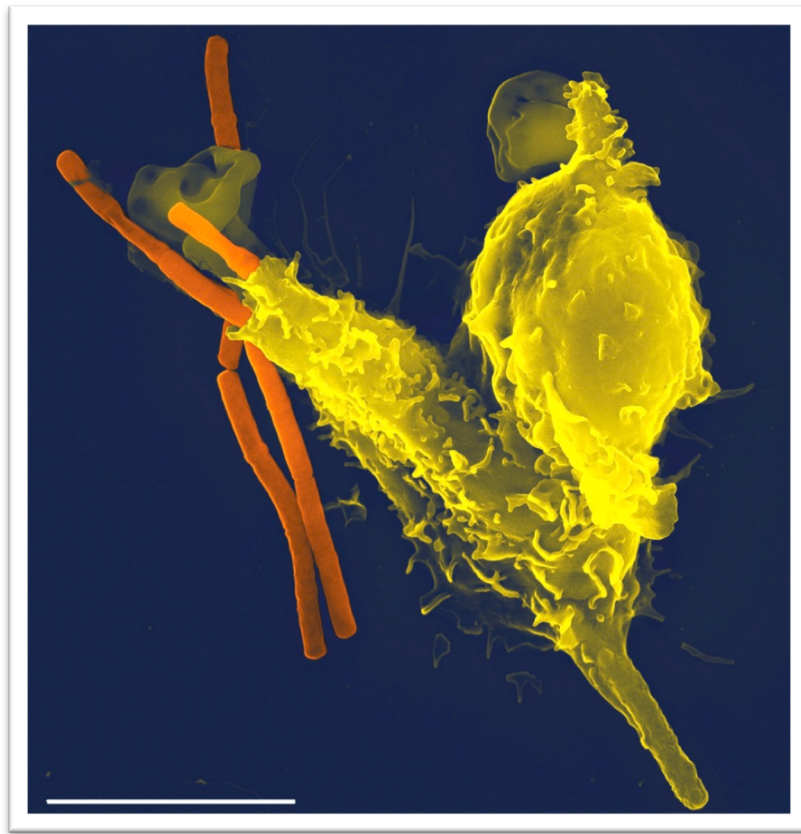


# Department of Microbiology and Immunology Graduate Student Handbook

2018-2019



## **Table of Contents**

	Page
Overview of the Microbiology and Immunology Program	3
Requirements for the Ph.D.	
Required courses	4
Qualifying exam	5
Dissertation advisor and advisory committee	6
Dissertation proposal	6
Admission to candidacy	7
Final defense	7
Requirements for the Master's Degree	
Required courses	9
Thesis advisor and advisory committee	10
Thesis proposal and proposal defense	11
Admission to candidacy	11
Thesis and Final defense	11
Appendix I: Program faculty	13
Appendix II: Courses for advanced credit offered by the M & I faculty	15

## **Microbiology and Immunology Graduate Program**

### **Overview of the Program:**

The Microbiology and Immunology Graduate Program at the Medical University of South Carolina is discipline-based, interdepartmental program involving more than 40 faculty members across campus involved in microbiological or immunological research. The Microbiology and Immunology Graduate Program confers both M.S. and Ph.D. degrees. Students wishing to pursue a PhD are admitted through the College of Graduate Studies Admissions Committee and enter the Microbiology and Immunology Program by choosing a mentor in the program at the end of their first year. Students wishing to pursue a master's degree apply to the Master in Biomedical Sciences Program and choose the Microbiology and Immunology Track as their field of concentration.

The Microbiology and Immunology Program is led by the Graduate Program Director Bei Liu ([liube@musc.edu](mailto:liube@musc.edu)) and Associate Director Chenthamarakshan Vasu ([vasu@musc.edu](mailto:vasu@musc.edu)). They are responsible for administering the written qualifying exam for the PhD degree each year, and monitoring individual student progress from the time of admission to the program until admission to candidacy. After admission to candidacy, the student's Advisory Committee takes over the monitoring roll, but the M&I Program is always available for advice and mediation if needed.

### Microbiology and Immunology Program Faculty

All faculty with full appointments in the Department of Microbiology and Immunology are M & I Program Faculty. In addition, any MUSC faculty member involved in research related to microbiology and immunology can make a request to the department Chair, Dr. Zihai Li, to become a member of the Program Faculty so that they may mentor students in the program. Currently more than half of M&I Program Faculty are appointed in departments outside of the Department of Microbiology and Immunology, and labs that students may work in towards their degree are distributed among all the research buildings on the downtown campus and at Fort Johnson. Several faculty members in the program have M.D.s or D.M.D.s and also have appointments in various clinical departments, thus permitting direct access to patients of interest. A list of current program faculty is included as Appendix I.

