MOLECULAR MICROBIOLOGY & IMMUNOLOGY, PHD

Introduction

The goal of the PhD in MMI program (https://publichealth.jhu.edu/academics/phd-dept-of-molecular-microbiology-and-immunology/) is to train independent scientists to take leading roles in advancing our understanding of the cellular and molecular mechanisms that drive infectious and immune diseases. The specific learning outcomes listed below are designed to foster ingenuity, creativity, and critical thinking skills that will enable graduates to recognize and solve key problems in infectious and immunological diseases of public health importance.

Program Requirements

Course location and modality is found on the BSPH website (https://publichealth.jhu.edu/courses/).

There are several levels of requirements for the completion of the degree program: those set by the school, by the department, by the Thesis Advisory Committee (TAC), and by the thesis adviser. The degree requirements established by the School are contained in the Policy and Procedure Memoranda available at the Bloomberg School of Public Health (https://my.jhsph.edu/).

The requirements for MMI are explained below. A student's thesis adviser with the participation of the Thesis Advisory Committee (TAC) generally will set requirements regarding the preparation for, and completion of, the thesis or dissertation project.

Advisers

Each student is assigned an MMI faculty member who will serve as their initial Academic Adviser during the first year of training. The Academic Adviser assists the student in navigating the first year by advising on the selection of appropriate courses, providing information concerning school and departmental policies, etc. The Academic Adviser is a temporary appointment and is typically replaced by the Thesis Adviser at some point during the first academic year. A student who wishes to change their Academic Adviser should contact the Student Coordinator who will consult the GPC.

Selection of a Thesis Adviser takes place after completion of laboratory rotations (see below), generally prior to June 1. After discussion with the prospective thesis adviser, the student should submit to the Student Coordinator a completed Thesis Adviser Selection form (https://my.jhsph.edu/sites/MMI/academic-forms/default.aspx) signed by the prospective adviser for approval by the department Chair.

Note that MMI graduate students must perform thesis research in the laboratory of a faculty member who holds a primary appointment in MMI or in the laboratory of a JHU faculty member who holds a joint appointment in MMI and is designated as a trainer on an MMI training grant. **Requests for thesis advisers other than these will not be approved**.

Every effort will be made to accommodate a student's request to work with a specific faculty member for their thesis research. However, the department cannot guarantee that a student will be able to work in the laboratory that is selected as a first choice. In the event that a student's first choice cannot be met, an alternative will be arranged in consultation with the student.

Thesis Advisory Committees (TAC) and Individual Development Plans (IDP)

The Thesis Advisory Committee (TAC) meetings provide a structured opportunity for students to discuss scientific goals, research progress, and issues relevant to their project as well as to adopt an Individual Development Plan (IDP) that will support and monitor their professional and career development. The TAC, which is composed of a customized group of faculty members with expertise in the areas relevant to the student's research project, meets at least annually through the fourth year of the program and semiannually thereafter.

Each student is required to form a TAC during their second academic year. The initial TAC meeting should be scheduled by the end of the 4th term of year two and the meeting should take place no later than the end of the first term of year three. Students in their second year and beyond who do not complete the annual TAC meeting including the submission of the TAC/IDP Report will not be allowed to register in the first term of the following academic year. It is the responsibility of the student and their faculty adviser to schedule the annual meetings. The Student Coordinator should be informed of the anticipated date of the TAC meeting when it is scheduled. Note that a long lead time (months) may be needed to find a date when all TAC members are available for the meeting, and it is wise to begin the scheduling process early.

TACs consist of the student's Thesis Adviser and at least two faculty members with a primary appointment in MMI at the rank of assistant professor or higher. The highest-ranking MMI faculty member, other than the adviser, will serve as the committee chair. TACs can include additional members and participants from other departments/divisions of JHU and from other institutions are welcome. Inclusion and diversity are encouraged in TACs. Committee members should be jointly selected by the student and the thesis adviser.

TAC meetings are conducted in four parts in the following order.

Introduction by the adviser. With the student absent, the adviser should briefly introduce the student (thesis topic, year in the program, background, unusual career circumstances, or other relevant matters) and assess the student's performance relative to the adviser's expectations. Factors that may be impeding the student's progress should be raised and discussed. At the discretion of the TAC, these may be discussed with the student during the meeting.

Review of the student's progress in the program and professional development, guided by the points listed in Part B of the TAC/IDP and the experiences gained in the programs offered by the JHU Professional Development and Career Office (see page 28). Part B should be completed by the student before the meeting and furnished to the committee members at the meeting. As appropriate, the committee will discuss the student's responses to the points on the form and offer recommendations, advice, and insights into how the student might best approach their professional goals. Starting in the 3rd year special attention will be focused on the completion of the first author paper requirement. At the end of this discussion, the TAC Chair will summarize this discussion and note action items on the form. It is recognized that career goals evolve, and it is the intent that TAC/IDP reports will reflect, facilitate, and potentially guide that evolution, not constrain it. At the end of this discussion, the TAC/IDP form is signed by the committee and student and returned to the Student Coordinator.

Discussion of the scientific aspects of the student's project, beginning with a concise presentation by the student that summarizes the current status of the research project, research accomplishments during the

previous year, and an outline of research plans for the coming year. The scientific discussion is intended to provide fresh perspectives on the project, overall guidance, potential technical solutions to difficulties that have arisen, and access to expertise in varied fields. This part of the TAC meeting will be summarized at the end of the discussion by the TAC Chair in Part A of the Thesis Advisory Committee and Individual Development Plan (TAC/IDP) Report form (https://my.jhsph.edu/sites/MMI/academic-forms/default.aspx).

Discussion with the student in the absence of the adviser. At the conclusion of the discussion of the IDP, the adviser will leave the meeting to give the student an opportunity to evaluate the status of their project, the relationship with the adviser or the lab generally, and to identify measures that would enhance their educational and professional experience. Substantive issues that are revealed should be summarized in a confidential email from the TAC Chair to the GPC c/o the Student Coordinator. The TAC chair should also inform the adviser of matters that arose unless the student specifies that the discussion remains confidential.

Annual Evaluation of Progress, Performance, and Mentoring

The principal element in the training and guidance of graduate students is the interaction with their Thesis Adviser. Such mentoring commonly occurs on an ongoing basis involving frequent informal discussions, lab meetings, etc. However, a formal mechanism of evaluation of performance and of satisfaction of both the adviser and student is valuable in many cases. Annual progress, performance, and mentoring meetings between each student and their mentor guided by the Annual Evaluation of Progress, Performance, and Mentoring (AEPPM) form ensure that such formal performance and satisfaction discussions occur in MMI. Once per year, a month prior to the TAC meeting, each student is required to complete this document (available on the MMI departmental portal) and to discuss it with their Thesis Adviser. Following that discussion, the form signed by the student and Thesis Adviser should be returned to the Student Coordinator. The signed form must be turned in prior to the TAC meeting. Completed forms are reviewed by the GPC with the object of identifying developing problems. This mechanism is intended to foster frank discussions between the student and adviser and will be of value only if the student's answers and the adviser's responses during the following discussions are honest. Note: A GPC committee member will be added to the TAC starting in year 5 if graduation is not scheduled.

