ACADEMIC PROGRAM GUIDELINES

Program in

Immunology
GUIDELINES TO THE PROGRAM IN IMMUNOLOGY

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Comments to Entering Students: The study of modern Immunology has both focus and breadth as exemplified by the eclectic research interests of the faculty in the Immunology Program at Washington University. Some of the key questions in Immunology are unique to our field, while others deal with the immunological versions of more basic phenomena in areas such as developmental biology, signal transduction and the regulation of gene expression just to name a few. It is also possible that as we learn more about the unique problems of Immunology we may find parallels in other areas of biology. Because Immunology is such a rapidly developing field, it is critical that you develop knowledge not only of Immunology itself, but also that you gain familiarity with a number of general "emphasis" areas with broader biological applicability. You should not expect to be able to develop a specialist's knowledge in all of these emphasis areas, but rather you should develop some basic knowledge in all of them while specializing in your specific area of interest in Immunology.

Immunology Program Steering Committee: The primary governing body of the Immunology Program is the Steering Committee. This panel is responsible for academic review of student progress, curriculum development, and liaison with other Programs of the Division. The Program Director heads this committee.

The Program Steering Committee consists of the following individuals:

Dr. Gene Oltz
Dr. Paul Allen
Dr. Chyi-Song Hsieh
Dr. Ken Murphy
Dr. Gwen Randolph
Dr. Emil Unanue

Early Matriculation: Students are encouraged to take advantage of the option to enroll in the Program during the summer after acceptance. Early entry into a laboratory setting without the demands of coursework permits a more effective transition to graduate work, especially for students with limited prior laboratory experience. The Program Director can provide assistance in arranging the first rotation for students who wish to exercise this option.

Advisory Mechanisms: First and 2nd and 3rd year Ph.D. students (and 1st and 2nd year MSTP students) will meet individually with the program director in the fall and spring to discuss student goals, course selections, selection of laboratory rotations and ultimately the selection of a thesis laboratory. Beyond the 3rd year for Ph.D., or 2nd year for MSTPs, students will continue to meet with the Program Director in the fall and spring to discuss progress towards their thesis work until such time that the student establishes a thesis committee and successfully completes their dissertation proposal. After successful completion of a dissertation proposal the thesis committee and thesis advisor become the formal advisors and semi-annual meetings with the Program Director for advising are no longer necessary. However, students should feel free to contact the Program Director should a problem arise at any point in their graduate career.

Admission to degree candidacy occurs after successful completion of the preliminary exam. Before admission to degree candidacy all registration forms and all add or drop notes authorizing changes in course work should be signed by the Program Director, even if a choice of thesis advisor has been made.
Coursework:

**Required Courses:** There are three required courses that must be completed with a grade of B or better.

- Bio 5053 Immunobiology I (4 credits): Fall of 1st year
- Bio 5054 Immunobiology II (4 credits): Spring of 1st year
- Bio 5272 Advanced Topics in Immunology (2 credits): Fall of 2nd year

**Electives:**

In addition to the three required courses, students must complete 2-3 additional elective courses, with a grade of B or better, for a total of no less than 5 credits.

**Bio 5068 Fundamentals of Molecular Cell Biology (4 credits): Fall** - recommended
- Bio 5392 Molecular Microbiology & Pathogenesis (3 credits): Spring
- Bio 5012 The Basics of Bio-Entrepreneurship (3 credits): Spring
- Bio 548 Nucleic Acids & Protein Biosynthesis (3 credits): Fall
- Bio 5312 Macromolecular Interactions (3 credits): Spring
- Bio 5325 Protein Structure and Function (3 credits): Fall
- Bio 5352 Developmental Biology (3 credits): Spring
- Bio 5384 Advanced Cell Biology/Biochemistry of Membranes (3 credits): Spring

Second year students are required to take Ethics (Bio 5011) and do a teaching assistantship (Bio 5915).