The main office for the Department of Microbiology and Immunology is Basic Science Building 203. The address is 173 Ashley Ave, MSC 504, Charleston SC 29425-0504.

## Program Requirements for Ph.D.

### 1. Coursework

#### **Year 1:** complete First Year Core Curriculum

All matriculating Ph.D. students participate in the first-year common curriculum of the College of Graduate Studies. The first-year curriculum includes 3 laboratory research rotations. Students interested in Microbiology and Immunology are encouraged to select their research rotations with faculty members in the Microbiology and Immunology Program Faculty (Appendix I). Students are also encouraged to speak to the Microbiology and Immunology Graduate Program Director (Bei Liu, [liube@musc.edu](mailto:liube@musc.edu)) to assist in the selection of rotations. At the end of the first year, Ph.D. students officially join the M&I Program by completing an "Appointment of Major Advisor Form". The form requires the signatures of the student's chosen advisor, the chair of the department in which their major advisor is appointed, and the M&I Graduate Program Director, before being turned in to be signed by the Dean of the College of Graduate Studies. Within three months of choosing a Major Advisor, students must also complete a "Program of Study" form, described below in Year 2.

**Year 2:** At least 6 credit hours of advanced coursework in microbiology and immunology Seminar (MBIM 770) each semester and enough Biomedical Research (MBIM 970) credits to qualify as a full-time student.

In the second year, Ph.D. students undertake advanced, elective courses, and complete any courses required by the College of Graduate Studies. As a prerequisite for the PhD degree, the College requires students to demonstrate a predetermined level of statistical competence. This may be achieved by either enrolling in and completing CGS 700 in the second or subsequent years of graduate study, or by providing the syllabus and transcript evidence of satisfactory completion of previously taken statistical course(s) that fulfill the College requirement to the Dean who will decide whether or not to grant a waiver.

The **Program of Study** for each student is planned jointly by the student and major advisor (and/or advisory committee) and is individualized according to the needs and goals of the student. All PhD students must complete **12 credit hours of advanced coursework** as a requirement of the degree, with **at least six credit hours of advanced course work completed prior to taking the qualifying exam**. In order to count for advanced credit, the course must be merit graded (graded on a 0.0 - 4.0 scale) and the student must receive a grade of 3.0 or higher. Course work can be in either microbiology or immunology or both; courses offered by the Department of Microbiology and Immunology are listed in Appendix II. Electives offered by other departments that are merit graded may also be applied toward the 12 hrs of advanced credit, with the approval of the student's advisor and committee. Additional courses in computer literacy and Grants or Manuscript Writing may also be required at the discretion of the Advisory Committee. The Program of Study form must be completed **prior to** scheduling the qualifying exam.

In addition, **all students must enroll in and pass MBIM 770 and 970 each semester** (see below). These courses are not merit graded and therefore do not count toward the 12-credit hour requirement.

**Year 2 and beyond:** completion of 12 credit hours advanced coursework plus the following

#### **MBIM 770 M&I Seminar (1 cr)**

All students must enroll every semester until a successful final defense, and one presentation is required per year

- This course is pass/fail and therefore, does not count for advanced credit MBIM 970

### **Biomedical Research (0.5-15 credits)**

- These credits account for the time spent on the student's original research project under mentorship of their major advisor.
- This course is pass/fail and therefore, does not count for advanced credit

### **MBIM 856 Critical Literature Review in Inflammation and Immunity (1 cr)**

- Enrollment is open to all students and required after admission to candidacy.
- Candidates must enroll for 4 semesters or until they successfully defend, whichever comes first.
- This is a refereed journal club style course and is merit graded. Therefore, up to 4 credits may be applied to the 12 hrs of required advanced credits.
- Credit hours earned in this course prior to achieving candidacy will NOT reduce the 4 semester / until defense requirement of candidates.

### **CGS 700 Introduction to Biostatistics or proof of proficiency in the topic**

- This is a requirement of the College of Graduate Studies
- Consult the College of Graduate Studies office for information on how to test out of the requirement
- The credits DO NOT count toward the 12 advanced credits for the PhD degree

**Students must maintain a minimum grade of 3.0 in all advanced courses, which satisfy the advanced graduate 12 credit hours.** If this requirement is not met, the student may retake a specific course once or may take additional courses to satisfy the 12 credit hours at the discretion of the Course Director and the Program Directors. Failure to achieve the required grade upon subsequent examination will usually result in dismissal from the program, as will a grade of less than 2.0 in any course. Extenuating circumstances will be considered by the M&I Program Directors.

