration, logistical planning, training for making hiring/admissions decisions, problem solving as a part of a team, time management, and leadership.

The requirements are as follows;

- 1st year: Assist 2nd and 3rd year cohorts as needed
- 2nd year: All 2nd year students will work as a team and with the Student Services Officer (SSO) to plan and execute the social activities occurring during recruitment of new students. Based on previous years, these activities include;
 - Ensuring every interviewee is matched with a current student mentor for the interview process
 - A poster session for current students and post-docs to showcase ongoing work by trainees in the department
 - Working with the SSO to plan dinners off-campus and transportation to and from those dinners. These may include events in downtown Palo Alto to showcase our community and/or a dinner hosted at a faculty member's home.
 - A final celebration on the last night of recruitment

*These events are subject to change and creative, new ideas by the current 2nd year cohort are encouraged.

- 3rd year: All 3rd year students will work as a team and with the SSO to plan and execute social events throughout the academic year, with a minimum requirement being a welcome event in the fall quarter to celebrate the arrival of the incoming cohort, but more social events throughout the academic year are highly encouraged.
- 4th year: Two fourth year students will serve on the admissions committee for the interview process. Beginning in the fall quarter, the two students who served on the admissions committee the previous year will solicit self-nominations from 4th years. Each current fourth year student is required to respond with whether or not they would like to self-nominate for the admissions committee position. If less than two fourth years are able or willing to serve on the admissions committee, then 3rd years may self-nominate for the position. If greater than two 4th year students self-nominate then the previous admissions representatives will distribute an anonymous poll (Google form) to the entire M&I student body to vote on which two 4th years will serve on the admissions committee.

Financial Aid

In the absence of independent fellowship support, entering predoctoral students are fully supported with a stipend, tuition, and health insurance from the university. Applicants are expected to apply for pre-doctoral fellowships such as those from the National Science Foundation. Beginning in the fifth year, the dissertation advisor is responsible for providing support for the student through completion of the Ph.D. degree.

The support used for a graduate student's tuition, stipend, and health insurance is derived from a variety of sources including government grants, fellowships, private, industrial, and philanthropic sources, and University funds. The total level of graduate student support is set annually by the School of Medicine and is generally the same (after tax) for all students regardless of the source of their support.

All M&I graduate students will follow the same program, as outlined in this handbook, regardless of the source of their support and similarly, the source of support will not impact on the rights of the student in any way (e.g., freedom to publish, etc.). Continued funding during the graduate program is subject to satisfactory academic progress toward conferral of the Ph.D. degree.

Grants and Fellowships

While the program guarantees funding for all students who are in good standing, applying for fellowships is an important part of graduate training. It not only develops scientific (and grant) writing skills but can also assist in further clarifying the aims of your research project. Whether you choose a career in industry or academia, these skills will also be transferable to your chosen field. Finally, receiving additional graduate fellowships adds prestige to your CV and makes you more marketable to employers upon graduation. **Students are expected to apply for appropriate awards and encouraged to consult their faculty advisors when preparing fellowship applications.**

For lists of funding opportunities available, visit:

- Grant Writing Academy: <https://grantwriting.stanford.edu/students/grad-funding/>
- Research Management Group: <https://med.stanford.edu/rmg/funding/fellowships.html>

To stay updated on workshops and fellowship deadlines, join the Biosciences fellowship mailing list: <https://mailman.stanford.edu/mailman/listinfo/fellowship-mentoring/>.

Grant Writing Resources and Support

- Biosciences Grant Writing Academy: <https://grantwriting.stanford.edu/students/>
- Stanford Biosciences Student Association (SBSA) – <http://sbsa.stanford.edu>
- The Stanford Research Management Group (RMG) holds mandatory computer training sessions to prepare students to submit the NIH NRSA application. Announcements about workshop dates will be sent to the neurostudents listserv as they are announced.

If you are awarded any Fellowship notify program administrators right away and forward your award notice to determine when your funding should begin and to ensure funds are disbursed

correctly.

