The Program in Immunology and Microbial Pathogenesis (IMP) is designed to take a multidisciplinary approach to the field by providing the student with a strong basic knowledge of immunology, microbiology, biochemistry, cell biology, and molecular biology, with additional exposure to other areas of related interest. The ultimate goal of this program is to provide aspiring students with the background, training and experience necessary to launch careers as independent scientific investigators.

**Program Director:**
Matthias Schnell, Ph.D.  phone: 3-4634  matthias.schnell@jefferson.edu

**IMP Graduate Studies Committee:**
David Abraham, Ph.D., D. Craig Hooper, Ph.D., Laurence Eisenlohr, V.M.D., Ph.D., Tim Manser, Ph.D., Matthias Schnell, Ph.D. (Chair), and Jianke Zhang, Ph.D.

**Training Programs Office:** 910 BLSB  fax: 215-503-0622
Joanne Balitzky  phone: 3-6687  Joanne.Balitzky@jefferson.edu
Kathleen Kieser  phone: 3-4636  Kathleen.Kieser@jefferson.edu

**General Ph.D. Requirements:** The Ph.D. degree earned through the IMP Program requires the student to complete all degree requirements of both the Program and the Jefferson College of Graduate Studies (JGSBS). JGSBS requirements are described in the JGSBS catalog and, in greater detail, in the “Guide to the PhD Degree and Thesis Manual” available at [http://www.tju.edu/Biomedical_Sciences/policies/](http://www.tju.edu/Biomedical_Sciences/policies/). An IMP specific synopsis of these requirements follows in this handbook.

**Credit Requirements:** A minimum of 180 credits beyond the bachelor's degree are required. 54 of these credits must be from a combination of required and elective coursework, including seminar/journal club. At least 18 of these credits must be from outside the major Program (i.e. not IMP). The remaining credits are dissertation research credits. Full time enrollment in the Fall Semester is 20 credits, Spring I and II combined is 30 credits, and Summer Semester is 10 credits.

<table>
<thead>
<tr>
<th>IMP</th>
<th>Fall</th>
<th>Spring 1</th>
<th>Spring 2</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full-time Enrollment</strong></td>
<td>20 credits total</td>
<td>30 credits total</td>
<td>10 credits total</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Year 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundations of Biomedical Science</td>
<td>10 credits</td>
<td>GC 550 10 credits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMP 505 A 2 credits</td>
<td>Fundamentals of Immunology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Immune System in Health and Disease IMP 505 B 2 credits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction to Microbiology IMP 600 2 credits</td>
<td>Seminar IMP 710 1 credit</td>
<td>Seminar IMP 730 1 credit</td>
<td>Research IMP 930</td>
<td></td>
</tr>
<tr>
<td>Seminar IMP 720 1 credit</td>
<td>Seminar IMP 722 1 credit</td>
<td>Seminar IMP 732 1 credit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Literature IMP 610 3 credits</td>
<td>Current Literature IMP 620 3 credits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lab Rotation 1 IMP 740 1 credit</td>
<td>Lab Rotation 2 IMP 630 3 credits</td>
<td>Lab Rotation 3 IMP 740 2 credits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethics GC 640 1 credit</td>
<td>Applied Statistics in Neuroscience NS 740 2 credits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research IMP 910 9 credits</td>
<td>Research IMP 920 variable credits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>Course</td>
<td>Credits</td>
<td>Course</td>
<td>Credits</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
<td>---------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>2</td>
<td>Infection &amp; Immunity</td>
<td>3 credits</td>
<td>OR</td>
<td>Advanced Cellular &amp; Molecular Immunology (even years)</td>
</tr>
<tr>
<td></td>
<td>IM 530</td>
<td>3 credits</td>
<td></td>
<td>IM 605</td>
</tr>
<tr>
<td></td>
<td>Planning &amp; Writing a Research Grant</td>
<td>1 credit</td>
<td>Seminar</td>
<td>IM 710</td>
</tr>
<tr>
<td></td>
<td>IM 730</td>
<td>1 credit</td>
<td>Current Literature</td>
<td>IM 712</td>
</tr>
<tr>
<td></td>
<td>Research</td>
<td>IMP 910 variable</td>
<td>Research</td>
<td>IMP 920</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Course</th>
<th>Credits</th>
<th>Course</th>
<th>Credits</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Infection &amp; Immunity</td>
<td>3 credits</td>
<td>OR</td>
<td>Advanced Cellular &amp; Molecular Immunology (even years)</td>
<td>3 credits</td>
<td>Seminar</td>
</tr>
<tr>
<td></td>
<td>IM 530</td>
<td>3 credits</td>
<td></td>
<td>IM 605</td>
<td>3 credits</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seminar</td>
<td>IM 710</td>
<td>1 credit</td>
<td>Current Literature</td>
<td>IM 712</td>
<td>1 credit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Transfer of Credits:** A student may be able to receive transfer credits up to a maximum of 18 credits for graduate level courses taken at another institution per policy described in the JGSBS Catalog. Check with your Program Director or the Training Programs Office for more details regarding credit transfers.

