

**Handbook of the
Immunology and Microbial Pathogenesis
Graduate Program**

West Virginia University

School of Medicine

Revised and Approved February 2018

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ABOUT THIS HANDBOOK

The Faculty of the Immunology and Microbial Pathogenesis Graduate Program developed this handbook which outlines the requirements that must be fulfilled to obtain a Doctor of Philosophy from the program. Students of the program must also adhere to standards and policies outlined in the Handbook for the Graduate Program in the Biomedical Sciences. Both handbooks are subject to amendment, and all students will be informed of such amendments.

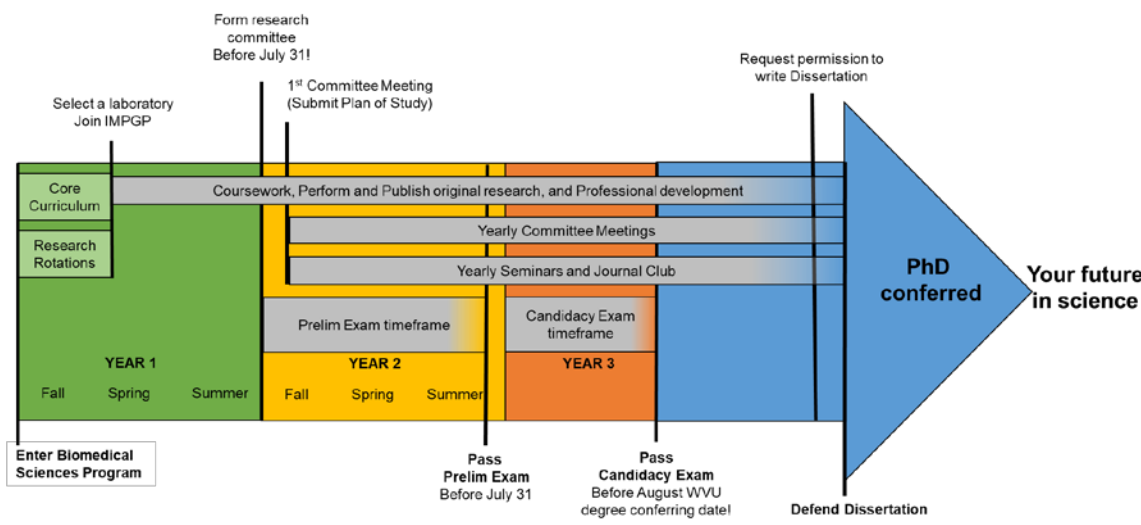
GOALS AND OBJECTIVES OF THE PROGRAM

The major objective of graduate education in the Immunology and Microbial Pathogenesis Graduate Program (IMPGP) is research training. To achieve this purpose, students are grounded with a strong foundation in basic concepts of microbiology, microbial pathogenesis, and immunology and allowed flexibility in choosing advanced coursework in their specific areas of interest. A major emphasis of the advanced coursework in the graduate program is extensive laboratory research in a specific area of immunology or microbial pathogenesis. Each student will complete an original, in-depth research investigation and document that investigation in the form of a written dissertation. The overall educational objective of the program is to produce doctoral students capable of designing, performing, and directing independent research in Immunology and Microbial Pathogenesis and teach at the highest academic levels.

The mission of West Virginia University (WVU) and the Graduate Program in Immunology and Microbial Pathogenesis is to provide excellence in education, research, and service to the State of West Virginia. The cornerstone to achieving this mission is a sustained research program that is internationally recognized as contributing to state-of-the-art knowledge in each of the sub disciplines of the program. This research expands knowledge necessary to provide new state-of-the-art treatments for our patients, develops in our students the knowledge base and skills necessary to mature to become independent investigators, and allows our faculty to contribute to the overall service mission of WVU.

PROGRAM REQUIREMENTS

Milestones leading to a Ph.D. from the Immunology and Microbial Pathogenesis Graduate Program.