Fellowship Reporting Deadlines: Students who have SGF support are required to advance to pass the qualifying exam and doctoral candidacy by the end of the 2nd year. NSF GRFP and NIH NRSA recipients must report on progress annually, and NSF students must declare their tenure status annually in March. Be sure to check your email for calls to action for your fellowships. Failing to submit fellowship reports or declare tenure for the NSF on time can result in your award being revoked by the funding agency. NSF awardees should check their email in FastLane to make sure it is current.

Tuition

A student's tuition is usually covered by either fellowships or research assistantships and students will receive tuition credit on their University bill.

Stipends and Salary

For students on fellowships, who are paid quarterly, the funding is disbursed at the beginning of the quarter if the student is enrolled. Student activities fee and housing charges will be deducted from the total stipend amount before the remaining funds are issued to the student.

Students who are on research assistantships are paid semi-monthly, on the 7th and 22nd of each month (or the preceding workday if these dates fall on a holiday or weekend).

Students can view their account their account activity and make payments through ePay. Automatic direct deposit is encouraged and can be set up through Axess.

Outside Employment

Doctoral students are expected to be full-time students. Outside employment, consulting, or other work is generally not permitted and must be discussed with and approved by the program directors in advance of initiating such work (or continuing, if initiated prior to joining the M&I Program). Summer internships must also be discussed with and approved by the student's dissertation advisor and program directors well in advance.

Additional Funding Resources

- Graduate Cash Advance - Helps graduate students with expenses before their graduate financial support is posted to their student account or TA/RA salary is paid. (<https://financialaid.stanford.edu/grad/funding/index.html>)
- Graduate Student Aid Fund - Assists with University fees (i.e., health services fee, health insurance) (<https://financialaid.stanford.edu/grad/funding/index.html>)
- Graduate Emergency Grant-in-Aid Funds - If graduate students experience an unexpected financial hardship (e.g., medical, legal), it is possible to apply for grant-in-aid (small grants, not loans) (<https://financialaid.stanford.edu/grad/funding/index.html>)
- Financial Aid Office - Information and application forms for federally subsidized student loans (<https://financialaid.stanford.edu/grad/>)
- 1:1 Financial Coaching - Mind Over Money's 1:1 financial coaching program provides

students with the opportunity to share their personal financial circumstance with university-trusted individuals and explore ideas and build skills (<https://mindovermoney.stanford.edu/people/coaches>)

- Graduate Housing Loan - assists with move-in costs for off-campus housing (<https://financialaid.stanford.edu/loans/other/gradhousing.html>)
- Opportunity Fund Assistance with expenses (including conference travel) for diversity and first-generation students (<https://fli.stanford.edu/financial-support/opportunityfund>)
- Biosciences Travel Grant Program - Defray conference fees including registration, travel, lodging, and food (<https://biosciences.stanford.edu/current-students/resources/travelgrant-program/>)
- Student Budget - Provides estimated expenses (<https://financialaid.stanford.edu/grad/budget/index.html>)
- Bechtel International Center – Provides information for international students about oncampus employment, CPT, OPT, internships and taxes (<https://bechtel.stanford.edu/>)
- Student Financial Services - Provides information about the bill, tax information, third party sponsor invoicing, etc. (<https://sfs.stanford.edu/>)
- Mind Over Money – Financial literacy for Stanford students (<https://mindovermoney.stanford.edu/>)
- Biosciences Financial Support Resources (<https://biosciences.stanford.edu/currentstudents/resources/financial/>)
- Office of the Vice Provost for Graduate Education – Provides information about graduate fellowships including SIGF, DARE, and more (<https://vpge.stanford.edu/>)
- Gateway to Financial Activities – Provides administrative resources (e.g., sign-up for direct deposit, tax treaty information) (<http://web.stanford.edu/group/fms/fingate/>)

Cardinal Care

Stanford's Cardinal Care plan provides medical and dental insurance for each student. Information about benefits can be found at <https://vaden.stanford.edu/insurance/cardinal-care-overview-and-benefits>. The funds for this health insurance are derived from training grants, departmental funds, advisors' grants, and/or University funds.