Laboratory Rotations

Rotation periods broaden a student's knowledge of laboratory techniques and skills, provide exposure to a variety of research areas, help in selecting a laboratory for thesis research, provide an opportunity for interaction with several faculty members, and develop the ability to carry out a research project. During a laboratory rotation, a student will be given a specific research problem of limited scope as their rotation exercise. At the end of the laboratory rotation term, the student will give a short oral presentation on the project at the Research Forum in Molecular Microbiology and Immunology (see below). Students are encouraged to discuss expectations (time and effort spent, etc.) with the rotation supervisor early in the rotation.

NOTE: Animal protocols; radiation licenses; pathogen, and recombinant DNA registrations. Any rotating student who participates in animal experiments must be added to the appropriate animal protocol before beginning work. While it is the responsibility of the Principal Investigator (PI) of the protocol, students working with the PI prior to the start of the rotation should make sure that they are included on the protocol(s) will prevent costly delays. Students also must complete online animal research training and must enroll in the Animal Exposure Surveillance Program prior to beginning work. Students must also be added to radiation licenses, pathogen registration and recombinant DNA registration, and human IRBs by the PI as required. In general, training in procedures is required for work with these agents or human samples.

Doctoral students are required to rotate through at least three (3) laboratories of faculty members who hold primary appointments in MMI or who are designated as members of the MMI training faculty.

MMI ScM students who matriculate to the PhD program are required to complete a total of 3 rotations over the course of both programs. These rotations must be in different departmental laboratories.

Each laboratory rotation lasts about 8 weeks. The rotation starting and ending dates are listed in the table below. Because laboratory rotations do not correspond to standard academic terms, **students should register for PH.260.851 Laboratory Rotations during the second, third, and fourth terms.**

MMI Laboratory Rotation Schedule

Rotation Period	Dates	Register in Term
First	11/3/25 - 1/16/26	2
Second	1/19/26– 3/13/26	3
Third	3/23/26 – 5/15/26	4

The selection of laboratories for rotations is the responsibility of the student. Students (with the assistance of their academic adviser) should identify potential laboratories for their rotations and consult with the faculty members in charge of these laboratories to arrange a rotation for a particular academic term.

Students may conduct rotations in addition to the three required to explore other laboratories or to learn particular laboratory techniques or skills. These extra rotations may be conducted in departmental laboratories or in labs outside the MMI training faculty. Because PhD students must conduct thesis research in a laboratory within MMI or in the laboratory of a designated MMI trainer, rotations outside such labs should **not** be considered a means for identifying potential thesis research laboratories.

It is expected that substantial time will be spent in the laboratory during each rotation. It is critical that the student and rotation supervisor discuss this issue and reach an agreement on their mutual expectations. In the case of questions on this point, seek the advice of the MMI Ombuds, the GPC chair, or any MMI faculty member.

At the conclusion of each rotation, the student and the rotation supervisor will complete a rotation report (https://my.jhsph.edu/sites/MMI/academic-forms/default.aspx) that will be turned in to the student coordinator. A copy of the form can be found on the MMI portal at: .

STUDENT Selection OF A Research Training Lab

Once the POE has been passed (see pages 23-24), the student needs to complete a **Thesis Research Documentation Form** that will be sent from the Dean's Office, which must be filled out **within 6 months of passing the POE.** It is the student's responsibility to ensure that the necessary research approvals are obtained (either IRB for human subjects research or ACUC for animal research) on the appropriate approved protocol(s). Retroactive research approval for research involving human subjects and/or animals **cannot**, under any circumstance, be granted. Failure to

obtain research approval will prevent a student from publishing their thesis/dissertation.

MMI guidelines request that 1st year PhD students choose a research adviser by no later than June 1st to ensure that any payroll change deadlines are met.

Research Forum and Laboratory Rotation Presentations

PhD students are required to give an oral presentation of their research. During the first year, the student will present the results of their rotation projects. These oral presentations will be delivered during the weekly Departmental Research Forum. Rotation presentations are 20 minutes long and thesis research presentations are 30 minutes long. Suggested organization of presentations:

1. Introduction - Present the background and rationale of the work and outline the working hypothesis.
2. Experimental Design - Describe the overall experimental approach.
3. Results/Discussion - Results should be presented in an organized, meaningful, and comprehensible manner.
4. Summary/Conclusion - Provide a short summary of the results and give an indication of future research directions.

An evaluation form (available from the departmental web portal and the TA) will be completed by two students and two faculty and returned to the student to provide constructive comments to improve future presentations.

Course location and modality is found on the BSPH website (https://publichealth.jhu.edu/courses/).

Required Courses

All MMI required courses must be passed with a grade of A or B. Students not meeting that standard must repeat the relevant course(s) and pass with an A or B. A student who earns a grade below that threshold in a course that meets a core requirement must, at the next opportunity, make a second attempt to complete the core course by repeating the same course or by completing another course that has been approved by the GPC Chair. A grade below the threshold on the second attempt may be grounds for dismissal and must be reported to the School's Committee on Academic Standards.

First year students must register for **16-22 credits each term**. Students in their 2nd year and beyond should register for a maximum of 16 credits. First year students should register for PH.260.851 Laboratory Rotations in terms 2, 3, and 4. (See Laboratory Rotations (p. 2), above).

The required core curriculum necessitates that each student takes:

- Principles of Immunology I & II and the companion courses Topics in Immunology I & II.
- At least three of the following four microbiology courses: Fundamental Virology (260.623), Biology of Parasitism (260.635), Pathogenesis of Bacterial Infections (260.627), Vector Biology and Vector Borne Diseases (260.650).
- At least two R3 core courses (currently How do we know? Theory & Practice of Science (260.700), Anatomy of Scientific Error (260.701) and Causation (260.844)).
- Cells-to-Society Learning Objectives (see table below).
- Completion of the R3 Certificate (see table below):
  - To fulfill this R3 minimum requirement students are allowed to choose two out of three from the following R3 core courses, which are offered several times per year.
    - How do we know? Theory & Practice of Science (260.700)
    - Anatomy of Scientific Error (260.701)
    - Causation (260.844)
  - Please note that a minimum of two core courses from the R3 Curriculum are required for all MMI doctoral students, regardless of their chosen track.
- The R3 Certificate is required to be completed by all MMI doctoral students within their first 2-3 years who want to be considered for an F31 fellowship (https://researchtraining.nih.gov/programs/fellowships/F31/) under the MMI training grant or for the Katharine E. Welsh Scholarship award of the MMI R^{3}IM PhD Track.

In addition, students are required to register for Research Forum in MMI (Monday noon research presentations) and Seminars in Research in MMI (Thursday departmental noon seminar) each term.

Outlined below is an example of a representative curriculum taken in the first and second years of the program. Depending on interests and background, the details of a student's specific curriculum can vary from the prototype outlined below. Students should consult their academic adviser prior to registering for courses.

NOTE: Students in the R^{3}IM Track – go to R^{3}IM Required Courses below.