Twelve credit hours are considered a full semester load and in the first two years, these credits should normally be earned from a mixture of formal course work and a laboratory rotation (Bio 590). Credit for laboratory rotations is given on a satisfactory/fail basis, while all other courses are letter graded. Grades of satisfactory in laboratory rotations are required, and a B average must be maintained in all other courses. Seventy-two credits are required for graduation, and these credits should usually be accumulated in six semesters.

**Teaching Assistantships:**

Effective communication of information and concepts is a critical skill for biomedical research scientists. While much of the teaching that scientists engage in is through one-on-one interactions with individuals in the laboratory, all scientists must be able to deliver lectures to a wide audience (from peers in the field to neophytes with a limited understanding of the nuances of the topic), and scientists in faculty positions will often teach courses to undergraduate and graduate students. Therefore, DBBS students must demonstrate the ability to effectively communicate complex ideas and concepts to groups of individuals at various levels of understanding. To develop these critical communication skills, DBBS students will:

- Complete the TA orientation and three approved workshops offered by the Teaching Center by the end of the 2nd year of graduate studies
- Serve as a Teaching Assistant in a DBBS-approved graduate or undergraduate course for 1 or 2 semesters. The TA assignment will include giving lectures and/or leading lab sessions. The TA is usually completed in the 2nd year of graduate studies.
- Deliver a minimum of four oral presentations at journal clubs, seminars, scientific conferences, and retreats. Presentations given as part of a TA assignment, lab meetings or thesis committee meetings will not satisfy this requirement.
Other educational activities: There are many educational activities that graduate students are expected to attend on a regular basis during the academic year. These include the Immunology seminar series held on Monday afternoon, the Immunology graduate student journal club held every other Thursday evening and work in progress held Friday afternoons. There will also be opportunities for students to meet with outside speakers. We consider attendance at these activities to be essential to the development of our students into well-rounded scientists.

Laboratory Rotations: Laboratory rotations are an excellent means to become acquainted with the general process of research, with particular areas of research, and with faculty members who may potentially serve as thesis preceptors. Students should plan laboratory rotations as far in advance as feasible. Individual faculty research interest statements are available on the DBBS WEB site. Students are strongly encouraged to seek the advice of the Program Director and other faculty members when considering potential laboratory rotations.

During the first year, three rotations (fall, spring, and summer) are required. These rotations typically require that students expend serious effort during the time available outside of coursework. Credit for Bio 590 is therefore assigned depending on the time available for lab work when coursework is more demanding.

In selecting rotation laboratories, students should take the opportunity to inquire about the nature of possible projects and the manner in which the rotation advisor will oversee the project. It is also necessary for the student to establish that a place in the laboratory will be available during a mutually acceptable time period. MSTP students often pursue rotations during the summer prior to their first year and in the summer following the first year of Medical School. Rotations within laboratories where the student was previously employed will not be allowed. However, no restriction is placed on choosing a laboratory where the student was previously employed as a possible thesis lab.

During each rotation students should take advantage of the one-on-one relationship with a faculty member. This allows him/her to discuss science as it is carried out in that laboratory, and to evaluate together the student’s approach to research and his/her progress in learning to ask and answer appropriate questions in the experimental system at hand. At the end of the rotation student performance will be evaluated by the rotation advisor. This evaluation will be communicated to the student and to the Program Director.

Choosing a thesis laboratory: Students can continue laboratory rotations in the fall of the 2nd year if necessary. However, a thesis lab should be chosen by December of the second year. Only under special circumstances would a student be allowed to continue laboratory rotations beyond December of their 2nd year and doing so requires the approval of the Program Director. Students are strongly encouraged to discuss potential thesis lab choices with the Program Director prior to making a decision. Once a decision has been made the student must submit a thesis lab approval form to the Immunology Program Coordinator for approval by the Program Director.

Degree Candidacy: To achieve degree candidate status, students must have completed their course requirements and must pass a preliminary examination in Immunology within two attempts by January of their 3rd year (2nd year for MSTPs).