Miscellaneous Expenses

The department provides each student with approximately \$1,500 over the course of their graduate career for educational expenses. These funds are to be used for travel, books, computers, and similar academic incidental expenditures. These funds should not be used to purchase lab supplies, save in exceptional circumstances and with approval of Student Services. Any fellowship allowances awarded to the student will be in addition to the \$1,500 department funds.

Taxes

Graduate students receiving stipend support (fellowships from HHMI, SGF, NSF, NIH Training Grants, etc., i.e., almost all students in their first three years) will be taxed on their stipend income. Stanford does not deduct taxes from quarterly stipend checks, except for international students as noted below. Therefore, students must pay estimated quarterly taxes (form 1040ES), <https://www.irs.gov/>. Please see the Student Financial Services website for information, <https://sfs.stanford.edu/taxes>. Stanford recommends seeking professional tax counsel whenever necessary.

Graduate students receiving salary support from assistantships will have taxes withheld from their bi-monthly paychecks.

International students are subject to a 14% tax rate and may be eligible for tax exemption if their country of residence has an existing tax treaty with the U.S. Information can be found here, <https://sfs.stanford.edu/taxes/non-resident-alien-students>.

Health and Safety

Stanford is committed to providing a safe and healthy environment for faculty, staff, and students. These programs are run by the Health and Safety Office: Health Physics (Radiation Safety), Biosafety, Industrial Hygiene & Fire Safety, and Chemical Safety. The P.I. (or a designated member of the lab) is responsible for providing information and training about lab equipment, procedures and chemicals. Additionally, all new students must sign up for a lab safety training seminar offered at the beginning of each quarter; information will be provided at the Biosciences Orientation. Depending upon the type of work undertaken in your rotation and thesis labs, you may have to take additional training for blood-borne pathogens, radioactivity, human and/or animal subjects.

The Lab Manager for the department will help you comply with University guidelines for health and safety. Any questions about policy or concerns about the safety of your surroundings should be addressed to the manager.

Facilities

General

This is going to be your home away from home for the next several years. As such, it is our collective responsibility to make those many hours as enjoyable as possible. Probably the most common complaint and source of discontent is irresponsible or inconsiderate behavior. This is simple to avoid and simply requires that people conform to a common set of ethics. Namely, be considerate of others around you and follow the guidelines discussed below.

Lab Equipment and Supplies

Lab materials are incredibly expensive and often fragile or sensitive so it is extremely important that a few basic rules are adhered to by all. These are:

- Never borrow anything from another lab without seeking their permission (ideally the person responsible for the material). In desperate conditions, you can usually take an item,

but be sure to leave a note.

- Learn a machine's proper operation before you try to use it. This means reading the directions that accompany it and check with a knowledgeable person (there should be at least one name attached to the machine). If you have questions, ask! A typical titanium ultracentrifuge rotor costs around \$10,000; a single cesium spill left unattended can ruin it. An ultracentrifuge costs about \$50,000 and one improperly attached bucket can virtually destroy it. Service for most of the equipment in our department starts at around \$400/hr.
- Always sign up to use a piece of major equipment, even if it is free and you plan to use it immediately. If it malfunctions during your use but you are not there, people will know whose samples to save. If a problem occurs after your run, the service people will know who to ask to help figure out the problem. Accidents happen - we all cause a few sooner or later - but it is important to know details as soon as possible. Breakage of equipment through negligence will be charged to your lab. The cost of repairs due to wear and tear is shared by the major users, thus sign-up sheets are also used for accounting.
- Handle borrowed reagents meticulously. That means keep them dry/cold/sterile, take only what you need and return the stock immediately. Never introduce anything into a dry reagent stock - tap it out; dispense liquids with clean sterile tips/pipettes.
- Keep common areas orderly and labeling anything that belongs to you. Purges of the cold and warm rooms are done frequently and unlabeled items will be disposed. It is also important to be able to identify the "owner" of an item in case of problems (e.g., the flask breaks, the rotator stops, the space is needed, etc.).