## **2. Qualifying Exam**

The qualifying exam is a written examination plus oral defense taken at the end of the **second year** of study following completion of at **least 6 approved advanced credit hours**. The format of the Microbiology & Immunology Written Qualifying Examination is an open book, one-month long test. The student must choose the topic of a written proposal that is irrelevant to her/his major mentor's research and approved by the Microbiology & Immunology Graduate Program Director and Associate Director before June 15. The written proposal will be based on the NIH R21 format (Margins are 1/2" all around, font=Arial 11 or Times New Roman, font=12, do not include headers or footers, Project Summary/Abstract is no more than 30 lines, Project Narrative is 3 sentences, Specific Aims=1 page, Research Strategy=6 pages and is organized in the order: Significance, Innovation, and Approach). The student can find guidelines from NIH website <https://grants.nih.gov/grants/funding/r21.htm>. Each proposal will be graded by the 5 faculties on the exam committee. The grading scale will be Honors, Pass, or Fail. The student needs to receive a Pass or above from a majority of graders to pass the exam. If a passing grade is not achieved, the student will be re-examined. Failure at the second attempt will result in dismissal from the program with a terminal masters degree.

The purpose of the qualifying exam is to determine one's maturity and preparation for completing the Ph.D. degree. The exam is designed to determine the following: 1) the ability to read and understand primary scientific literature, 2) the ability to summarize detailed information on novel subjects requiring students to consult the scientific literature, 3) the ability to develop hypotheses about new information that is read, 4) the ability to propose experiments to test such hypotheses and 5) the ability to communicate this information in writing. All of these abilities are essential for future success in a career in science, and are thus considered during grading of the exams. A passing grade on the written

### 3. Dissertation Advisor and Advisory Committee

Students are encouraged to select the members of the Advisory Committee as early as is feasible after completing the qualifying exam, but no later than the **beginning** of the third year. In exceptional circumstances, approved by the Program Committee, this may be extended six months. During this time, the Program Committee will act as the Student Advisory Committee.

The Advisory Committee will consist of at least five members including the student's Dissertation Advisor. At least three members of the Advisory Committee must be Microbiology and Immunology Program Faculty, and two must be from outside the department. All members must be faculty of the MUSC College of Graduate Studies. The chairperson must be a full member of the Graduate Faculty or an associate member with a full member co-chair. Faculty from other universities are permitted, but they must apply to the College of Graduate Studies credentials committee to become associate members of the graduate faculty. The Program Director must approve and recommend the Advisory Committee by signing the form for this purpose and providing it to the Dean of the College of Graduate Studies. The approved Advisory Committee assumes primary responsibility for the Dissertation Research and general progress of the student.

The student will meet at least yearly with the Advisory Committee, and will provide a concise written summary of his/her research progress to the Committee prior to the annual meeting. This annual meeting usually coincides with the student's annual seminar. A copy of the completed Annual Evaluation of Student Progress form must be signed by all Committee members and the Graduate Program Director, then forwarded to the Dean of the College of Graduate studies to verify that the annual meeting has taken place. Failure to hold timely meetings will first result in warnings, and if necessary, withholding of stipends until the form is submitted.

### 4. Dissertation Proposal

A written plan of research (thesis proposal) must be prepared by the student in consultation with the Advisory Committee, in the organizational format of a research grant application in accordance with the current National Institutes of Health Guidelines, except that page limits and margins do not apply. The proposal must contain clearly stated and original hypotheses to be tested, with introductory background and preliminary data that support the objectives. The student must defend the proposal **orally** before the Advisory Committee and the M&I Program faculty. This presentation usually takes place during the regular Microbiology and Immunology Seminar Series and will fulfill the seminar requirement for that year. The written dissertation proposal is generally submitted and defended within 10 months after passing the qualifying examination. The Graduate Program Coordinator must be notified of the time and date of the proposal defense at least two weeks in advance, and be provided with a summary (abstract) of the proposal that will be distributed to all M&I Program Faculty. The



written proposal **MUST** be distributed to the student's advisory committee and the Graduate Program Coordinator **at least one week prior** to the oral presentation. The final written proposal must be approved by the Advisory Committee, who may request first changes. Approval is documented by submitting the title page of the Dissertation proposal to the graduate office attached to a signed College of Graduate Studies "Plan of Research" form.

## 5. Candidacy for the PhD degree

Admission to candidacy requires a passing grade on the M&I qualifying exam and a successful proposal defense. Immediately following a successful proposal defense, the advisory committee certifies the admission to candidacy by signing the Plan of Research and Admission to Candidacy forms, which are then submitted to the Dean of the College of Graduate Studies. Usually, the proposal defense and Admission to Candidacy is accomplished by the end of the third year. All students in the Ph.D. degree program must be admitted to candidacy at least one year prior to submission and defense of the Dissertation. Exceptions to the timeline outlined above will be considered only if student illness or other extenuating circumstances exist, or if unsatisfactory performance mandates re-examination.

The College of Graduate Studies recognizes that the student's research may deviate from that originally proposed. The student should be encouraged to pursue promising leads; however, substantial or long-term changes in the direction of the student's research should be made only after consultation and with the approval of the Advisory Committee.