Requirements for General PhD Program

First-Year Course Requirements

Course	Title	Credits
First Term		
Summer		
Introduction to Online Learning: https://courseplus.jhu.edu/core/index.cfm/go/course.home/cid/90 (https://courseplus.jhu.edu/core/index.cfm/go/course.home/cid/90/)/ (non-credit)		
First Term		
PH.550.860	Academic & Research Ethics at BSPH	0
PH.260.623	Fundamental Virology	4
PH.260.607	Methods in life sciences, literature and practice	2
PH.260.611	Principles of Immunology I	4
PH.260.801	Topics in Immunology I	1
PH.260.700	How Do We Know? - Theory, History, and Practice of Science	3
(See R3 Course Offerings for a full list)		
PH.552.6XX	Cells-to-Society (p. 4)	Varies
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1
PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
	Credits	**16**
Second Term		
PH.260.635	Biology of Parasitism	5
PH.260.612	Principles of Immunology II	3
PH.260.802	Topics in Immunology II	1
ME.260.709	Molecular Biology and Genomics (Molecular Biology and Genomics)	3

PH.260.607	Methods in life sciences, literature and practice	2
PH.260.701	Anatomy of Scientific Error,Anatomy of Scientific Error - Meta-Science in Research Practice	3
(See R3 Course Offerings for a full list)		
PH.260.851	Laboratory Rotations (Variable credits)	4 - 8
PH.552.6XX	Cells-to-Society (p. 4)	Varies
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1
PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
	Credits	**23-27**
Third Term		
PH.260.627	Pathogenesis of Bacterial Infections	4
ME.110.728	Cell Structure and Dynamics (Cell Structure and Dynamics)	3
PH.260.607	Methods in life sciences, literature and practice	2
PH.260.650	Vector Biology and Vector-Borne Diseases	3
PH.260.851	Laboratory Rotations (Variable credits)	4 - 8
PH.552.6XX	Cells-to-Society (p. 4)	Varies
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1
PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
	Credits	**18-22**
Fourth Term		
PH.260.851	Laboratory Rotations (Variable credits)	4 - 8
PH.552.6XX	Cells-to-Society (p. 4)	Varies
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1
PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
	Credits	**6-10**
	Total Credits	**63-75**

Second year and beyond, PhD students should continue to register for a minimum of 16 credits per term, including courses (if any), 1 credit for Research Forum (260.821), 1 credit for Seminars in Research (260.822), and Thesis Research (260.820). PhD students must also register for summer term: 12 credits Summer Thesis Research (260.829.)

Electives

PhD students are strongly advised to take at least one departmental advanced course during each of the third and fourth terms of their first year. The specific courses taken should be chosen after discussion between the student and their adviser. Generally, these courses will include at least one in the area in which the student expects to conduct their thesis research.

Cells-to-Society Requirements for All Degree Programs

The Council on Education for Public Health (CEPH) requires didactic coursework covering and assessing 12 CEPH-defined Introductory Public Health Knowledge Learning Objectives. It is important to emphasize that this is a School-level requirement of all degree programs.

The School's Committee on Academic Standards approved 12 online, 0.5 credit, mini-courses, graded S/U (satisfactory/unsatisfactory) that will cover each of the 12 Learning Objectives (see table below). Each of the mini-courses consists of 3-5, 30-40 minute presentations with an accompanying assessment. **Note:** Certain learning objectives can be fulfilled by taking a course that covers this material instead of the mini-course (see the right-hand column in the table below).

Each of the C2S mini-courses will be offered several times each year, starting in the summer term. The schedule is here.

Please note that for the presentation of these mini-courses, each term has been split into an A section covering the first 4 weeks of the term and a B section that covers the second 4 weeks of the term.

These 12 mini-courses must be completed by the end of the first academic year.

Code	Title	Credits
PH.552.601	Foundational Principles of Public Health	0.5
PH.552.602	The Role of Quantitative Methods in Public Health (or take any of the following courses: 140.611-12 (term 1 and 2) or 140.615-16 (term 3 and 4) or 260.705 (term 3 or term 4))	0.5
PH.552.603	The Role of Qualitative Methods and Science in Describing and Assessing a Population's Health (or take 260.700 (term 1 or term 3))	0.5
PH.552.604	Causes and Trends in Morbidity and Mortality (or take 260.600 (summer, credit in term 1) or 260.844 (term 2 or term 4))	0.5
PH.552.605	The Science of Primary Secondary and Tertiary Prevention in Population Health	0.5
PH.552.606	The Critical Importance of Evidence in Advancing Public Health Knowledge (or take 260.700 (term 1 or term 3))	0.5
PH.552.607	Essentials of Environmental Health	0.5
PH.552.608	Biologic, Genetic and Infectious Bases of Human Disease (or take 260.600.81 in summer (credit in term 1))	0.5
PH.552.609	Psychological and Behavioral Factors That Affect A Population's Health	0.5
PH.552.610	The Social Determinants of Health	0.5
PH.552.611	Globalization and Population Health (or take 260.844 (term 2 or term 4))	0.5
PH.552.612	Essentials of One Health	0.5
Total Credits		**6**

Second-Year Course Requirements

Course	Title	Credits
First Term		
PH.550.600	Living Science Ethics - Responsible Conduct of Research	1
PH.260.820	Thesis Research Molecular Microbiology and Immunology (Variable credits)	1 - 22
PH.140.611	Statistical Reasoning in Public Health I	3
PH.260.617	Scientific Grant Writing - Project Development	3
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1

PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
	Credits	**10-31**
Second Term		
PH.260.625	Scientific Grant Writing - Build a Compelling Grant Proposal	2
PH.260.730	Civility, Inclusion, and Professionalism in the Workplace	1
PH.260.820	Thesis Research Molecular Microbiology and Immunology (Variable credits)	1 - 22
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1
PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
	Credits	**6-27**
Third Term		
PH.260.820	Thesis Research Molecular Microbiology and Immunology (Variable credits)	1 - 22
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1
PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
Select one of the following: [1]		4-8
PH.140.615	Statistics for Laboratory Scientists I (Recommended)	
PH.140.611 & PH.140.612	Statistical Reasoning in Public Health I and Statistical Reasoning in Public Health II	
PH.140.621 & PH.140.622	Statistical Methods in Public Health I and Statistical Methods in Public Health II	
	Credits	**7-32**
Fourth Term		
PH.260.820	Thesis Research Molecular Microbiology and Immunology (Variable credits)	1 - 22
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1
PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
	Credits	**3-24**
	Total Credits	**26-114**

[1] All BSPH doctoral degree candidates are required to take coursework in biostatistics. The required biostatistics course is 140.611 Statistical Reasoning in Public Health 1. (140.612, Statistical Reasoning in Public Health 2 is recommended, yet not required). Other recommended statistics coursework includes PH.140.615/616 Statistics for Laboratory Scientists I and II; PH.260.705 Fundamentals of Quantitative Reasoning; PH.140.638 Analysis of Biological Sequences; PH.140.688 Statistics for Genomics; ; 140.621/622 Statistical Methods in Public Health 1 & 2.