Library

Lane Library, <http://lane.stanford.edu>, is the main library for the medical school (Lane Library) has an extensive catalog of journals, books, databases to support researchers in the School of Medicine. In addition to their catalog, they offer classes on research, publishing, presentations, programming, etc.

Annual Events and Holidays

Department BBQ. The department has a start of the year kick off barbeque in September. This is an opportunity for you to meet faculty, graduate students, postdocs, and staff in the department.

Departmental Scientific Conference. As mentioned earlier, our annual departmental conference is held each Autumn quarter. At this conference, each lab presents an overview of its work and what is particularly hot at the time in a relaxed and informal atmosphere. It is a great opportunity to find out what's going on around you, get to know people, hatch some project ideas, and have fun.

Graduate Student Retreat. Students and the SSO are responsible for organizing the graduate student retreat which happens each year during Spring term. Announcements will be made each year in Winter term to provide a date and location for the event.

Holidays. Two to three weeks per year is the guideline for the amount of graduate student holiday time. This is the intended to represent a reasonable guideline and will vary according to personal

work habits. The supervisor and student must judge what is appropriate on an individual basis. Be sure to inform your supervisor of any absences in advance.

The department also has an annual Halloween costume contest and holiday party. Twice a month, labs take turns hosting *M&I Happy Hour*. There are also birthdays and intra-lab events to celebrate and enjoy! In the Department, you will find groups interested in hiking, mountain climbing and other sports, and in cultural activities such as opera, concerts, etc.

Appendix I. Degree Requirements

Microbiology and Immunology Requirements 2023-24

Quarter Offered	Subject/ Course Number	Course Title	Units	Day(s)	Time(s)
Autumn	BIOS 200	Foundations in Experimental Biology	5 unit	M/W/F	10:30am-12:20pm
	MI 250	Frontiers in Microbiology & Immunology	1 unit	Tues	5:30-6:30pm
	MI 200 ^{1,2}	Cellular and Molecular Immunology: An Introductory Course	4 units	M/W/F	9:30am-10:20am
	MI 399	Graduate Research	4 unit	N/A	N/A
	BIOS 217	Foundations of Statistics and Reproducible Research	2 unit	M/W/F	10:30am-12:20pm
Winter	BIOC 224 ¹	Advanced Cell Biology	3 unit	M/W	1:30pm-2:50pm
	IMMUNOL 201 ¹	Advanced Immunology I	3 units	M/W	1:30pm-2:50pm
	GENE 205 ^{1,3}	Advanced Genetics	3 units	T/TH	1:30pm-2:50pm
	MI 210	Advanced Pathogenesis of Bacteria, Viruses, and Eukaryotic Parasites	4 unit	T/TH	1:30-3:30pm
	MI 399	Graduate Research	3 unit	N/A	N/A
	BIOS 216	The Practice of Reproducible Research	1 unit	M/W/F	10:30am-12:20pm
Spring	MI 215	Principles of Biological Technologies	3 unit	T/TH	1:30-3:00pm
	MED 255	The Responsible Conduct of Research	1 unit	Varies	Varies
	MI 399	Graduate Research	5 unit	N/A	N/A

¹For the Core requirement it is required to choose one of these four courses: MI 200, BIOC 224, IMMUNOL 201, GENE 205. Please see footnote 2 and 3 for timing when to take the course. Note that once the core requirements are fulfilled (one course) additional courses can be taken as elective.

² If MI 200 is chosen as core course, it needs to be fulfilled in the **second year** as to not exceed 10 units in the Autumn quarter.

³ If GENE 205 is chosen as core course, it needs to be fulfilled in the **second year** as to avoid overlap with the MI 210 core course.

Students will register for MI 250: Frontiers in Microbiology and Immunology once in their first year and once in the second year for a total of 2 units. Even though students only enroll in MI 250 in the Fall term it is an entire year course. In the fourth year, students will need to complete a second ethics course, please see **Appendix II** for a list of approved courses.

Take one elective from the approved list, **Appendix III**. Prior approval from the student's adviser and department Graduate Program Director is required to use a course not from the elective list.