Entrance into the Immunology and Microbial Pathogenesis Graduate Program (IMPGP). The Office of Research and Graduate Studies directs the Recruitment Committee and Admission Committee for the recruitment and selection of applicants into the first semester core curriculum. Once accepted and enrolled in the Biomedical Science Graduate Program (BSGP) the student will take the common first year core curriculum as described in the “Handbook for incoming students to the Graduate Programs in the Biomedical Sciences.” During the first semester, students will rotate in research laboratories (BMS 791A) as described in the aforementioned BSGP handbook. After short lab rotations, the student is to meet with their selected research advisor and discuss formally joining the laboratory. For guidance on the process of how to select a laboratory, the students should consult with the Assistant Vice President for Graduate Education. Additionally, the Director of the IMPGP can also be consulted for guidance.

In order to join the IMPGP Graduate Program, the following are required:

- 1) The student must have a minimum GPA of 3.0 in the core curriculum
- 2) The advisor must agree to accept the student into his/her laboratory
- 3) The advisor must inform the Director of the IMPGP of the decision to join the program and file the required form with the BSGP. A copy of this completed form will be added to the student’s IMPGP permanent file.

Trainee support. The Office of Graduate and Research Studies will support students for the first two years in residence. For the remainder of their graduate

studies the research advisor will be responsible for student support. This will typically be from fellowships, traineeships, teaching assistantships, faculty research grants, and/or individual fellowships from outside sources. Support will include full tuition, health services and hospitalization insurance to the student, and a monthly stipend.

REQUIREMENTS OF GRADUATE STUDENTS (1ST to 3rd YEAR) BEFORE PASSING the Ph.D. CANDIDACY EXAMINATION

Initiation of Research and Selection of Research Advisory Committee. Entering IMPGP students are required to meet with the Director of the IMPGP in order to select courses for the second semester. Upon joining a laboratory in the program, the student will initiate or continue research in the second semester. During the second semester, the student and research advisor will select an appropriate research committee of at least 5 members. Typically, the student's research advisor will be the Chair of the Committee; however, this is not required and the chair could be one of other members of the Committee.

The requirements for the Research Advisory Committee are:

1. The majority of the members of the Research Advisory Committee (to include the graduate advisor) must be *regular members* of the graduate faculty.
2. No more than one member without WVU graduate faculty status may be included.
3. Three of the members are required to be members of the faculty of the IMPGP.
4. The Chair of the Committee will typically be the research advisor. For students working in NIOSH laboratories, the student can either have their NIOSH mentor co-chair along with a regular member of the graduate faculty or the committee can be solely chaired by a regular member of the graduate faculty.
5. In compliance with the WVU Graduate Catalog, at least one member of the Committee must be from a program other than IMPGP. The outside member can be from another graduate program at WVU or another institution.

The Research Advisory Committee will monitor the student's progress throughout the graduate program, certify admission to candidacy, and evaluate the final oral examination (defense of dissertation). The Scholarship Committee and the Director of the IMPGP must approve all exceptions to the above. **The student should file the completed BSGP Committee Approval Form to the Office of Research and Graduate Education by July 31st at the end of the first year in the program.** A copy of this form will be added to the student's IMPGP permanent file.

Individual Development Plan. Prior to the annual Research Advisory Committee meeting, students should meet with their research advisor and prepare an Individual Development Plan:

(<http://www.hsc.wvu.edu/resoff/graduate-education/policies-and-forms/forms/>)

The IDP is designed to facilitate the progress of the student's research program and their future career development. The IDP must be added to the students file and submitted to the BMS Graduate office once a year together with documentation of their annual Research Advisory Committee meeting.

Scholarship Committee. The departmental Chair will annually appoint a three-member committee to oversee the progress of all students in the graduate program and administer the written preliminary examination. The Scholarship Committee will represent, as best as possible, the disciplines of Microbiology, Immunology, and Microbial Pathogenesis. The Scholarship Committee's major responsibilities are to provide an annual report on the progress of all graduate students and to oversee all written preliminary examinations (described in detail below).

Progress Assessment. Progress in the IMPGP will be assessed by regular meetings of the student's Research Advisory Committee. In addition, the Scholarship Committee will give a formal report on the progress of all students twice a year. The reports will be done at the regular faculty meeting in January after the fall semester and at the end of the spring semester, usually at the annual faculty retreat. All students will receive a letter from the Scholarship Committee informing them of their status and of any deficiencies in their file.