The prelim exam is usually taken in March or May – PhD students in the 2nd year; MSTP students in the 1st year. All prelims are administered on the same day. The prelim consists of each student being questioned by a faculty team consisting of 6 faculty members, separated into 3 rooms. The students rotate sequentially through the 3 different rooms, with each questioning period lasting 25 minutes. To expedite the process, there will be 2 teams of faculty. After all of the students are questioned, the faculty will meet to determine who passed. If a student failed, he/she will take a second test ~4-6 weeks later, with the same format.
Thesis Proposal/Thesis Committee: The requirement for a thesis proposal and the accompanying committee review of the proposal and its progress is designed to provide the student with a readily accessible source of advice and constructive criticism during the development of the dissertation research. To achieve this goal, the proposal must be made and the thesis committee convened early in the course of dissertation planning and execution. Students should present a thesis proposal (in oral and written form) to a thesis committee within 12 months of passing the preliminary examination.

The thesis proposal should include a statement of purpose and rationale for the project, an outline of the methods to be used and an assessment of their feasibility, a summary of work performed already, an idea of the potential outcome, and alternative plans for high risk portions of the project. Although these are all essential components of a thesis proposal, it is not intended that the written proposal be very lengthy, and preliminary data, while desirable, need not be profuse or absolutely conclusive. Thesis proposals require a cogent, but scholarly written assessment of the field and a testable hypothesis with possible branch points. The written proposal must be in the hands of the committee one week prior to an oral presentation. The thesis committee is composed of a total of five members including the thesis advisor. Four committee members (research mentor plus 3 other) are required at the time of the thesis proposal. At least three of the members must be faculty in the Immunology Program. Exceptions to these rules can be made in unusual circumstances after discussion of these circumstances with the Program Director.

To form a thesis committee the student must submit to the Immunology Program Coordinator an abstract for the proposal (not longer than one page) and a list of at least six faculty (excluding the thesis advisor) that would be reasonable members of the thesis committee. If a student is requesting an exception to the rules outlined above the reason for this exception should also be submitted in writing. The Immunology Program Coordinator will make arrangements for the student to discuss the composition of their thesis committee with the Program Director. The final composition of the thesis committee must be approved by the Director of the Immunology Program. Students should NOT ask faculty to be members of their thesis committee until after they have met with the Program Director.

The thesis committee members should be selected for their expertise in areas on which the research will touch, and for their willingness to contribute advice. The committee is chaired by a faculty member other than the thesis preceptor, and the chairperson should be designated in advance of the proposal, based on his/her willingness to be responsible for the committee’s activities. The student and preceptor should view the committee system as a source of objective criticism and expert advice, and it is expected that the student will convene the committee for interim consultations at least annually after the proposal has been approved.

The thesis committee consists of four faculty members plus the thesis preceptor for a total of five. The University requires that the final dissertation defense committee be composed of three faculty from the student's program and one from inside or outside the students program or from departments outside the Division. The addition of committee members or changes of committee composition should be made no later than six months before the defense date.

Monitoring of student progress by the Thesis Committee: It is expected that the student will meet regularly with the thesis committee to review progress and outline future goals. The frequency of these meetings will be left to the discretion of the student and the thesis committee but required to occur at least once per year. Students are responsible for providing committee members with a brief written summary of progress (including copies of submitted or published papers) and plans for future studies at least one week prior to these meetings. This summary should be in PDF format and emailed to all committee members and the Graduate Student Coordinator. A quorum of four members including the thesis adviser is needed for any pre-defense meeting.

The final thesis committee meeting: Students should schedule a final thesis committee meeting within six months of their expected thesis defense. At this meeting the student must provide: 1) Evidence for completion of a scholarly body of work as demonstrated by at least one first author paper that has been submitted, or is going to be submitted, for publication prior to the defense date and; 2) An outline for the final
experiments that need to be completed prior to the defense date. This material should be provided to the committee members at least one week prior to the meeting.

Approximately six months before defending, students must contact their coordinator to discuss all appropriate paperwork needed for the thesis defense. This information can also be found on the DBBS website.

