

M&I
Microbiology
and Immunology

Guide to Graduate Studies



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PREFACE

The Department of Microbiology and Immunology is part of the School of Medicine and is also a unit of the Graduate School. Currently there are about 60 MCRO faculty members with active research laboratories in which to train graduate students. The Department and its personnel are nationally and internationally recognized for significant contributions to science and to the University.

This guide is designed to provide information to our graduate students about the department, the graduate program, and specific degree requirements, including the preliminary written and oral examinations (“Prelims”). We are also interested in trying to improve the utility of this document so please make suggestions for improving its contents and its clarity.

In order to jump the University's hurdles more easily, please familiarize yourself with the Graduate School Handbook located on-line at <http://handbook.unc.edu/>; it contains most of the rules, regulations, policies, and procedures of the Graduate School and it takes precedence over any discrepancies in this guide. Also familiarize yourself with the Department of Microbiology and Immunology's degree requirements found in this guide. It is your responsibility to make sure that you fulfill all of these requirements as you go through the program.

We encourage each of you to discuss all aspects of academic life at this University with the Graduate Student Advisor, your preceptor, and other members of your Committee. Frequent discussions with all of these individuals will make your progress through the program much smoother and more rapid.

THE DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

The three intertwined missions of the Department of Microbiology & Immunology in the School of Medicine at the University of North Carolina, Chapel Hill are to:

- Conduct research that significantly advances the science of microbiology and immunology, broadly defined and with emphasis on topics that could contribute to improved human health;
- Educate diverse graduate, professional, and pre-professional students as well as postdoctoral scholars in the aspects of microbiology and immunology appropriate for their careers; and
- Serve the people of North Carolina and the United States, whose support enables our research and teaching missions, as well as the international community of scholars, who provide the framework in which to conduct high-quality peer-reviewed microbiology and immunology research.

The Department of Microbiology & Immunology strongly believes that diversity is crucial to our pursuit of academic excellence, and is deeply committed to creating a diverse and inclusive community. Diversity Liaison Natalie Nesbitt is responsible for coordinating these efforts and works directly with the Chair on issues related to recruitment, education, and communication. We support the University's policy not to discriminate on the basis of age, color, disability, gender, gender expression, gender identity, genetic information, national origin, race, religion, sex, sexual orientation or veteran status

In its over 80-year history, the Department has focused on a commitment to excellence in the teaching and training of scientists and medical practitioners. In 1984, the Department received its first NIH T32 award to develop and enhance research training opportunities for our students. Department faculty now participate in T32s with training emphasis on Virology, Microbial Pathogenesis, Sexually Transmitted Pathogens, Immunology, and Cancer. Of the doctoral candidates and postdocs who have received training from these grants, 80% continue in active, independent research careers, either in academia or industry. Because of our faculty affiliations throughout the Medical School, other schools within Health Affairs and across the campus, there are numerous opportunities for collaborations that result in joint publications between labs. As a department within the Medical School, there are opportunities to interact with physicians and to work on research projects that have the possibility of making a direct impact on human health and the practice of medicine.

GUIDE TO THE PH.D. DEGREE IN MICROBIOLOGY AND IMMUNOLOGY

I. REGISTRATION

After year 1 with the BBSP, if you commit to a Faculty member of our Department, please contact the Student Services Specialist (SSS), Michelle Hightower, or the Director of Graduate Studies, Bob Bourret.

II. REQUIREMENTS

A. Required by the Graduate School:

1. Four Full Semesters of Credit (9 hrs each)
2. Written Preliminary Examination
3. Oral Preliminary Examination
4. Submit a progress report of your research to each member of the committee at least once a year.
5. Dissertation and public presentation of research results at a seminar

B. Additional Requirements Imposed by this Department:

1. **Six Courses including MCRO795 and at least two seminar/tutorial courses**

One of the seminar/tutorials may be outside the department but requires:

- the class to be based on discussion of the primary research literature, not lectures.
- approval by the Director of Graduate Studies after reviewing a course syllabus. (The student is responsible for obtaining the class syllabus)

2. **Two semesters of TAship assigned by our Department.**
3. **Participation in Department seminars and student seminars (MCRO 701).**
4. Minimum publication requirement

III. TIMELINE OF EVENTS

A. During the First Year

1. **During the First Year – BBSP will advise you**

- Meet with the BBSP Graduate Student Advisor (GSA) to choose courses.
- Recommend no more than two didactic or seminar courses per semester.
- Three Laboratory Rotations: Choose labs of your interest and contact the Faculty.
- Choose Research Preceptor later in the year (who can support you and your research).
- Professional development (including training in Scientific Ethics) in First Year Groups

B. During the Second Year

1. Departmental Courses: No more than 2 didactic or seminar courses per semester. These courses are chosen in consultation with your research advisor or with the departmental Director of Graduate Studies. In addition, students are required to take **MCRO 795** as well as attend two-thirds of the Departmental seminars and student seminars (MCRO 701).
2. Once during the year act as a T.A. for a departmentally approved course. (Microbiology 251 or Microbiology 515)
3. Take the written preliminary examination.

Our departmental written prelim exam format is a research proposal written in a format similar to an NIH pre- or postdoctoral fellowship proposal. Specific guidelines will be discussed in detail when the students meet as a group with the Prelim Exam Advisor at the start of the Spring semester. The exam is understood to be an expression of each student's independent ability to formulate an experimental approach and adequately express it on paper. The exam period will start with the distribution of a list of foundation publications on the first day of classes of the Spring semester and must be completed by June 1.

C. During the Third Year

1. Departmental Course Requirements:

Required to attend two-thirds of the Departmental seminars and student seminars (MCRO 701). Appropriate seminar/tutorial courses may be taken in consultation with your research advisor.

2. Once during the year act as a T.A. for a departmentally approved course (Microbiology 251 or Microbiology 515)

3. Student Seminars:

Graduate students are expected to participate and attend student presentations held weekly during the academic year. Students are required to attend two-thirds of the presentations.

All graduate students who are Year 3 and above will be scheduled to give a formal presentation of their research (typically in PowerPoint) of about 30 minutes in length.

4. Form a Dissertation Committee and choose a thesis committee chair:

Committee Members: According to Graduate School rules, the dissertation committee must consist of at least five persons: the dissertation advisor and at least four members of the Graduate faculty. One must be chosen as your thesis chair. Our department requires that the four members of the dissertation committee be faculty (primary or joint appointees) in our department. The names of the Faculty should be listed on the 'Report of Doctoral Committee Composition' form. The committee and chair must be selected by the start of the Fall semester.

5. Oral Examination:

The oral preliminary exam (also known as the doctoral oral examination) centers on the topic of the thesis project, and provides an opportunity for you to demonstrate your ability to discuss the fields of science related to your thesis proposal, as well as your ability to analyze problems and design experiments. The exam serves a dual purpose as the initial meeting of the thesis committee. Therefore, a separate decision to approve or disapprove your thesis project will occur in the same meeting.

6. Dissertation Research Project Approval:

Each student develops a dissertation research project with his or her research advisor during year 2. The proposed dissertation project must be approved by your dissertation research committee. The committee must meet to consider approval of your proposed dissertation project by December 31 of the third year. Prior to your project approval meeting, please obtain the 'Report of Approved Dissertation Project' form from departmental Student Services Specialist. Provide the committee members a written prospectus of the dissertation research problem and methodology, at least one week in

advance of the committee meeting. The prospectus should be two pages or less and describe hypotheses, Specific Aims and a brief overview of research design, including which parts of the project have been completed. At the meeting, you will present (orally) the dissertation research proposal and any experimental data to the committee. The committee determines the soundness of the problem and its feasibility. If a topic requires additional experimentation to determine feasibility, then topic approval may be deferred to subsequent meetings within the year. When your topic is approved, the Graduate School will be notified in writing that the dissertation project has been approved and that you are advised to proceed. **You must meet at least once every year with your dissertation committee to review your progress on your dissertation research project.** See *Committee Meetings and Progress Reports*. Be sure to pick up your progress report form from the Student Services Specialist prior to each meeting. This meeting is typically held in conjunction with the annual Student Seminar.

D. During the Fourth and Fifth Years

1. Register for three credit hours of MCRO 994 (dissertation in progress) and one credit hour of MCRO 701.
2. Provide 30 minute Student Seminar annually
3. Conduct Research and hold committee meetings.
Monitor your research progress, work hard, tabulate results, publish papers, and write your dissertation. Dissertations are largely a collection of your manuscripts unified with a comprehensive Introduction and an overall Discussion.
4. Complete minimum publication requirement. As a minimum standard, to earn the Ph.D. degree we *require* that (i) a student must make meaningful contributions to and be an author on at least two manuscripts intended for publication in respected, high-quality professional journals or books, (ii) at least one of the two manuscripts must be accepted for publication, and (iii) prior to the private Ph.D. defense, a student must have peer reviews returned for at least one first (or co-first) author primary research manuscript. Parts ii and iii cannot be satisfied with the same manuscript. See the Publication Requirement for complete information.
5. Dissertation: The decision of when to write the dissertation is a collective one made by you, your advisor and your committee. When you are ready to begin writing your dissertation, you must consult with your advisor and committee members regarding content and format of the document.

Summary of Requirements for a Ph.D.

First Year Grad Student - BBSP

Second Year Grad Student – Year 1 in Microbiology & Immunology

Take MCRO 795 & 701 and enough courses to total six (yr 1-2), two of which must be seminar/tutorials	Teaching Assistant 1	Written Preliminary Exam-Spring semester	Research in Progress
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Third Year Grad Student – Year 2 in Microbiology & Immunology

Dissertation Committee & Chair selection and approval by the first day of Fall classes	Have your thesis project approval meeting and Oral Preliminary Exam by December 31 .	MCRO 701 Present Student Seminar	Teaching Assistant 2	Research in Progress
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Fourth Year Grad Student – Year 3 in Microbiology & Immunology

MCRO 701	Present Student Seminar and have a committee meeting	Research in Progress
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Fifth Year Grad Student and above – Years 4 and above in Microbiology & Immunology

MCRO 701	Present Student Seminar and have a committee meeting	Research in Progress until final defense and graduation	Apply for graduation by appropriate deadline.
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Bold indicates a Graduate School requirement as well as departmental.