Initial Research Advisory Committee Meeting and Annual Committee Meetings. After the Research Advisory Committee is formed by the end of the first year, the student should have their initial research committee meeting in Fall of the second year (3rd semester). The student should present their Plan of Study for review by the Committee, have the form signed and submit to the BMS graduate office. The Plan of Study is required to be submitted to the Office of Research and Graduate Studies in the fall of the second year (3rd semester). A copy of this completed form will be added to the student's IMPGP permanent file.

The student will update the Committee on their coursework, research, and future research plans. The Research Advisory Committee must meet *at least* once every 12 months to review the academic and research progress of each graduate student. Additional meetings are at the discretion of the Committee. The 12-month period will begin when the student has chosen an advisor and officially enters a laboratory. As students join an IMPGP laboratory in the second semester, the first annual meeting should occur in the first semester of the second year (Fall). Following each meeting, the advisor will complete the Dissertation Committee Evaluation form, the student will sign to acknowledge the content and the advisor will submit it to the Office of Research and Graduate Education. A copy of these evaluations will be kept in the student's permanent

file. Students who fail to have a graduate advisory committee meeting at least once every 12 months will receive an Incomplete (I) in research. A grade of incomplete must be resolved by the end of the following semester or it will be recorded as an F. The Director of the IMPGP, the Scholarship Committee, and the Research Advisory Committee must approve exceptions to the 12-month deadline at least one month prior to the 12-month deadline.

Plan of Study. The Plan of Study should be completed after 30 hours of coursework with the required information for the required courses. All courses listed must meet the progression and graduate standards for certification for graduation. After completion, Committee members must sign the form. Any changes in the Plan of Study must be made through mutual agreement, between the student and Committee members. The student must submit a memorandum of changes to the HSC Research and Graduate Education Office. The Plan of Study is required to be submitted to the Office of Research and Graduate Studies in the fall of the second year (3rd semester). A copy of this completed form will be added to the student's IMPGP permanent file.

Grades. Students in the Immunology and Microbial Pathogenesis Graduate Program must maintain a minimum of a B (3.0/4.0) average in all attempted coursework numbered 500 or above to remain classified as a *regular graduate student*. Students who fall below this grade-point average will be reclassified as *probationary*. Probationary students have one semester to elevate their grade point average to 3.0 or better. The Research Advisory Committee of the student must approve the courses taken during the probationary semester. The courses must be at the 700 level or above. Note: MICB 796 (Graduate Seminar), MICB 785 (Journal Club), MICB 793 (Special Topics), Research (MICB 797), and Teaching Practicum (MICB 790) will NOT be used in the calculation of the GPA to determine if a probationary student will return to regular graduate student status. Return to regular status must be approved by the Director of the IMPGP. Students who do not return to regular student status in one semester will be dismissed from the program. Students may appeal this decision to the Scholarship Committee and the Director of the IMPGP who must approve all exceptions to the above.

Appeals. Students have rights to appeal grades. Information on the appeals process can be found at the HSC website: <http://www.hsc.wvu.edu/resoff/graduate-education/policies-and-forms/>

CURRICULUM

Course requirements for the degree of Ph.D.

First semester core curriculum. The first semester graduate courses are overseen by the Office of Graduate Research and Studies and are listed below.

1st Semester

Course	Code	Credits
Foundations for Contemporary Biomedical Research 1*	BMS 793A	4
Foundations for Contemporary Biomedical Research 2*	BMS 793B	4
Cellular Methods	BMS 706	1
Discussion on Scientific Integrity	BMS 700	1
Short Laboratory Experiences	BMS 791A	2

Required core courses for the IMPGP

BMS 720 Scientific Writing (2 credit hours). This course introduces students to scientific writing and requires them to write a journal article and a pre-doctoral grant proposal, based on the format used by NIH.

MICB 785 Journal Club (1 credit hour/semester of residence). Students are required to register for MICB 785 each semester of residence and are required to present at least one research paper in a regularly attended journal club each semester.

