DEPARTMENT OF MICROBIOLOGY & IMMUNOLOGY

GRADUATE STUDENT HANDBOOK

2017 – 2018

5641 MEDICAL SCIENCE BUILDING II
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UNIVERSITY OF MICHIGAN
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GENERAL INFORMATION

The Microbiology and Immunology (M/I) Department offers a Ph.D. degree through the Rackham School of Graduate Studies. Most students are admitted through the Program in Biomedical Sciences (PIBS) at the University of Michigan. The Microbiology and Immunology Program will give a foundation that will enable students to pursue a broad range of career choices spanning from academics to industry and from the theoretical to the translational.

The M/I Department has instituted a M.S. degree program through the Rackham School of Graduate Studies. M.S. students are admitted directly to the M/I Department. Specific details of that program are given in the Appendix.

This handbook outlines the steps necessary to complete the requirements for the Ph.D. degree or the M.S. in the Microbiology and Immunology Department.

MSTP students entering the M/I Program are considered to be at the same level as students entering the program after 1 year in PIBS.

MICROBIOLOGY & IMMUNOLOGY GRAD STUDIES COMMITTEE

The role of the M/I Graduate Studies Committee is to advise students, address student concerns, facilitate M/I admissions, approve dissertation committee selections, approve advancement to candidacy, and resolve issues concerning the graduate student curriculum. The Committee is appointed by the Department Chair and includes a Chair, Associate Chair(s), faculty members (both primary and joint appointees), and 1 or more student representatives.

REQUIREMENTS FOR M/I DOCTORAL STUDENTS

(For Rackham requirements, see [http://www.rackham.umich.edu/policies/academic_policies/](http://www.rackham.umich.edu/policies/academic_policies/))

1. A minimum of 17 credit hours in didactic graduate-level course work (*course numbers designated 500 and above except as noted), excluding MICRBIOL 812 seminars and research. Students are required to earn a grade B or better in required course work; this may necessitate re-taking a required course prior to obtaining the doctoral degree. Students must maintain an overall average of B or better for all coursework.

2. The course requirements detailed in “COURSE SELECTION,” below. The 17 credits should consist of at least one basic core course (3 Cr), 7 credits in specific MICRBIOL courses 607 (2 Cr), 615 (2 Cr), and 640 (3 Cr), and 7 credits of approved electives.
3. At least two laboratory research rotations (3-4 are recommended).

4. Successful completion of the preliminary examination (Checkpoint 1).

5. Successful completion of the dissertation evaluation (Checkpoint 2)

6. Annual progress evaluations of “excellent” or “satisfactory” by the dissertation committee.

7. Successful completion of the thesis project and defense of a dissertation, with at least one first-author primary research article accepted for publication.

ACADEMIC ADVISING
PIBS students meet with at least two faculty during the first year for course registration. One is a PIBS director and the other is the M/I Grad Studies Chair or Associate Chair.

Each pre-candidate student with a primary interest in M/I meets individually with the M/I Grad Studies Chair or Associate Chairs twice a year, before Fall and Winter terms, to discuss course work, lab rotations, student seminars, prelim preparations and performance. These meetings facilitate smooth and efficient transitions from the first PIBS year into the M/I department.

Annually, the M/I Grad Studies Chair and Associate Chairs review each student’s transcript, lab progress, dissertation research report and dissertation committee meeting reports. They will then meet with each student to discuss progress and plans.

COURSE SELECTION
Objectives for the M/I curriculum

1) Promote flexibility and efficiency for integrating coursework and dissertation research while providing a solid foundation in the core concepts of microbiology and immunology.
2) Maximize curriculum possibilities for each student by customizing coursework that builds on pre-graduate education.
3) Facilitate transition from PIBS into Microbiology and Immunology.

The Rackham Graduate School requires students to complete a minimum of 18 credits of graded coursework while at the Ann Arbor Campus to achieve candidacy. Students should register for at least 9 credits each fall and winter term as pre-candidates; Rackham requires 9 hours for full-time study. Rackham does not have a concern/upper limit for credits per term until ~15 credits. As a candidate, students should register for a minimum of 8 credits (research and ONE other approved course).

1. Basic core coursework: M/I doctoral students are required to take at least 1 of 3 core courses or approved alternatives (3 credits total), during the first Fall term. Students are strongly encouraged to take a 2nd core course in the Fall of their 2nd year.
   a. Biochemistry (BIOLCHEM 660, 2 Cr, or approved alternative: CHEMBIO 501, 3 Cr)
   b. Cell Biology (CDB 530, 3 Cr, or approved alternative CANBIO 553, Cancer Biology, 3 Cr)
   c. Genetics (HUMGEN 541, 3 Cr, or approved alternative MCDB 415, Microbial Genetics, 3 Cr; or EEB 516, Principles of Evolution, 4 Cr; or BIOLCHEM 650, Mechanisms of Eukaryotic Gene Expression, 3 Cr)

   The specific courses elected to fulfill these requirements should be based on student’s prior educational background. These core courses can be used to fulfill the cognate requirement set by Rackham (“4 credit hours of cognate coursework with a grade of B- or better” [“cognate” means outside of M/I]. Except for students with a very strong background in biochemistry, biochemistry is generally recommended to fulfill this requirement. However, discussion with PIBS and M/I advisors will help students choose the best core course to take in the first Fall term.

   • These core courses are waived for MSTP students due to their extensive medical school coursework; MSTPs take BIOLCHEM 552, 2 Cr during their first semester of medical school.
2. **Required M/I coursework:** M/I doctoral (including MSTP) students must take 7 additional credits. (NOTE that the M/I course code for the Registrar’s Office omits the “O”!!!). Students must earn a grade B or better in required course work; this may necessitate re-taking a required course prior to obtaining the doctoral degree.

MICRBIOL 607 Microbial Pathogenesis (3 Cr)
MICRBIOL 615 Viral Pathogenesis (2 Cr)
MICRBIOL 640 Molecular and Cellular Immunology (3 Cr)

3. **Additional REQUIRED courses for Microbiology & Immunology Doctoral Students**

PIBS 503 – Research Responsibilities and Ethics (1 Cr)
PIBS 600 – Laboratory Rotation (2 terms, 1-8 Cr) (Or MICRBIOL 599 for M&I direct admit students)
MICRBIOL 812 – Each term, beginning in the Year 2, (except as waived to take other course(s) after advancing to candidacy; such non-registered students are expected to attend and present in 812).

4. **Elective credits:** M/I doctoral students need at least 7 elective credits approved by the Department. This requirement is waived for MSTP students. Electives should be selected to complement the student's research interests and needs. Course offerings change frequently, so students should check the PIBS Curriculum Guide for the most recent listings: [http://www.med.umich.edu/pibs/pdf/curriculum.pdf](http://www.med.umich.edu/pibs/pdf/curriculum.pdf)

Approved electives for M/I doctoral students include the following; see appendix for a list of current classes listed by the term they are currently offered. If the student wants to count other courses not listed here toward the 7 hrs of electives, s/he must get prior approval from the Chair of Grad Studies.