Department of Microbiology & Immunology
Timeline of Key Steps in Typical Progression to Ph.D. Degree

Before Joining Department (in either BBSP or M.D./Ph.D. program)

- Professional development activities in BBSP First Year Groups
- Classroom courses (typically two per semester)
- Three lab rotations
- Choose research advisor and join department

First Year in Department (2nd year Ph.D. students, 1st year M.D./Ph.D.)

- Begin thesis research
- Finish classroom course requirements (six total, including two seminar/tutorial)
- Act as TA for one semester
- Fall - Begin attending at least 2/3 of department and student seminars each semester. Take MCRO 795 proposal writing & logic class (required).
- Spring - Think about topics, choose topic by April 1, and complete written preliminary exam describing original research proposal by June 1.

Second Year in Department (3rd year Ph.D. students, 2nd year M.D./Ph.D.)

- Continue thesis research and required seminar attendance
- Begin annual presentations in student seminar series
- Act as TA for one semester to complete teaching requirement
- Choose thesis committee & chair by first day of Fall semester classes.
- Fall - Inform the Student Services Specialist and the Director of Graduate Studies of your exam date and Oral Exam Committee members by October 1. Complete oral preliminary exam and project approval by December 31. At least one week prior to meeting, provide thesis committee with a written document of two pages or less describing hypotheses, Specific Aims, and a brief overview of research design, including which parts of research design have been completed.

≥ Third Year in Department (≥ 4th year Ph.D. students, ≥ 3rd year M.D./Ph.D.)

- Continue thesis research and required seminar attendance. Meet at least once annually with thesis committee. Provide committee with a progress report at least one week prior to each meeting. The report consists of a Specific Aims page followed by a description of progress to date organized by Aim. The progress report should include any changes in Aims, a summary of key results, and plans for future experiments. The report should also communicate the student's vision for how results could be organized into publications, and the current status of progress toward publications.

Degree Completion - typically Fourth or Fifth Year in Department (5th or 6th year Ph.D. students, 4th or 5th year M.D./Ph.D. students)

- Fulfill publication requirement (see pg. 13). When ready to graduate, submit thesis to committee at least two weeks prior to defense. Defend thesis in private meeting with committee. Give public seminar of thesis research two weeks after private defense.
- Fifth year students will be required to take MCRO 721 in the Fall as a refresher training in the Responsible Conduct of Research.

IV. GENERAL INFORMATION and DESCRIPTIONS

COMMITTEE MEETINGS & PROGRESS REPORTS

Students should form their thesis committee and select their committee chair by the first day of Fall classes starting of their 3rd year in graduate school for PhD students and the 2nd year for MD/PhD students. Students should have annual committee meetings.

Note: Your second year in the department is your third year in graduate school.

Students will provide their committee with a progress report at least one week prior to each meeting following approval of the thesis topic. The document will consist of a Specific Aims page followed by a description of progress to date organized by Aim. The progress report should include any changes in Aims, a summary of key results, and plans for future experiments. The report should also communicate the student's vision for how results could be organized into publications, and the current status of progress towards publications.

To assist you with scheduling your meetings, you may want to try doodle.com or another on-line meeting scheduler.

COMMITTEE MEETING FORMS

There are two forms that you will need, one is for the Graduate School and is required for graduation. Part I is the Report of Doctoral Committee Composition, which must be completed by the first day of classes of your third year in Graduate School; and part II is for your Report of Approved Dissertation Project and it should be completed no later than **December 31** of your third year in graduate school. Always let the Student Services Specialist know in advance when you have a meeting so that she may prepare the appropriate form for you to pick up prior to your meeting. She will need the working title of your dissertation prior to your project approval meeting. See Appendix B.

The second form is a departmental form that helps us keep track of your committee meetings and of your progress. You will pick up this form from the Student Services Specialist before each meeting, give it to your committee chair to complete, keep a copy for yourself, and return the original to the Student Services Specialist. See Appendix C.

DISSERTATION COMMITTEE SELECTION

The doctoral dissertation committee should consist of no fewer than five people, at least one of whom shall be named the dissertation advisor and one your committee chair. A majority of each dissertation committee must be regular members of the graduate faculty. At least four of the committee members must be members of the Department (either primary or joint faculty). After your committee is recorded, please let the Student Services Specialist know of any subsequent additions or substitutions of a Faculty member on your committee.

The thesis committee chair will be a department faculty member different than the research advisor. The duties of the thesis committee chair are as follows:

- Chair leads all thesis committee meetings, including final defense
- Chair opens each thesis committee meeting by separately asking the student and the research advisor, in each other's absence, to briefly describe for the committee (i) their perception of the student's progress toward their degree, and

- (ii) any problems or challenges that may benefit from the advice or intervention of the committee.
- Chair signs the final oral examination and report of final dissertation form. Also certifies (by initialing box in part IV of form) that dissertation has been approved for electronic submission at time of defense if no minor edits are requested or after any required edits are done.
- Chair acts as an impartial mediator in any disputes that may arise between the research advisor and the student related to the student's research or thesis. The student will choose the thesis committee chair in consultation with the research advisor. In order to enhance the independence of the chair, it is suggested that the chair not be a close collaborator of the research advisor. The thesis committee chair cannot be the spouse or "significant other" of the research advisor.

Note: The thesis committee chair cannot be the spouse or "significant other" of the research advisor; however, such individuals are allowed to serve on the thesis committee.

DISSERTATION PROJECT APPROVAL and ORAL PRELIMINARY EXAM

Students will hold a thesis project approval meeting with their thesis committee by December 31 of their second year in the department. The oral preliminary exam (also known as the doctoral oral examination) centers on the topic of the thesis project, and provides an opportunity for you to demonstrate your ability to discuss the fields of science related to your thesis proposal, as well as your ability to analyze problems and design experiments. The exam serves a dual purpose as the initial meeting of the thesis committee. Therefore, a separate decision to approve or disapprove your thesis project will occur in the same meeting. This document is not a written exam, and will not be graded, but rather serves to provide the committee with useful background reading. However, it is to your advantage to prepare a thoughtful, logical, well-written thesis proposal.

DISSERTATION COMPOSITION

Timing. The decision of when to write the dissertation is a collective one made by you, your advisor, and your committee. The expectation of the Department of Microbiology & Immunology continues to be that all Ph.D. students will conduct sufficient research to result in at least two first-author publications describing original results in high quality, peer reviewed journals. As a minimum standard, to earn the Ph.D. degree we require that (i) a student must make meaningful contributions to and be an author on at least two manuscripts intended for publication in respected, high-quality professional journals or books, (ii) at least one of the two manuscripts must be accepted for publication, and (iii) prior to the private Ph.D. defense, a student must have peer reviews returned for at least one first (or co-first) author primary research manuscript.

Expectations. When you are ready to begin writing your dissertation, you must consult with your advisor, committee chair, and committee members regarding the content and format of your dissertation. It is important that you have a clear understanding of the expectations of all committee members for your dissertation. Students who ignore this step have had their defense postponed while they rewrite their dissertation to meet committee expectations.

Introduction. Chapter 1 is the Introduction. Typically, the Introduction is a narrowly focused review of the material necessary to understand the main body of the dissertation. However, the expected scope of the Introduction should be explicitly discussed with committee members before writing. If the student has written a review article, a suitably modified version may be utilized for the Introduction.

Results. The results chapters are typically published, submitted, or in preparation manuscripts reformatted to meet dissertation guidelines. Note that manuscripts written for journals with severe length restrictions (e.g. *Nature* or *Science*) may be too cryptic for a dissertation in their original form and may require suitable expansion and clarification. A student does not need to be the first author or co-first author to include a manuscript in their dissertation. Depending on circumstances, student preference, and committee advice, non first-author manuscripts may be included in the main body of the dissertation, included in the Appendix, or left out of the dissertation. For incomplete projects, we strongly recommend that students write up all available information (introduction, materials and methods, results, discussion, references, figures and tables) as a dissertation chapter. This will make it as easy as possible for someone else to complete the project and submit the final manuscript. Writing as much as possible before leaving also protects the student's position as a potential author on the eventual manuscript. Each results chapter must include a footnote with actual or planned publication information, a list of all actual or planned authors involved in the described research, and a statement specifying the contributions of the student to the project. Such footnotes should also be provided for the Introduction and/or Conclusion if review articles serve as the basis for these chapters, as well as for any manuscripts included in the Appendix.

Conclusion. The final chapter is the Conclusion. The Conclusion typically includes two types of material: (1) putting the results into broader context describing how the student's research has advanced the field, and (2) describing potential future directions to extend the line of investigation. However, the expected scope of the Conclusion should be explicitly discussed with committee members before writing.

Appendices. The dissertation serves as a formal record of a student's accomplishments during their Ph.D. studies. Therefore, students can choose to use appendices for material that does not easily fit into the main body of the dissertation (e.g. side projects, publications from time in another lab, intriguing preliminary observations, etc.). Such material can also be left out of the dissertation. What to include or exclude is a subject for conversation with your committee members.

Advisor approval. The student is expected to be the primary author of their dissertation, with advice and editing assistance from their research advisor. The advisor should read and approve the dissertation before distribution to the rest of the committee. Be sure to allow enough time for your advisor to approve your dissertation, given that you must deliver the dissertation to your committee at least two weeks prior to your private defense.

Official guidelines. For the latest Graduate School guidelines on writing your dissertation, visit <https://gradschool.unc.edu/academics/thesis-diss/guide/>. For information about the electronic submission of your dissertation, visit <https://gradschool.unc.edu/academics/thesis-diss/guide/submission.html>. See App. G.

DISSERTATION DEFENSE – FINAL EXAM

The final defense of your dissertation will take place in two stages only after you have met the minimum publication requirement (see Appendix H):

(1) First, a private defense in front of the thesis committee. The student should meet with the committee chair beforehand to discuss and agree upon general expectations for a brief initial presentation of no more than 10 slides. The presentation can include a synopsis of dissertation highlights, but should highlight broader or unresolved aspects of the thesis research and facilitate a forward-thinking conversation. The intent of the presentation is to help the committee assess whether or not the student has become a mature scientist. The committee will engage the student by asking questions arising from the presentation, the dissertation, and if applicable, peer reviews of a manuscript used to satisfy the publication requirement but not yet accepted for publication. If the student passes the defense, then all committee members, including the advisor and chair, will sign the appropriate graduate school document. The thesis committee chair will certify (by initialing the final exam form) that the dissertation has been approved for electronic submission at the time of defense if no edits are requested, or after any required edits are completed and approved.