Students register for MI 399 Graduate Research as needed to maintain enrollment in 10 units each quarter, including summer, until they complete a minimum of 135 units and are eligible for TGR status.

Other requirements

- 1st year
 - M&I Noon Seminar and speaker luncheon attendance
 - M&I Journal Club (MI 250) participation autumn, winter and spring quarters
 - Two to four laboratory rotations (commitment to join a lab is made after Apr. 1st)
 - Faculty research seminars (Thursday evening autumn quarter)
 - Sign up for Teaching Assistantship for 2nd or 3rd year (May)
 - Specific aims page for qualifying exam due Sept. 1st

- 2nd year
 - 10-page double-spaced qualifying exam research proposal due November. 1st
 - Qualifying exam to be completed by December. 15th
 - University Teaching Assistant orientation and training
 - One course Teaching Assistantship
 - Doctoral Dissertation Reading Committee Form due by the end of autumn quarter
 - M&I Noon Seminar and speaker luncheon attendance
 - M&I Journal Club (MI 250) participation autumn, winter and spring quarters
 - 10-page double-spaced thesis research proposal due May 1st
 - Oral defense of research proposal to be completed by the end of Spr. Quarter
 - Application for Candidacy for Advanced Degrees due by the end of Sum. Quarter

- 3rd year
 - University Teaching Assistant orientation and training (if not fulfilled in 2nd year)
 - One course Teaching Assistantship (if not fulfilled in 2nd year)
 - Seminar attendance
 - Annual thesis committee meeting
 - Poster presentation at Department Scientific Conference and chair sessions

- 4th, etc.
 - Semi-annual thesis committee meeting
 - Seminar attendance
 - Oral presentation at Department Scientific Conference
 - One additional oral presentation (Wednesday Noon Seminar Series, CMB Symposium, National or International Meeting or Department Scientific Conference)

Appendix II. List of Ethics Courses

Students need to be familiar with current issues in research ethics and of responsible conduct of

research. The department requires students to enroll in MED 255: The Responsible Conduct of Research in the winter quarter of the first year. In the third or fourth year of the program, students will need to complete another ethics course from the list below or refresh their knowledge by retaking MED 255.

Please check Explore Courses for yearly course offerings, <https://explorecourses.stanford.edu>.

Subject/Course Number	Course Title	Units
BIOE 122/ EMED122/ EMED 222/ PUBLPOL 122/ PUBLPOL 222	Biosecurity and Bioterrorism Response	4-5 units
BIOE 131/ ETHICSOC 131X	Ethics in Bioengineering	3 units
*BIOS 224	Big Topics in Stem Cell Ethics	2 units
*BIOS 258	Ethics, Science, and Society	1 unit
*CSB 272	Research Ethics	1 unit
HUMBIO 174	Foundations of Bioethics	3 units
*MED 255C/ CHPR 255	The Responsible Conduct of Research for Clinical and Community Researchers	1 unit
NBIO 101/ NBIO 201	Social and Ethical Issues in the Neurosciences	2-4 units
PEDS 251A	Medical Ethics I	2 units
MED 255	The Responsible Conduct of Research	1 unit
*PEDS 251B	Medical Ethics II	2 units

Please note courses with () have not been offered within the last few years given the pandemic. If or when these courses are reactivated they can be taken to meet the second ethics course requirement.

Appendix III. List of Approved Electives

Please check Explore Courses for yearly course offerings, <https://explorecourses.stanford.edu>.