**Approved:**

- The core courses and their alternatives listed in (1) above
- MICRBIOL 510 – Mathematical Modeling of Infectious Disease (3 Cr)
- MICRBIOL 619 –Special Topics in Microbiology and Immunology (1-2 Cr, can be taken multiple terms on different topics)
- MICRBIOL 512 (PHRMACOL 502) - Introduction to Scientific Communication (“Grant writing”) (2 Cr) (for second year students and beyond)
- BIOINF 525 – Foundations in Bioinformatics and Systems Biology (4 Cr 3 modules/Winter)
- BIOINF 545 – High-throughput Molecular Genomic and Epigenomic Data Analysis (3 Cr Winter)
- BIOINF 551 – Proteome Informatics (3 Cr)
- BIOSTAT 503 Intro to Biostatistics (4 Cr)
- BIOSTAT 521 – Applied Biostatistics (4 Cr)
- BIOSTAT 646 High Throughput Molecular Genetic and Epigenetic Data Analysis (3 Cr)
- CANBIO 554 – Cancer path and treatment (3 Cr)
- GEOSCI 513 – Introduction to Geomicrobiology (3 Cr)
- IMM 850 – Experimental Immunology (2 Cr)
- IMM 851 – Special topics in Immunology (2 Cr)
- PATH 581 Tissue, Cellular and Molecular Disease (3 Cr)
- PATH 643 Immunological basis of disease (1 Cr)
- PHYSIOL 576 Signal Transduction (1 Cr)
- PHYSIOL 577 Membrane and Cell Physiol (2 Cr)

**Additional Electives to Consider** (These will not count toward M/I 17 Cr hour requirement; could be taken in year 2 and beyond, with approval of mentor and Grad Studies)

PIBS 505 – Teaching in Sciences (2 Cr) (Year 2 Winter)
PIBS 507 – Introduction to Translational Research (2 Cr) (Winter)
PUBPOL 650 Intro to Science & Technology Policy Analysis
PUBPOL754 Research Seminar in Science, Tech and Public Policy
ES 515 (1.5) Intro to Entrepreneurship
BA 518 (2.25) The Business of Biology
Taking 400-level courses to fulfill graduate degree requirements

Undergraduate courses that the M&I department deems appropriate for our curriculum must be approved on a course-by-course basis by Rackham. Approval can be granted in two ways. First, if a 400-level course is not currently approved for graduate credit, students may ask the instructor for additional work assignments appropriate for graduate study and petition Rackham on an individual ad-hoc basis to grant graduate credit based on the additional work done. They should also get approval from Grad Studies. The Rackham petition form may be downloaded here: http://www.umich.edu/~neareast/gradhandbook/rackham-petition-for-modification-waiver-form.pdf.

Second, if a 400-level course is of interest to many M&I students, the current instructor of the course can be asked to fill out a Course Approval Request Form and submit it to the UM registrar. The form can be downloaded here http://ro.umich.edu/forms/. The department and the instructor must decide on whether or not additional work will be required for graduate credit (to be described on the form) and whether or not to cross-list the class with a 500-level course designation. This form only needs to be filed once with the registrar, not each semester. The Graduate Studies Committee should receive a copy of the Course Approval Request Form and keep in on file in the Department.

Currently the following 400-level courses approved for Rackham graduate credit include MCDB 415, Microbial genetics (counts toward M/I 17 Cr requirement); and MICRBIOL 405 (Medical micro), 415 (Virology), 430 Microbial symbiosis), 440 (Immunology), and 460 (Eukaryotic micro). The MICRBIOL 400-level courses count for Rackham grad credit but NOT for the M/I 17 Cr requirement.

LABORATORY ROTATIONS

During the first year, under the auspices of PIBS, each student participates in research immediately upon entering the University by completing at least two laboratory rotations. Students are strongly encouraged to complete at least 3 rotations to take advantage of the breadth of research in the biomedical sciences at Michigan. Laboratory rotations are either one full term (including summer term prior to the first academic school year or spring term after the first year), or half-term. Half-term rotations may be arranged with permission of the mentors and are strongly encouraged to give students a broad experience in Microbiology and Immunology and biomedical sciences. The student receives academic credit for each rotation by enrolling in PIBS 600 for a number of hours arranged in consultation with the sponsoring faculty member. At least two laboratory rotations should be completed during the first 10 months of enrollment and must be completed prior to the selection of a dissertation mentor. Students may do additional rotations before selecting a mentor.

New students should become acquainted with the research interests of the M/I department faculty. These are detailed on the M/I website (http://www.med.umich.edu/microbio/faculty/). Students also learn about M/I faculty research in private discussions with faculty members, public seminars and research presentations, and in literature surveys.

MSTP students entering the program will have completed two lab rotations, with a possible third, during the summers.

Picking the right rotations is critical for finding a dissertation lab where the student will be successful. Before choosing a rotation lab, students should meet with the professor to discuss expectations and research projects. Some questions students may want to ask before choosing a rotation lab:

- Is the lab currently taking new students? How many other students are interested in rotating and how many new students can the mentor accept into the lab?
- What does the mentor expect from rotation students? How much time do rotation students generally spend in the lab and how much data are students expected to produce?
- What projects are available? Does the mentor expect the student to work on a project on the mentor's grant or do graduate students have more freedom to define their own research projects?
• How many people are in the lab and are the other members of the lab experienced researchers? Do the members of the lab enjoy training students? Are lab members happy in the lab?
• How are lab meetings and meetings with the mentor structured? Is there a venue for supportive and open discussion of student’s work within the lab and with the mentor?
• Does the lab have sufficient funds to support a graduate student through the duration of the dissertation research? Where does the funding come from? Are students expected to apply for training grants or write grant proposals to secure their own funding?
• What is the mentor’s managing style? Younger researchers are more likely to be in the lab and involved in training students on a day-to-day basis, while more senior professors often have administrative and professional duties that keep them away from the lab some of the time.
• How long has it taken previous graduate students to complete their degrees?

M/I STUDENT SEMINAR (MICRBIOL 812)

Overview
Student seminars are presented Fridays from 12:00 -1:00 p.m. during the academic year. Second, third, and fourth year students present seminars on their own research. Students work with the research mentor to prepare the talk and practice it formally before the actual presentation. **Students must send out an email to the department** (microbiology@umich.edu) **one week in advance with their name, mentor’s name, assigned reviewers’ names, title of abstract, and abstract within the body of the email.** At the formal seminar, discussion and criticism of the research by the audience are encouraged. Two faculty members evaluate and discuss the presentation with each student at the end of the seminar. Attendance is required for all students.

Details of 812 Seminar Preparation
1. In May-June of the preceding school year a schedule is set up for student presentations for the academic year. Students may have a brief time to choose a date, after which they are assigned if they haven’t chosen. The faculty member in charge of MICRBIOL 812 assigns two faculty reviewers for the year. **If a student needs to change dates of their 812 seminar (in order to schedule it when their mentor can be there, etc.), they should arrange, a swap with another presenter; make sure Heidi is informed of the changes as they happen.** Often students invite their dissertation committee members to get informal or formal (committee meeting) feedback from them.
2. At least four weeks prior to the presentation, the student should begin preparations with the dissertation mentor. They should discuss the topic, and the student should begin preparing the abstract and presentation with advice from the member.
3. One week prior to the seminar, the student should distribute the abstract of their presentation to Microbiology and Immunology as described above.
4. One week or more before the seminar the student may want to schedule a formal practice with their research mentor and relevant lab or non-lab members. Evaluators provide comments about the strengths and weaknesses of the presentation. Based on feedback from the practice session, the student has an opportunity to implement suggestions for the formal seminar presentation the following week.
5. Two faculty reviewers meet with each student immediately after the presentation to discuss strengths and weaknesses of the seminar. These are generally focused more on organization, presentation style, graphics, and question answering, and less on the experimental data details.

SELECTION OF A DISSERTATION MENTOR FOR THE DOCTORAL PROGRAM IN THE DEPARTMENT OF MICROBIOLOGY & IMMUNOLOGY

Each student selects a dissertation mentor from the PIBS faculty to guide his or her dissertation research. As soon as possible after completion of laboratory rotations, the student should discuss with the mentor the possibility of joining the lab. If both mentor and student are in agreement that the student will join the lab, s/he should next meet with the M/I Grad Studies Coordinator to discuss program requirements; the Grad Studies Committee may be consulted to determine the appropriateness of the student for the M/I program if this was not the original first choice program. Upon mutual agreement with the mentor and Grad Studies Committee, the decision should be announced to PIBS. The student should inform the other rotation mentors of his/her decision as soon as it is official. The selection of the dissertation mentor
should generally occur by the end of the 1st academic year.