(2) The student will present a formal public seminar of their research results no sooner than two weeks after their successful private defense. Thesis committee members are encouraged but not required to attend the public seminar. A final grade for MCRO 994 will not be submitted until after the required public seminar.

Schedule a date and location that works for you and all of your committee members for your private oral exam. All committee members are expected be present at your final oral defense meeting. If a common date cannot be determined, substitution of a committee member is an alternative after approval by the committee and the advisor. Please notify the Student Services Specialist for formal substitution of a committee member. At least two weeks prior to the final oral exam, give your committee a draft of your dissertation. (If the thesis is not provided to the committee at least two weeks prior to the defense, then the thesis committee may, at their discretion, postpone the defense.)

Pick up the *Report of Final Oral Examination* form the day before, or the day of the meeting and give it to your committee chair and committee members for their approval and signatures in sections III and IV. A majority of the committee members must approve and sign the final dissertation.

The Student Services Specialist will need your abstract, seminar title and seminar logistics at least two weeks prior to your seminar.

For the latest information on writing your dissertation, please see ***Thesis and Dissertation Guide*** available online at <https://gradschool.unc.edu/academics/thesis-diss/guide/>. For information about the electronic submission of your dissertation, visit <https://gradschool.unc.edu/academics/thesis-diss/guide/submission.html>.

ETHICS

All first year Ph.D. students in the BBSP and School of Medicine are required to participate in formal training discussions on the subject of Scientific Ethics.

All MCRO students who have not yet graduated are required to take MCRO721 Refresher Training in the Responsible Conduct of Research during their fourth year in the department (i.e. 5th year Ph.D. students and 4th year M.D./Ph.D. students).

GRADING

As described in *The Graduate School Handbook*, grades for graduate students are H (High Pass), P (Pass), L (Low pass), F (Fail), IN (Incomplete), AB (Absent from final exam), and NG (No grade). Students who fail to complete satisfactorily the work in any course ordinarily receive the grade of F. However, if the faculty member teaching the course is satisfied that exceptional circumstances warrant extending the time for completion of course work, the grade of IN may be given and a date set, **in writing**, for completing the work. A grade of IN indicates that the student has failed to meet the requirements and will turn to an F after the set date, or one year after the IN was received if no date was set. A graduate student who receives one grade of F, or nine or more semester hours of L, is ineligible for continued graduate study.

GRADUATION REQUIREMENTS

Four semesters in residence, at least six hours of MCRO 994, written and oral exams, committee approval, dissertation topic approval, publication requirement, final oral exam, seminar and dissertation submission and Graduate School exit survey. There are official Graduate School forms for each of these milestones so please notify the Student Services Specialist, in advance, of each one. You must apply for graduation at your Student Center in Connect Carolina and complete a Certification of Program Degree Requirements form and give it to the Student Services Specialist. See Appendix F.

GRADUATE SCHOOL GUIDEBOOKS

The Graduate School no longer gives you copies of *The Graduate School Handbook* or *The Thesis and Dissertation Guide*. It is strongly recommended that you review these, which you can access here: <http://gradschool.unc.edu/publications/>.

HEALTH INSURANCE

A part of your student fees goes towards Campus Health Services (CHS); however, not everything is covered at 100%. Therefore, the department pays for you to have a 12-month comprehensive plan called GSHIP, which is underwritten by BCBSNC. After the initial sign-up period, you will receive policy information and an insurance card. You will be asked prior to each sign-up period if you do, or do not want this coverage. You must **waive out** of the UNC mandatory health insurance plan each semester.

Because you are not registered during the summer and therefore do not pay the student fees, there will be additional funds in your stipend to cover your summer fees. This means you may cover either your Campus Health Services (CHS) fee for each summer session, and/or your student registration fee if you are defending your dissertation and have to be registered for MCRO 994. You are responsible for paying these fees with funds that have been provided for this purpose.

INFORMATION REQUEST

-Awards: Please remember to inform the Student Services Specialist anytime that you receive a fellowship, award, honor or distinction from inside or outside of the university. It would be very helpful to have this information soon after it happens so that it can be included in the graduate student database and extracted when needed.

- Presentations:** Please remember to inform the Student Services Specialist of when, what and where you've presented your research outside of the department.
- Publications:** Please inform the Student Services Specialist when your manuscript(s) have been accepted and where they have been accepted.
- Post Graduate Work:** Please notify the Student Services Specialist about your plans of employment or post-doctoral fellowship and contact information.

LABORATORY ROTATIONS

Rotations into laboratories in year one are meant to acquaint the graduate student with the mentor, the field of research and scientific environment. The object is to determine after year one, which particular laboratory will be your field of research for your dissertation. Rotations are arranged with the BBSP. At the end of your rotations, the BBSP will help formalize your designated lab and transfer your name to our department.

M.D./PH.D. STUDENTS

M.D./Ph.D. students are required to take three courses, including MCRO 795 and at least one seminar/tutorial, and to TA once. The timing of the other activities (prelim exams, committee formation, etc.) is usually accelerated by one year for M.D./Ph.D. students compared to regular Ph.D. students.

NC RESIDENCY FOR TUITION PURPOSES & TUITION REMISSION

Upon arrival in NC, all out of state students need to begin the steps to become NC Residents for Tuition Purposes. After you have lived here for 12-months, you are required by the department to apply for NC Residency for Tuition Purposes every Fall and Spring semester until you are granted in-state residency. Students who do not provide their paperwork showing that they applied may NOT be eligible to receive a department tuition remission; therefore it is imperative that you take steps to become a NC Resident for Tuition. Tuition remissions are allocated funds from the Legislature to pay the out-of-state portion of tuition, offsetting the tuition cost for your PI and/or the department, and are limited.

OUTSIDE EMPLOYMENT

If you are receiving a stipend from the department, outside employment is not allowed, this includes teaching assistantships in other departments. However, in certain instances an exception may be made for TA'ing with prior approval from the Director of Graduate Studies and your advisor. A reduction in stipend will occur. Please contact the Director of Graduate Studies for information.

PRELIMINARY EXAMINATIONS

Written Exam

The written preliminary exam (also known as the doctoral written examination) consists of a research proposal, written in a format similar to a NIH pre- or postdoctoral fellowship proposal. The proposal is written whenever the student likes over the course of the Spring semester and the subsequent three and a half weeks. See Appendix A.

Oral Exam

The oral preliminary exam (also known as the doctoral oral examination) centers on the topic of the thesis project, and provides an opportunity for the student to demonstrate his or her ability to discuss the fields of science related to the thesis proposal, as well as his or her ability to analyze problems and design experiments. The exam serves a dual

purpose as the initial meeting of the thesis committee. Therefore, a separate decision to approve or disapprove the thesis project will occur in the same meeting. See Appendix A.

MINIMUM PUBLICATION REQUIREMENT

The *expectation* of the Department of Microbiology & Immunology continues to be that all Ph.D. students will conduct sufficient research to result in at least two first-author publications describing original results in high quality, peer reviewed journals. As a minimum standard, to earn the Ph.D. degree we *require* that (i) a student must make meaningful contributions to and be an author on at least two manuscripts intended for publication in respected, high-quality professional journals or books, (ii) at least one of the two manuscripts must be accepted for publication, and (iii) prior to the private Ph.D. defense, a student must have peer reviews returned for at least one first (or co-first) author primary research manuscript. Parts ii and iii cannot be satisfied with the same manuscript. If a manuscript used to meet part iii is not accepted for publication by the time of the doctoral defense, then the peer reviews will be submitted to the dissertation committee for discussion at the defense along with the dissertation. The student will submit to the dissertation committee a brief description of their specific contributions to the two manuscripts used to fulfill the publication requirement. Prior to the Ph.D. defense, the dissertation committee will decide (in consultation with the Director of Graduate Studies if necessary) whether the two manuscripts meet the part i standards of "meaningful contribution" and "respected, high-quality professional journals or books". The dissertation committee chair will inform the Director of Graduate Studies and the Student Services Specialist when the publication requirement is met, as well as the basis for the committee's decision. Each chapter in the dissertation other than the Introduction and Conclusion must list all actual or planned authors involved in the described research and include a statement specifying the contributions of the student to the project. See Appendix H for form.

SEMINARS

Tuesday Departmental Seminars: On most Tuesdays throughout the Fall and Spring semesters, a guest speaker from other universities, research institutes or industry visits the department, meets with faculty, postdoctoral fellows and students, and presents a seminar. This provides excellent opportunities for students to meet outstanding scientists from outside the University of North Carolina scientific community. **All students are required to attend at least two-thirds of the Tuesday Seminars each semester throughout their tenure in the department. All students should be enrolled in MCRO 701. Students will be graded for their attendance at both the departmental seminars and student seminars.**

Monday Student Seminars: Beginning in your third year you will be required to give a seminar once a year in the student seminar series for graduate students. You will be assigned a seminar date beginning in your third year. These seminars are meant to be a formal short (30 minute) PowerPoint presentation describing the goals and progress of your dissertation research. Currently, two students from different areas of study (virology, immunology, etc.) are assigned to present a short seminar on the same date. This seminar is intended to be a progress report. It is also an opportunity for feedback/critique from fellow graduate students. Another objective is to practice the task of relating your detailed research topic to an audience of peers whose own interests and expertise may not be identical to your own. **All students are required to attend at least two-thirds of the Monday Student Seminars each semester.**

TEACHING ASSISTANTSHIP

You are required to be a teaching assistant in a lab of one of our courses, MCRO 251 or 515, for one semester during your second year and during your third year. Gina Donato, Coordinator of Teaching Labs, is in charge of making these assignments and overseeing all TA's.

TRAVEL AWARD

We have a two-tiered program to provide support for departmental students who will be presenting their research at national/international scientific conferences, and we have decided to increase award levels for meetings scheduled during 2014 and later. A travel award of \$1000 is available for selective, high-profile conferences that have limited attendance (e.g., most Gordon Research Conferences, FASEB Summer Research Conferences, Keystone Symposia, etc.). For larger unrestricted meetings (e.g., ASM or ASV or AAI annual meetings) or for narrowly focused meetings (e.g., the Herpesvirus Workshop, the Pseudomonas Conference, etc.), the Department will contribute \$500 towards the student's travel expenses. A graduate student is eligible for this one-time award after approval of the dissertation research proposal by his/her dissertation committee. To apply, send your request, invitation and/or abstract to the Student Services Specialist.

