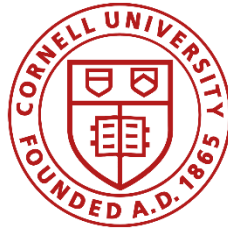


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# **Graduate Student Handbook**

## **Field of Microbiology**



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## Contacts

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### **Graduate Field Administrative Assistant and Undergraduate Coordinator**

607-255-3088, 107 Wing Hall

### **Department Chair**

Professor John Helmann, 607-255-3086, 372 Wing Hall

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### **Assistant to the Chair**

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## Foreword

The Microbiology graduate handbook is prepared to assist both new and continuing graduate students, not only with their studies, but also with policies and procedures of the Graduate field of Microbiology as well as general policies of the Graduate School of Cornell University.

This handbook should be used as a guide to specific activities within the Field of Microbiology. Additional valuable information can be found in the *Guide to Graduate Study* which was sent to all new graduate students, on campus at the Graduate School in Caldwell Hall, and on-line at: <http://gradschool.cornell.edu/>.

The Cornell University Course of Study catalog is also a useful tool and is available through the Graduate School or on-line at: <http://courses.cornell.edu/>.

All forms are now online via the Graduate school at: <https://gradschool.cornell.edu/forms/>

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## **GENERAL GRADUATE INFORMATION**

### **University Policies**

Detailed information on Graduate School policies is available online or in person in Caldwell Hall.

### **Registration**

A graduate student that resides in Ithaca must be registered and pay tuition for that part of the term while on campus, even if the student is only engaged in thesis writing and taking no courses. Further details available at:

<http://gradschool.cornell.edu/academics/requirements/registration>

During the summer before your first year all new graduate students should receive a packet from the Cornell University Graduate School containing registration information. Filling out these forms will expedite the registration process when you arrive at Cornell. Official new graduate student registration takes place a week before the start of classes. The Director of the Graduate program will host an orientation day, typically held the Friday before classes.

During the registration process students will pick up a New Student Information Packet, Cornell ID card, and receive a Cornell Network ID (NetID). This process will only register you as a Cornell student, but does NOT register you for courses. Registration for continuing graduate students occurs automatically when the student registers for classes in the fall and spring semesters. In order to register a student cannot have a “hold” on their records.

### **Student Computing and Networking**

Cornell Information technologies (CIT) is located in the Communications and Computing Center (CCC). They offer a wide variety of computer hardware, operating systems, and general and specialized application programs. To make these resources readily accessible, CIT operates public computer terminal facilities and provides some free consulting services.

Cornell Information Technologies CIT: <https://it.cornell.edu/>

Software Licensing: <https://it.cornell.edu/software-licensing>

CALS does provide IT services to Graduate students.

To place a help ticket: [Help.CALS.Cornell.edu](http://Help.CALS.Cornell.edu)

### **Cornell Health**

Cornell Health is located at 110 Ho Plaza and serves the Cornell community with medical care, counseling, and pharmacy services. Please review their website for hours during the academic year and summer session.

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To schedule same-day or routine appointments or consult with a health-care provide call 255-5155 during regular hours.

If there is an emergency call 911 or the Cornell Police at 255-1111.

A complete list of services can be found on-line at: <https://health.cornell.edu/>

**Student Health Insurance Plan (SHIP)**

Cornell enrolls all graduate and professional students in SHIP. This plan has been developed especially for Cornell students and is reviewed annual by a committee of Cornell students, faculty, and staff members. All graduate and professional students will be enrolled automatically in Cornell’s Student Health Insurance Plan. The premium is covered as part of your graduate student support package.

You can enroll dependents on the SHIP for an additional fee. Additional information can found at: <https://studenthealthbenefits.cornell.edu/health-plans/shp>

*They are NOT enrolled automatically.*

It is important to print your insurance card by visiting the Cornell University Office of Student Health Benefits website at:

<https://studenthealthbenefits.cornell.edu/health-plans/shp>

Student Insurance Office

Email: [studentbenefits@cornell.edu](mailto:studentbenefits@cornell.edu)

Phone: 607-255-6363

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## **GRADUATE DEGREE INFORMATION**

**Cornell Graduate School:** <https://gradschool.cornell.edu/>

### **Graduate Fellowships and Grants**

Most students in the Graduate Field of Microbiology enter the program as rotation students. Some students are directly admitted into a laboratory without doing lab rotations. These designations are made prior to acceptance into the Microbiology Graduate Program.