Once a student selects a lab, M/I research credits are elected each term. MICRBIOL 599 for pre-candidates, and MICRBIOL 995 for candidates.

EVALUATION OF PROGRESS OF MICROBIOLOGY & IMMUNOLOGY DOCTORAL STUDENTS
The M/I Graduate Studies Committee has a policy for evaluating doctoral candidates. Specifically, our goals are to:

- Ensure rigor and academic excellence of our graduate training program, thereby enhancing the career success of our trainees
- Clearly articulate expectations to the incoming students joining our department
- Incorporate training goals and competencies important for the Ph.D. degree
- Minimize the average time to degree of our doctoral students
- Provide a framework for students to master biological paradigms and literature relevant to their dissertation topic early in their career
- Conduct checkpoints to ensure that students who do not meet the defined criteria are mentored and encouraged to pursue other career options earlier rather than later.
- Provide regular feedback to our students to reward outstanding work and to allow for timely improvement in any areas that require it
- Maximize productivity of our doctoral students to promote their future success

PRELIMINARY EXAM - ADVANCEMENT TO CANDIDACY (Checkpoint 1)
1. Eligibility and Timing: Students must be in good academic standing (GPA 3.0 or better) to take Checkpoint 1 at the normal time. The Graduate Studies Committee will determine whether students on academic probation will be permitted to continue in the program and take Checkpoint 1 at a later time. The normal time for Checkpoint 1 is at ~12 months after matriculation (~ August after the 1st year of study). The specific date and departmental preliminary examining committee(s) for each year will be announced by July 15. This prelim date may be adjusted for MSTP students who may take it after their second rotation and after having decided on a dissertation mentor. It may also be adjusted for students deciding on M&I who had a primary interest in another department/program when they originally matriculated in PIBS.

2. Format: Students will be given three primary research articles (3 weeks prior to the exam), and will be required to understand the relevant literature and experimental approaches described therein, as well as general biological concepts. The students will choose 1 paper (of the 3) and prepare 1 page describing Specific Aims for future experiments (1-2 paragraphs Background & Significance, Statement of Hypothesis and Specific Aims, Description of 2-3 specific aims with subaims in bullet point format). References are not included in the page limitation.

3. Students will complete a 1.5-2 hr oral exam to answer questions about relevant general knowledge, the 3 papers and the student’s Specific Aims. Examining committees consisting of a limited number of faculty will examine all students over a 1-2 day period. See additional information in next section.

4. The GSC Chair will communicate the summary of the exam to the student and mentor, and outline expectations and requirements for academic success (lab productivity, mastery of dissertation topic, etc). Remediation will be rare and limited to cases with notable extenuating circumstances, as described below.

5. Before the end of Fall term of Year 2, Grad Studies will assess each student for **advancement to candidacy**. In order to advance, students must pass Checkpoint #1, maintain academic performance standards according to Rackham, and have a written letter of support from their research mentor. Each student’s academic record and laboratory progress will be reviewed. The final approval as to whether the student is advanced to candidacy will incorporate the totality of the student’s record, and failure to progress in any one of the 3 areas may result in denial of advancement to candidacy. Approved students’ paperwork will be completed so that they advance officially with Rackham at the beginning of the next term.
PRELIMINARY EXAM – FOCUS AND FORMAT

1. Focus: The questions and concepts in the exam will focus on three assigned papers: one each in the areas of virology, immunology and bacteriology/parasitology. The oral exam will test broad knowledge of biological paradigms and probe the student’s ability to reason analytically and to develop and defend ideas. Thus, the emphasis will be on hypothesis testing and experimental design, as well as general knowledge. The student should be familiar with past experiments that support stated hypotheses and should have a strong conceptual grasp of relevant methodology. The committee members will expect students to be familiar enough with each technique proposed in the papers or specific aims to understand its theoretical basis, as well as its appropriateness and limitations in addressing the hypothesis being tested. However, detailed knowledge of such things as buffer ingredients and incubation times are less important, unless they are vital to the interpretation of the results. For example, if one proposes to use qPCR technology to measure mRNA levels, one should know how the assay works, whether the necessary starting materials are available, whether qPCR is the best approach to address the question being asked, and the limitations of using qPCR measurements. One does not need to know things like the exact ions needed for buffers or the reaction time of a particular step (unless it is a critical parameter for the assay in question). In contrast, if one were studying ion channels, one would be expected to know the ion concentrations in the buffers to be used to measure ion transport.

2. Format: Three weeks prior to the date of the examination, students will be assigned three recent papers related to microbiology or immunology. Students will be expected to understand the biological concepts underlying the papers and to have analyzed in minute detail the experiments performed in those papers. Further, students should be familiar with general biological concepts relevant to the studies. In addition, each student will be asked to choose 1 of the 3 papers as the basis for a Specific Aims page to be turned in 3 days prior to the exam date. The Aims page generally consists of:
   (a) Background and significance (1 paragraph)
   (b) Rationale and statement of hypothesis or question (1 paragraph)
   (c) 2-3 specific aims with brief bullet point descriptions of sub-aims

The examiners will ask questions related to the three assigned papers and the hypothesis and experiments in the student’s Specific Aims. While questions will center around the three papers and the student’s proposal, questions pertaining to general biological knowledge related to the papers should be anticipated by the student. Hence, the student should have a good grasp of microbiology and immunology in general at the level covered by M&I coursework. Within 1 day after the exam, the examining committee will communicate a report on strengths and weaknesses to Graduate Studies and recommend a “Pass with distinction,” “Pass,” or “Fail.” After discussion by Graduate Studies, this information will then be communicated to the student and mentor. The student and mentor together must discuss the evaluation and prepare a plan to remedy any indicated knowledge gaps. Progress in this plan will later be reported (1) to Graduate Studies Committee when seeking advancement to candidacy and (2) to the Dissertation Committee prior to Checkpoint 2. If a student earns a “Fail” evaluation, the mentor must petition Graduate Studies in writing within 1 week to request a re-take, with an explanation of why the student merits an additional opportunity. Re-takes will be scheduled within a month using the same format described above with a new examining committee and 3 new papers.

Advancement to candidacy requires passing the Checkpoint #1 exam, but in addition, coursework and laboratory performance must also be satisfactory. The final candidacy decision will be made by the Graduate Studies Committee after a full evaluation of the student’s file. In most cases, this full evaluation will be by the end of the Fall term of Year 2.

DISSERTATION COMMITTEE AND RESEARCH
The dissertation committee guides the research project of the student. The committee should be appointed within one month after advancing to candidacy, usually by the end of January of Year 2, and meet within 3-6 months for the first committee meeting (Checkpoint #2; see details below) and at least every 12 months thereafter. The committee advises, guides and reviews the dissertation progress. Once the committee has been constituted, the Checkpoint 1 summary will be communicated.
to each member, so they can be aware of the student’s strengths and weaknesses and ensure that the student is filling any knowledge gaps.


Briefly, the dissertation mentor is chair of the committee, which includes at least 3 additional members. At least 2 committee members must be from the home department (M/I). At least 1 member must be a cognate member (holding at least a 0.50 appointment in a Rackham doctoral program other than M/I). At least 3 members must be members of the Graduate Faculty (defined by Rackham as persons who are tenured or tenure-track instructional faculty holding an “unmodified” [i.e., not visiting, adjunct, etc.] appointment at the University of Michigan as Professor, Associate Professor, or Assistant Professor with an earned Doctorate from an accredited institution.).