*Please expect ongoing changes to course schedule and availability. Please check the Stanford online catalog for up-to-date information: <https://explorecourses.stanford.edu/>

BIOC/ BIOPHYS/ SBIO 241	Biological Macromolecules	3-5 units	Not given this year
BIOE 221G/MI 221	Gut Microbiota in Health and Disease	3 units	Autumn
MI 200/BIO	Cellular and Molecular Immunology: An Introductory	4 units	Autumn

230/IMMUNOL 200	Course		
CSB 210	Cell Signaling	4 units	Not given this year
CSB 220	Chemistry of Biological Processes	3 units	Spring
DBIO 210	Developmental Biology	4 units	Spring
GENE 205	Advanced Genetics	3 units	Winter
GENE 211	Genomics	3 units	Winter
GENE/PATH/MI 218	Computational Analysis of Biological Information: Introduction to Python for Biologists	3 units	Spring
IMMUNOL/MCP 201	Advanced Immunology II	3 units	Winter
IMMUNOL/MCP 202	Advanced Immunology II	3 units	Spring
MCP 256	How Cells Work: Energetics, Compartments and Coupling in Cell Biology	4 units	Winter
STATS 141/BIO 141	Biostatistics	3-5 units	Autumn

Additional Approved Electives

Here is a list of additional courses students have benefited from in previous years. These may be used to meet the departmental elective requirement. Please contact the graduate director for final approval.

MCP 222: Biological Light Microscopy

BIOS 294: Chemistry for biologists and others

GENE 218: Computational Analysis of Biological Information: Introduction to Python for Biologists

CS 271: Artificial Intelligence in Healthcare

BIOS 221: Modern Statistics for Modern Biology

EARTHSYS: 214 Global Change and Emerging Infectious Diseases

MI 221: Gut Microbiota in Health and Disease

MCP 256: How Cells Work: Energetics, Compartments, and Coupling in Cell Biology

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Appendix IV. Teaching Assistantship


DEPARTMENT OF MICROBIOLOGY and IMMUNOLOGY
Record of Teaching Assistantship

Teaching is an integral part of the graduate program training experience. All graduate students, regardless of support source, are required to act as a teaching assistant for one course during the third year of training. If a student elects to TA for a second course, they must have their advisor's approval before the course begins.

This form will need to be completed by the student and submitted to Student Services Officer in Fairchild D338B a quarter prior to the start of the TAship.

Student's Name: _____

Quarter and Year of TAship: _____

Department and Course Number: _____

Course Title: _____

Name of Course Instructor: _____

Instructor's signature: _____ Date: _____

Please use the space below to provide a description of TA responsibilities:

Approved _____
 Signature of Principal Advisor Printed Name Date

TA information entered into database:

Student Services Officer: _____ Date: _____

Appendix V. Qualifying Exam



DEPARTMENT OF MICROBIOLOGY and IMMUNOLOGY
QUALIFYING EXAM

Date:

Name:

Title:

Committee:

_____	_____
_____	_____
_____	_____


Outcome:

___ Pass ___ Pass with minor revisions ___ Pass with major revisions ___ No Pass

Comments:

Immediately following the examination, the committee should dismiss the student and briefly discuss his/her performance. The committee may choose among the following outcome options: pass, pass with minor revisions, pass with major revisions (such as rewriting an aim), or no pass. If the 'no pass' or 'pass with major revisions' grade is given, please indicate whether the student should rewrite the examination (or portion thereof) and/or re-defend it orally. Set a date for the rewrite or defense. Note any dissensions under comments. The committee should then discuss their decision with the student.

Appendix VI. Dissertation Committee Meeting Form

	DEPARTMENT OF MICROBIOLOGY and IMMUNOLOGY RECORD OF DISSERTATION COMMITTEE MEETING
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Instructions: For each meeting of the committee, the principal advisor should summarize the general feeling of the committee as regards to performance and future directions. Students are required to meet with their committee at least annually. Beginning in their 4th year of study, students will meet with their committee semi-annually. Return this form to the Student Services Officer, Fairchild D338B.

Composition of Committee (please print your name and sign):

Principal Advisor: _____

Committee Member: _____

Committee Member: _____

Committee Member: _____

Committee Member: _____

Record of Meeting:

Date: _____ Student's Name: _____

Purpose: _____

Progress Report/Comments/Goals (please attach pages as needed):

Date of Next Meeting (mm/year): ____ / ____

Appendix VII. Faculty Research Interests

Manuel Amieva, M.D., Ph.D. Professor, Genetic variation in human immune systems: functional importance for long-term survival.