For rotation students, financial support during first year is typically provided either through a Teaching Assistantship or a type of Graduate Fellowship. After your required rotations, with the help of the DGS, the student will select the lab where they will perform research and complete their PhD thesis. Financial support after the first year is typically provided by Graduate Research Assistantship or Teaching Assistantship.

Students are encouraged to apply for individual fellowships and grants. The benefit of having an individual fellowship or grant is: 1) It will help your PI by freeing up resources that can be used for additional students, equipment, etc. and 2) benefits when applying for post-doc or job.

<https://gradschool.cornell.edu/costs-funding/graduate-school-supplement-external-fellowships>

### **Graduate Degree Programs**

The Graduate Field in Microbiology awards a Doctor of Philosophy (PhD). Detailed academic requirements for the degree can be found in the Guide to Graduate Study book which is published by the Graduate School.

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## **FIELD OF MICROBIOLOGY**

### **Introduction**

Overall administrative responsibility for the Microbiology Graduate Field rest with the Director of the Graduate Program, Professor Joe Peters. Questions about the graduate program should be directed to either Professor Peters, or to the Graduate Field Assistant (GFA), 107 Wing Hall.

Please become familiar with the information available to you concerning the timeline for graduation.

*The Graduate School places the responsibility on you, the student, to know and meet all the requirements.*

### **Selecting a Chairperson and Committees**

One of the most important decisions will be the selection of the Chairperson for your Special Committee, the person to supervise your project. For the purpose of administration as a rotation student starting in the graduate program, the DGS is automatically your Committee Chairperson until after your three required lab rotations. After your rotations you will select a Chair who leads the lab where you will be doing your PhD. With the committee Chair you will select two minor committee members forming your Special Committee. The Special Committee guides the student on courses to help support their thesis work and helping them decide when they are ready for their A and B exams. Students are required to meet at with the Special Committee least once a year and fill out a Student Progress Report (SPR) annually. Graduate students are required to inform the Graduate School of the composition of their Special Committee online using a “A Special Committee Selection and Change” form. The form can be found on-line at: <https://gradschool.cornell.edu/forms>.

When it comes time to schedule your A Examination, the DGS will also work with the student to select an additional two members from the Field of Microbiology to form a testing committee of five members.

### **Laboratory Rotations**

First-year graduate rotation student complete three laboratory rotations starting in the fall semester and ending in the spring semester. The rotations are of equal length (12 weeks) and the number of hours the student works in the lab is decided with the principal investigator hosting the rotation. The objective of the rotations is to find a research topic, lab, and advisor that best fits the student. From experience, a point of concern during the first year can be a lack of clarity of expectations and a perceived absence of feedback. There can also be frustration from field faculty that rotation students sometimes don't seem to "get" what is expected of them during the rotation. These issues can be addressed with better communication.

The following three required steps help avoid any communication problems.



1. **Expectations should be set at an initial meeting** - Expectations should be set from the start for what is expected of a rotation student (Roughly the kind of hours to be spent in the lab, presentations, how work will be cataloged, background reading requirements, etc.).
2. **There must be a mechanism to give and get feedback during the rotation** - The faculty member must have a way of communicating concerns and accolades during the rotation and the rotation student is entitled to know if they are meeting expectations. This is also essential so that when it comes to step 3 there are no surprises.
3. **Final Rotation Evaluation** - At the end of the rotation the faculty member must complete and submit an evaluation document to the Field Assistant. Both the faculty member and the rotation student must sign the first page of this document. While this can be awkward for both individuals, it will be much less uncomfortable if communication has occurred throughout the rotation period.

It is important for the student or rotation host to contact the DGS with any concerns during the rotation.

Finally, it is important that the rotation advisor does not press the student to make a commitment for joining the lab nor the student make any promise to join the lab until the very end of the third rotation (The DGS will send an email to signify this). To do so would go undermine the three-rotation system that we have embraced in the Graduate field of Microbiology.

### **First Year Course Requirements**

Although students are encouraged to take any classes that interest them, the following courses are required of Microbiology students. In the Field of Microbiology students must receive a grade of B- or higher in a class to have it count as completed. Students may take courses in their potential minor fields.