Students should submit the names of proposed dissertation committee members for approval by the M/I Grad Studies Committee. MSTP students have special requirements: MSTP policy is that the students should have their committees formed in the fall following their preliminary exams (they must submit their research abstract and aims as well as the committee members’ names to the MSTP for approval by the MSTP Operating Committee in addition to approval by their department or program). They are expected to have their 1st committee meeting by the end of the year, and then every 6-9 months until graduation.

**Dissertation committee meetings take place every 6-12 months.** Students must advise Heidi Thompson when each committee meeting is scheduled. There are special requirements for the first committee meeting, as described below. For subsequent meetings, students are expected to prepare and distribute to the committee and the Grad Studies Chair a brief summary/outline, including recent data one week in advance. At each committee meeting after the Thesis Evaluation, all members of the thesis committee will fill out the evaluation form (found at the end of handbook and at [http://www.med.umich.edu/microbio/doc/MIStudCommEvalForm2011.doc](http://www.med.umich.edu/microbio/doc/MIStudCommEvalForm2011.doc)) for the student’s and mentor’s review and to be archived in the student’s file. The student should bring paper copies for the committee members to the meeting and provide the URL for the form electronically. If any committee member finds the student’s progress to be unsatisfactory, the mentor should notify the Graduate Studies Chair for further discussion. Unsatisfactory evaluations received in two consecutive meetings may result in dismissal from the program.

**Dissertation and oral defense.** Prior to requesting permission to defend the doctoral dissertation, students are required to have published (or have accepted for publication) at least one first-authored primary research paper. *This is a minimum requirement.* A petition can be made by the thesis mentor if the student has made a major discovery, and the work has been submitted to a higher-level journal that is likely to have more stringent criteria for final acceptance. The student is expected to complete a substantial body of independent scholarly work. *Upon approval by the dissertation committee,* the student writes a scholarly dissertation formatted according to the Rackham guidelines. Published manuscripts are often included as chapters in the dissertation. In addition, scholarly introduction and discussion chapters are typically included to provide an integrated dissertation. The defense consists of a public oral seminar and a final meeting with the dissertation committee, during which the student must satisfactorily defend the ideas and conclusions of their thesis research. Students must be registered for the semester in which the dissertation is defended. **The Rackham website should be consulted for detailed instructions regarding the Ph.D. dissertation.** There are important deadlines to meet and meetings to schedule with Rackham well in advance of the oral defense. ([http://www.gradtools.umich.edu/](http://www.gradtools.umich.edu/)). **Follow carefully the departmental checklist for Year 5 to insure that you meet all the Rackham and departmental requirements and deadlines!!! There won’t be many recently completed Ph.D. students around to tell you how they did this.** At the time of the defense, the student should provide a copy of the M&I Doctoral Student Progress Checklist to their mentor, with completed items in Years 1-5 indicated with dates/initials. This document is in the Appendix to the Handbook.
FIRST DISSERTATION COMMITTEE MEETING/DISSERTATION EVALUATION (Checkpoint 2)

1. Students will schedule the Dissertation Evaluation in Year 2 (April to September). At the time the Evaluation is scheduled, Heidi will insure that the dissertation committee again receives a copy of the student’s Checkpoint 1 summary.

2. Students will prepare for this evaluation throughout the Years 1 and 2 by reading key literature, discussion with mentors/colleagues, filling in knowledge gaps, and by performing relevant laboratory research. Students are discouraged from significant absence (>1 week) from the laboratory before the exam for last minute preparations.

3. A detailed evaluation from the mentor and a self-evaluation from the student including progress on filling in knowledge gaps will be provided to the GSC at least 1 week prior to the dissertation exam for evaluation and deposited in the student’s file (Student and mentor will use the form found at the end of handbook and at http://www.med.umich.edu/microbio/doc/MIStudCommEvalForm2011.doc). Students are expected to demonstrate progress and independent motivation for laboratory research in order to be considered ready for the dissertation proposal evaluation.

4. For the Dissertation Evaluation, students will submit a dissertation proposal (NIH R21 format; 1 page of Specific Aims and 6 pages of Research Strategy) 7 days in advance of the exam date and are expected to exhibit deep knowledge of their dissertation topic and associated methodology. Faculty will rigorously test relevant knowledge and ability of the student to defend the central hypothesis and aims of the proposal as the basis for approval. The mentor will be present during the evaluation, but may not contribute to the discussion. Another member of the dissertation committee, ideally a member of the M/I department, should be asked in advance to chair the meeting.

5. Students should use ~5 slides to introduce their dissertation topic and proposed experiments and are expected to show preliminary data from their own work in support of their proposal. Additional slides can be prepared and held in reserve to respond to anticipated questions by the committee.

6. Each dissertation committee member will evaluate the student’s academic progress (broad and specific knowledge, critical thinking skills) and dissertation proposal, provide a 1 page evaluation post-exam (using the form found at the end of handbook and at http://www.med.umich.edu/microbio/doc/MIStudCommEvalForm2011.doc) of the student’s readiness to proceed with the dissertation plan, and will also provide scientific feedback for the benefit of the student and mentor. These evaluations will be given to the student and mentor and archived in the student’s file.

7. Students who receive approval from their dissertation committee will continue with their dissertation research, meeting with their committee at least annually.

8. Students who do not receive approval will be placed on academic probation and required to have an additional Dissertation Evaluation within 3-6 months.

9. Any student whose Dissertation Evaluation is not approved by the dissertation committee in the second meeting will likely not be allowed to proceed further in the program, barring extenuating circumstances.

SUBSEQUENT THESIS COMMITTEE MEETINGS

Students must schedule a committee meeting at least every 12 months during their doctoral training. When committee meetings are scheduled, the date must be communicated to the student services coordinator, Heidi Thompson (heiditho@umich.edu). For the thesis committee meeting, students should prepare the following:

1. A 1 page summary of the thesis project and progress since the last committee meeting to be emailed to the committee at least 3 days prior to the meeting.

2. A slide presentation consisting of the following information:
   a. A brief introduction and rationale for the thesis project (~10 min)
   b. A summary of prior progress on the thesis project from previous committee meetings, if there have been any (~10 min)
   c. Data slides from the previous year’s work structure as much as possible in the form of figures for a paper (~80 min with discussion and feedback).
   d. Goals for progress towards thesis completion (~10 min)
e. Goals for professional development and plans post-graduation, as appropriate (~10 min).

DEPARTMENTAL SEMINARS
Microbiology & Immunology seminars normally start at 12:00 noon on Thursdays. All faculty and graduate students should consider attendance at the departmental seminar to be mandatory. The seminar series is held at great expense to the department and features cutting-edge work in microbiology and immunology. For your own professional development and as a courtesy to the speakers and hosts please make it a habit to attend the seminars. The schedule is listed on the M/I website http://www.med.umich.edu/microbio/seminars/. The UMHS Weekly Calendar lists other seminars of interest: http://umhsheadlines.org/research-seminars-and-events/.

TEACHING
All M/I students are required to participate as a teaching assistant (TA, GSI) for 2 terms in a Microbiology and Immunology class, generally teaching shortly after achieving candidacy. As a minimum, students are expected to attend lectures, prepare material to present in a formal class context (review session or lecture), and to participate in student evaluation (e.g., grading lab reports, exams). The teaching requirement must be fulfilled prior to completion of the degree. Grad Studies will make teaching assignments in consultation with faculty teaching the courses that have GSIs assigned.

VACATION, LEAVES OF ABSENCE, AND PARENTAL ACCOMMODATION
Participation in the M/I Program, regardless of the source of financial support, is to be full time; that is, 12 months per year. Participation includes regularly scheduled departmental graduate student events and registration in the graduate school for relevant course work, directed research and dissertation research. Other relevant activity such as off-campus course work may be done with the Grad Studies Chair’s approval in consultation with the Grad Studies Committee and research mentor. Other activity will be viewed as personal and may be undertaken subject to the following policies covering Vacations, and Leaves of Absence, and Parental Accommodation.