## 6. Dissertation Defense

When the student's advisory committee agrees that the student has completed the agreed upon goals for his or her thesis project, the student will be given permission to write the final dissertation, and a final defense date will be set. The draft dissertation must be distributed to the advisory committee members and the Graduate Program Coordinator 4 weeks prior to the defense date. The "Dissertation Defense Notification" (or Ready to Defend) form must be completed and turned into the College of Graduate Studies office **21 days in advance of the defense date, with no exceptions. The student must have at least one first-author publication that is related to her/his thesis work before dissertation defense.**

**Dissertation:** The dissertation/thesis must be based upon original investigation, provide evidence of mature scholarship and critical judgement, indicate knowledge of research methods and techniques, and demonstrate the ability to carry on independent investigation. Preparation of the dissertation/thesis must comply with the regulations contained in "A Guide to the Preparation of Thesis and Dissertations" which is available in the College of Graduate Studies Office. **Three weeks prior** to the date of the student's thesis/dissertation defense, the "Thesis/Dissertation Defense Notification" must be signed by all members of the thesis/dissertation Advisory Committee, the graduate program director, and department chair, and received by the College of Graduate Studies. At this time, the graduate program director will place a completed copy of the thesis/dissertation in the Microbiology and Immunology common area for review by M&I faculty. The thesis/dissertation needs to be distributed to the Advisory Committee for review **at least one week** before they are asked to sign the "Thesis/Dissertation Defense Notification." **Therefore, the dissertation should be in a complete form and distributed at least four weeks prior to the intended defense date.**

*Thesis/Dissertation Seminar:* Student candidates for the Ph.D. degree are required to present

completed research results in a formal seminar prior to their final examination. The date of the Thesis/Dissertation Seminar must be agreed upon by the Advisory Committee and publicly announced by the College of Graduate Studies in advance of the defense.

*Final Examination (Oral Defense of Thesis/Dissertation):* Each candidate is required to pass a general oral examination directed primarily to the defense of the thesis/dissertation. This will follow the Thesis/Dissertation Seminar. The examination is conducted by the Advisory Committee, with the Chair of the Department or Graduate Program Director presiding. (The Chair or Program Director may appoint another faculty member, who is not a member of the student's Advisory Committee, to preside at this meeting.) The M&I Program Faculty, other Graduate Faculty and General Faculty are invited to be present and participate. The review of the thesis/dissertation by an external reviewer (a person outside of the University that is an expert in the field) can be extremely helpful and is suggested. Approval by the Advisory Committee, with no more than one dissenting vote, is a requirement for awarding of the degree. In the event of disapproval, the candidate may, at the discretion of the Advisory Committee, be permitted to retake the examination after six months, and not more than two years from the time this decision was made. Only one opportunity for re-examination is given. Any candidate who is granted this privilege shall retain the status and obligations of a graduate student until the time of such re-examination. The Advisory Committee has the authority for final approval of the candidate for the awarding of the degree, and their recommendation is forwarded to the Dean of the College of Graduate Studies.

Upon completion of the defense, each faculty committee member will fill out a "Thesis/ Dissertation Defense Rubric" form and give them to the Major Advisor. The Major Advisor will in turn collate the evaluations into one form, discuss it with the trainee, and then submit it to the College's Registrar.

The Advisory Committee may request changes to the Thesis/Dissertation. All changes must be made within three weeks, and **the final Dissertation MUST be electronically submitted as PDFs to [MEDICA](#)**, MUSC's Institutional Repository, no later than the last day of classes for the semester. Failure to do so will result in the completion date being moved to the following semester and the student will be responsible for paying for tuition out of pocket.

Final Diplomas are awarded twice a year, in December and May. Official Graduation Ceremonies are held in May. ***NOTE: The final dissertation MUST be electronically submitted prior to the last official day of class of the Fall semester for a December graduation, or prior to the last official day of class of the Spring semester for a May graduation.***

**Please Note:**

**IT IS THE STUDENT'S RESPONSIBILITY TO MEET THE REQUIREMENTS SET FORTH IN THIS HANDBOOK.**



## Program Requirements for Master of Science degree

The M.S. program is expected to last two fall semesters, two spring semesters and one summer, so that a degree can be obtained 19 - 21 months after the start of the program. The timeline below is recommended for students wishing to finish within this time frame.