#### ***BioMI 6900 Modules (1 credit per course)***

There are six total modules, three in the fall and three in the spring, graduate students are *required to take all modules.*

#### **Fall Semester**

Two 75-minute meetings  
BioMI 6901 Microbial Structure & Function  
BioMI 6902 Environmental Microbiology  
BioMI 6903 Microbial Physiology & Diversity

#### **Spring Semester**

Two 75-minute meetings  
BioMI 6904 Microbial Genetics  
BioMI 6905 Microbial Pathogenesis  
BioMI 6906 Viral Diversity and Ecology

***BioMI 7910 Advance Topics in Microbiology (1 credit)***

Once a week for 1 hour.

Reading and presentation by graduate students of current literature in selected areas of modern microbiology. This course is strongly encouraged for students during their first year in the program. Students are then required to take the course each semester until they complete their A-exam (typically three semesters). Students may substitute this course with another journal club if there is one more relevant to their thesis work with the permission of the DGS.

***BioMI 7970 Scientific Communication Skills (1 credit)***

Once a week for 1 hour.

This course is designed to help students learn the basics of being a graduate student and becoming a successful PhD recipient. The Fall semester will mostly focus on grant writing. Both semesters also involve developing presentation and public speaking skills, as the ability to communicate effectively is essential for success as a scientist. Each first-year student is required to take BioMI 7970 their first two semesters. Each semester you will give presentations, based on primary literature on an assigned topic, or on the progress of your rotation project. Feedback for improving the presentation and peer evaluations will be emphasized.

***BioMI 7980 Graduate Research Seminar in Microbiology (0 credits)***

Once a week for 1 hour.

This course provides an opportunity for students in their second-year and beyond to give a seminar about their research progress. All students are required to enroll and attend each week.

***BioMI 7990 Microbiology Seminar Series (0 credits)***

Once a week for 1 hour.

Microbiology seminar series featuring faculty from Cornell and other Universities. All students are required to enroll.

**Teaching Opportunities**

The field of Microbiology requires that students perform at least one semester of teaching as a part of your graduate training.

TA training includes a weekly discussion of topics in pedagogy, such as backwards design, developing learning objectives, different assessment methods, Bloom's taxonomy and writing good questions, using grading rubrics, active learning, and facilitating a group discussion.

For more information on teaching in Microbiology:

<https://micro.cornell.edu/academics/graduate/teaching>

**Other Teaching Resources**

The Cornell Graduate School offers workshops and on-line resources to help enhance teaching and presentation skills.

<http://gradschool.cornell.edu/pathways-success>

Center for Teaching Excellence (CTE) supports graduate students with improving their teaching skills, offers weekly programs and workshops for students who are either TAing or teaching their own course.

<https://teaching.cornell.edu/>

Cornell Science Inquiry Partnerships (CSIP) is funded by grants from NSF and Cornell, graduate fellows integrate their personal scientific expertise and inquiry-based curricula into pre-college science and engineering curricula in rural and urban classrooms.

<http://csip.cornell.edu/>

Graduate Student School Outreach Program (GRASSHOPR) pairs Cornell graduate students with teachers in Tompkins County and Geneva to teach 3-5 mini courses on topics related to the graduate student's field or interest.

<https://sites.google.com/site/grasshopratcornell/>

## **A Examination**

### Preparing for the A-Exam

Towards the end of the Student's second year at Cornell the student should meet with members of the Special Committee to discuss expectations for the A-Exam. It is often convenient to meet with the committee immediately following the student's first research seminar in BioMI 7980. Alternatively, the student may arrange for individual meetings with each committee member. Subjects covered in the A-Exam include, but are not limited to, current literature in the student's field of expertise; material covered in the BioMI 6900 modules and general knowledge of the research programs of other laboratories in the Field of Microbiology. *Note: additional topics may be covered in the Exam, based on the student's course work and minors.* The student should also work with the Special Committee chair to put together a draft list of ideas for Field representatives for the A-Exam committee, which will be finalized with the help of the DGS.

It is the student's responsibility to contact all committee members to schedule an exam date. The student must also inform the DGS and Field Assistant of the finalized exam date at least two weeks prior to the exam date to allow adequate time to give fair notice to other Field Faculty who may wish to attend. However, it is best to schedule the exam well in advance as faculty schedules fill up early. The student must notify the Graduate School of the exam at least 7 days in advance of the A-Exam date.

The details of A-Exam preparation are at the discretion of the Special Committee Chair. The following are *suggested* guidelines. The student should spend 1 –2 months preparing for the exam. The expectation is that students also remain engaged in their thesis research as they prepare for their A-Exam. Approximately half of the preparation time should be spent preparing a written research proposal and the other half of the time should be spent reviewing course materials, in-depth knowledge in the student's major and minor fields, and background information concerning the student's research project. In addition, the student should continue to attend departmental seminars. The student may be questioned about those seminar topics as well as research on-going in the Field of Microbiology.