**The thesis defense:** The thesis committee will serve as the student’s thesis defense committee. The thesis advisor will become the Chairman of the thesis defense committee. The completed written thesis must be submitted to the members of the committee at least two weeks prior to the defense. All members of the committee must be present at the defense, which will involve a public seminar by the student followed immediately by a private examination of the student by the members of the thesis committee.

**Length of the Program:** There will obviously be significant variability in the amount of time it takes students to complete a Ph.D. in Immunology. However, we would expect that all students (Ph.D. and MSTP) will complete their Ph.D. by the end of the 7th year. Each spring the Director of the program will provide the Faculty Steering Committee members with the names of students who wish to extend their graduate studies beyond 7th year and the plan for completion of their studies during the next year. Extension of Ph.D. work beyond the 7th year will require review and approval by the Faculty Steering Committee.

**Publications**

There is no specific requirement for publication to receive the Ph.D. However, high quality, peer-reviewed publications are an important determinant for a student’s career. Similarly, the process of writing and submitting a manuscript and responding to reviewer critiques is an essential part of a student’s training. Therefore, the publication record is one of several important and appropriate measures to be used by a thesis committee in evaluating a Ph.D. candidate. It is generally expected that students will have submitted and/or published one or more first author manuscripts in peer-reviewed journals at the time of the defense.

**Students’ Responsibility to Meet Program Requirements:** Graduate students in the Program in Immunology are responsible for completing the requirements of the program in a timely fashion. In particular, the requirements for courses, preliminary examinations, thesis proposals, and thesis committee meetings are important components of graduate training and should be regarded seriously. In the event that a student has trouble meeting any requirement, he or she should request consideration of the situation by the Program Director.

**Transfer Between Programs:** Transfer between programs is initiated by the request of the student. While this is easiest to do during the first year, it can also be accomplished at later times. Prior to the completion of one semester, requests for transfers must be approved by the Directors of both programs involved and the Admissions Committees of those programs. In order to transfer between programs after the completion of one semester, the student must be in good academic standing with both the Division and the Graduate School of Arts and Sciences. The student must have the approval of the Program Directors of the program they wish to leave and the program they wish to enter.

**Thesis Completion at Another Site:** Rarely, completion of thesis research at another appropriate institution may be necessary if the thesis preceptor relocates during the course of the student's thesis work. Permission for such arrangements must be obtained from the Steering Committee, and will only be granted if the student 1) has been admitted to degree candidacy, 2) has successfully passed the preliminary examination, 3) has a functioning thesis committee, 4) has gained approval from the thesis committee for the thesis proposal, for the planned program at the host institution, and for the environment of the host institution, and 5) agrees to return to Washington University at least two times per year to report in person to the committee on the progress of the work. The Chairperson of the thesis committee at Washington University will designate the time of the projected visits. MSTP students must also secure the permission of the Director of the Medical Scientist Training Program for
thesis completion at another site. In all such cases, presence of the thesis preceptor at the thesis defense will be required.

**Travel:** The Division provides up to $600 toward travel expenses for all students during their graduate training to present their research at a meeting/conference. Students may request use of the Division travel funds after the thesis proposal has been approved by the Thesis Advisory Committee and if they are presenting (oral presentation, abstract or poster) at the meeting. Any exceptions to these requirements must be approved by the Program Director. To request travel support, the student and the thesis mentor submit a letter to the Program Director asking for use of the funds and stating the purpose of the trip, including its educational benefit. Students should see their Coordinator to discuss details and obtain appropriate forms. Washington University does not reimburse business expenses on a per diem basis. Reimbursements are based on actual expenses incurred, and are requested by turning in original receipts and the Travel Expense Report form. Automobile expenses will be reimbursed at the current IRS mileage rate; gas receipts cannot be reimbursed. Students should turn in information regarding any presentations (talk or poster) made at a meeting to the appropriate student coordinator. If the cost of the trip is greater than $600, the additional expense must be paid by the thesis mentor.

For more information regarding Division requirements, refer to the Division Student Handbook or visit the Division website at: [http://dbbs.wustl.edu](http://dbbs.wustl.edu)