MICB 796 Graduate Seminar (1 credit hour/semester of residence). Students are required to register for MICB 796 each semester of residence and are required to present at least one seminar during each school calendar year (Fall – Spring semesters).

MICB 797 Research (as needed per semester). MICB 797 credits are recorded as Satisfactory (S) or Unsatisfactory (U) as determined by the student’s research advisor. Research advisors can provide written comments on the student’s research progress. Even with a satisfactory grade, a student can still be subjected to disciplinary action based on the written comments. Failure to remediate the issues can result in the student receiving a grade of Incomplete (I).

MICB 790 Teaching Assistant. Students are required to serve as a laboratory teaching assistant for at least two semesters during their residence in the program as needed in one of the following service courses taught by the Department of Microbiology, Immunology, and Cell Biology: MICB 801, Immunity, Infection and Disease (medical student course), MICB 702, Microbiology (dental student course), MICB 327 Parasitology, or MICB Microbiology (medical technician course). Laboratory teaching assistants provide basic laboratory instructions and introduction to laboratory exercises, assist students with laboratory exercises as needed, and grade laboratory reports. Students can choose to participate as a teaching assistant more than

two semesters especially if they are looking to increase their teaching experience for future employment.

Remaining Coursework: Additional graduate coursework to be included in the Ph.D. program may come from any department at WVU and is included at the discretion of the graduate student's research advisory committee. Although the number of graduate courses required will vary for different students, most students will be expected to complete *at least* two additional advanced graduate level courses (numbered 700 or above) beyond the basic required courses taken as part of the common core curriculum in the first year of graduate school and those listed above. One of the two advanced courses must be an IMGP advanced course (MICB 781 or MICB 791L). The second advanced course can be from another WVU graduate program. In order for a course to be classified as an advanced course, it must be approved by the Director of the IMPGP. The Research Advisory Committee can recommend additional coursework to exceed the minimum requirement. Note: MICB 796 (Graduate Seminar), MICB 785 (Journal Clubs), and MICB 790 (Teaching Assistant) do not fulfill this requirement.

Advanced graduate courses:

MICB 781 Advanced Immunology (3 credit hours)

MICB 791L Advanced Microbiology (3 credit hours)

Courses that meet the required 30 hours but do not fulfill the advanced requirement of the program:

MICB 784C Special Problems: Bacterial Pathogenesis (4 credit hours)

MICB 720 Cellular Immunology (3 credit hours)

BMS 715 Molecular Genetics (3 credit hours)

Required Credit Hours. Full time students on a stipend must register for nine or more credit hours in each of the fall and spring semesters and three or more credit hours in each summer.

Immunology and Microbial Pathogenesis Seminar Series. The Department of Microbiology, Immunology, and Cell Biology supports a regular series of extramural seminar speakers whose research is relevant to the interests of the Graduate Program in Immunology and Microbial Pathogenesis. Students are required to attend this seminar series and time will be specifically set aside for the students to meet with each invited speaker for informal discussion. The grading for the course will be specified in the course syllabus. Students are also expected to invite speakers of their choosing.

EXAMINATIONS: PRELIMINARY EXAMINATION AND CANDIDACY DEFENSE

Comprehensive Preliminary Examination. All students in the IMPGP are required to successfully pass a comprehensive preliminary examination. **The preliminary examination will be administered and completed prior to July 31 of Year 2 in the graduate program** (See timeline on page 2). Students must have a cumulative GPA of ≥ 3.0 in their graduate courses to be eligible to take the written preliminary examination. All required graduate courses from the first semester common core curriculum must be successfully completed before taking the examination. The Preliminary Examination Advisory Committee will consist of the members of the student's Research Advisory Committee but will exclude the research advisor.

The preliminary examination includes both a written and oral component and is based on two scientifically significant published papers selected by the student's Preliminary Examination Advisory Committee. Students will be provided the selected papers two weeks prior to the examination and will be excused from all laboratory work during this 2-week period. The goal of this examination is to evaluate the student's ability to synthesize information and solve problems. Students should rely on outside reading resources when preparing for the examination, and may not discuss their assigned papers with other students, postdocs, staff, or faculty. Students who have passed the preliminary examination are not permitted to provide or discuss the questions or the nature of their preliminary examination with other students.