	<b>Fall Year 1</b>	<b>Spring Year 1</b>	<b>Summer</b>	<b>Fall Year 2</b>	<b>Spring Year 2</b>
<b>Courses</b>	CGS 710 MBIM-770 MBIM-970  CGS 701-P Immunology  2-4 cr electives	MBIM 770 MBIM 970  2-4 cr electives MBIM 788 Immunobiology (optional)	CGS 762	MBIM 770 MBIM 970	MBIM 770 MBIM 970
<b>Other Milestones</b>	Two 6-wk lab rotations. Choose mentor at end of semester.	Start thesis research project with chosen mentor.	Start writing thesis proposal in CGS 762 course.	Finish and defend thesis proposal by Oct 31. Admission to candidacy for M.S. degree.	Finish research (Jan). Write thesis (Feb). Defend thesis (March). Graduate in May!
<b>CGS Forms to Complete</b>	✓✓ Appointment of Major Thesis Advisor	✓✓ Program of study  ✓✓ Selection of Advisory Committee		✓✓ Admission to Candidacy  ✓✓ Annual Evaluation of Student Progress	✓✓ Thesis Defense Notification ( <i>Ready to Defend</i> ) ✓✓ Successful defense ✓✓ Thesis Defense Rubric

### 1. Required Courses for the Masters Degree

The program of study for each student is planned jointly by the student and his or her advisors and is highly individualized according to the needs and goals of the student. All Masters students must complete **CGS 710, CGS 701P, MBIM 762, MBIM 770 (every semester), and 3 credit hours of elective advanced coursework** as a requirement of the degree. In order to count for advanced credit, the course taken **must be merit graded (graded on a 0.0 - 4.0 scale)**. Course work can be in either microbiology or immunology or both, and elective courses offered by the Department of Microbiology and Immunology are listed in Appendix II. Possible electives are listed on page 10.

Merit graded electives offered by other departments or under the CGS designation may also be applied toward the 3 hrs of advanced credit, with the approval of the student's advisor. In addition, **all students must enroll in and pass MBIM 770 and 970 every semester** that they are enrolled in the program. These courses are not merit graded and therefore do not count toward the 3-credit hour requirement for advanced coursework.

Students must maintain a **minimum grade of 3.0 in all courses**, in order to satisfy the required graduate credit hours. If this requirement is not met, the student may retake a specific course once or

may take additional courses to satisfy the required credit hours at the discretion of the Course Director and the Program Committee. Failure to achieve the required grade upon subsequent examination will usually result in dismissal from the program, as will a grade of less than 2.0 in any course. Extenuating circumstances will be considered by the Program Committee.

Possible electives for Masters students are:

**Fall:**

CGS 700 Introduction to Biostatistics

MBIM 725 Immunogenetics

MBIM 856 Critical Literature Review of M&I

**Spring:**

CGS 702

MBIM 788 Immunobiology Selective (last 7 weeks of semester)

MBIM 623 Microbiology for Dental Students

MBIM 772 Environmental Microbiology

MBIM 775 Special Topics in Immunology

MBIM 856 Critical Literature Review of M&I

An M.S. program is also currently offered in conjunction with the Department of Periodontics in the School of Dental Medicine. Students admitted to this program must hold a D.M.D./D.D.S. degree, and be acceptable to the Department of Periodontics for Graduate Training in that specialty of clinical dentistry.

## **2. Thesis Advisor and Advisory Committee**

The student is encouraged to select an Advisor by the end of the first semester of the program, so that he/she may start work on a thesis at the beginning of the spring semester. The student's Advisory Committee should be chosen no later than the end of the first spring semester, in consultation with their major advisor and in consideration of the faculty expertise best suited to the planned thesis project.

The Advisory Committee will consist of at least four members, three of whom (including the Major Advisor) must be M&I Program Faculty and one outside member. The Graduate Program Associate Director (Chenthamarakshan Vasu) must approve and recommend the Advisory Committee to the Dean of the College of Graduate Studies by signing the "Selection of Advisory Committee" form. The approved Advisory Committee assumes primary responsibility for the Thesis Research and general progress of the student. Until the "Selection of Advisory Committee" form is submitted, the M&I Program Committee acts as the student's advisory committee.

The student will meet at **least yearly** with his/her Advisory Committee, and will provide a concise written summary of his/her research progress to the Committee prior to the meeting. This meeting usually coincides with the student's annual seminar. The advisory committee should fill out and sign an annual evaluation form at the meeting to document that the meeting has taken place. A copy of the signed annual report should be forwarded to the Graduate Program Director who will turn it in to the Dean of the College of Graduate studies. The Evaluation form, along with all required forms are available on the College of Graduate Studies website under Current Student Forms and Guidelines resources, and in the Master of Biomedical Science student handbook.