Second year and beyond, PhD students should continue to register for a minimum of 16 credits per term, including courses (if any),

- 1 credit for PH.260.821 Research Forum in Molecular Microbiology and Immunology,
- 1 credit for PH.260.822 Seminars in Research in Molecular Microbiology and Immunology, and
- PH.260.820 Thesis Research Molecular Microbiology and Immunology.

PhD students must also register for summer term:

Code	Title	Credits
PH.260.829	Summer Thesis Research	12
Total Credits		**12**

Additional Course Requirements

PhD students must complete the online course Academic and Research Ethics (550.860.82) in the first term they are enrolled. Additionally, PhD students must take Living Science Ethics – Responsible Conduct of Research (550.600, 1st term) or Research Ethics and Integrity (306.665, 3rd term.) These courses are usually taken during the second year and must be taken prior to taking the Preliminary Oral Exam (POE.)

**All BSPH doctoral degree candidates are required to take coursework in biostatistics. The required biostatistics course is 140.611 Statistical Reasoning in Public Health 1. (140.612, Statistical Reasoning in Public Health 2 is recommended, yet not required). Other recommended statistics coursework includes PH.140.615/616 Statistics for Laboratory Scientists I and II; PH.260.705 Fundamentals of Quantitative Reasoning; PH.140.638 Analysis of Biological Sequences; PH.140.688 Statistics for Genomics; 140.621/622 Statistical Methods in Public Health 1 & 2.

R3 Course Offerings – Online (.81) and blended (.60) R3 courses by Term

Code	Title	Credits
First Term		
PH.550.860	Academic & Research Ethics at BSPH	
PH.260.607	Methods in life sciences, literature and practice	2
PH.260.611	Principles of Immunology I	4
PH.260.700	How Do We Know? - Theory, History, and Practice of Science	3
PH.260.707	Evidence-Based Teaching in the Biomedical and Health Sciences: Foundations	3
PH.260.713	R3 Writing Seminar for Graduate Students	1
PH.260.801	Topics in Immunology I	1
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1
PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
PH.260.720	Communications Primer for the Public Health Sciences	1
Second Term		
PH.260.612	Principles of Immunology II	3
PH.260.701	Anatomy of Scientific Error,Anatomy of Scientific Error - Meta-Science in Research Practice	3
PH.260.708	Evidence-Based Teaching in the Biomedical and Health Sciences – Practice	3
PH.260.710	Communication Practice for Health Science Professionals	3
PH.260.713	R3 Writing Seminar for Graduate Students	1
PH.260.715	Unleash Your Writing Superpower: Crafting Clear, Concise and Persuasive Prose	3

PH.260.720	Communications Primer for the Public Health Sciences	1
PH.260.802	Topics in Immunology II	1
PH.260.844	Causation	3
PH.260.851	Laboratory Rotations	4 - 8
Third Term		
PH.260.704	Critical Dissection of the Scientific Literature: Taking the Scalpel to Journal Articles	3
PH.260.705	Fundamentals of Quantitative Reasoning in the Biomedical and Health Sciences	3
PH.260.713	R3 Writing Seminar for Graduate Students	1
PH.260.720	Communications Primer for the Public Health Sciences	1
Fourth Term		
PH.260.705	Fundamentals of Quantitative Reasoning in the Biomedical and Health Sciences	3
PH.260.710	Communication Practice for Health Science Professionals	3
PH.260.713	R3 Writing Seminar for Graduate Students	1
PH.260.812	The Performance of Leadership: Foundations	2
PH.260.844	Causation	3
PH.260.848	Community-Based Practice Through Civic Engagement	2

Distribution Requirement

The School requires PhD students to complete a minimum of 18 credits in formal courses outside their own department with no fewer than nine (9) of these credits taken in the Bloomberg School of Public Health. All 18 credits must be taken for a grade (Pass/Fail is not acceptable). Credits earned for Molecular Biology and Genomics and Cell Structure and Dynamics count toward the required credits outside of MMI, as do credits earned for biostatistics. Credits for Academic and Research Ethics, Responsible Conduct of Research and Cells to Society are counted as separate School requirements and are not included in the 18-credit requirement.

Academic Performance and Academic Probation

PhD students are required to maintain a 3.0 grade point average or better. Students who do not satisfy this and other academic requirements will be placed on Academic Probation by the GPC. Formal notification of Academic Probation generally will be accompanied by conditions that the student must fulfill in order to be returned to good academic standing. Students who fail to meet those conditions may be dismissed from the program. Students cannot graduate with a GPA lower than 3.0.

Winter and Summer Institute Courses

Tuition for these courses is charged separately by the School of Public Health Registrar and is not covered by tuition paid during the academic year. Students wishing to take any of these courses may do so at their own expense.

Certificate Programs

There are several certificate programs offered by the School in specific areas of public health that have fewer course requirements than formal degree programs. Certificate programs are focused academic training programs designed to appeal to students seeking targeted education in a specific area of public health. Educational objectives, admission requirements, courses of study, and other information are provided for each certificate program and can be found here.

R3 Certificate

This certificate is required for all MMI doctoral students within their first 2-3 years, who want to be considered for an F31 fellowship (https://researchtraining.nih.gov/programs/fellowships/F31) under the MMI training grant or for the Katharine E. Welsh Scholarship award of the MMI R3IM PhD Track.

Offered by the MMI-based R3 Center for Innovation in Science Education (R^3ISE), the R3 Certificate is unique to JHU and aims to help students develop outstanding scientific thinking, analysis, ethical decision-making, as well as professional skills for being role models in a wide range of science-based careers. R3 stands for Rigor, Reproducibility, and Responsibility, which are the cornerstones of good scientific inquiry. The R3 Certificate's required and elective courses center around the philosophical underpinnings of how science works, from bench research to public health. Suggested R3 courses counting towards this Certificate are indicated in the sample curriculum list above, as well as the R3IM PhD track curriculum (see page 16). The full R3 certificate completion requirements can be found here (https://e-catalogue.jhu.edu/public-health/certificates/rigorreproducibilityandresponsibilityinscientificpractice/).

Tropical Medicine Certificate

This certificate program is designed to provide training in tropical medicine and related public health issues through a multidisciplinary approach. It is also designed to prepare participants for working with current and emerging health problems in developing countries and health problems of travelers. This program focuses broadly on issues of tropical health and on clinical tropical medicine. Toward the program's conclusion, students will have acquired a strong scientific basis for preventing, diagnosing, treating, and controlling tropical health problems. The full Tropical Medicine Certificate completion requirements can be found here (https://e-catalogue.jhu.edu/public-health/certificates/tropical-medicine/).

Teaching Assistant

Teaching Assistant positions provide students with an opportunity to develop their teaching and interpersonal skills, to work professionally with faculty and fellow students, and to contribute service to the Department.

Policy: The policy for MMI PhD students serving as teaching assistants is currently being evaluated to ensure that it is compliant with the TRU-UE JHU Collective Bargaining Agreement.

TA Training: Students are required to complete the TA training during their first year in the program. The TA training course is offered twice per year- July-December and January-June. The academic program administrator will verify the student has completed the training prior to starting a TA position.