The Preliminary Examination Advisory Committee will develop a set of questions based on the selected papers that requires the student to think beyond the content of the paper. These questions will address the two areas of emphasis of our program:

1. An immunological problem
2. A microbial pathogenesis problem

Examination questions will be reviewed by the Scholarship Committee prior to administration of the exam, to insure consistency and parity among student examinations in the program.

The preliminary examination will consist of two parts:

1) Written Exam. The first part of the examination will consist of written responses to the questions formulated by the Preliminary Examination Advisory Committee. Students will be allowed to bring the 2 papers to the exam and are allowed to use a word processing program to construct their answers. They will not be allowed to use any other material (hardcopy or electronic) to aid in their responses during the written examination period. The student will be allowed 4 hours to complete the examination.

All answers will be evaluated by each member of the Preliminary Examination Advisory Committee and by the Scholarship Committee. All members of the committee will provide feedback to the student no less than three days prior to the oral examination.

2) Oral Defense of the Preliminary Exam. After completion and preliminary grading of the written portion of the examination, the student will meet with their Preliminary Examination Advisory Committee to discuss their answers within one week of the Written Exam. It is expected that the student will address the feedback that was provided by the Preliminary Examination Advisory Committee. The members may, at their discretion, ask additional questions relevant to assessing the student's suitability to continue in the graduate program. In cases where students have exceeded expectations in the written component, committee members have the option to state that he/she is satisfied with the performance of the student and further examination is not required. This does not prevent other committee members from asking questions as they see fit. Committee members should attend the oral exam even if they plan to refrain from the oral examination.

One member of the Scholarship Committee will attend the oral exam to ensure parity between examinations for all students. The Scholarship Committee Member will only observe the exam and will not participate in the exam. Preliminary Examination Advisory Committee members are encouraged to use the second part of the examination to assess the student's ability to think through a problem and to clarify with the student's positives and negatives about their written answers.

The scored preliminary examination and recommendations (pass/fail) will be forwarded to the Scholarship Committee and the program director for further action. The Committee will consider a score of 75% on any section to be a passing performance and will use the average score for all of the questions in a given section of the examination in determining overall performance. If a student fails any section of the written preliminary examination, that section must be taken a second time within four months of the date of the first exam. However, in order for a student to retake any part of a preliminary exam, or an entire exam, an affirmative and supportive vote by the Scholarship Committee must occur. If a student does not receive this affirmative vote after having failed their first attempt at the preliminary exam, the student will be dismissed from the program. If a student fails the written examination a second time, they will be dismissed from the program. The program Director and the Scholarship Committee of the IMPGP must approve exceptions to this process. In compliance with the WVU Graduate Catalog, in no case will this examination be administered more than 3 times. The student will submit a signed and completed Doctoral Preliminary Examination form to the Office of Research and Graduate Education once the oral examination has been passed. A copy of this completed form will be added to the student's IMPGP permanent file.

Candidacy Examination.

Candidacy Research Proposal Defense. After successfully passing the comprehensive preliminary examination, students must complete an NIH style research proposal using the electronic format from the NIH to be considered for candidacy for the degree of Doctor of Philosophy. The Scholarship Committee will provide a set of specific instructions for the sections to be completed for this written portion of the candidacy examination. The proposal should be in the area of the student's proposed research and formulated in consultation with the graduate advisor. The written proposal will be presented to the student's Research Advisory Committee for review. Typically, the student will submit the proposal to the Committee within 2 weeks of the defense but this deadline is at the discretion of the Committee and the student should confirm the time-frame. The student will present the proposal at a formal research seminar. The proposal will be defended as the focal point of an oral candidacy exam administered by Research Advisory Committee. The oral examination is not limited to the research proposal and should include general questioning of the candidate to establish scientific competency. Passing performance on the candidacy examination is voted on by the committee and no more than one dissenting vote is allowable. If a student fails the candidacy examination, they must repeat the examination. A second failing mark on this examination will result in dismissal from the program. The IMPG Director, the Scholarship Committee, and the Graduate Advisory Committee must approve exceptions to this process. In compliance with the WVU Graduate Catalog, in no case will this examination be administered more than 3 times. Students are encouraged to schedule the candidacy examination by late Fall or early Spring of the third year. In all cases, successful defense of the research proposal **must occur on or before the last working day of year three, which is usually August 3 (but changes year to year)**. Students who fail to complete and pass the candidacy exam within this time frame will be dismissed.