Vacations. Students are entitled to time off during vacation periods, such as University-designated holidays, winter and spring breaks, and may request time off during the summer. Students must discuss and receive approval for proposed vacation periods with their mentors well ahead of time (generally 4 weeks in advance), and vacation time is expected not to exceed 4 weeks per year, including University breaks and mentor-approved vacations. Any further vacation time should have the additional approval of the M/I Grad Studies Chair, and it may be necessary to grant it without financial support. Since progress towards completion of dissertation studies is normally directly related to the amount of time devoted to work in the lab, it is highly recommended that students enrolled in classes take advantage of time off from classes to make rapid progress in the laboratory.

Leaves of Absence. Ph.D. students who need to temporarily suspend all work toward their degrees for reasons of health, dependent care, family needs, or military service will be able to apply to take a Leave of Absence. In addition, Ph.D. students may take a limited leave of absence for personal reasons. During the period of the leave, students will be considered to be active in the Ph.D. program but will not have to register and are not expected to make any progress on their degree work. Students can apply for a leave of up to 12 months; when circumstances persist, most leaves can be extended to a total of 24 consecutive months. However, students are limited to one term of personal leave during their Ph.D. studies. All requests for leaves of absence must be submitted to Rackham via website (below) and be reviewed by the M/I Grad Studies Chair and Committee. A formal letter indicating the duration of the leave is kept in the M/I office.

While on a Leave of Absence, students are eligible for limited University services. At the conclusion of a leave, students will automatically return to active study status. Funding and other commitments made to students prior to the leave will carry over and are available as they resume active work toward their degrees. Information and materials on the Leave of Absence process for program students, faculty, and
Staff are available on Rackham’s website (http://www.rackham.umich.edu/current_students/doctoral_students/phd_students/leave_of_absence/), which includes the electronic application form. For specific questions about Leaves of Absence, contact the Leave of Absence Coordinator by e-mail rackham.loa@umich.edu or call (734) 647-2640.

**Parental Accommodation Period (Parental Leave).** All eligible students will be granted a Parental Accommodation period up to six weeks long immediately following the birth of a child or the adoption of a child under the age of 6 for whom the student has parental responsibilities. During this period of accommodation, the student will continue to be enrolled as a full time student. Additional information can be found at the following Rackham website: http://rackham.helpserve.com/index.php?_m=knowledgebase&_a=viewarticle&kbarticleid=47&nav=0.

**STUDENT EMPLOYMENT OUTSIDE THE PROGRAM**

The faculty of the M/I Program believes that Ph.D. training is a full-time endeavor. Outside employment detracts from the time and mental energy a student can devote to his or her research. In addition, it is an NIH policy that students supported by a PHS training grant may not be employed outside their training program. For this reason, students may not be employed outside the M/I Department except in unusual circumstances approved by the dissertation mentor and Grad Studies Committee.

**TAXES**

If you are a scholarship/fellowship/training grant student taxes are NOT taken out of your paycheck. Students are responsible for their own taxes at this time. If you are a GSRA/ GSI or not registered for classes (Spring/Summer) taxes are taken from your paycheck. FICA is always taken from your paycheck. During the Spring/Summer months as a candidate you may fill out a tax exempt form.

**DEADLINES AND CHECKLISTS**

The Rackham Graduate School has assembled a special set of web-based tools to help doctoral students as they work toward their degrees, known as Grad Tools (http://gradtools.umich.edu). Doctoral students create and access their individualized Kerberos-protected Grad Tools site. Resources include an individualized Dissertation Checklist, which is automatically updated with the required steps from the Graduate School. Grad Tools also provides a place to store and distribute dissertation drafts and documents to committee members, a discussion capability, and other features.

M/I should consult the “Microbiology and Immunology Doctoral Student Progress Checklist” for special departmental deadlines and requirements in the Appendix of this handbook.

**TRANSFER STUDENTS**

Graduate students who wish to transfer to the M/I Program from other Departments/Programs within the University’s Horace Rackham School for Graduate Studies should first contact the M/I Grad Studies Chair, who will then bring up the matter with the Graduate Studies Committee if needed. The student’s academic file will be evaluated. If the transfer is approved, the student will be responsible for completing all M/I requirements, as detailed above.

**RACKHAM RESEARCH GRANTS**

Rackham has research funds for graduate students. The success rate when you apply for these funds is >90%. This is easy money for research, and you can list on your CV that you got this award. If you haven't advanced to candidacy, you can apply for $1500. If you have advanced to candidacy, you can apply for $3000.

You can do both, i.e., you can get in total up to $4500 in research funds from Rackham. www.rackham.umich.edu/rhd.php?id=26

**TRAVEL**

Students can apply to Rackham for travel to one meeting per fiscal year (July 1- June 30), if they are in good academic standing, have responded to a formal call for meeting abstracts, and have been accepted
to present a poster or a talk at a conference. See the Rackham website for details: http://rackham.helpserve.com/index.php?m=knowledgebase&a=viewarticle&kbarticleid=21

The amounts awarded are (1) up to $600 for meetings in the continental US, (2) up to $850 for meetings in Alaska, Hawaii, Puerto Rico, Canada, Mexico, the Caribbean, and Europe, and up to $1,100 for Africa, Asia, South America, and Australia. Any Rackham travel grant online application not completed and submitted prior to the first day of the conference will not be approved.

TRAVEL AND HOSTING EXPENSE REIMBURSEMENT
All graduate students who are on fellowship must submit travel/expense reports via Concur (online). Please see instructions for accessing Concur and creating a profile below. All other graduate students must submit expense reports by filling out a ‘Travel and Hosting Expense Report’ checklist (paper). These are located in the office with Bonnie Clark at the front desk. Unless it is a personal expense, a SHORT CODE MUST BE PROVIDED WITH EACH RECEIPT. No expenses will be reimbursed if submitted over 45 days after the return date!!

Getting Started with Concur
Access Concur via Wolverine Access (https://wolverineaccess.umich.edu/index.jsp) – choose University Business, then choose Travel and Expense. Log on with your Kerberos password. Once you’re in the system, the first step is to create a profile. At the top right of the home page, click on ‘Profile’. From the list on the left, select ‘Personal Information.’ Your name should exactly match the photo ID that you plan to use at airport security. Fill in the required information and hit ‘save’. Next; from the list to the left under ‘Expense Settings’, choose ‘Expense Delegates’. Click ‘Add Delegate’, and then add Bonnie Clark (easiest to search via her unique name = blcl). Hit save. Next, choose ‘Expense Approvers’, and add Ann Smith (annsmith). Hit save. Lastly, under ‘Other Settings’, choose ‘E-receipt Activation’ and follow the instructions. You are now ready to submit expense reports. Following submission, reimbursement generally takes 2 – 3 days. Contact Bonnie Clark for assistance (763-3531 or blcl@umich.edu).

Travel and hosting expenses that are reimbursable include the following:
1. Airfare (or train fare). Coach fare only. Must use US airline if traveling overseas and expensing to a federal account. Original receipt/statement required indicating method of payment.

2. Lodging. Itemized hotel receipts required. Single occupancy or conference rate only.

3. Per diems (travel meals). The per diem rate is based on current IRS rates. Please visit this website for details. http://www.gsa.gov/portal/category/21287. (On the first and last days of travel, the per diem is 75% of the daily rate.) Although we reimburse per diems for travel meals, the department still requires receipts. It is departmental policy to reimburse travelers solely for the amount they actually spent if that amount is less than the full per diem rate. Also, the university requires that we submit the conference program from any meeting you attend. This is so that the auditors can verify that we are not asking for reimbursement for meals that were provided for you by the meeting. (The breakdown of the amounts provided for breakfast, lunch, dinner provided below.)