For other funding resources visit the Graduate Funding Information Center
<http://gradfunding.web.unc.edu/>

GRADUATE SCHOOL FUNDING

The Graduate School offers fellowships and grants to eligible graduate students, including recruitment awards for incoming students (such as the prestigious Royster Society of Fellows) and dissertation completion, off-campus research, summer research and other awards for current students. These awards include:

Graduate Tuition Incentive Scholarship: Helps to cover the cost of in-state tuition for master's and doctoral students who receive eligible external funding awards.

Graduate Student Transportation Grant: Assists graduate students with some of the transportation costs necessary for travel to a regional, national, or international academic conference or professional society meeting to present their thesis or dissertation research.

Graduate Student Opportunity Fund: Assists students with unusual and unexpected academic expenses.

Dissertation Completion Fellowship: Supports doctoral students engaged in research and writing toward the completion of their dissertations. Includes a non-service stipend, tuition, fees, and health insurance during a student's final year.

Off-Campus Dissertation Research Fellowship: Supports doctoral students conducting dissertation research away from the Chapel Hill campus. Includes a non-service stipend, tuition, fees, and health insurance.

For more information about funding opportunities from The Graduate School, visit <https://gradschool.unc.edu/funding/gradschool/fellowshipsandgrants.html>

TUITION AND FEES

Your tuition will be paid directly to the University Cashier's Office from your stipend source via Gradstar, the Student Tuition and Reporting System. Your base stipend is increased to include your fees and you will be responsible for paying them to the

Cashier's Office via payroll deduction or by paying 100% to the Cashier at the start of each semester. You will receive information about the process, including the link (see appendix F) prior to the start of each semester. When you receive your tuition and fee bill from the Cashier's Office, check it over for anything that you are responsible for paying (i.e. library fines, Campus Health charges, parking tickets, etc.) and take care of it prior to the start of registration so a hold is not placed on your account, or your registration gets cancelled. You will receive several bills before your tuition is actually electronically paid. Rest assured that your tuition will be paid.

Link to the electronic payroll deduction form: <https://cashier.unc.edu/payment-options/graduate-student-employees-payroll-deduction/>

UPON DEGREE COMPLETION

- Turn in all keys and your key card and ask to be removed from the departmental network after transferring your files to another lab member or PI.
- Change your address in ConnectCarolina so that you will receive your W-2, diploma, etc. Go to <https://connectcarolina.unc.edu/> and link to your Student Center.
- Request a transcript from the Registrar's Office or print off your grade summary from ConnectCarolina. More than likely, you will need this information in the future when you're completing Fellowship applications and the department cannot provide you with a copy.
- Give a copy of your current curriculum vitae to the Student Services Specialist to close out your file.
- Leave your forwarding address with the Student Services Specialist and change your current & permanent address in ConnectCarolina.
- Let the Student Services Specialist know where and what position you will be going to and each subsequent position thereafter. We will not ask for money, we just like to know what our alum are "doing now." It is also a frequently asked question of prospective students and of training grant reports.
- Complete the exit interview survey sent to you from the Graduate School or they will not release your diploma.
- Sign your ECRT before departing. Email Ecrt_help@unc.edu
- Update alumni record: <https://alumni.unc.edu/resources/documents-and-records/update-your-address/>
- Alumni Email Forwarding service: <https://alumni.unc.edu/resources/documents-and-records/update-your-address/update-your-email-address/>

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GUIDELINES FOR THE MICROBIOLOGY & IMMUNOLOGY DEPARTMENT 2021 WRITTEN PRELIMINARY EXAM

The written preliminary exam (also known as the doctoral written examination) consists of a research proposal, written in a format similar to a NIH pre- or postdoctoral fellowship proposal. The proposal is written whenever the student likes over the course of the Spring semester and the subsequent three and a half weeks.

1. Prelim exam advisor. If you have questions or concerns about any aspect of the preliminary examination process, please contact the Prelim Exam Advisor [Bob Bourret, bourret@med.unc.edu, 919-215-2733 (cell), 6108 Marsico Hall].

2. Preparation. Writing a successful preliminary exam requires multiple skills, including good choice of topic, critical reading of scientific papers, proposing well-founded hypotheses, experimental design, logical analysis and interpretation of data, clear writing, etc. The MCRO795 course on writing grant proposals is required for all Microbiology & Immunology Ph.D. students and must be completed before taking the written preliminary examination. The skills acquired in MCRO795 are necessary but not sufficient for success on the exam. Poor writing quality scores in MCRO795 or other indicators that a student is not ready may result in a recommendation to complete appropriate remediation activities before taking the written exam.

3. Exam period. The prelim exam period will start with the distribution of the list of foundation publications during the first week of classes of the Spring semester. Students are encouraged to reach a mutual agreement with their research mentor with regard to the time during the semester to be devoted to proposal preparation. The expectation is that most proposal preparation outside of the actual writing can be done over the course of the semester in addition to normal graduate student responsibilities. However, at a minimum, there will be a period of at least three and a half weeks immediately following Spring semester final examinations (Saturday, May 15 - Monday, June 7, 2021) during which the student is protected from all other responsibilities (i.e. classes, serving as a Teaching Assistant, laboratory research, etc.) and able to devote 100% of their time to writing their research proposal. The exam may be completed and submitted at any time prior to the deadline, i.e. there is no requirement to wait until the formal May writing period.

The following items must be submitted by 12:00 noon on Monday, June 7, 2021 to the Student Services Specialist (Jamie Desoto):

- One .pdf digital file of the completed examination.
- One paper copy of the completed examination for your permanent file.
- One paper copy of the topic verification statement from the research mentor.
- The names of up to two Microbiology & Immunology faculty members requested as potential reviewers.

If we are still operating under pandemic conditions at the time of submission, and/or Jamie is not in her office, then it is OK to leave the paper copies of the proposal and topic verification statement in Jamie's mailbox in 6101 Marsico Hall.

This is a firm deadline; late proposals will not be accepted and will receive a grade of Fail. If there is some reason why you cannot make the deadline, contact the Prelim Exam Advisor as soon as you know there might be a problem.

4. Topic selection

Foundation publications. A faculty committee will screen sources such as *Nature Reviews Immunology*, *Nature Reviews Microbiology*, *Trends in Immunology*, and *Trends in Microbiology* to generate a list of at least 30 original research publications to serve as the foundations for research proposals. The list will include at least 20 papers with a focus on "microbiology" (viruses, bacteria, eukaryotic pathogens), and at least 10 immunology papers.

Permissible topics. Students will choose one paper from the provided list to serve as the foundation for an original research proposal. The final proposal can take off in any direction from the foundation publication. However, there must be a clear connection between the foundation paper and the eventual proposal, i.e. the paper should inspire, lead to, be the fundamental reference for, etc. the final proposal.

Project scope. The scope of proposed work should be comparable to that of a fellowship application from a graduate student or postdoctoral scientist. Specifically, it should be plausible for the amount of proposed research to be accomplished by one person working for three years. Use of unlimited external support services or core facilities (e.g. antibody preparation, mouse breeding, DNA sequencing, etc.) is allowed, but the timeline for such services must be realistic. Similarly, there is no budget limit (i.e. it is OK to propose expensive methods).

Impermissible topics. Because we want to evaluate a potential line of investigation that is generated by you and not by your mentor, you may not choose a topic that involves projects from the laboratory where you are carrying out your dissertation research, whether that research is past, present, or future:

- A prelim topic cannot build on data collected in your lab, even if the project was discontinued or there are no plans to follow up on the observation, because your lab originally initiated the project.
- Overlap with current projects should be straightforward to evaluate.
- The prohibition against future projects means that a prelim topic cannot be under serious discussion as a thesis topic or as part of a grant proposal by anyone in your lab. It does NOT mean that your lab can never investigate the topic.
- The spirit of the prohibitions outlined in this section also apply to a student's research experiences prior to joining their dissertation lab. The topic idea should originate with the student, not from a former mentor or lab.
- A prelim topic can apply a method developed or used in your lab. The restriction applies to the topic, not to the method of investigation (unless the method is the topic).

Topic verification by mentor. Students are not always aware of all past or anticipated future research activities in their lab. Therefore, students should check with their advisors early in the proposal development process to be sure that their topic is not too close to their lab's research. Although the final topic verification statement includes a copy of the project Specific Aims page, a Specific Aims page is neither required nor expected for an early conversation to verify a proposed topic is permissible. Note that topic verification is one of two minor exceptions to the prohibition on students discussing their proposal with Microbiology & Immunology faculty members (see point #6). The conversation should be tightly restricted to verifying the absence of overlap between a student's prelim topic and the lab's research activities.

In addition, the research mentor must sign a topic verification statement to be submitted along with the proposal. The student will create a document in which the statement below precedes the final version of their Specific Aims page:

"Please verify that this proposed prelim topic is permissible by reading the Specific Aims page provided by your student and then signing the following statement:

The topic of this research proposal has not previously been investigated in my laboratory, is not currently being explored in my laboratory, and is not the subject of an existing or planned grant application from myself or anyone in my lab.

Mentor Signature _____ Date _____"

The mentor will sign the document, which must be submitted by the deadline along with the final proposal. If a student has two mentors, both should sign. If the student's mentor is not physically available to sign the document, then an equivalent email message sent directly from the mentor to the Student Services Specialist is an acceptable substitute.

Deadline for initial choice of foundation publication and first draft Specific Aims page. By 12:00 noon on Thursday, April 1, 2021 at the latest, students must submit by email the following two items to the Student Services Specialist (Jamie Desoto, jamie_desoto@unc.edu):

- The choice of publication to be used as the foundation of their proposal.
- A .pdf file of the first draft Specific Aims page of the proposed project. This document will not be graded, but is intended to encourage serious consideration of all aspects of the research proposal by this date. Students will receive general feedback on the contents of their draft Specific Aims page from MCRO faculty. The draft Specific Aims page should not contain any information that could reveal the identity of the author. A topic verification statement from the advisor is not needed. The page is subject to the same font/margin/length format rules as for the final document (see section #8). A separate reference list is not allowed.