### 3. Thesis Proposal and Proposal Defense

A written plan of research (thesis proposal) must be prepared by the student, in consultation with the Advisory Committee, in the format of a research grant application. The proposal must contain clearly stated and original hypotheses to be tested and preliminary data that support the objectives. Preliminary data may include work by others in the lab, such as past students, as well as the student proposing. Contact Dr. Vasu for examples. The written proposal **MUST** be given to the student's advisory committee and the Graduate Program Associate Director at least one week prior to the oral presentation. The student will also provide Dr. Vasu with a summary (abstract) of the proposal to distribute to all Program Faculty. The written proposal must be approved by the Advisory Committee. The student must present their proposal in the form of a public seminar, and defend the proposal orally in a closed session afterwards before their Advisory Committee and any Program faculty that wish to attend. The seminar presentation usually takes place during the regular Friday Microbiology and Immunology Seminar Series and will fulfill the seminar requirement for the year. First year students will have opportunities to attend several proposal seminars during their first year as examples.

The written thesis proposal defense is usually completed in the fall of the second year of study. Upon successful defense of the thesis proposal and completion of required coursework, the student is admitted to candidacy for the Master's degree. **At least three months must elapse between the thesis proposal defense and the final thesis defense.**

The date of the proposal defense must be agreed upon by the Graduate Program Associate Director, who will attend or send an alternate.

The M&I Graduate Program recognizes that the student's research may deviate from that originally proposed. The student should be encouraged to pursue promising leads; however, substantial or long-term changes in the direction of the student's research should be made only with the approval of the Advisory Committee.

### 4. Thesis and Final Defense

When the student's advisory committee agrees that the student has completed the agreed upon goals for his or her thesis project, the student will be given permission to write the final dissertation, and a final defense date may be set. **The draft dissertation must be distributed to the advisory committee members 4 weeks before the defense date**, and the Thesis Defense Notification (Ready to Defend) form must be signed by all committee members and turned into the College of Graduate Studies at least **21 days in advance of the defense date, no exceptions.**

*Dissertation:* The dissertation/thesis must be based upon original investigation, give evidence of mature scholarship and critical judgement, indicate knowledge of research methods and techniques and demonstrate ability to carry on independent investigation. Preparation of the dissertation/thesis must comply with the regulations contained in "A Guide to the Preparation of Thesis and Dissertations" which is available in the College of Graduate Studies Office.

**Three weeks prior** to the date of the student's thesis/dissertation defense, the "Thesis/Dissertation Defense Notification" must be signed by all members of the thesis/dissertation Advisory Committee, the graduate program director, and department chair, and received by the College of Graduate Studies. At this time, the graduate program director will place a completed copy of the thesis/dissertation in the Microbiology and Immunology common area for review by M&I faculty. The thesis/dissertation needs to be distributed to the Advisory Committee for review at least one week

before they are asked to sign the "Thesis/Dissertation Defense Notification." **Therefore, the dissertation should be in a complete form and distributed at least four weeks prior to the intended defense date.**

*Thesis Seminar:* Student candidates for the Master's degree are required to present completed research results in a formal seminar prior to their final examination. The date of the Thesis Seminar must be agreed upon by the Advisory Committee and publicly announced.

*Final Examination (Oral Defense of Thesis/Dissertation):* Each candidate is required to pass a general oral examination directed primarily to the defense of the thesis/dissertation. This will follow the Thesis Seminar. The examination is conducted by the Advisory Committee. The M&I Program Faculty, other Graduate Faculty and General Faculty are invited to be present and participate. Approval by the Advisory Committee is a requirement for awarding of the degree. In the event of disapproval, the candidate may, at the discretion of the Advisory Committee, be permitted to retake the examination within two years from the time this decision was made. Only one opportunity for re-examination is given. Any candidate who is granted this privilege shall retain the status and obligations of a graduate student until the time of such re-examination. The Advisory Committee has the authority for final approval of the candidate for the awarding of the degree, and their recommendation is forwarded to the Dean of the College of Graduate Studies.

Upon completion of the defense, each faculty committee member will fill out a "Thesis/ Dissertation Defense Rubric" form and give them to the Major Advisor. The Major Advisor will in turn collate the evaluations into one form, discuss it with the trainee, and then submit it to the College's Registrar.

The Advisory Committee may request changes to the Thesis/Dissertation. All changes must be made within 30 days, and **the final Dissertation MUST be electronically submitted as PDFs to [MEDICA](#)**, MUSC's Institutional Repository, no later than the last day of classes for the semester. Failure to do so will result in the completion date being moved to the following semester. The student will be required to register for the next semester **at their own expense** for a minimum of one hour, and will receive that semester as their completion date.