Additional Opportunities:
Gordis Teaching Fellowship
Teaching Academy- Preparing Future Faculty Program

R ^{3}IM Track - Required Courses

All MMI required courses must be passed with a grade of A or B. Students not meeting that standard must repeat the relevant course(s) and pass with an A or a B. A student who earns a grade below that threshold in a course that meets a core requirement must, at the next opportunity, make

a second attempt to complete the core course by repeating the same course or by completing another course that has been approved by the GPC Chair. A grade below the threshold on the second attempt may be grounds for dismissal and must be reported to the School's Committee on Academic Standards.

First year students must register for 16-22 credits each term. Students in their 2nd year and beyond should register for a maximum of 16 credits.

First year students should register for 260.851 Laboratory Rotation in terms 2, 3, and 4. (See Laboratory Rotations table).

Please note: The R3 Certificate is included in the curriculum below, i.e., MMI doctoral students completing the R3IM PhD track are automatically granted the R3 Certificate.

Course	Title	Credits
First Year		
Summer Term		
Introduction to Online Learning: https://courseplus.jhu.edu/core/index.cfm/go/course.home/cid/90 (https://courseplus.jhu.edu/core/index.cfm/go/course.home/cid/90/)/ (non-credit)		
	Credits	**0**
First Term		
PH.550.860	Academic & Research Ethics at BSPH	
PH.260.621	Introduction to the Biomedical Sciences I	2
PH.260.700	How Do We Know? - Theory, History, and Practice of Science	3
PH.260.611	Principles of Immunology I	4
PH.260.801	Topics in Immunology I	1
PH.260.607	Methods in life sciences, literature and practice	2
PH.552.6XX	Cells-to-Society (p. 4)	Varies
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1
PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
Choose at least 1 of the courses below:		
PH.260.623	Fundamental Virology [1]	
PH.120.602	Concepts of Molecular Biology	
PH.260.636	Evolution of Infectious Disease	
PH.260.707	Evidence-Based Teaching in the Biomedical and Health Sciences: Foundations	
PH.260.713	R3 Writing Seminar for Graduate Students	
	Credits	**14**
Second Term		
PH.260.622	Introduction to the Biomedical Sciences II	2
PH.260.701	Anatomy of Scientific Error,Anatomy of Scientific Error - Meta-Science in Research Practice [2]	3
PH.260.612	Principles of Immunology II	3
PH.260.802	Topics in Immunology II	1
PH.260.710	Communication Practice for Health Science Professionals [3]	3
PH.260.607	Methods in life sciences, literature and practice	2
PH.260.851	Laboratory Rotations	4 - 8
PH.552.6XX	Cells-to-Society (p. 4)	Varies
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1
PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
Choose at least 1 of the courses listed below:		
PH.260.635	Biology of Parasitism	
ME.260.709	Molecular Biology and Genomics (Molecular Biology and Genomics)	
PH.260.710	Communication Practice for Health Science Professionals	
PH.260.844	Causation [4]	
PH.260.715	Unleash Your Writing Superpower: Crafting Clear, Concise and Persuasive Prose [5]	
PH.260.713	R3 Writing Seminar for Graduate Students	
PH.260.709	Evidence-Based Mentoring	3
PH.187.632	Molecular Toxicology	
PH.140.638	Analysis of Biological Sequences	
PH.223.662	Vaccine Development and Application	
	Credits	**23-27**
Third Term		
PH.260.705	Fundamentals of Quantitative Reasoning in the Biomedical and Health Sciences (Fundamentals of Quantitative Reasoning in the Biomedical and Health Sciences)	3
PH.260.607	Methods in life sciences, literature and practice	2
PH.260.851	Laboratory Rotations	4 - 8
PH.552.6XX	Cells-to-Society (p. 4)	
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1
PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
Choose at least 2 of the courses listed below:		
PH.260.627	Pathogenesis of Bacterial Infections	
PH.260.650	Vector Biology and Vector-Borne Diseases	
PH.260.656	Malariology	
ME.110.728	Cell Structure and Dynamics (Cell Structure and Dynamics)	
PH.140.615	Statistics for Laboratory Scientists I	
PH.260.704	Critical Dissection of the Scientific Literature: Taking the Scalpel to Journal Articles	
PH.260.713	R3 Writing Seminar for Graduate Students	
PH.221.700	Public Engagement Practices for Scientists (Peps) in International Settings	
PH.306.665	Research Ethics and integrity	
	Credits	**11-15**
Fourth Term		
PH.260.844	Causation [4]	3
PH.260.851	Laboratory Rotations	4 - 8
PH.552.6XX	Cells-to-Society (p. 4)	
PH.260.821	Research Forum in Molecular Microbiology and Immunology	1

PH.260.822	Seminars in Research in Molecular Microbiology and Immunology	1
Choose at least 1 of the courses listed below:		
PH.260.658	Advanced Malariology	
PH.260.710	Communication Practice for Health Science Professionals	
PH.260.701	Anatomy of Scientific Error,Anatomy of Scientific Error - Meta-Science in Research Practice	
PH.140.616	Statistics for Laboratory Scientists II	
PH.260.713	R3 Writing Seminar for Graduate Students	
PH.340.618	Epidemiology: the Basics	
PH.120.627	Stem Cells and the Biology of Aging and Disease	
PH.140.688	Statistics For Genomics	
PH.260.848	Community-Based Practice Through Civic Engagement	
PH.187.625	Animals in Research: Law, Policy, and Humane Sciences	
PH.260.812	The Performance of Leadership: Foundations	
PH.223.687	Vaccine Policy Issues	
	Credits	**9-13**
	Total Credits	**57-69**

1) First year students must take **at least three out of the following four microbiology** courses: PH.260.623 Fundamental Virology; PH.260635 Biology of Parasitism; PH.260.627 Pathogenesis of Bacterial Infections; PH.260.650. Vector Biology and Vector Borne Diseases. If of interest, students have the option to take any of the microbiology courses that could not be taken in AY 1 as an AY 2 elective.

2) MMI PhD students are required to take two molecular and cell biology courses taught at the School of Medicine – Molecular Biology & Genomics (ME 260.709); Cell Structure & Dynamics (ME.110.728)

3) The required course 260.701 Anatomy of Scientific Error is suggested for AY 1 yet can be taken in AY2.

4) The required course 260.710 Communications Practice for Health Science Professionals can be taken in AY 1,2 or 3.

5) The required 260.844 Causation course is suggested for Term 4 of AY1 or during year 2.

6) The required course 260.715 Unleash your Writing Superpower can be taken during AY 1, 2, or 3.

7) All BSPH doctoral degree candidates are required to take coursework in biostatistics. The required biostatistics course is 140.611 Statistical Reasoning in Public Health 1. (140.612, Statistical Reasoning in Public Health 2 is recommended, yet not required). Other recommended statistics coursework includes PH.140.615/616 Statistics for Laboratory Scientists I and II; PH.260.705 Fundamentals of Quantitative Reasoning; PH.140.638 Analysis of Biological Sequences; PH.140.688 Statistics for Genomics; 140.621/622 Statistical Methods in Public Health 1 & 2.