Deadline for second draft Specific Aims page. By 12:00 noon on Thursday, April 22, 2021 at the latest, students must submit by email their second draft Specific Aims page to the Student Services Specialist (Jamie Desoto, jamie_desoto@unc.edu). Instructions for the second draft Specific Aims page are the same as for the first.

Faculty comments on draft Specific Aims pages will be returned to students as quickly as possible following submission. Students need not wait until the April 1st or April 22nd deadlines to obtain faculty feedback. Faculty feedback on draft Specific Aims pages may be shared with anyone whom the student is allowed to consult, because the student did not write the text.

We strongly discourage students from changing their foundation paper after April 1st. However, students may switch to a different foundation paper (e.g. if they discover information suggesting their proposed project may not be viable). *The Student Services Specialist must be notified of a change in foundation paper. A change must again be accompanied by two draft Specific Aims pages, which will receive faculty feedback.* Students should be completely settled on their project by May 8th at the latest; changes in foundation paper after this date are unlikely to lead to a Passing proposal.

Deadline for exit from exam. The purpose of the written preliminary exam is to identify students who need more training in scientific thinking skills such as designing experiments, creating hypotheses, interpreting results, etc. If as a result of attempting the exam, a student recognizes that they are not adequately prepared to successfully complete the exam, then it is generally possible before May 8th to stop without penalty. Such students should consult with the Director of Graduate Studies, who will meet with the student and their advisor to make a plan to develop the necessary skills before retaking the exam. Students who continue to work on the exam after May 8th will receive a grade that is reported to the Graduate School.

If faculty feedback indicates that the second draft Specific Aims page is weak, then the Director of Graduate Studies will initiate a conversation with the student and their advisor about the best course of action. The final decision of whether or not to continue with the exam is made by the student.

What if you are "scooped"? Foundation papers are drawn from active areas of research and student proposals often anticipate projects that are underway in the real world. Sometimes the results of a project proposed by a student are published before the student has submitted their exam. If this happens, then consult with the Prelim Exam Advisor (Bob Bourret) immediately. A mutually agreeable course of action will be determined depending on the specific circumstances. You will NOT need to start the exam over.

5. Grading

Anonymous submission. The Student Services Specialist will assign each student an alphabetical code (Student A, B, etc.) and will be the only person with the key to the code. Thus, graders will not know the identity of the student whose proposal is being graded. Codes will be assigned when students submit their choice of foundation publication and first draft Specific Aims page.

Prior to submitting the draft Specific Aims page or their initial or revised proposals, students should open their .pdf file with Adobe Acrobat Reader and select the "Properties" option under the "File" pull-down menu. In the "Description" category, delete any information that may be present in the "Author" box to preserve anonymity.

Reviewers. All reviewers will be faculty members with appointments (primary or joint) in the Department of Microbiology & Immunology. Each proposal will be graded by Primary and Secondary Reviewers with appropriate scientific expertise, plus one Common Reviewer to provide consistency across scientific disciplines. The Foundation Paper Committee will suggest several faculty members with potentially relevant expertise for each proposal. **Students can provide names of up to two potential reviewers, with the understanding that there is no guarantee their request will be met.** The Prelim Exam Advisor will inspect submitted proposals for compliance with formatting rules, briefly survey the scientific content, and then assign the Primary and Secondary Reviewers based on:

- The expertise and availability of reviewers suggested by the Foundation Paper Committee.
- Ideally using at least one of the reviewers suggested by the student (subject to availability and work load constraints).
- Ensuring that the Primary and Common Reviewers have experience with Microbiology & Immunology preliminary exams.
- Ideally limiting each faculty member to no more than three review assignments.

Grading criteria. The five criteria upon which the exam will be graded are:

- Is there a clearly presented hypothesis or hypotheses? Is the hypothesis supported by a reasonable rationale? Does testing the hypothesis have the potential to significantly advance the field?
- Are the proposed experiments logically consistent with the Specific Aims, i.e. can the planned experiments actually answer the questions posed? Do the planned experiments represent a reasonable way to address the Aims, or have much better approaches been overlooked?
- Are the reasons for various choices in experimental design explained and appropriate alternate experimental approaches proposed? The nature and extent of what constitutes an appropriate alternate approach depends on the suitability and feasibility of the primary approach.
- Are various possible experimental outcomes and interpretations considered, including the possibility that a hypothesis might be incorrect?
- Is the proposal clearly written and illustrated?

Proposals are not required to include an Innovation section. However, reviewer comments about innovation are welcome, particularly if innovation is a strength of the proposal.

Scoring metrics. A three-point scale will be used for each criterion:

3 = Exceeds Expectations. A score of Exceeds Expectations should be used whenever a proposal addresses a scoring criterion noticeably better than we expect from a competent second year Ph.D. student. *A score of Exceeds Expectations should be used whenever performance exceeds expectations, and is NOT reserved only for rare, exceptional performances.*

2 = Meets Expectations. A score of Meets Expectations is intended to cover a broad range, from barely acceptable to competent.

1 = Does Not Meet Expectations. A score of Does Not Meet Expectations is appropriate when a proposal contains significant errors in scientific thinking or understanding, exhibits serious logical flaws, addresses a criterion poorly or not at all, omits or overlooks critical points, etc.

With five component criteria and three reviewers, the maximum possible score is 15 points per reviewer and 45 points overall. If each component is graded as Meets Expectations, then the score would be 10 from each reviewer and 30 points overall.

If no reviewer gives more than one score of Does Not Meet Expectations, then the exam will get a score of Pass.

If any reviewer gives more than one score of Does Not Meet Expectations, then the three reviewers will meet in person to discuss the proposal. At the end of the meeting, there will be a secret ballot submitting new scores. If the total number of points is ≥ 26 (the score that would result if one reviewer scored two criteria as Does Not Meet Expectations, two reviewers scored one criterion as Does Not Meet Expectations, and all eleven other criteria were scored as Meets Expectations), then the exam will be awarded a score of Pass. A total score of ≤ 25 will result in an initial score of Revise or a final score of Fail.

Incomplete submissions. Proposals that are obviously incomplete (or not submitted at all) will not be sent out for faculty review, will not have an opportunity for revision, and immediately will be given a final grade of Fail.

Opportunity for revision. The MCRO Ph.D. program encourages an emphasis on excellence. Because all research proposals can be improved, all students will have the opportunity to revise their initial proposal in response to faculty feedback and potentially improve their final grade:

- No later than three weeks after submission of their initial proposal, each student must inform the Student Services Specialist of the start and end dates for their desired revision period.
- The revision period can last up to two weeks and must begin and end on weekdays. The start and end dates cannot be UNC holidays (e.g. Monday, July 5, 2021). We expect the two-week revision period to end before August 7th. To accommodate inflexible summer plans, revisions must be done by August 22nd.
- The start date can be no sooner than five weeks after the original submission for students taking the exam for the first time, and no sooner than six weeks after initial submission for students who have previously taken the exam. These waiting periods are to ensure faculty review of the initial proposal is complete before the revision period starts. Faculty reviewers are NOT informed of the exam history of students. However, if a proposal from a student who previously failed the exam initially receives a non-passing score, then additional faculty reviewers are consulted before returning reviews to the student.
- When specifying their revision period, students have the option to request "As soon as possible". Although the planned start date for revisions must be at least five (or six) weeks after initial submission, faculty reviews are sometimes completed sooner. If the student has a flexible schedule, then the revision period can start as soon as reviews are available.

- On the first day of their chosen revision period, students will receive faculty feedback on their initial proposal. In 2020, the feedback was one page or less, limited to identification of “big picture” strengths and weaknesses, and did not provide solutions to problems. The nature and extent of feedback in 2021 remains under discussion at the time this document was written. Students in 2021 will receive at least as much information as students in 2020. Faculty feedback on the initial proposal may be shared with anyone whom the student is allowed to consult, because the student did not write the text.
- On the first day of their chosen revision period, students will also receive an initial grade of Honors, Pass, or Revise. An initial grade of Revise will be accompanied by an indication of the extent of revisions needed to Pass.
- Student may discuss the feedback they receive on their initial proposal with their research advisor(s) and/or the Prelim Exam Advisor for the exclusive purpose of making a decision about whether or not to revise. Writing or scientific advice cannot be provided. This is the second of two minor exceptions to the prohibition on students discussing their proposal with Microbiology & Immunology faculty members (see point #6).
- Students who choose to revise their proposal could potentially improve their final grade to Pass or Honors. There is no guarantee that the grade on the revised proposal will be better than the grade on the initial proposal. However, the final grade will be based on whichever of the initial or revised proposals scores best (i.e. there is no risk of lowering your grade during revision).
- Each student decides the extent of revisions he or she wishes to make. To focus the final grading decision on the revised version, changes between the initial and revised proposals will not be tracked. The same reviewers who evaluated the initial proposal will again review the anonymous revised proposal, which will receive a grade of H, P, or F.
- If a student decides not to revise, then the initial grade immediately becomes the final grade of H, P, or F.
- When receiving their final grade, whether based on the initial or revised proposal, students will receive detailed reviews that identify the three reviewers. To maintain a healthy focus on the outcome that matters (Pass or Fail, with Pass indicating no need for remediation and Fail indicating a need for remediation), students will not be given the individual numerical scores on which their final grade is based.

Asynchronous grading. Examinations can be submitted any time prior to the applicable deadline for the initial or revised version. Reviews will be arranged as quickly as possible. Results of initial reviews will be revealed at the start of the revision period chosen by the student. Results of final reviews will be revealed as soon as available.

Honors. After all exams are scored, the scores will be examined with regard to the possibility of awarding Honors grades to recognize truly exceptional performances. It is anticipated that Honors grades will be awarded similarly to historic practice (i.e. not necessarily every year). Rarely, a remarkable proposal may merit an Honors grade before all exams are scored.