Students are encouraged to meet with their committee members to discuss specific expectations before the exam. Effective preparation also includes practice exams, which can involve other members of the student's lab or fellow graduate students. While the general organization of all A-Exams is the same, the content and tone of each exam will vary. Therefore, discussing previous A-Exam questions can be helpful but the questions in your A-Exam will reflect the interests of your committee. Given that not all questions can be anticipated an important skill to master is the ability to 'think on your feet'.

#### Research proposal format.

In general, the research proposal should cover experiments that could be performed by the student in the course of 3-4 years. The proposal should be well formulated and presented in sufficient detail that it can be evaluated for its scientific merit. Include sufficient information to permit an effective review without readers having to refer to the literature. Brevity and clarity in the presentation will be considered indicative of an applicant's approach and ability to conduct a superior project. Proposals are generally 15 pages in length, double-spaced, and typically follow NIH, NSF, or USDA proposal format.

A week or so before the exam date, the student must provide a copy of the written proposal to each member of the exam committee. A copy of the proposal is also given to the Graduate Field Assistant. All committee members should agree upon any deviation from this schedule.

#### Expectations during the A-Exam.

The student must bring a list of courses taken at Cornell with final grades to the A-Exam:

Typically, the student is asked to leave the room at the start of the exam to allow the committee to discuss classes and the format for the exam. After this the student typically presents a very brief (5-10 minutes) summary of his or her background, interests, goals, and research. The student will then begin discussing their proposal using the brief presentation they have prepared, which may then serve as a starting point for further discussion. Presentation materials should generally be limited to a few PowerPoint slides. An extensive, research talk is not expected, and students are discouraged from preparing detailed presentation materials. This is an oral examination so the student should be prepared to be an active participant in a question-and-answer format. Using the blackboard to enhance your answers with diagrams, graphs or other relevant information is an important component of a successful exam.

In the normal progression of the exam, committee members will initiate detailed discussions on the research proposal and background information. Questions concerning general knowledge often naturally evolve from these discussions. If necessary, a separate formal general knowledge discussion will be initiated. Faculty consider successful candidates to be proficient in the specific topics mentioned above as well as the following:

- Ability to reason through problems and to formulate and test hypotheses
- Ability to communicate ideas and concepts effectively

- Ability to discuss the major trends in Biology, Microbiology, and his/her specific area of research
- Ability to discuss how his/her research fits in with the bigger picture of his/her specific field, microbiology, and biology

#### Results of the examination.

Upon conclusion of the exam the student will be asked to leave the room so that the committee can deliberate the outcome. Passing the A-Exam means demonstrating proficiency in the two sections of the exam: defense of the research proposal and general knowledge. The committee members vote to pass or fail the student on each section of the A-Exam. There are three possible outcomes of the A-Exam: Pass, Conditional Pass or Fail. A minimum of 4 out of 5 committee member votes is needed to pass or fail an exam section. A Conditional Pass typically means the student must complete additional requirements such as taking extra courses or writing a paper on a particular research topic. Upon completion of this requirement the Conditional Pass is changed to Pass.

If the student fails one or both portions of the exam the committee will discuss with the student options for re-examination. Re-examination is allowed only with the approval of the Special Committee and not earlier than three months after the failed exam. If re-examination will be allowed, the student is so informed at the end of the failed A-Exam. If the student fails the examination, the Special Committee may agree to grant the student a terminal MS degree only if the student's performance during the A-Exam is at least at the level of a passed MS exam. Graduate Faculty visitors at an examination are at liberty to inform the Dean in writing if they disagree with the judgment of the examining committee and wish to request a review of the case by the General Committee.

Results of Examination is processed via an online form that is sent to the student on the day of the exam and initiated after the exam. *Note: The Field of Microbiology does not offer a master's degree as part of the PhD process. Please do not check the box on the form that indicates a master's degree will be award as part of the exam as this will delay processing of the form.*

#### **B Examination**

The B Exam is an oral defense of your thesis or dissertation. The exam can be taken after completing all degree requirements, but not earlier than one month before completing the minimum Registration unit requirements. At least two registration units must be earned between the passing of the A exam and the scheduling of the B exam.

Students must fill out the [Schedule B Examination](#) form 10 days prior to defending. After completing their B Exam they must fill out the [Results for Final Defense of PhD Degree](#) (B Exam).