Ann M. Arvin, M.D., Professor, Molecular Mechanisms of Varicella-zoster Virus Pathogenesis.

Jennifer K. Bando, Ph.D., Professor, Mucosal immunology, innate lymphocytes.

Helen M. Blau, Ph.D., Professor, Regenerative medicine & stem cells, nuclear reprogramming, cell fate plasticity.

Mathew Bogyo, Ph.D., Professor, Small molecules to study function of proteases in cancer, inflammation, parasitic diseases

Paul Bollyky, Ph.D., Assistant Professor, Study how immune responses are regulated within injured and infected tissues.

John C. Boothroyd, Ph.D., Professor, Cell and molecular analysis of Toxoplasma's interaction with the host.

Jan Carette, Ph.D., Assistant Professor, Genetic screens in human cells to study host-pathogen interactions.

Yueh-Hsiu Chien, Ph.D., Professor, Antigen recognition and function of lymphocytes in health and disease.

Wah Chiu, Ph.D., Professor, Development of methodology for electron cryo-microscopy to determine 3D structures of macromolecules, molecular machines, organelles and cells.

Mark M. Davis, Ph.D., Professor, T cell recognition and human immunology.

Dylan Dodd, M.D., Ph.D., Assistant Professor, Study of gut microbial metabolism to improve human health.

Shirit Einav, M.D., Assistant Professor, Viral-Host Interactions by molecular and systems virology approaches.

Elizabeth Egan, M.D., Ph.D., Assistant Professor, Elucidating the role of the host erythrocyte in Plasmodium falciparum malaria.

Michael Fischbach Ph.D, Associate Professor, Combination of genomics and chemistry to identify and characterize small molecules from microbes, with an emphasis on the human microbiome.

Stephen J. Galli, M.D., Professor, The development of mast cells and basophils, and their roles in health & disease.

Matthias Garten, Ph.D., How the malaria parasite interfaces with its host-red blood cell, how we can use the unique mechanisms of the parasite to treat malaria and to re-engineer cells for

biomedical applications.

Jeffrey Glenn, M.D., Ph.D., Associate Professor, Molecular virology, novel antiviral strategies, and liver tissue engineering.

Harry B. Greenberg, M.D., Professor, Molecular mechanisms of viral pathogenesis.

K.C. Huang, Ph.D., Professor, Cell shape detection, determination, and maintenance in bacteria.

Peter Jackson, Ph.D., Professor, Cell cycle control of DNA replication in embryonic and somatic cells.

Prasanna Jagannathan, M.D., Assistant Professor, Understanding the mechanisms of clinical immunity to malaria through field-based studies.

Karla Kirkegaard, Ph.D., Professor, Understanding RNA virus replication to thwart drug resistance and disease.

Holden Maecker, Ph.D., Associate Professor, Immune profiling; T cell response signatures to chronic pathogens and cancer.

A. C. Matin, Ph.D., Professor, New cancer therapy; Heritable MRI contrast; Bacterial antibiotic resistance.

Denise Monack, Ph.D., Associate Professor, Co-evolution of host immune mechanisms and pathogen virulence strategies.

Garry P. Nolan, Ph.D., Professor, Single cell proteomics and genomics of cancer, stem cells & autoimmunity.

Peter Parham, Ph.D., Professor, Genetic variation in human immune systems: functional importance for long-term survival.

David A. Relman, M.D., Professor, Human and animal microbiomes: ecology and genomics.

Peter Sarnow, Ph.D., Professor and Chair, Interactions of viruses with host macromolecular machines.

David S. Schneider, Ph.D., Associate Professor, Balancing tolerance and resistance of infections.

Upinder Singh, M.D., Associate Professor, Molecular basis of pathogenesis by the parasite *Entamoeba histolytica*.

Justin Sonnenburg, Ph.D., Associate Professor, Mechanistic insight into intestinal microbiota dynamics.