R3 certificate requirement for support on the Molecular and Cellular Basis of Infectious Diseases (MCBID) T32 training grant

The MCBID T32 training grant typically has slots open each year to support MMI PhD students. PhD students who are working in the laboratory of a training grant preceptor can apply for up to two years of training grant support. To receive support, students must commit to completing the R3 certificate program (https://e-catalogue.jhu.edu/public-health/certificates/rigorreproducibilityandresponsibilityinscientificpractice/) as described. The R3 certificate will be considered a PhD degree requirement for students who are supported by the MCBID T32.

DEPARTMENTAL COMPREHENSIVE EXAMINATION (PhD COMPS)

The School requires a departmentally-administered written comprehensive examination for students in doctoral degree programs. In MMI, the comprehensive examination is intended to test the student's grasp of basic factual material necessary for PhD-level research in molecular microbiology and immunology and their ability to integrate the information obtained in the several disciplines of departmental interest. The examination also assesses each student's ability to identify important scientific problems and formulate hypotheses and plausible experimental approaches to testing those hypotheses.

The MMI comprehensive exam will be administered during the first two terms of the second year and will be in the form of a NIH F31 research proposal on a currently active topic relevant to first-year coursework. Since this exam is administered after students join a thesis laboratory, it is expected that students will choose a topic related to their thesis research. It is also expected that students will make use of the grant writing course to develop proposal text and will ultimately be able to apply for fellowship funding on this proposal topic.

The student's written proposal will be evaluated by a Comprehensive Exam Committee (CEC) of three MMI faculty who are chosen by the GPC according to the timeline below. This is an examination. Thus, the written proposal must be the student's own work. However, students must select the proposal topic in consultation with their Thesis Adviser and will receive the CEC's comments on their outline/description (see below). Additionally, students are encouraged to discuss their original ideas, concepts, experimental approaches, etc. with advisers, faculty and colleagues at whatever length. Members of the CEC will not evaluate the written proposal before submission. The GPC suggests that students hold at least three substantive meetings with their adviser(s): prior to topic selection, before finalization of the outline/description, and during preparation of the proposal document.

Summary of the Comprehensive Examination Process

- Students select a topic in consultation and with the approval of their Thesis Adviser.
- Submit an email stating the topic, cc'd to the thesis adviser, to the Student Coordinator.
- The GPC will appoint a CEC of three MMI faculty members.
- Students submit an outline or brief description of their topic (about 1 page) to their CEC and to the Student Coordinator. The CEC will comment on the proposed content and organization of the proposal. If necessary, a student's adviser will assist in revision of the outline.

- Provide copies of the finished proposal in NIH F31 format to each CEC member. The CEC will grade the proposal.

MMI PhD Comprehensive Examination Timetable

Steps	Dates	Who is Responsible?
Letter stating topic due to Student Coordinator	9/8/2025	Student
Review Committee appointed	9/22/2025	GPC
Outline/description due	9/29/2025	Student
Committee response to student	10/13/2025	Adviser/Committee
Final review due	12/1/2025	Student
Grades/request for revision due from committee members	12/15/2025	Committee members
Oral examinations completed	1/12/2026	Student/Committee

Written Component

The proposal will be graded Pass/Conditional Pass/Fail in its entirety on criteria that include:

- Significance to the field
- Innovation
- Quality of the background literature review, including inclusion of primary literature, depth and synthesis of the review, and inclusion of recent literature
- Clarity and precision of writing
- Quality of proposed experimental approaches

CEC members will grade the proposal, meet to discuss the critiques and determine the outcome, and the Chair, on behalf of the CEC, will inform the student of a Pass, Conditional Pass, or Fail. A Conditional Pass constitutes revisions that the CEC has decided would help the student improve the quality of the proposal. The student can make these corrections and resubmit the proposal to the CEC any time before the Final Revisions deadline.

A Fail indicates that substantial revisions are required and that the student should use the entire period before the Final Revisions deadline to make these changes. If the revised document receives a failing grade, the GPC will meet to consider the student's dismissal from the PhD program.

Oral Component

The oral exam will consist of a brief (10-15 minute) oral summary of the review topic, followed by questions from the committee. Students are strongly encouraged to use PowerPoint, Keynote, or similar software in presenting their summary. During the exam, questions will address topics both related to and outside the immediate subject area of the proposal to assess the student's breadth of understanding of material presented in required coursework, departmental seminars, and research forum. The oral exam will be one to two hours long. The student is responsible for reserving a room for the exam (the Student Coordinator can assist if needed).

Preliminary Oral Examination

Note: PH.550.600 Living Science Ethics - Responsible Conduct of Research **and the 552.6XX Cells-to-Society series must be completed before taking the POE.**

The purpose of the preliminary oral examination (POE), an exam required by the University for all PhD candidates, is to determine whether the student has the depth and breadth of scientific and technical knowledge to undertake dissertation research. Examiners will be concerned with the student's reasoning ability; depth and breadth of knowledge; and ability to develop and conduct research leading to a completed thesis or dissertation. The POE is conducted by a committee of examiners usually selected by the student's adviser according to eligibility rules set by the university (link below). Note that the student's adviser, or co-adviser of record, is NOT a member of the POE committee. Diversity and inclusion are encouraged on the POE and any student who would like to include a faculty member from outside of the University, including faculty members from groups underrepresented in the biomedical sciences, on the POE voting committee, may do so by having their adviser seek appointment of the outside faculty member to a Senior Associate position at the BSPH. Appointment as a Senior Associate must be requested in a letter by the Department Chair in a nomination letter to the Dean, for vote by the School's Advisory Board. A copy of the external faculty member's CV (in BSPH CV format) must be included.

The POE must be scheduled by February 1 and completed by May 31 in the student's second year. The student is responsible for arranging for a room for the exam.

The PPM (https://my.jhsph.edu/Resources/PoliciesProcedures/ppm/PolicyProcedureMemoranda/Academic_Programs_03_Doctor_Of_Philosophy_Degree_071717.pdf) describing the preliminary oral exam process: .

The preliminary oral examination form is available using the Exam Request System (https://solutions.jhu.edu/ers/Pages/default.aspx) (ERSP).

Please note that the POE form must be must be filled out using the ERS system at least six weeks prior to the exam.

At least two weeks prior to the scheduled date of the exam, the student should make their Grant Writing Course proposal available to the committee members. This is for background purposes and the proposal will not be evaluated as part of the exam by committee members nor will the examination be confined to topics related to the proposal.

Conduct of the Exam

The student's adviser does not participate in the student's POE. However, in the student's absence, the adviser will provide a brief overview of the student's research progress to the committee prior to the start of the POE.

The student may prepare a short talk (5 min) based on their proposal and/or their anticipated research project to serve as an introduction to the examination. If a presentation is made, students are strongly encouraged to make use of PowerPoint, Keynote, or similar presentation software.

Exams last 1 to 2 hours. After the exam, a form indicating the outcome (Pass, Conditional Pass, or Fail) will be filled out by the examiners and returned to the School of Public Health Registrar. It is suggested that the POE Committee Chair inform the student's PI of issues that arose in the course of the exam. In particular, if the outcome of the exam is a

Conditional Pass or Failure, the advisor will require this information to assist the student in correcting deficiencies.