4. Car Rental. Original itemized receipt/rental agreement required. In most cases, you will need to provide a memo explaining why it was more cost efficient to rent a car as opposed to taking public transportation or taxis.

5. Taxi/Shuttle. Original receipts required.

6. Hosting. Must be directly related to University business. Itemized receipts required. (No credit card authorization slips, please – must be itemized.) Maximum allowable rates are $25 for breakfast, $25 for lunch and $55 for dinner. The department does not reimburse for alcohol with the exception of rare, special events. Prior approval must be granted. $20 max per person.

7. Other Expenses
   a. Registration Fees
   b. Personal automobile mileage (56¢ per mile). Mileage includes the cost of fuel. The amount requested for personal automobile mileage may NOT exceed the cost of coach
airfare. Please provide mapquest or google map documenting the mileage.

c. Fuel. Fuel is only reimbursable with rental cars.
d. Parking.
e. Photocopying, conference materials, etc.
f. The department does NOT reimburse for alcohol with the exception of rare, special
events. Prior approval must be granted. $20 max per person.

Registration and airfare can be reimbursed prior to travel. Meals, lodging and other travel expenses will
be reimbursed after completion of the trip. If you are paid via direct deposit for your payroll check,
your travel reimbursement will automatically be deposited there. Reimbursement of paper Travel
and Hosting Expense Reports takes approximately 6 weeks. If you have any questions about
reimbursement and/or allowable expenses, please contact Bonnie Clark (763-3531 or bli@umich.edu)
or visit the University of Michigan Accounts Payable Travel and Expense website.
http://www.procurement.umich.edu/travelexpense.html

Students can apply to Rackham for travel to one meeting per fiscal year (July 1- June 30), if they are in
good academic standing, have responded to a formal call for meeting abstracts, and have been accepted
to present a poster or a talk at a conference. See the Rackham website for details:
http://rackham.helpserve.com/index.php?_m=knowledgebase&_a=viewarticle&kbarticleid=21
The amounts awarded are (1) up to $700 for meetings in the continental US, (2) up to $950 for meetings
in Alaska, Hawaii, Puerto Rico, Canada, Mexico, the Caribbean, and Europe, and up to $1,200 for Africa,
Asia, South America, and Australia.

Frequent problems with travel expenses
Rackham travel awards are paid directly to you. Therefore, you are responsible for spending the entirety
of the award on business travel and for disclosing the amount of the award when submitting for
reimbursement.

PIs may agree to pay in advance for your airfare, registration, hotel, etc. If you are subsequently notified
that you have received a Rackham Travel Award or some other travel award, you are responsible for
notifying the office and your PI. If you do not spend the entirety of your award on your travel, you are
responsible for submitting a check to Marilyn Weir or to your PI’s accountant made out to the University
of Michigan, and we will reimburse your PI’s account for the travel expenses they paid in advance.

GRIEVANCE PROCEDURES
If appropriate, a student’s first course of action may be to discuss a grievance with his/her dissertation
mentor or committee. The student should also discuss his or her grievance with the Grad Studies Chair,
who will consult with the Department Chair and the Grad Studies Committee, as appropriate. Rackham
also has resources about grievances:
http://rackham.helpserve.com/index.php?_m=knowledgebase&_a=viewarticle&kbarticleid=151
From the Rackham website: Depending on the issue or concern, your grievance or complaint could be
handled by a variety of University resources. For instance, Rackham’s Academic Dispute Resolution
Policy and Procedures:
http://www.rackham.umich.edu/policies/dispute_resolution/academic_dispute_resolution/ addresses
academically related complaints or grievances. Any Rackham graduate student can use these
procedures to file a grievance. Rackham’s Academic and Professional Integrity Procedures:
http://www.rackham.umich.edu/policies/academic_and_professional_integrity/ address allegations of
academic or professional misconduct against graduate students. Any student, faculty or staff can file a
complaint against a graduate student under Rackham’s Integrity procedures.

M/I graduate students are responsible for knowing the policy and procedures on academic honesty at
the University of Michigan. See the Rackham Statement on Graduate Academic and Professional
Integrity,
http://www.rackham.umich.edu/policies/academic_and_professional_integrity/statement_on_academic_integrity/.
HEALTH AND WELLNESS
(From the Rackham website): Rackham offers a variety of health and wellness activities for students, and provides information to faculty, staff, and students to help you navigate the resources available to support you in graduate school. An extensive list of topics, including alcohol, tobacco and other drugs; domestic violence/child abuse; eating disorders; mental health; sexual harassment; sleep; etc. can be found at this site http://www.rackham.umich.edu/student_life/health_and_wellness/resources/.

Maize/Net App STORAGE (Department storage)
The M/I department has a share on the Maize/Net App server called Microbio. As a Grad student should you need additional backup or storage you will need to see Heidi and also have your mentor request access via MSIS.

Dissertation distribution
Rackham has policies regarding public distribution of the dissertation (Consult the Rackham Dissertation Handbook). This has implications for unpublished and/or un-vetted data that students may include in the Appendix of their dissertation. Once a dissertation is deposited in Deep Blue, the entire document can be located by search engine and read. Briefly, the policy (modified 4/4/12) is as follows:

Policy on Electronic Submission of Dissertations
- The Rackham Executive Board voted to require all dissertations to be submitted electronically to Rackham for deposit as the official copy of record in the University's Deep Blue archive.

- The Board voted to approve a new policy that strongly recommends, but does not require, that candidates submit their dissertations to ProQuest.

- The Board voted to allow candidates, in consultation with their dissertation chairs, to restrict the public electronic availability of dissertations deposited in Deep Blue to the University community (persons with unique names and Kerberos passwords) for up to one year from the date of degree conferral. The candidate is responsible for making this request, which must be approved by the chair (or co-chair, if any) of the dissertation committee. With permission from Rackham for a compelling reason, a partial embargo may be renewed for additional one-year periods.

The Board voted to allow students to seek permission from the Graduate School for a one-year embargo of all public electronic access to their dissertations deposited in Deep Blue to protect information for which a patent is being sought, or other confidential or time sensitive data. With permission from Rackham for compelling reasons, a full embargo may be renewed for an additional year.
MICROBIOLOGY & IMMUNOLOGY GRADUATE PROGRAM WHO’S WHO 2017-2018

STUDENT SERVICES COORDINATOR:
Heidi Thompson heiditho@umich.edu 734-763-3532

GRADUATE STUDIES COMMITTEE:
Faculty representatives:
Eric Martens, Chair
Cheong-Hee Chang, Associate Chair
Other members change yearly (Heidi has the current list).

APPENDICES
Microbiology & Immunology Doctoral Dissertation Student/Committee Evaluation Form
Travel and Hosting Expense Report Checklist
Microbiology & Immunology Doctoral Student Progress Checklist
Microbiology & Immunology Doctoral Program Courses by Semester
Microbiology & Immunology M.S. Degree Program Guidelines
MICROBIOLOGY & IMMUNOLOGY DOCTORAL STUDENT/COMMITTEE EVALUATION FORM
(fillable Word document is at www.med.umich.edu/microbio/doc/MICStudCommEvalForm.doc)
Please *discuss* and return original to student, who will give it to Heidi Thompson.

Student: ___________________________  Faculty mentor: ___________________________

Prepared by:  □ Student  □ Mentor  □ Dissertation committee member (double click or right click to check □)

Year of matriculation: ________________  Anticipated date of graduation: ________________

This report covers the period from ________________ to ________________

Place an “X” in the box that best describes the student’s overall performance. Performance details should be elaborated on the next page and discussed with the student.