**Guidelines for Good Standing:**
1. Maintain a B average in coursework
2. Performance in core courses – GC 550, IMP 505 A and B, IMP 530, IMP 600
   a. A grade less than a B- in any core course could be grounds for dismissal. If this takes place the Graduate Program Committee will meet with the student. The final decision rests with Graduate Studies Committee.
3. A grade less than B- in any advanced course triggers a meeting with the Graduate Studies Committee, and could be grounds for dismissal from the Program after review of circumstances and overall performance.
Presentation of Scientific Information
The student must register for Journal Club each semester until they have completed 54 credits total. At that time the student should continue to attend and participate, but does not need to register for the course.

Starting in their third year, each student will present his or her progress once a year in the "Research in Progress" Seminar series that occurs on a weekly basis and in which pre- and postdoctoral trainees participate.

Laboratory Research Rotations: During the first year of study graduate students are required to rotate through at least three different laboratories, each rotation lasting one semester. The purpose of laboratory rotations is threefold: 1) to expose the student to various experimental approaches to laboratory research problems dealing with different aspects of biomedical research, 2) to help the student select a dissertation research advisor, and 3) to assist the faculty in evaluating the student's strengths and areas needing further attention. The student arranges his or her research rotations in consultation with the Program Director on the basis of the student's own interests and the willingness of a faculty member to serve as rotation mentor. The student is expected to spend all available working hours when not attending classes engaged in research-related activities during each of these rotations. At the end of each rotation, the student is required to submit a written report summarizing the rationale of the experiments conducted, the methodologies, results, and a brief discussion. The faculty member in whose laboratory the rotation has occurred then makes a written evaluation of the student's performance for each rotation. With approval of the Program’s Graduate Studies Committee, students with substantial research experience and/or a Masters degree may be allowed to take fewer than the three required rotations, depending upon individual circumstances.

Evaluation at End of the First Year: The Graduate Studies Committee will evaluate the performance of students in the Program at the end of the Spring semester. The criteria for evaluation will be the student's course grades, lab rotation evaluations, and participation and presentations in Journal Club. Students deficient in any of these areas will be brought before the Committee to discuss problems and possible ways to remedy the situation. Students with overall poor performance and judged unable to rectify the situation will be asked to leave the Program at this time.

Thesis Advisor and Research Advisory Committee: The Program Director will be the student's advisor during the first year and will meet with the student in order to establish the student's academic program and ascertain the nature of the student's research interests. Subsequent meetings will occur at the end of the first and second semesters in order to review academic progress and the development of research interests.

Permanent thesis advisor: The Thesis Advisor is selected on the basis of the student's academic accomplishments and research interests in consultation with the Program Director after the completion of three laboratory rotations.

Research Advisory Committee: This Committee is selected by the student and permanent thesis advisor, in consultation with the Graduate Studies Committee. This committee needs to be formed before December 31 of the second year, with the first committee meeting completed by March 31 of the second year. The Research Advisory Committee shall consist of the permanent thesis advisor and at least three other members of the graduate faculty; two of them should be members of the IMP Program. One member can be from outside of the Program (or a faculty from another institution with the appropriate credentials). The Program Director is an ex-officio member of all student Advisory Committees and, as such, should be notified of the date and time of each meeting. Each student must have at least two Committee meetings per academic year. It is the responsibility of the student to arrange Committee meetings and procure forms for recording minutes. Meeting forms are available at
http://www.tju.edu/Biomedical_Sciences/policies/ there is one form for the committee chairperson and a form for each individual member. All forms need to be returned to the Training Programs Office for inclusion in the student's file and distribution to the JGSBS Dean. Either the student or thesis advisor may call committee meetings at any time.

If a student desires to change a permanent thesis advisor, or a thesis advisor desires to be relieved of responsibility to a student, the matter shall be brought before the Graduate Studies Committee for consideration.

**Comprehensive Examination:** A student in good academic standing officially becomes a candidate for the degree of Doctor of Philosophy after passing the Comprehensive Examination.