6. Obtaining advice and information from others. You must work independently in preparing the proposal. Therefore, you may not discuss your proposal with other students who choose the same foundation publication. However, you are allowed (and strongly encouraged) to seek advice from colleagues and experts, either at UNC or elsewhere, concerning specific techniques or experimental approaches, or the feasibility of your scientific ideas. You should inform potential consultants that a question relates to the prelim exam, because this context may affect how they answer your questions. There are two important restrictions on obtaining advice about your proposal:

First, you may not give your written proposal in any form (outline, draft, polished text, etc.) to anyone to read, with two exceptions:

(i) The only text from the written preliminary exam that may be shared broadly with others is the Specific Aims themselves (NOT the entire Specific Aims page). Thus, you may not receive feedback of any kind on your writing other than the Specific Aims themselves. The ban on sharing text that will end up in your proposal extends to writing on a white board, email messages, Powerpoint slides, etc. Similarly, reading your proposal aloud to others would obviously violate the spirit of the rule and is not permitted. Sharing of text is prohibited because we want to assess whether a student can communicate their ideas without assistance. We do not expect students to design their entire project by themselves. Because consultation with others should primarily focus on issues of experimental design and feasibility, there really is no need to show others any text from your proposal besides the few sentences that comprise your Specific Aims. If you violate this rule, then you will receive a grade of Fail for the exam.

(ii) You may utilize the free services of the trained graduate student writing coaches at the UNC Writing Center (<https://writingcenter.unc.edu>) without limit. This is an educational service, not a copy-editing service. The coaches will provide advice on your document and answer your questions, but will not change your words or ideas. You must inform the Writing Center that the document under discussion is part of your preliminary exam, and that their conference summary should be sent to Bob Bourret after each meeting.

Second, with the exception of the topic verification procedures described in point #4 and the feedback on your initial proposal described in point #5, you may not discuss your proposal with any faculty member who has an appointment in the UNC Chapel Hill Department of Microbiology & Immunology. This includes both primary and non-primary appointees, and both tenure track and research track appointees, all of whom are potential graders.

One resource that may be particularly useful for discussions of scope, experimental design, feasibility, and methods is the Prelim Consulting Corps. The Corps is comprised of senior students, postdoctoral scientists, and research associates in the Department of Microbiology & Immunology who have volunteered to provide scientific advice for preliminary exams. A document listing Corps members, contact information, and areas of scientific expertise will be provided. Please be respectful of consultant's time by making an appointment in advance and being prepared for your meeting.

7. Avoid plagiarism. The proposal must be written in your own words; use of sentences (even with a word or two changed) or ideas from another's work, without attribution, is unacceptable. If it is necessary to use someone else's words, they must be indicated as such by quotation marks, with the appropriate source cited. Violations of acceptable citation practices will be pursued through the Honor System of the University.

8. Format rules. The proposal is to be written in the following format. Proposals that do not comply with formatting rules will not be accepted.

- Use our format rules. Do not use NIH format rules.
- The length of the proposal is not to exceed seven pages of text (single-spaced, at least one-half inch margins on all sides), excluding the title page and references.
- Tables and figures are included within the seven-page limit; be sure to make them large enough to be legible.
- Use Arial font, 11 point or larger, for the text, tables, and for figure legends. A symbol font may be used for Greek letters or other special characters.
- Pages must be numbered. Include your student code letter in a header on each page (e.g. Student A). Page numbers and student code letters can go within the margins.
- The proposal must include the sections described below; other sections (e.g. Innovation, Background, Future Directions) may be included as desired.

In the following description of required sections, **text highlighted in yellow is advice**, whereas non-highlighted text gives additional format rules:

Title Page. The Title page has two elements: the Title and a complete literature reference for the foundation publication from which your proposal is derived. The Title page does not count against the overall seven-page limit. Do not include an Abstract.

Specific Aims Page. What are you going to do? This section usually opens with an introduction to the topic and its significance, and then defines the broad, long-term objectives of the project and states the major hypothesis that you have formulated. Then, list the Specific Aims, which may be presented as hypotheses to be tested, questions to be answered, or goals to be reached. Starting with the Specific Aims page template used in MCRO795 is a good way to help organize your thoughts and the description of your project. Literature references are permitted on the Specific Aims page, but are not required. There is a length limit of one page for Specific Aims.

Significance. Explain the importance of the topic addressed by your proposed project. Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice. Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed Specific Aims are achieved. (Paraphrased from NIH instructions.)

The proposal format does not contain a required "Background" section, so it is up to the author to decide where to best provide the information necessary for the reader to understand the proposal. Some will undoubtedly go in the Significance section. Other background information will go in the Approach section. Wherever you put background information, be sure to **critically** evaluate existing knowledge and evaluate the conclusions that have been made in previous studies.

Innovation. An Innovation section is not required, but may be included if desired.

Approach. Describe the overall research strategy and the procedures you will use to accomplish the Specific Aims of the project. Include the means by which you will collect, analyze, and interpret data. Describe any new methodology and its advantage over existing methodologies. **Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the Aims.** For each set of experiments, include a consideration of possible outcomes and how you will interpret those different possibilities. Indicate how you will establish priorities. Point out particular hazards (beyond routine laboratory activities) associated with the planned research and the appropriate precautions to be taken, including institutional approval. **The scope of the investigation should be appropriate for a three-year project for one investigator (total of three person-years of work).** The Significance and Approach sections together are limited to six pages. **The Approach section should constitute most of the proposal (at least four pages).**

Note that in contrast to MCRO795 writing exercises, in which students pretend to be authors of their foundation paper, the written preliminary examination should be written from the real world perspective of the student performing the research at UNC. It is permissible to assume that other laboratories will provide you with materials (e.g. strains, antibodies, drugs, etc.) whose creation has been published. Unpublished information included in the proposal must be supported by a citation of Personal Communication based on an actual conversation or correspondence with the source.

References Cited. Provide complete references, **including all authors and titles.** Citations for references with more than 50 authors may be truncated using "*et al.*" after listing the first 50 authors. If you get information from Web sites, include the URL in this section. **Use of bibliographic software such as EndNote is strongly encouraged.** The reference list does not count against the page limit. Also, if you refer to DNA sequences or protein structures, you should include the GenBank accession numbers or the PDB file numbers respectively in the text.

9. Examples of successful proposals. The Prelim Exam Advisor will distribute at least three examples of successful proposals from a previous year.

10. Avoid computer problems. Be sure to make a backup copy of all your relevant files (text, figures, references, etc.) on a separate memory device at least once a day. Loss or damage to your files for any reason (hardware or software problems, virus, theft) will not be accepted as a reason to extend the deadline for exam completion.

11. Lifting of exam embargo. After either (i) accepting the grade on the initial version of their proposal as final, or (ii) submission of the revised version, the student may share their proposal with any Microbiology & Immunology faculty members that they choose (e.g. their research mentor), but no one else until the Prelim Exam Advisor lifts the embargo on sharing exam text. Note that sharing a proposal with faculty members other than the research mentor carries the risk of compromising student anonymity during grading. The general prohibition is because other students may be writing or revising proposals based on the same foundation paper. Microbiology & Immunology faculty members are exempt because they cannot talk to students about exams in

progress. Because students may revise their proposals (or unusual situations may arise), the embargo may last for several months after the initial June 7 deadline. Once all exams and revisions for the year have been submitted, the Prelim Exam Advisor will inform students that they can share their proposals more broadly.

GUIDELINES FOR THE MICROBIOLOGY & IMMUNOLOGY DEPARTMENT 2021 ORAL PRELIMINARY EXAM

The oral preliminary exam (also known as the doctoral oral examination) centers on the topic of the thesis project, and provides an opportunity for you to demonstrate your ability to discuss the fields of science related to your thesis proposal, as well as your ability to analyze problems and design experiments. The exam serves a dual purpose as the initial meeting of the thesis committee. Therefore, a separate decision to approve or disapprove your thesis project will occur in the same meeting.

1. Prelim Exam Advisor. If you have questions or concerns about any aspect of the preliminary exam process, please contact the Prelim Exam Advisor [Bob Bourret, bouret@med.unc.edu, 919-966-2679 (cell), 6108 Marsico Hall].

2. Exam format

At least one week prior to the meeting, provide your committee with a written thesis proposal of two pages or less describing your hypotheses, Specific Aims, and a brief overview of research design, including which parts of the research design have been completed. It is best to start with a formal Specific Aims page that captures the entire essence of your project and then expand to provide more details as appropriate about background, experimental design, results to date, etc.. The thesis proposal is not a written exam, and will not be graded, but rather serves to provide the committee with useful background reading. However, it is to your advantage to prepare a thoughtful, logical, well-written thesis proposal. It is permissible to get editing help when writing the thesis proposal, and the student should certainly discuss their proposal with their research mentor.

At the oral exam/thesis proposal meeting the student will give a short prepared presentation (~ 10 slides in total, three or four of which can be background information, approximately 15 minutes of presentation time if uninterrupted). The committee can interrupt at any time and ask any type of question relevant to the proposed work or relevant background knowledge. This presentation serves primarily as a stimulus for questions from the committee, rather than being a typical talk or seminar. The presentation should include a brief summary of the relevant background, then a statement of the overall question(s) you address in your proposal and the hypotheses that you will test. You should then go through each of your Specific Aims, summarizing the goals and the experiments that you propose. Expect to be interrupted with questions from the committee members throughout your presentation. The oral questioning typically lasts about 1.5 hours.

The oral exam will focus primarily on your thesis proposal and related topics, although it is permissible for the committee to ask questions about any area of microbiology or immunology, as they deem appropriate. You should particularly be prepared to:

- Use the white board as needed when answering questions.

- Summarize the key findings of the main publications relevant to your topic and the implications for your proposed research.
- Describe the general features of any experimental methods that you proposed to employ (e.g. how the method works conceptually, what the method can or cannot tell you, key components, etc.)
- Suggest experiments to test hypotheses or answer questions raised by the committee.

Do not bring food or drinks for your committee members.

2A. Zoom exam format

Hopefully the pandemic will be sufficiently under control with a widely vaccinated population that oral exams can safely be held in person in 2021 (most exams are typically held in November and December). If it is not safe to hold your exam in person, then Bob will supply supplemental information about how to conduct the exam by Zoom, which we did in 2020.

3. **Grading criteria.** The criteria for Passing the oral exam will be:

- Demonstrated command of background knowledge regarding the thesis topic
- Demonstrated ability to propose a logically sound thesis project
- Demonstrated understanding of the concepts (not the experimental minutiae) underlying the experimental techniques proposed for use in the thesis project
- Demonstrated ability to "think on one's feet"

4. Examiners

Thesis Committee. The student chooses the Thesis Committee and Chair according to the guidelines specified in the document "M&I Thesis Committee Policies".