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<th>Excellent</th>
<th>Satisfactory</th>
<th>Unsatisfactory</th>
<th>Unable to comment</th>
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<tr>
<td>Productivity</td>
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<td>Effort</td>
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<td>Technical ability in contributions to project</td>
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<tr>
<td>Contributions to opening and maintaining communication</td>
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<td>Intellectual contribution to the project</td>
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<td>Reads and comprehends the literature</td>
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<td>Contributions to discussion of work by other colleagues</td>
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<td>Knowledge of project</td>
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<td>Personal initiative</td>
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<td>Creativity</td>
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<td>Presentation skills: Written</td>
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<td>Presentation skills: Oral</td>
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<tr>
<td>Progress towards long term career goals</td>
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Revised 4/2017
Please specify areas and strategies for improvement, based on the assessment above:

Were goals from the previous year met? Please explain:

List concrete goals for the next year to advance towards degree completion:

Student comments on evaluation (or mentor comments if this is a student self-evaluation):

Overall summary – should be supported by all evaluation details listed above.

<table>
<thead>
<tr>
<th>Performance Levels</th>
<th>Performance Level Descriptions (double click or right click to check □)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready to defend □</td>
<td>• Has accomplished a scholarly body of work and program milestones for degree</td>
</tr>
</tbody>
</table>
| Excellent □        | • Exceeds expectations; notable performer, competent in chosen field  
                       • Work is thorough and accurate; Accountable for own outcomes  
                       • Willing to go beyond the norm to contribute to the project at the practical and theoretical levels  
                       • Professional and interactive |
| Satisfactory □     | • Meets expectations; may have areas for improvement, but overall, student is showing expected intellectual and scientific progress |
| Unsatisfactory □   | • Has multiple areas that require remediation and has not met expectations for intellectual or scientific progress |

Student _______________________________ Date ___________ Doctoral Committee Chair or Member ________________________ Date ___________

(Student’s signature denotes that the evaluation was reviewed with the faculty member and is not necessarily concurrence with the evaluation [if this is a faculty member’s evaluation]).
Travel and Hosting Expense Report Checklist

Name & Title: ______________________________________________________
Home Address: ______________________________________________________
City, State, Zip: ______________________________________________________
UMID #: ____________________________________________________________
Purpose of Trip: ______________________________________________________
Departure: __________________________________________________________
Return: ____________ _________________________________________________
Destination: _________________________________________________________
Project/Grant #: ____________________________________________________
E-mail: ___________________________ Daytime phone #: ____________________

Was travel advance taken? _________ If yes, amount of advance: $______________

Please attach all receipts for expenses that you are claiming along with a cover sheet of the total amount you expect. Below is a list of acceptable expenses and what documentation is required for reimbursement. Please note ORIGINAL receipts are required for reimbursement.

- REGISTRATION FORMS – We must have a copy of the meeting registration/conference with the dates indicated.

Airfare
- Economy/Coach Fare only
- E-ticket/Internet – Original receipt/statement required indicating method of payment

Lodging
- Itemized hotel receipts required
- Room charge and applicable taxes only
- Reasonable single occupancy or conference rate

Meals
- Tear away meal stubs are NOT acceptable
- Maximum allowable meal reimbursement for food (including tax and tip)
  Breakfast .... $25 Alcohol is NOT REIMBURSABLE except for Departmental special hosting events. $20/person. INCLUDES tax and tip.
  Lunch ........ $25
  Dinner $55

Meal expenses incurred while on travel status should not exceed the maximum allowances above. These amounts are not per diems and only the actual amount of the meal should be charged back to the University.
- Car Rental

Revised 4/2017
Original itemized receipt/rental agreement required

- **Taxi/Shuttle**

Receipts required

Other Expenses

1. Registration Fees
2. Personal automobile mileage (56¢ per mile). Mileage includes the cost of gas. Therefore, you cannot request both mileage and gas.
3. Parking
4. Business calls
5. Laundry expense (over one week stay)
6. Faxes, photocopies, conference materials

**HOSTING**

Purpose of Hosting
Activity:___________________________________________________________________________

_________________________________________________________________________________

List of Attendees: (Attach additional page if necessary) Alcohol NOT allowed per dept policy.

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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Attach receipts and any explanation with this checklist and give to Bonnie or Sheryl. She will finalize your report and give back to you for your final signature. Once report has your signature, higher administration authority signs off and report is immediately sent to the Accounts Payable/Travel Audit Office.

If you have direct deposit for your payroll check, your travel reimbursement will automatically be directed there unless you state otherwise. Please contact Bonnie or Sheryl if you have not received your travel reimbursement after 4 weeks.

For questions regarding travel policies, please contact the following:
Bonnie Clark 3-3531, blcl@umich.edu
**Sheryl Smith, 4-1466, sherylhs@umich.edu**

Microbiology & Immunology Doctoral Student Progress Checklist

11/30/17

***Students can also use gradtools.umich.edu to track their progress with Rackham.***

<table>
<thead>
<tr>
<th>YEAR 5</th>
<th>Register for classes, hold regular dissertation committee meetings, attend MICRBIOL 812, perform research, publish papers, attend meetings</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>Consult with dissertation mentor about scheduling of dissertation committee meetings, especially “penultimate” meeting 3-6 months prior to anticipated dissertation. <strong>Committee must ensure the publication requirement has been met prior to their providing calendars for scheduling of oral defense.</strong></td>
</tr>
<tr>
<td>September - December</td>
<td>Discuss post-graduation plans with dissertation mentor, committee, and others. Contact potential postdoctoral mentors or employers.</td>
</tr>
<tr>
<td></td>
<td><strong>Consult Rackham deadlines for completion of oral defense and other requirements:</strong> <a href="http://www.rackham.umich.edu/dissertation_information/oral_defense/">www.rackham.umich.edu/dissertation_information/oral_defense/</a></td>
</tr>
<tr>
<td></td>
<td><strong>Discuss with your thesis mentor what unpublished material you want to put in the thesis (it will become publicly available online in Deep Blue), and whether you want to apply to Rackham for an embargo (these are not automatically granted).</strong> See RackhamDoctoral Dissertation Handbook, Chapter III (pp 18-20) <a href="http://www.rackham.umich.edu/downloads/oard-dissertation-handbook.pdf">http://www.rackham.umich.edu/downloads/oard-dissertation-handbook.pdf</a></td>
</tr>
</tbody>
</table>

**THE FOLLOWING DEADLINES ARE ABSOLUTE, NO EXCEPTIONS!!!!**

<table>
<thead>
<tr>
<th>6 weeks before oral defense</th>
<th>Arrange seminar room and post-seminar defense room with Heidi. Heidi will inform the department to “save the date.”</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3-4 weeks before oral defense</strong> (Rackham requirement)</td>
<td>Register online with Rackham to schedule a group pre-defense meeting which must occur 10 working days before the oral defense; plan to bring as much of dissertation as possible for format review. At this meeting Rackham distributes evaluation forms to be given to dissertation committee members by the student with the dissertation. <strong>and</strong> Provide Rackham with date, time, and location of oral defense, as Rackham publishes your defense information.</td>
</tr>
<tr>
<td><strong>3 working days/15 working days before oral defense</strong></td>
<td>Give final draft of all dissertation sections to dissertation mentor. This means your mentor should have already seen rough drafts of each section of the dissertation and given feedback.</td>
</tr>
<tr>
<td><strong>10 working days before oral defense</strong> (Rackham requirement)</td>
<td>Give final draft of all dissertation sections to dissertation committee (provide hard copy unless instructed otherwise) along with Rackham evaluation forms. Indicate the date, time and place of the seminar, post-seminar meeting and time for celebration.</td>
</tr>
</tbody>
</table>
Provide abstract, publications list, and biographical material to Heidi for dissertation brochure and seminar announcement.