Taia T. Wang, M.D., Ph.D., Assistant Professor, Study the role of IgG in human immunity and susceptibility to disease

Ellen Yeh, Ph.D. Assistant Professor, Novel eukaryotic biology of the plastid organelle in malaria parasites

Appendix VIII. Current MI Graduate Students

Name	Advisor	Admit Year
Susan Brewer	Denise Monack	2014-15
Spencer Cesar	K.C. Huang	2014-15
Alicia Cygan	John Boothroyd	2014-15
Michael Lyons	Peter Kim	2014-15
Terrence Theisen	John Boothroyd	2014-15
Bryan Merrill	Justin Sonnenburg	2015-16
Dorothy Tovar	Karla Kirkegaard and Elizabeth Hadley	2015-16
Nicole Davis	David Schneider	2016-17
Tamar Feldman	Denise Monack	2016-17
Jasmine Moshiri	Karla Kirkegaard	2016-17
Kimberly Vasquez	K.C. Huang	2016-17
Dylan Dahan	Justin Sonnenburg	2017-18
Rebecca Gellman	Justin Sonnenburg	2017-18
Adam Kiro Singh	David Schneider	2017-18
Christine Peters	Jan Carette	2017-18
Sarah Ruddle	Denise Monack	2017-18
Bokai Zhu	Garry Nolan	2017-18
Matthew Carter	Justin Sonnenburg	2018-19
Oscar Diaz	Denise Monack	2018-19
Meagan Hamblin	Denise Monack	2018-19
Alvin Han	Ami Bhatt and Denise Monack	2018-19
Brian Ho	Karla Kirkegaard	2018-19
Alma Mendoza	John Boothroyd	2018-19
Mary DeFeo	Dylan Dodd	2019-20
Isabel Delwel	Erin Mordecai	2019-20
Youlim Kim	Manuel Amieva	2019-20
Daniel Navarrete	Elizabeth Egan	2019-20
Ruth Schade	Denise Monack	2019-20
Elisa Caffrey	Justin Sonnenburg	2020-21
Elyse Grossi-Soyster	Peter Sarnow and David Schneider	2020-21
Taylor Pursell	Scott Boyd	2020-21
Danica Schmidtke	Ami Bhatt	2020-21
Miles Tyner	Michael Howitt	2020-21
Lily Xu	Jan Carette and Wah Chiu	2020-21
Alyssa Cutter	Jennifer Bando	2021-22
Nicole Tanenbaum	Jan Carette	2021-22
Savannah Lewis	Prasanna Jagannathan	2021-22
Desmond Edwards	Taia Wang	2022-2023
Emma Esterman	Jan Carette	2022-2023
Jasmine Arunachalam	Jennifer Bando	2022-2023
Katherine Travisano	Justin Sonnenburg	2022-2023

Miles Tuncel	Christine Jacobs-Wagner	2022-2023
Sebastian Somolino Cedeno	Drew Endy	2022-2023
Alyssa Carter	TBD	2023-2024
Katherine Miller	TBD	2023-2024
Nana Peterson	TBD	2023-2024
Morgan Su	TBD	2023-2024

Appendix IX. Department Administration

Name	Title	Lab	Phone	Email
Nanette Beacham	Accountant	Department	3-2753	nbeacham@
Mayumi Beppu	Asst. Director of Administration	Department	4-9920	mbeppu@
Yen Chau	Admin Associate	Boothroyd, Matin, Monack, Sarnow, Schneider Labs	8-7074	yenc@
Samantha Kerath	Director, Finance & Administration	Department	5-4756	skerath@
Monica Cryan	Admin Associate	Carette, Idoyaga, Sonnenburg Labs, Postdocs	8-8035	mlcryan@
Richard Cuevas	Admin Associate	Davis Lab	5-4755	rcuevas@
Polly Leung	Assoc. Director of Finance	Department	3-3744	pollyl@
Megan Mayerle	Associate Director of Research Development	Baxter Lab	3-6270	Megan.mayerle@
Kathleen Shaw	Admin Associate	Chien Lab and Baxter Lab - Jackson		kshaw1@
Heather Ginther	Student Services Officer	Department	5-8541	hginther@

All phone numbers have prefixes:
723-, 724-, 725- or 498-XXXX
Area Code is 650