Oral Exam Committee. Note that the Oral Exam Committee overlaps extensively with, but is distinct from, the Thesis Committee. Both committees will be present for the oral prelim exam/project approval meeting as described in point #5 below. The Oral Exam Committee is composed of the following members:

- The Thesis Committee, minus the research advisor(s).
- A Common Reviewer, who serves on several Oral Exam Committees, to ensure that there is uniformity in the treatment of the students during the exam. The Microbiology & Immunology faculty members fulfilling this function are chosen by the Prelim Exam Advisor, and assigned after the Thesis Committee is determined.

The two bullet points above should complete the Oral Exam Committee for most students. To deal with less common situations, the following rules apply:

- The final Oral Exam Committee must have five members who are independent of the research advisor(s).
- Therefore, if the spouse or significant other of your research advisor is a member of your thesis committee, or if you have co-mentors from different labs, then an additional member of the Oral Exam Committee will be chosen by the Thesis Committee Chair, after discussion with you. The circumstance of two committee

members from the same lab is already handled by Thesis Committee composition guidelines.

- Four of the five "independent" members of the Oral Exam Committee must be members of the Department of Microbiology & Immunology. The policies governing composition of Thesis Committees will ensure this, except when the research advisor is not a member of our department.

5. Dual purposes. The oral prelim format combines the oral preliminary exam and thesis topic approval into a single meeting. There are two committees with overlapping membership simultaneously present during the exam:

- The Thesis Committee, which includes the research advisor(s), but not the Common Reviewer or other members appointed for the purpose of the exam.
- The Oral Exam Committee, which includes the Common Reviewer, but not the research advisor(s) or other faculty not independent of the research advisor. Oral exam committee members who are not also members of the Thesis Committee will not attend future Thesis Committee meetings.

In the simplest and most common case, there will be six faculty members present - four who serve on both committees, the research advisor, and the Common Reviewer.

To resolve the conflict inherent between the two purposes, exam rules take precedent. The Common Reviewer will chair the exam. The research advisor may not participate in the questioning and is not allowed to offer comments, clarifications, or answers during the exam. Similarly, faculty who may be part of the Thesis Committee but are not independent of the research advisor (e.g. a second faculty member from the same lab, the spouse or significant other of the research advisor, the research co-advisor for students who jointly belong to two labs) must attend, but may not speak when the student is present.

After the student leaves the room, the Oral Exam Committee, led by the Common Reviewer, will first decide the outcome of the oral exam, again, without participation of the research mentor (and any non-independent faculty members who are present). The Thesis Committee, led by the Thesis Committee Chair, will then make a decision about thesis project approval, without participation of the Common Reviewer (and other faculty appointed only for the purpose of the prelim exam). The two decisions are independent of one another, so four outcomes are theoretically possible (i.e. the student could Pass both, either, or neither the oral exam and thesis project approval).

6. Outcomes. You will be notified of the outcomes of your oral exam and thesis project approval on the same day or the following day.

The Oral Exam Committee has the authority to require you to do something to remedy a particular area of weakness, regardless of whether you Pass or Fail the exam. Remediation might include taking a course, reading a defined list of publications, attending a journal club, writing the answers to a series of specific questions, writing a minireview, etc..

If the Oral Exam Committee requires you to remedy a deficiency, then the Common Reviewer will write you a letter in which the remediation requirements are clearly

specified. Copies of this letter should be sent to the Director of Graduate Studies/Prelim Exam Advisor (Bob Bourret) and to the Student Services Specialist (Jamie Desoto) for your file.

If you Fail the oral exam, then you will have a second opportunity to take it, after waiting at least three months (delay specified by Graduate School rules). Before a second attempt, you will meet with the Prelim Exam Advisor and your research advisor to assess what went wrong, develop a plan for success next time, and agree on appropriate timing for a retake.

If your thesis project is not approved, then another Thesis Committee meeting will be scheduled to discuss the matter again, typically within six months.

7. Deadlines. There are four deadlines in the oral prelim process:

- The student must inform the Student Services Specialist and the Director of Graduate Studies of their Thesis Committee and Chair by the first day of classes of Fall semester (not yet available, likely August 19, 2021) of the second year in the department (3rd year Ph.D. students, 2nd year M.D./Ph.D. students).
- Students schedule their oral exam to include all members of both their Thesis Committee and Oral Exam Committee. The student must inform the Student Services Specialist and the Director of Graduate Studies of their exam date and Oral Exam Committee members by October 1st. It would be prudent to confirm that the composition of the Oral Exam Committee meets departmental guidelines prior to scheduling the exam.
- The student must provide all committee members with a copy of their thesis project proposal at least one week prior to the exam.
- For students who pass the written prelim on the first attempt, or delay taking the written prelim for a year, the oral exam must be completed by December 31st of the second year in the department (3rd year Ph.D. students, 2nd year M.D./Ph.D. students). For other students, the deadline for completion of the oral exam will be set based on individual circumstances.

COMMITTEE MEETING PROGRESS REPORT

Student: _____ Committee Chair: _____
 Advisor: _____

Directions: Take this form to all committee meetings and have your committee Chair complete his or her assessment and include recommendations or comments. Return the original form to the Student Services Specialist (SSS) after each meeting and keep a copy for yourself. **You are required to have at least one committee meeting every twelve months**, however, it is in your own best interest to have them more frequently.

The committee has reviewed the student's academic research progress and makes the following assessment and recommendation(s):

Committee Meeting 1 Date: _____ Publication Plans Discussed: _____ Assessment: _____
 (Usually topic approval) Next meeting in: 6 months _____ or 12 months _____

Comments/Recommendations: (use additional

Signatures: -Chair: _____ **Student:** _____

Committee Meeting 2 Date: _____ Publication Plans Discussed: _____ Assessment: _____
 Next meeting in: 6 months _____ or 12 months _____

Comments/Recommendations:

Signatures: -Chair: _____ **Student:** _____

Assessment Categories

- #1 Exceptional Performance— Dissertation on schedule and/or manuscripts in press or publication.
- #2 Good Performance—Student is making satisfactory progress, research for dissertation is on schedule.
- #3 Potential Problems—Student is not meeting our expectations and should be encouraged to improve. (Schedule meeting with the DGS.)
- #4 Unsatisfactory—Student is making unsatisfactory progress (Schedule meeting with the DGS.)

Other: Complete the Publication Requirement form when appropriate.

Optional: Indicate when student has permission to write dissertation.

By signing this form after each meeting, all agree that the student is in good standing and is making satisfactory progress

over

Committee Meeting 3 Date: _____ **Publication Plans Discussed:** _____ **Assessment:** _____
Next meeting in: 6 months _____ *or 12 months* _____

Comments/Recommendations:

Signatures: -Chair: _____ **Student:** _____

Committee Meeting 4 Date: _____ **Publications Discussed:** _____ **Assessment:** _____
Next meeting in: 6 months _____ *or 12 months* _____

Comments/Recommendations:

Signatures: -Chair: _____ **Student:** _____

Assessment Categories

- #1 Exceptional Performance— Dissertation on schedule and/or manuscripts in press or publication.
- #2 Good Performance—Student is making satisfactory progress, research for dissertation is on schedule.
- #3 Potential Problems—Student is not meeting our expectations and should be encouraged to improve. (Schedule meeting with the DGS.)
- #4 Unsatisfactory—Student is making unsatisfactory progress (Schedule meeting with the DGS.)

Other: Complete the Publication Requirement form when appropriate.

Optional: Indicate when student has permission to write dissertation.

By signing this form after each meeting, all agree that the student is in good standing and is making satisfactory progress

over

THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

The Graduate School

DOCTORAL EXAM REPORT FORM

NOTE: The Committee Composition form should be on file with the Graduate School **before** exam results are reported.

Student's Name _____ PID# _____
 Department/Curriculum/School: _____

PART I: REPORT OF PRELIMINARY WRITTEN EXAMINATION

On behalf of a majority of the examining committee, I certify that the above named student:

_____ successfully passed the examination _____
 _____ failed to pass the examination _____ *signature of committee chair* _____ *date*

Check here if student previously failed exam. Date(s): _____

By initialing, the committee chair certifies that this student was registered as required during the term this work was completed.

PART II: REPORT OF ORAL EXAMINATION

On behalf of a majority of the examining committee, I certify that the above named student:

_____ successfully passed the examination _____
 _____ failed to pass the examination _____ *signature of committee chair* _____ *date*

Check here if student previously failed exam. Date(s): _____

By initialing, the committee chair certifies that this student was registered as required during the term this work was completed.

PART III: REPORT OF THE FINAL ORAL EXAMINATION (defense of dissertation)

A majority of the committee for the above named student has judged the dissertation defense to be:

_____ acceptable _____
 _____ unacceptable _____ *signature of committee chair* _____ *date*

Committee member signature/date	Pass/Fail	Committee member signature/date	Pass/Fail
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Check here if student previously failed exam. Date(s): _____

By initialing, the committee chair certifies that this student was registered as required during the term this work was completed.

PART IV: REPORT OF THE FINAL DISSERTATION (can be completed at the same time as Part III as appropriate)

A majority of the committee for the above named student has judged the dissertation to be:

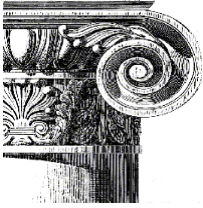
_____ acceptable _____
 _____ unacceptable _____ *signature of committee chair* _____ *date*

Committee member signature/date	Pass/Fail	Committee member signature/date	Pass/Fail
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

By initialing, the committee chair certifies that the required edits were made and the final document is approved for electronic submission.

- Submit to the Graduate School after all activities have been successfully completed
- Keep copies for your files

Complete the top half of the form and give it to Student Services Specialist. Be sure to apply for graduation in ConnectCarolina by the deadline.



THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL
The Graduate School

PROGRAM CERTIFICATION OF DEGREE REQUIREMENTS FORM

Student's Name _____ PID# _____

Student's Email Address _____

Major: _____ Degree Intent: _____

Together with university and Graduate School requirements, all program-level requirements for a graduate degree must be satisfied and properly documented before The Graduate School can complete degree clearance.

By approving this form, the graduate program is certifying that the student has met all program requirements for degree clearance. Such requirements may include specific coursework, foreign language certification, or any other requirements tracked at the degree program level.

Approved: _____ Not approved: _____
Director of Graduate Studies *Date* *Director of Graduate Studies* *Date*

Please submit this form to The Graduate School for processing and inclusion in the student record when all program requirements are completed. It should only be submitted once.