Final Diplomas are awarded twice a year, in December and May. Official Graduation Ceremonies are held in May. ***NOTE: The final dissertation MUST be electronically submitted prior to the last official day of class of the Fall semester for a December graduation, or prior to the last official day of class of the Spring semester for a May graduation.***

**Please Note:**

**IT IS THE STUDENT'S RESPONSIBILITY TO MEET THE REQUIREMENTS SET FORTH IN THIS HANDBOOK.**

## Appendix I: Microbiology and Immunology Program Faculty 2018-2019

Faculty name & contact	Research interests	Recruiting?
<b>Naren Banik</b> baniknl@musc.edu	Calpain in spinal cord injury and demyelinating diseases, neuroprotective effects of proteinase inhibitors	Yes PhD
<b>Eric Bartee</b> bartee@musc.edu	Myxomavirus based cancer therapeutics	Yes PhD, MS
<b>Beichu Guo</b> guobe@musc.edu	Innate immunity in inflammatory diseases and tumor development.	Yes PhD, MS
<b>Azizul Haque</b> haque@musc.edu	Tumor immunology (lymphoma, melanoma and prostate cancer) and autoimmunity	Yes PhD, MS
<b>Wei Jiang</b> jianw@musc.edu	Memory B cell death and vaccine responsiveness in HIV	Yes PhD
<b>Zihai Li</b> zihai@musc.edu	Cancer Vaccines, Innate Immunity, Immune Tolerance, Stem Cells	Yes PhD
<b>Bei Liu</b> liube@musc.edu	Cancer immunotherapy, stem cell-based cancer vaccine and innate immunity	Yes PhD, MS
<b>Barb Rohrer</b> rohrer@musc.edu	Immunopathology of macular degeneration	Yes PhD
<b>Stephen Tomlinson</b> tomlinss@musc.edu	The complement system and its role in inflammation and immunity	Yes PhD
<b>M. Julie Westerink</b> westerin@musc.edu	Immune response to pneumococcal vaccination in HIV patients	Yes PhD, MS
<b>Xue-Zhong Yu</b> yux@musc.edu	Graft vs Host Disease, Stem cell transplantation, T cell development	Yes PhD
<b>Carl Atkinson</b> atkinsoc@musc.edu	Complement inhibitory proteins and their role in cancer, emphysema. and transplantation	Yes MS
<b>Shikhar Mehrota</b> mehrotr@musc.edu	Adoptive immunotherapy of cancer	No
<b>Christina Voelkel-Johnson</b> johnsovcv@musc.edu	Gene therapy of cancer to promote apoptosis, ceramide and spingolipid metabolism of cancer	Yes MS
<b>Chenthamarakshan Vasu</b> vasu@musc.edu	Immune tolerance, Immunotherapy of autoimmunity, cancer, and transplant rejection	Yes PhD, MS
<b>Gary Gilkeson</b> gilkeson@musc.edu	Autoimmune disease: rheumatoid arthritis, lupus	No
<b>Diane Kamen</b> kamend@musc.edu	Autoimmunity and environmental exposures	Possibly
<b>Carsten Krieg</b> kriegc@musc.edu	Cancer Immunotherapy	Possibly
<b>Amanda LaRue</b> laruerc@musc.edu	Hematology/stem cell biology and vascular biology.	Possibly
<b>Eric Meissner</b> meissner@musc.edu	HCV and HIV immunobiology	Possibly PhD
<b>Satish Nadig</b> nadigsn@musc.edu	Treg biology and transplantation tolerance	Possibly
<b>Chrystal Paulos</b> paulos@musc.edu	Immunotherapy of Cancer, adoptive T-cell therapy, Th17 cell biology	Possibly
<b>Titus Reaves</b> reaves@musc.edu	Inflammatory bowel disease	Possibly MS

Faculty name & contact	Research interest	Recruiting?
<b>Mark Rubinstein</b> rubinsmp@musc.edu	Immunotherapy of cancer, adoptive T cell therapy	Yes PhD
<b>Michael Schmidt</b> schmidt@musc.edu	Nosocomial infection control, biosafety	Possibly MS
<b>Jessica Thaxton</b> thaxton@musc.edu	Cancer immunology	Possibly MS
<b>Paula Traktman</b> traktman@musc.edu	Vaccinia virus biology and VRK protein kinases	Possibly
<b>John Wrangle</b> wrangle@musc.edu	Immunotherapy of lung cancer	Yes PhD
<b>M. Rita Young</b> youngmr@musc.edu	Immunotherapy of head and neck cancer	Possibly
<b>Laura Kasman</b> kasmanl@musc.edu	Gene therapy of cancer, virus-virus interactions	No
<b>Hal May</b> mayh@musc.edu	Bioremediation, microbial fuel cells, biofuel production	No
<b>Tamara Nowling</b> nowling@musc.edu	Regulation of gene expression, sphingolipids and T cell function in in lupus-associated kidney disease	No
<b>James Oates</b> oatesjc@musc.edu	Biomarkers of disease and role of reactive intermediates in lupus nephritis and CVD in lupus	No
<b>Janardan Pandey</b> pandeyj@musc.edu	Immunogenetics of infectious, autoimmune, and malignant diseases	No
<b>Inderjit Singh</b> singhi@musc.edu	Immunology of Neurological disorders such as Multiple Sclerosis, Stroke and Spinal Cord Injury	No
<b>Cynthia Wright</b> wrightcf@musc.edu	Viral gene expression and virus host interactions	No