The student will submit a signed and completed Doctoral Research Proposal Defense form to the Office of Research and Graduate Education once the oral proposal defense has been passed by the candidate. A copy of this completed form will be added to the student's IMPGP permanent file. At this point, the student is considered a "candidate" for the Ph.D. degree. The Scholarship Committee must be consulted for an accurate list of requirements for the candidacy examination and are subject to change. Below are the sections required for the proposal.

NIH F32 sections required for the candidacy proposal. The student can contact the Director of the program to acquire the necessary NIH forms.

1. NIH SF424 face page (student information)
2. Project summary
3. Project narrative
4. Bibliography
5. Facilities and other resources (include BSL biohazards)

6. Equipment
7. Biosketch
8. Specific Aims (1 page limit)
9. Research Strategy (6 page limit)
10. Vertebrate Animals
11. Budget (this is expected to be detailed)

Laboratory work schedules, vacations, and sick leave. Work schedules are to be discussed and agreed upon between the research advisor and the student. If conflicts arise due to the student not meeting work expectations, this should be discussed with the Director of the IMPGP, the Research Advisory Committee, and the Director of Graduate Recruitment. If students are unable to complete coursework, grades of incomplete will be assigned until the student is able to complete the required coursework. The HSC Graduate programs adopted a uniform leave of absence policy which covers vacations and sick leave which can be found here: <http://www.hsc.wvu.edu/resoff/graduate-education/policies-and-forms/>

RESEARCH AND PROFESSIONAL EXPECTATIONS

To fulfill the research expectations in order for a candidate to defend their dissertation and receive a Ph.D. from the program the following metrics must be met.

- 1) The candidate must be able to apply scientific method to solving research problems. The student's advisory committee will be responsible for determining that the student is sufficiently capable. Record of this progress will be measured by the yearly committee meeting reports that will be submitted to the scholarship committee and placed on file after each committee meeting.
- 2) The candidate must be proficient at discussing and defending their original research. This will be assessed during the yearly departmental seminars and other presentations of their original research.
- 3) The candidate must have at least one first author peer reviewed publication of their dissertation research (previous publications are not considered) accepted for publication before defending the dissertation. The exact publication expectations for the student are to be determined by the advisory committee.

Changing research advisors

The Handbook for the Graduate Program in the Biomedical Sciences details procedures for changing research advisors due to either: 1) the research advisor leaves WVU or 2) conflicts between the student and the research advisor. The Director of the IMPGP and the Assistant Vice President for Graduate Education

are to be notified when such situations arise to determine the plan of action for the student.

DISSERTATION REQUIREMENTS

Written Dissertation. When the agreed upon expectations of the candidate's Research Advisory Committee are sufficient (*i.e.* publications, presentations, and overall professional development), the candidate will ask for permission to write their dissertation and a time-line for submission can be established. Once permission has been granted by the committee, the student should apply for graduation with the Office of Research and Graduate Education by the semester deadline.

The form of the dissertation will be decided by the graduate advisory committee, but it must be consistent with the *WVU Guide to the Preparation of Master's Theses and Doctoral Dissertations* (<http://etd.lib.wvu.edu>) and the guidelines published in the WVU graduate catalog. All dissertations written in partial fulfillment of the requirements of any doctoral degree conferred by the WVU must be filed electronically with the WVU Libraries system according to WVU procedures. Exceptions to filing electronically must be approved by the Office of the Provost. The program recognizes that, in many cases, the form will be that of a compilation of published or completed manuscripts with the addition of an appropriate abstract, introduction, literature survey, and conclusion. For the document to be approved, there must be no more than one unfavorable vote among members of the student's committee.