Requirement for a Conditional Pass includes demonstration of a limited deficiency in a specific area. Examples of acceptable requirements that can be used to fulfill a Conditional Pass include:

1. Reading assigned literature in the area of deficiency and taking an oral examination on the subject material; and
2. Reading assigned literature in the area of deficiency and writing a review paper to be read by one or more POE committee members.

The requirement for a Fail includes demonstration of a significant deficiency in two or more areas. Receipt of a Fail requires retaking the POE. A student who receives a Fail on a POE will be granted one additional try to pass the POE. Two Fails on the POE will result in termination from the PhD program.

After the completion of the preliminary oral exam, PhD students will be required to complete a "Thesis Documentation Form." Melissa Cooke in the Dean's Office collects these forms. Final orals paperwork will not be processed unless this form is on file with the Dean's Office.

MMI Fellowship Proposal Incentive

Success in obtaining independent funding for research is an essential element of most scientific careers. Therefore, as part of their training, each MMI PhD student is strongly encouraged to submit a grant proposal for funding. It is anticipated that most proposals will be for NIH F31 grants and will make use of the proposal text developed during the grant writing course and the comprehensive exam process. This text can also be formatted for similar fellowship applications to NSF or other governmental or non-governmental organizations. The department will award students with $2,500 for each year of external fellowship support they receive.

Publication Requirement

Publication is an essential component of training for a research career and a strong publication record as a graduate student is of great benefit to the trainee, the laboratory, and the program. Therefore, each PhD student in MMI is required to have published or submitted for publication in a peer-reviewed journal one or more first-author manuscripts prior to the date of the Final Oral Examination. Publication plans should be discussed as part of the IDP portion of each TAC meeting, and the TAC must indicate on the TAC Report Form whether the student is making satisfactory progress toward publication. If not, the TAC must provide a written recommendation for steps to be followed to expedite publication. Students must notify the Student Coordinator of first author publications by completing the First Author Form: Submission of the First Author Form is required before the student's paperwork can be submitted to schedule their final defense.

Final Oral Exam

The PhD thesis/dissertation is the culminating product of a student's PhD studies and provides a permanent record of a student's intellectual contribution to the field. Unlike published papers that might result from the same work, the thesis both requires and provides the opportunity for the student to creatively place their work in the broadest possible context, explore implications, and speculate on where the future of the field lies. The preparation of a thesis requires the greatest care both in thought and execution.

Most students find that writing a dissertation requires much more time and effort than expected. For that reason, students are encouraged to write as they go, rather than wait for the final few weeks of their graduate careers. Students are also encouraged to work closely with their advisers on thesis organization, scope, and content. To facilitate these recommendations, the Department requires a student to submit a draft of each of the components of the thesis to their adviser at least eight weeks prior to the Final Oral Examination (thesis defense) date and to submit a final draft of the complete thesis to the readers at least four weeks prior to that date. Readers will provide comments on the thesis at or before the Final Oral Examination and may require that changes be made prior to approval.

The Committee of Thesis Readers conducts the Final Oral Examination and ultimately must approve the thesis. Diversity and inclusion are encouraged for the Final Oral Exam and any student who would like to include a faculty member from outside of the University, including faculty members from groups underrepresented in the biomedical sciences, on the Final Oral Exam voting committee, may do so by having their adviser seek appointment of the outside faculty member to a Senior Associate position at the BSPH. Appointment as a Senior Associate must be requested in a letter by the Department Chair in a nomination letter to the Dean for vote by the School's Advisory Board. A copy of the external faculty member's CV (in BSPH CV format) must be included.

School-wide policies and deadlines governing the selection of readers, conduction of the oral examination, and approval of the written thesis are available from the School of Public Health Registrar's office and online.

Note: The Appointment of Thesis Readers and Final Orals Form must be submitted to the School of Public Health Registrar's Office for processing at least one month prior to the scheduled exam.

Comprehensive information for doctoral students including timelines, guidelines, exam and graduation information for doctoral students, including Thesis Reader Appointment forms can be found here (https://my.jhsph.edu/Offices/StudentAffairs/RecordsRegistration/DoctoralCandidateInfo/Pages/default.aspx).

Details of the required format of a PhD thesis are available here (https://www.library.jhu.edu/library-services/electronic-theses-dissertations/).

For dissertations that contain published work, suitably modified versions of the published manuscripts may be used as chapters, with careful attribution of the work of co-authors. In general, because the depth of the introductions and discussions of published papers are not sufficient for thesis use, additional introductory and summary chapters will be required in the thesis.

Essay/thesis writing/editing assistance is offered at both campuses:

- JHMI: Editing Referral Service
- JHU: Writing Center

Other resources: Bloomberg School of Public Health - Office of Student Affairs (https://publichealth.jhu.edu/offices-and-services/office-of-student-affairs/)

Official PhD thesis submission to the University is now done electronically. Please review the checklist for specific requirements regarding thesis submission (https://my.jhsph.edu/Offices/StudentAffairs/RecordsRegistration/DoctoralCandidateInfo/Documents/AFTER%20 THE%20FINAL%20DEFENSE%20-%20Revised%20March%202019.pdf).

The department requires one printed copy of the PhD thesis, which will be kept in the Department Library. Students should provide the

Student Coordinator with a PDF, and they will have a copy printed for the department.

Final Seminar Presentation

At the conclusion of their dissertation research, students are required to present their work at a formal seminar that is advertised throughout the University and open to the public. This seminar is scheduled in conjunction with the Final Oral Examination.

Time Limits

PhD students must successfully complete all program-specific requirements (such as a dissertation, as detailed in the specific program PPMs) within 7 years. Extensions are possible and must be formally approved by the Committee on Academic Standards.

Program Policies

For a full list of program policies, please visit the PhD in MMI page for the handbook.

Vacation/Holiday/Sick/Bereavement and Visa Related Leaves

- All University holidays are recognized, dates can be found here (https://hr.jhu.edu/wp-content/uploads/2025-2027-JHU-Holiday-Calendar.pdf).
- PhD student employees can take up to 15 vacation days per year. Additional time can be given by a supervisor.
- PhD student employees can take up to 15 sick days per year with an additional 5 days per dependent.
- PhD student employees can take up to 5 days of bereavement leave for the passing of immediate and extended family members and close friends, with 1 additional day for those needing international travel.
- International PhD student employees who are required to travel out of the country in order to maintain their immigration status necessary to be able to continue their program at the University are eligible for up to fourteen (14) days with pay during the period of such travel.

New Parent Leave and Leaves of Absences

- PhD student employees who are new parents are eligible for 8 weeks of paid leave following birth or adoption, with an additional 4 weeks for birthing parents. NOTE: PhD students who want to take academic leave following the birth or adoption of a new child should use the New Child Accommodation policies (https://wellbeing.jhu.edu/wp-content/uploads/2022/06/New-Child-Accommodations.pdf).
- Leaves of Absence (LOA), including family leave, medical leave, and personal leave, are governed by the University leave policies.