## Appendix II: Microbiology and Immunology Courses 2018-2019

**MBIM-623G. Microbiology for Dental Students.** Microbiology is a core course in the dental curriculum that is intended to foster a knowledge base and understanding of the fundamentals of bacterial physiology and genetics; clinical bacteriology, virology, parasitology and mycology; antimicrobial therapy; asepsis in dentistry; and infection control. The primary goals of the course are to explore the relationship between the physiology of medically important microbes to the pathobiological sequelae of human-microbial interactions, with particular reference to the role of oral microbes in human disease. Emphasis is placed on the study of oral ecology, dental caries, periodontal disease, hepatitis and AIDS. Laboratory instruction includes problem based, small group exercises in microbiology, with specific sections on oral flora and aseptic techniques. 4 hr. Spring. (**Michael Schmidt**).

**MBIM-735. Molecular & Cellular Basis of Inflammation & Immunity.** This course represents an intensive and in-depth study of the areas of cellular immunology, immunogenetics, clinical immunology, and the immunobiology of tumor development. Each area will be presented with the intent of developing a sound understanding of experimental and theoretical observations. Emphasis will be placed on the most current research involving sophisticated methodology. 4 s.h. Fall/Spring. (**Beichu Guo**).

**MBIM-742. Advanced Microbiology.** The course will present in-depth perspectives on the agents responsible for the major bacterial, viral and parasitic-induced diseases. Emphasis will be placed on current research and new insights gained into the biochemistry, molecular biology and immunology of these organisms. 4 s.h. Fall. Alternate Years. (**Michael Schmidt/Harold May**).

**MBIM-770. Seminar.** Participation of graduate students in this course is mandatory. Guest speakers supplement the regular program. Each graduate student gives at least one seminar yearly. Pass/Fail 1 s.h. Fall/Spring. (**Azizul Haque**).

**MBIM-772. Environmental Microbiology.** The course emphasizes fundamental microbiological principles as they apply to the environment. Its main goal is to introduce the student to the concepts of microbial diversity and evolution, microbial metabolism and catalysis in the biodegradation and synthesis of natural and man-made compounds, the microbial role in biogeochemical cycling, and the interactions of microbes with the physical environment and with other organisms related to the application of microbiological approaches to problems which exist in today's environment. The course should prepare the student interested in environmental problems and issues with the necessary practical information to make sound judgements in assessing meaningful solutions and the role microorganisms play in those processes. 3 s.h. Fall/Spring. (**Harold May**).

**MBIM-776. Special Projects in Immunology and Microbiology.** Individual faculty accept limited numbers of students to pursue a "small" research project. Intended for those students desiring research experience but open to those who would pursue relevant projects of their own design. Prerequisite: permission of instructor. Variable s.h. Fall/Spring.

**MBIM-779. Immunogenetics.** Initial lectures will review the fundamental principles of genetics. The principle focus of the course will be the genetics of human MHC and immunoglobulin allotypes. Major blood genes will also be discussed. Statistical methods employed in delineating the genetic contribution to human diseases will be reviewed. 2 s.h. Fall. (**Janardan Pandey**).

**MBIM-786. Cancer Immunotherapy Lessons.** (K12 Scholars Program.) This course will combine didactic lectures with participation in mock study sections. The first 3 weeks of class will be lecture and the remaining 12 weeks will be used to review and critique past grant proposals related to cancer immunotherapy recently submitted by principal investigators at MUSC. Students will also attend the monthly meetings of the Cancer Immunology and Immunotherapy (CII) program faculty (4 meetings during the semester) and submit a 1 page written summary and response for each. 2 s.h. Fall/Spring. **(Zihai Li).**

**CGS-788. Spring Selective: Immunobiology.** Intensive 7-week introductory immunology course for graduate students in lecture format, utilizing Janeway's Immunobiology as a textbook. Emphasis is on understanding molecular mechanisms resulting in immunity, and experimental methods for testing and discovering these mechanisms. **\*\***(not for advanced credit if taken as part of the PhD first year curriculum). 3 hr. Spring **(Chrystal Paulos/Wei Jiang).**

**MBIM-856. Critical Literature Review in Inflammation and Immunity.** Course is a formalized, refereed Journal Club focused on topics of general interest in Microbiology and Immunology. Mandatory for PhD candidates in Microbiology and Immunology. 1 s.h. Fall/Spring. **(Mark Rubinstein).**

**MBIM-970. Research.** Variable s.h.

**MBIM-980. Thesis.** Variable s.h.

**MBIM-990. Dissertation.** Variable s.h.