## GRADUATE STUDENT INVOLVEMENT

### **Journal Club** (*BioMI 7910-Advanced Topics in Microbiology*)

The Department of Microbiology, a graduate student volunteer and Professor organize the Journal Club. For each class meeting, one graduate student is paired with a faculty, post doc or senior graduate student to present background information and the results of a current research article. Participating in the Journal Club is an excellent way to keep up on current literature, trends in microbiology, provides the opportunity to critically evaluate the literature, interact with faculty members, and practice presenting scientific information to an audience of peers and professors.

### **Field of Microbiology Students (FoMS)**

FoMS is a voluntary student organization that facilitates discussion on various topics relevant to Microbiology graduate students. Both academic and non-academic matters are covered at FoMS meetings such as: nomination of departmental and student-invited speakers, organization of activity schedules for recruitment weekend, organization of social/recreational events, dissemination of information for all Cornell graduate students (e.g. changes in health insurance, dissertation guidelines, etc.). FoMS is a great way to interact with Microbiology graduate students and graduate students across campus. The FoMS group is led by the third-year students in the program.

For more information on FoMS: <https://micro.cornell.edu/academics/graduate/foms>

### **Graduate and Professional Student Assembly (GPSA)**

GPSA is part of the Cornell's system of governance charged with representing the interest of graduate and professional students. Every graduate field and professional school selects a representative to attend the assembly; from the field representatives, voting members and executive officers are elected. Graduate and professional students pay a student activity fee, which the funds collected GPSA sponsors social events, such as the End-of-Year BBQ.

For more information on GPSA: <http://assembly.cornell.edu/GPSA/Home>

### **Seminars**

There are many opportunities to hear speakers from fields other than Microbiology such as Microbiology and Immunology, Biogeochemistry, Environmental Science and Sustainability, Infection and Immunity. Please look for the Microbiology weekly announcement sent, they vary from day and time.

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## **FACULTY IN THE FIELD OF MICROBIOLOGY**

Due to the constant addition of field members the most recent list of Faculty in the Field of Microbiology can be found [online](#).

## **MISCELLANEOUS DEPARTMENT INFORMATION**

### **CU INFO**

CUinfo is a website maintained by Cornell University that provides faculty, staff, and students with current campus alerts, Ithaca weather, and other happenings around Cornell.

<http://cuinfo.cornell.edu/>

### **STUDENT CENTER**

Student center provides students to check registration, add/drop classes, make changes to special committees, view financial aid information, and details on your student record.

[www.studentcenter.cornell.edu](http://www.studentcenter.cornell.edu)

### **MAIL AND MAILBOXES**

The Department of Microbiology mail room is located in 151 Wing Hall and is open from 8:00 am to 4:30 pm. Mailboxes are provided for all faculty, staff, and labs.

Campus mail is a free service and is to be used for university business only. Envelopes and mailing supplies are available in 151 Wing Hall.

Packages can be sent via UPS or Fed Ex with an account number. Please contact any staff member to help with the process.

### **BULLETIN BOARD**

The department provides bulletin boards to provide important information to the community:

- Seminar Announcements-outside 102 Wing Hall
- Job Postings-across 115 Wing Hall
- List of faculty, staff, and graduate students-outside 106 Wing Hall

### **PURCHASES**

If the project director expects you make frequent purchase, they can request that you gain access to the Cornell's purchasing system, eShop. Permission, account number, and detailed business purpose must be obtained from the project director *before* making the purchase. To gain the access needed the project director needs to contact Department Manager, 103 Wing Hall.

### **PARKING ON CAMPUS**

All vehicles on campus must be registered with the University Transportation Services at 116 Maple Avenue. Parking is limited and permits are disbursed on a tier system. Their hours of operation are 7:30 am-4:00 pm, Monday-Friday.

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<https://fcs.cornell.edu/content/parking-students>

**KEYS AND BUILDING ACCESS**

Wing Hall is open 7:30 am-5:00 pm daily. If you need access to the building, office, or lab your PI must request access from the Administrative Manager in 103 Wing Hall.

**LAB INFORMATION-TRAINING**

Students who will be working a lab are required to take a series of basic lab safety courses. Extensive safety training that is specific to each lab will occur under the supervision of the PI.

The department also encourages students to take the Dry Ice and Hazardous Materials Shipping trainings.

For further information and available trainings please see the Environmental Health & Safety website: <https://sp.ehs.cornell.edu/lab-research-safety/Pages/default.aspx>