Work Hours

- No PhD student employee shall be required to perform work for more than 20 hours/week on average.
- Teaching Assistantship (TA) hours are included in the 20 hours of work that may be assigned regardless of whether the TA is part of an academic learning experience or not.
- Academic coursework, exams, and research related to a student's academic learning and dissertation are not considered work and are not included in the work hour limitations.
- There are no restrictions on work external to Hopkins except when decreed by funding source or visa status, as long as academic progress is not impeded.
- All work appointments (stipend or supplemental funding) require an appointment letter. Appointment letters will define the expectations and requirements of the teaching, research, or other University activity appointment. The first set of appointment letters will be generated in mid-to-end of August. A PhD student employee can expect to receive an appointment letter for each work activity, which may result in multiple appointment letters during the course of the year. Students should contact their department/program administrator with any questions.

Policy for MMI PhD Students Changing Thesis Laboratories

MMI PhD students occasionally change thesis laboratories. In those cases, to remain in good standing, students must adhere to the following process:

PhD students considering changing thesis laboratories must first schedule a confidential meeting with the departmental ombud to discuss the proposed change. In the course of discussions, the ombud may offer assistance in resolving issues that surround the proposed laboratory change, or may direct the student to additional resources such as the MMI Student Advocate, BSPH Office of Student Life or the university ombuds office. The intent of this requirement to explore alternatives to the disruptive decision to leave a thesis lab. The ombud does not have the authority to prevent a student from changing thesis labs.

After a discussion with the ombud, the student may consult with faculty members to identify a new thesis laboratory and thesis project. The student also must notify their current adviser of the proposed change with copy of this correspondence also sent to the graduate student coordinator, the department administrator and the chair of the GPC. When leaving a thesis laboratory, the student must work with their current adviser in a professional manner to transfer any relevant notes, data, reagents, or supplies.

The student and proposed new thesis adviser must then submit a new Thesis Adviser Form to the graduate student coordinator for approval by the departmental administrator. In addition to serving as a commitment to advise the student, this form also details the available financial support. Once this form has been approved, the student will be free to pursue thesis research in the new laboratory. In all cases, PhD students must choose to do their thesis research in the laboratory of a faculty member with a primary appointment in MMI, or in the laboratory of a faculty member with a joint appointment in MMI who is also designated as a trainer on an MMI training grant. Students can request a list of current training faculty who are eligible to accept PhD students from the academic coordinator or the Graduate Program Committee (GPC) chair at any time.

Learning Outcomes

According to the requirements of the Council on Education for Public Health (CEPH), all BSPH degree students must be grounded in foundational public health knowledge. Please view the list of specific CEPH requirements by degree type (https://e-catalogue.jhu.edu/public-health/ceph-requirements/).

The MMI Department offers two doctoral programs with the following learning outcomes:

Students in the traditional MMI PhD program will:

- Demonstrate knowledge of the principles of immunology (molecular and cellular interactions that govern innate and

adaptive immunity), applied to the conduct of laboratory research in areas of biology relevant to public health.
- Demonstrate fundamental and advanced knowledge in the genetics, immuno- and molecular biology, and biochemistry of infectious diseases of public health importance.
- Demonstrate a foundational and applied understanding of the epistemological evidence base and logical reasoning underlying the rigorous, reproducible, and responsible scientific processes in biomedicine and public health.
- Explain the theory and applied principles of conducting research ethically and responsibly.
- Use conceptual and practice-applicable skills in biostatistics to analyze, interpret and critically evaluate study designs and methods to address basic science and public health problems.
- Design and conduct rigorous experiments independently to generate new knowledge of molecular mechanisms and host-pathogen interactions in infectious diseases.

Students in the MMI PhD program concentration on Rigorous, Reproducible, and Responsible Research Investigation in Immunology & Microbiology (R^3IM) will:

- Demonstrate a foundational and advanced understanding of the philosophical and historical evidence base underlying the rigorous and reproducible scientific processes in biomedicine and public health.
- Judge the data quality and methodological appropriateness of research used to support cause-effect relationships and evidence-based decision-making across the biomedical and public health disciplines.
- Use conceptual and practice-applicable skills in biostatistics to analyze, interpret and critically evaluate study designs and methods to address basic science and public health problems.
- Explain the theory and applied principles of conducting research ethically and socially responsibly.
- Communicate (orally and in writing) scientific data, methods, and reasoning to the public health and basic science communities, as well as to lay audiences.
- Acquire fundamental and advanced knowledge in the genetics, molecular biology, and biochemistry of the human immune system, as well as host-pathogen interactions in the course of infectious diseases of public health importance.
- Design and conduct rigorous experiments to acquire new knowledge of molecular mechanisms and host-pathogen interactions in infectious diseases.

The Department's Graduate Program Committee (GPC) and faculty constantly monitor the components of the MMI graduate program for its effectiveness. Adjustments are made when necessary to maintain an optimal balance of didactic, literature-based, and technical training.

Professional Development

In addition to the commitment to enhancing their scientific knowledge base, critical thinking, and research skills, MMI is equally dedicated to students' development as science professionals. Experience teaches that students who start the process of formulating and refining a career plan early in their academic career have a better chance of achieving their goals. In this spirit, MMI requires that starting in their first year each student participate in the structured career and professional development OPTIONS program offered by the Johns Hopkins Professional Development and Career Office (PDCO). This multi-year program is designed to help students identify career objectives and systematically devise and implement a strategic plan to achieve their goals. This plan includes a series of programs - **Career Exploration**, **Career Development**, and **Career Readiness** – that provide opportunities to explore career options, train in and develop valuable professional skill sets, and even gain hands-on experience as an intern in their field of interest. In addition, PDCO holds **Career Clinics** to aid students in preparing winning resumes, CVs, and web pages to prepare them to enter the marketplace. The progress and direction developed through the PDCO program will be monitored at each Thesis Advisory Committee meeting and documented in each student's customized Individual Development Plan (IDP).

In addition to the program offered by the PDCO, MMI has academic offerings designed to assist students with professional development such as the required course Scientific Grant Writing (260.625) and the elective Business of Academic Biomedical Research (260.815).

Johns Hopkins Teaching Academy

The Teaching Academy serves as an exceptional graduate and post-doctoral fellow professional development program. The Teaching Academy offers PhD students and post-doctoral fellows college-level teacher training and academic career preparation opportunities through courses, workshops, teaching practicums, teaching as research fellowship appointments, and individual consultation. The Teaching Academy (https://cer.jhu.edu/teaching-academy/) is located in the Center for Educational Resources (CER) in the Garrett Room of the Milton S. Eisenhower Library on the Homewood campus.

NOTE: Teaching or outside work: Federal law stipulates a maximum of 19 hours for paid work outside of laboratory thesis work. All paid fellowships, part-time working opportunities, and teaching need to be discussed with the student's primary adviser.

Career Resources

The Career Services Office at the Bloomberg School helps students, alumni, faculty, staff, and employers navigate the world of public health jobs. Career Services Office provides valuable resources to assist students in the process. Specifically, the Bloomberg School's Career Services Office provides career coaching, resume preparation, a database of jobs and internships, and networking opportunities.