A copy of the dissertation draft should be delivered to the graduate advisory committee and to the Office of Research and Graduate Studies no less than one month prior to the defense of dissertation to allow for public notice of the defense of the dissertation. The shuttle sheet request form will be submitted to the Office of Research and Graduate Education no less than two weeks prior to date of defense.

Defense of dissertation. Each candidate must present their research in an open seminar to the faculty of WVU. A public announcement of the Defense of Dissertation Seminar must be published prior to the examination date. Following the public seminar, there will be an oral defense of the dissertation to the Research Advisory Committee. Successful completion of this requirement of the program and conferral of the degree of Doctor of Philosophy is determined by: a vote of the advisory committee, approval by the Director of the IMPGP, and is subject to guidelines stated in the general graduate catalog of the WVU.

Time limit. According to the WVU Graduate Catalog guidelines doctoral candidates must complete all degree requirements within five years of achieving candidacy. The Associate Provost for Graduate Education must approve

extensions of the time limit and the student will be required to repeat the candidacy examination. Please note, that it is unlikely the Associate Provost for Graduate Education will approve time limit requests.

Conferral of degree. Completion of the final examination requires the conferral of the degree by the student's graduate advisory committee. The student must also fulfill all of the appropriate deadlines and guidelines for graduation posted by the WVU Health Sciences Center Office of Research and Graduate Studies.

Requirements for requesting a change to the Biomedical Sciences Master's program from the Ph.D. program.

1) A student who is in the Ph.D. program that fails to successfully pass the written preliminary exam at the end of the second year, or the candidacy exam, will be dismissed from the program. Students who fail either exam and would like to enter the Master's program in Biomedical Sciences must apply to the Admissions Committee in the Office of Research and Graduate Studies for admission into the Master's program.

2) A student in the Ph.D. program that has successfully passed the written preliminary exam, and is in good academic standing in the program, may request to write a thesis and defend for a Master's degree or complete a non-thesis Master's. The student's Research Advisory Committee and the Department of Microbiology, Immunology, and Cell Biology Scholarship Committee must approve the request.

3) A student in the Ph.D. program that has successfully passed the written preliminary exam, the candidacy exam, and is in good academic standing in the program, may request to write a thesis and defend for a Master's degree or non-thesis Master's. The student's Research Advisory Committee and the Department of Microbiology, Immunology, and Cell Biology Scholarship Committee must approve the request.

Requirements for Students Enrolled in the M.D.-Ph.D. Program.

Requirements for students enrolled in the WVU School of Medicine M.D.-Ph.D. program will be exactly the same as for regular Ph.D. graduate students, with the following exceptions: (1) M.D.-Ph.D. must complete the first two years of the medical school basic sciences curriculum and this will be considered equivalent to the required course component (i.e. the first year Ph.D. curriculum) (2) M.D.-Ph.D. students must have passing score on the Step 1 USMLE Board Examination taken at the end of the second year of the medical school curriculum. This will be considered the equivalent to a passing score on the written preliminary examination of the Ph.D. curriculum; (3) M.D.-Ph.D. students must serve as a teaching assistants in an approved Department of Microbiology, Immunology, and Cell Biology course at least once during their residence in the program. The Director of the IMPGP will approve which courses qualify as credit for this requirement.

CAREER OPPORTUNITIES IN THE FIELD. Most previous graduates of this program have gone to post-doctoral fellowships in academic institutions, government (NIH, NIOSH) or pharmaceutical companies. After their post-doctoral fellowships they have obtained permanent positions in academics, government, and biotechnology companies. Skills learned in this program are especially versatile because they allow students to work in most fields of cell and molecular biology, as well as more specialized areas of microbiology and immunology.

Review and Approvals

DATE: _____

This handbook was reviewed and approved upon by the faculty of the program.

John Barnett, PhD Director of the Immunology and Microbial Pathogenesis Graduate Program

F. Heath Damron, PhD Co-Director of the Immunology and Microbial Pathogenesis Graduate Program

This handbook was reviewed and approved upon by the students and candidates of the program.

1. Dudley McNitt

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3. Emel Sen Kilic

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5. Savannah Sims

6. Catherine Blackwood

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8. Kelly Monaghan

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10. Rachel Baur

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14. Nichole Mihalik

15. Rachael Rush

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