<table>
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<tr>
<th>Completed (date, initials)</th>
<th>Schedule/Deadline</th>
<th>What</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 working days before oral defense</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- With time to spare to meet absolute Rackham deadline
  - Register for post-defense meeting with Rackham “when corrections are complete.” Note: Rackham OARD often requires additional format revisions before the dissertation can be approved. Candidates should allow enough time to make these formatting revisions before the final submission deadline.

- After Rackham post-defense meeting
  - Submit all required materials to Rackham at post-defense meeting (your student financial account will be assessed a $70 fee for mandatory publishing with ProQuest/UMI)
    - Optional: complete online Rackham exit survey
  - Upload digital copy of dissertation to Rackham OARD for the University Library (preferred). (Or provide a bound copy bound by a Rackham-approved bindery). Rackham will transfer the dissertation to Deep Blue in the University Library when the degree is conferred.

- After completing all dissertation requirements
  - Arrange with research mentor for handling of personal copies of dissertation/thesis after binding.

- Laboratory space cleaned, notebooks and samples cataloged

- Return lab keys to UM key office MUST REQUEST a receipt which you will give to Bonnie Clark in the M/I office.

- Research mentor initials, completion of all post-defense items.

- Year 5 portion of this Departmental Check Sheet completed, initialed by research mentor, and given to Heidi Thompson. Also give your mentor and Heidi your forwarding address and permanent (non-UM) email.
# Microbiology & Immunology Doctoral Program Courses by Semester

<table>
<thead>
<tr>
<th></th>
<th>FALL</th>
<th>WINTER</th>
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</thead>
<tbody>
<tr>
<td><strong>REQUIRED</strong></td>
<td></td>
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</tr>
<tr>
<td>MICRO 640 (3)</td>
<td>Molec &amp; cell immunology</td>
<td>MICRO 607 (2) Microbial pathogenesis</td>
</tr>
<tr>
<td>PIBS 503 (1)</td>
<td>Research responsibility</td>
<td>MICRO 615 (2) Viral pathogenesis</td>
</tr>
<tr>
<td>PIBS 600 (2-3)</td>
<td>Laboratory rotation</td>
<td>PIBS 600 (2-3) Laboratory rotation</td>
</tr>
<tr>
<td>PIBS 800 (1)</td>
<td>PIBS seminars</td>
<td>PIBS 800 (1) PIBS seminars</td>
</tr>
<tr>
<td>MICRO 812 (1)</td>
<td>Student seminar¹</td>
<td>MICRO 812 (1) Student seminar¹</td>
</tr>
<tr>
<td><strong>CORE COURSES</strong></td>
<td></td>
<td></td>
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<tr>
<td>BIOCHEM 550 (3)</td>
<td>Macromolec struct &amp; function</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(alt) CHEMBIO 501 (3) Chemical biology I</td>
<td></td>
</tr>
<tr>
<td>CDB 530 (3)</td>
<td>Cell biology</td>
<td></td>
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<tr>
<td></td>
<td>(alt) MICRO 553 (3) Cancer biology</td>
<td></td>
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<tr>
<td>HG 541 (3)</td>
<td>Gene struct &amp; regulation (alt)-&gt;</td>
<td></td>
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<tr>
<td></td>
<td>EEB 516 (4) Principles of evolution</td>
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<tr>
<td></td>
<td>MCDB 415 (3) Microbial genetics (Chapman)³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>not offered every year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BIOLCHEM 650 (3) Mechanisms of euk gene expression</td>
<td></td>
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<tr>
<td><strong>APPROVED ELECTIVES</strong></td>
<td></td>
<td></td>
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<tr>
<td>MICRO 612 (3)</td>
<td>Microbial Informatics</td>
<td>MICRBIOL430 (3) Microbial symbiosis</td>
</tr>
<tr>
<td>MICRO 619 (1-2)</td>
<td>Special topics in M&amp;I</td>
<td>MICRBIOL 504 (3) Cellular biotechnology</td>
</tr>
<tr>
<td>MICRO 641 (1)</td>
<td>ADV. molec &amp; cell immunol²</td>
<td>MICRBIOL 510 (3) Mathematical model infect disease</td>
</tr>
<tr>
<td>BIOSTAT 503 (4)</td>
<td>Intro to biostatistics</td>
<td>MICRBIOL 512 (PHARM 502) (2) Scientific communication(grant writing)¹</td>
</tr>
<tr>
<td>BIOSTAT 553 (4)</td>
<td>Applied biostatistics</td>
<td>MICRO 619 (1-2) Special topics in M&amp;I (not taught 2015)</td>
</tr>
<tr>
<td>GEOSCI 513 (3)</td>
<td>Intro to geomicrobiology</td>
<td>BIOINF 525 (3 x 1 Cr) Foundations bioinf &amp; systems bio</td>
</tr>
<tr>
<td>IMM 851 (2)</td>
<td>Special topics in immunology</td>
<td>BIOINF 545 (3) Data analysis in molec bio</td>
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<td></td>
<td>BIOINF 551 (3) Proteome informatics</td>
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<td></td>
<td>BIOSTAT 646 (3) High throughput molec gen &amp; epigen data</td>
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<td></td>
<td>CANBIO 554 (3) Cancer path &amp; treatment</td>
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<td></td>
<td>IMM 850 (3) Experimental immunology</td>
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<tr>
<td></td>
<td>PATH 581 (3) Tissue, cellular, molec disease</td>
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<td></td>
<td>PHYSIOL 576 (1) Signal transduction</td>
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<tr>
<td></td>
<td>PHYSIOL 577 (2) Membrane and cell physiol</td>
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</tbody>
</table>

¹ Not offered 2015

² Not offered every year

³ Not offered
ADDITIONAL ELECTIVES (with mentor and GSC chair approval)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 518</td>
<td>The business of biology</td>
<td>2.25</td>
<td>1,4,6</td>
</tr>
<tr>
<td>PIBS 505</td>
<td>Teaching in the sciences</td>
<td>2</td>
<td>1,4</td>
</tr>
<tr>
<td>PIBS 507</td>
<td>Intro to translational research</td>
<td></td>
<td>1,4</td>
</tr>
<tr>
<td>PUBPOL 650</td>
<td>Intro science &amp; tech policy analysis</td>
<td>3</td>
<td>1,4</td>
</tr>
<tr>
<td>PUBPOL 754</td>
<td>Res sem science &amp; tech public policy</td>
<td>1 or 3</td>
<td>1,4</td>
</tr>
<tr>
<td>ES 515</td>
<td>Intro to entrepreneurship</td>
<td>1.5</td>
<td>1,4</td>
</tr>
<tr>
<td>ENGR 490</td>
<td>Entrepreneurial ownership</td>
<td>1.5</td>
<td>1,4</td>
</tr>
</tbody>
</table>

1. Second year students and beyond; all take it for a S/U grade.
2. Additional core courses (beyond the first required one) count toward M/I 17 Cr hr. requirement
3. Grad credit for MCDB 415 counts toward M/I 17 Cr hr. requirement
4. In Fall 2012 it will be taught as MICRBIOL 619; it will first be taught as MICRBIOL 641 in Fall 2013
5. These do not count toward M/I 17 Cr hr. requirement
6. BA 518 is cross-listed with HMP 630, PHRMACOL 620, BIOMEDE 523, & ENGR 523 and meets ~ Sept. 7 - Oct. 22
7. BA 518 has three 3-hr additional sessions

*NOTE* Prior to advancement to candidacy, students take MICRBIOL 599 (for a letter grade) for additional research credits to reach a full-time load (8 Cr). After advancement, they take MICRBIOL 995 (for S/U grade).