Degree requirements tracked at the university and Graduate School level, such as exam results and thesis/substitute or dissertation defenses, should continue to be submitted on appropriate forms.

Graduate School Graduation Tracking Action: _____


How to access the electronic payroll deduction of fees form:

<https://cashier.unc.edu/payment-options/graduate-student-employees-payroll-deduction/>

Select Payroll Deduction Form (Electronic) → select the **yes** and **monthly buttons** and fill out the rest of the required information and submit. Keep a copy for your records.

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

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HOW TO PAY
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STUDENT ACCOUNTS
TAX INFO
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How to Pay

- Online
- Mail
- Installment Payment Plan
- Wire
- Financial Aid
- Sponsored
- Employee Waivers
- Graduate Student Employees
Payroll Deduction**
- Other

Graduate Student Employees Payroll Deduction

The University has a payroll deduction plan to allow graduate student employees (NOT work-study) to pay student fees from their paychecks during the fall and spring terms.

To be eligible, the student employee may not be receiving financial aid or any departmental funding other than Tuition Remission or Instate Tuition Award.

Payroll Deduction Form (Electronic)

Departmental staff with questions about the payroll deduction for graduate student fees should email payplan@unc.edu.

[1110.1.2f - Graduate Student Employee Payroll Deduction Cancellation form](#)

Guidelines for Ph.D. Dissertations
Department of Microbiology & Immunology

Always refer to UNC Graduate School Thesis and Dissertation Guide

(<http://gradschool.unc.edu/etdguide/index.html>) for formatting guidelines for each specific page and the body of the dissertation. Samples are given online. Below is a typical ordering of sections in a dissertation. In this example there are three chapters containing results or manuscripts: the actual number of chapters will vary from one student to another.

Face Page: Title

Candidate's name

Purpose of the Document:

Place:

Date:

Dissertation Committee Member's Signatures

Copyright page

Abstract (General hypothesis, overview of results and conclusion/significance)

Dedication and Acknowledgements

Table of Contents:

List of Tables

List of Figures

List of Abbreviations

Chapters

References

Chapter 1: Introduction (General and specific background literature, hypothesis)

Chapter 2: Result 1

Chapter 3: Result 2

Chapter 4: Result 3

Chapter 5: Summary (Significance of the work) and Future Directions (speculations)

References: (Authors, year, title, journal, volume, full pages)

Results chapters are typically either published papers (see more below) or manuscripts intended for submission. In addition, a dissertation results chapter can be a useful place to write up incomplete studies, in order to make a record of what was done and facilitate eventual publication and authorship if other lab members eventually finish the investigation. Once a student leaves, it is often difficult to otherwise reconstruct what was accomplished.

Note: Use of Publications as Chapters. The use of published papers as part of the dissertation is permitted upon consultation with the Dissertation Committee and Advisor. As stated from the UNC Graduate School Handbook, the Chapter using published material should be reformatted consistent with the body of the dissertation (Abstract, Introduction, Methods and Materials, Results, Discussion, Tables/Figures, References at the end of the Dissertation is recommended). If references are used at the end of the chapter, it should be placed at the end for each chapter within the dissertation. Written permission must be obtained from the publisher that holds the copyrights (see below).

In some cases, the dissertation committee may ask the student to include in the chapter data not in the published material but relevant to the development of the chapter (titrations, tables, tangential data sets). Usually, these supplemental data are easily incorporated within this format.

Appendices provide an acceptable alternate organization to accommodate supplemental data or material that is tangential to the main body of work (e.g. a publication arising from a rotation project in a different lab) that the student nevertheless wishes to include in his or her dissertation as part of what was accomplished during their graduate student career.

Each chapter (including appendices) in the dissertation other than the Introduction and Conclusion must list all actual or planned authors involved in the described research and include a statement specifying the contributions of the student to the project.

Taken from the Guide to Thesis and Dissertation:

1. The material, if included in the body of your text, must be rendered in a typeface and citation form consistent with the body of the text.
2. If the material is co-authored, the department must approve its inclusion in your thesis/dissertation.
3. If the material is copyrighted (if you are the sole author but the copyright is held by the publisher), you must fulfill the conditions specified in Section III above. The date on the title page should be the year in which your committee approves the thesis/dissertation.

Using Copyrighted Materials

Any copyrighted materials used in your work, beyond brief excerpts, may be used only with the written permission of the copyright owner. Book and journal publishers normally hold the copyright for all materials they publish. Therefore, even if you are the sole or one of several authors of material in a published book or journal, you must obtain written permission from the copyright holder if you are

including this material in your document. Remember that use of reproductions or excerpts of other media, such as music, graphic images, or computer software may also require permissions.

Your letter to the copyright holder needs to make clear that you seek written permission to preserve (on microfilm and digitally) and publish (in print and digital form) your thesis or dissertation through ProQuest and that ProQuest may sell, on demand, for scholarly purposes, single copies of your work, which includes the copyright holder's material. Your letter must also seek written permission for the document to be submitted in electronic format to UNC-Chapel Hill where it will be placed in a database and made available through the University Library to the general public at no charge via the Internet.

You are responsible for securing all necessary permissions and paying any permission fees in advance of using copyrighted materials in your work.

Use of Your Own Previously Published Material

Some academic programs permit you to include articles or other materials that you have previously published, that have been accepted (or submitted, in press, or under review) for publication, or that have been otherwise presented to the public within the body of your thesis or dissertation. In all such instances the following guidelines apply:

1. If the material is co-authored, your academic program must approve its inclusion in your thesis or dissertation.
2. If the material is copyrighted (if you are the sole author but the copyright is held by the publisher), you must fulfill the conditions specified in the section above on [using copyrighted materials](#).
3. The material, if included in the body of your text, must conform to all formatting guidelines outlined in this Guide. See the [Formatting Previously Published Work](#) section for details.

RBB
3/26/15

**Department of Microbiology & Immunology
Completion of Minimum Publication Requirement
Form 1 - Student**

Instructions: The full text of the minimum publication requirement is on the next page. Note that the expectation of two first-author research publications is a goal that is met by most students, but is not a requirement. When a student is ready to complete the minimum publication requirement, fill out this form and send it to all members of your thesis committee. In addition, send your thesis committee chair a blank copy of Publication Requirement Form 2.

Student: **Name here**

Paper #1. Full literature citation for a published paper (all authors, title, journal, year, volume, page numbers if published; or "In press" if accepted but not yet published). If "In press" attach acceptance letter.

(citation of a published paper here)

Briefly describe your contributions to paper #1. Which experiments did you do? How much of the writing did you do? Etc.

(explanation here)

Paper #2. Literature citation for a peer-reviewed, first-author (or co-first-author) research manuscript (all authors, title, journal, year, volume, page numbers if published; or where submitted and publication status if not published):

(citation of a peer-reviewed, first-author or co-first-author research manuscript here)

Briefly describe your contributions to paper #2. Which experiments did you do? How much of the writing did you do? Etc.

(explanation here)

If paper #2 is not yet published, then attach either the peer reviews (if not accepted for publication) or the acceptance letter (if accepted and "In Press").

RBB
8/10/15

**Department of Microbiology & Immunology
Completion of Minimum Publication Requirement
Form 2 - Thesis Committee Chair**

Instructions: The full text of the minimum publication requirement is on the next page. As specified in the second paragraph of the requirement, the student will submit to the dissertation committee a description of how they believe they have met the requirement, and the committee will decide whether or not the requirement has been met. The decision can be reached at a regular committee meeting, or through an email discussion. The committee chair will then complete this form and submit it to both the Director of Graduate Studies (Bob Bourret, bouret@med.unc.edu) and the Student Services Manager. Ideally, the requirement should be met before students start to write their dissertation.

Date: **Date here**

Student: **Name here**

Committee Chair: **Name here**

Paper #1. Full literature citation for a published paper (all authors, title, journal, year, volume, page numbers if published; or "In press" if accepted but not yet published):

(Citation of a published paper here)

Briefly, how does paper #1 meet the standards of (a) "meaningful contribution" by the student and (b) publication in "respected, high-quality professional journals or books"?

(Explanation here. Be sure to answer both parts a and b. Note from the complete text of the requirement on the next page that "meaningful contribution" means the student's contribution to the publication, not the publication's contribution to the advancement of knowledge.)

Paper #2. Literature citation for a peer-reviewed, first-author (or co-first-author) research manuscript (all authors, title, journal, year, volume, page numbers if published; or where submitted and publication status if not published):

(Citation of a peer-reviewed, first-author or co-first-author research manuscript here.)

Briefly, how does paper #2 meet the standards of (a) "meaningful contribution" by the student and (b) intended for publication in "respected, high-quality professional journals or books"?

(Explanation here. Be sure to answer both parts a and b.)

If paper #2 is not yet accepted for publication, did you see the peer reviews?

(yes, no, or not applicable)

Minimum Publication Requirement

"The *expectation* of the Department of Microbiology & Immunology continues to be that all Ph.D. students will conduct sufficient research to result in at least two first-author publications describing original results in high quality, peer-reviewed journals. As a minimum standard, to earn the Ph.D. degree we *require* that (i) a student must make meaningful contributions to and be an author on at least two manuscripts intended for publication in respected, high-quality professional journals or books, (ii) at least one of the two manuscripts must be accepted for publication, and (iii) prior to the private Ph.D. defense, a student must have peer reviews returned for at least one first (or co-first) author primary research manuscript. Parts ii and iii cannot be satisfied with the same manuscript. If a manuscript used to meet part iii is not accepted for publication by the time of the doctoral defense, then the peer reviews will be submitted to the dissertation committee for discussion at the defense along with the dissertation.

The student will submit to the dissertation committee a brief description of their specific contributions to the two manuscripts used to fulfill the publication requirement. Prior to the Ph.D. defense, the dissertation committee will decide (in consultation with the Director of Graduate Studies if necessary) whether the two manuscripts meet the part i standards of "meaningful contribution" and "respected, high-quality professional journals or books". The dissertation committee chair will inform the Director of Graduate Studies and the Student Services Manager when the publication requirement is met, as well as the basis for the committee's decision.

Each chapter in the dissertation other than the Introduction and Conclusion must list all actual or planned authors involved in the described research and include a statement specifying the contributions of the student to the project."