1. The exam will be completed between November and December of the Fall semester of the 3rd year; dates will be assigned
2. An Examining Committee is convened annually. The student's thesis advisor will not be part of the Examining Committee but may participate in discussions regarding the student before the examination.
3. At least two weeks prior to the exam the student is expected to distribute a written grant proposal to the members of the Immunology and Microbial Pathogenesis Examining Committee. This proposal, which forms the basis for the subsequent oral examination can, but need not be based on the student's anticipated thesis project. The Proposal should be approximately 10 pages single-spaced or 20 pages double-spaced and should contain the following sections: Specific Aims (a maximum of 2), Background and Significance, and Approaches. At the end of each Specific Aim there should be a discussion of anticipated results, pitfalls, alternatives, and future directions. The student is expected to write the proposal entirely on his or her own, but can consult with colleagues (e.g. other students, postdocs and faculty) regarding the content of the proposal.
4. The oral examination is scheduled for a two hour period, and the student will begin by first reviewing the proposal for approximately 20 minutes. The student should be prepared, at a minimum, to state clearly the hypotheses to be tested, to provide in depth background information and logic to support the significance of these hypotheses, to provide strong rationale and technical details of the experimental design, be able to propose alternative approaches and interpretations based on hypothetical results, and to describe the caveats and limitations of each experimental and technical approach discussed. If the members of the Immunology and Microbial Pathogenesis Examining Committee agree that the student has satisfied these requirements during the oral examination, as evidenced by a unanimous vote, the student will be passed on to candidacy for the Ph.D. (grade: pass).
5. If the Committee decides that the student's performance in any of these regards is inadequate, the student will be asked to rewrite the whole or a part of the proposal, repeat the oral examination, or both. In each case, the Committee will provide the student with a critique and outlines of needed improvement(s) and one of the Committee Members will be assigned to support the student if she or he has concerns or questions. The student has a maximum of two months after the oral examination to complete and distribute this proposal to the members of the Examining Committee. Dependent on the required improvements to the first examination, the Committee will reevaluate the proposal and/or the student's performance in an oral examination and the written proposal/oral examination will be re-evaluated. If the majority of the Examining Committee agrees, the student will be passed on to candidacy for the Ph.D. If this is not the case, the student will not be considered for candidacy for the Ph.D.

**Readiness to Write the Thesis:** Before the student begins writing, the Research Advisor, Research Advisory Committee, and candidate must reach a consensus on the content of the thesis and the format – either traditional or manuscript. JGSBS is notified by use of the
Chairperson’s report (see above). At this time the student and committee will also designate the format of the thesis.

**Thesis Defense:** All PhD candidates must successfully present a public seminar and defend the Thesis prior to graduation. The JGSBS Dean attends the defense. In the closed oral defense following the public seminar, the candidate must demonstrate competence in his or her specific area of research as well as successfully defend the thesis research. By the time of the thesis defense, the research work performed by the student should generally have reached a stage of completion such that at least one paper, representing work to which the student has been a primary contributor (though not necessarily sole first author), has been published or accepted for publication in a respected peer-reviewed journal. If the candidate wishes to participate in the upcoming Spring Commencement, the thesis defense must be passed and the final approved copy of the thesis must be turned into the Dean’s office no later than April 1 of that year.

**Final Examination (Defense) Committee:** This committee is chaired by the Program Director (or his or her designate) and is composed of members of the Research Advisory Committee. The JGSBS Dean or his or her designate is an ex-officio member of all Defense Committees.

**Scheduling the Seminar and Defense:** At least two months before the planned date, the student will be responsible for scheduling the date and time of the defense with the JGSBS Dean’s Office (contact Lisa DiCampli, 3-8982). The student will also contact the Training Programs Office to reserve a room and AV equipment for the public seminar.

**Letter from the Program Director:** At least one month before the planned Defense, the students will contact the Training Programs Office to generate an official letter from the Program Director to the JGSBS Dean. The following information is necessary for this letter:

1. date, time, location of Public Seminar and Thesis Defense
2. thesis title
3. student’s name as it should appear on the diploma
4. members of the Final Examination Committee; addresses for any outside the University
5. the date on which the student stipend payment will stop (this information is for JGSBS Financial Office use only; it will not appear on other defense documents)

At least six weeks before the Thesis Defense, the Ph.D. candidate will deliver one copy of the thesis draft to the Dean’s Office, one copy to the student’s Program Director, and one copy to each of the Final Examination Committee members.

In order to provide objectivity in evaluation of the student’s thesis it will need to be evaluated by a scientist/faculty member at a University or other entity distinct from Thomas Jefferson University. This outside reviewer should submit a written report to the Program Director two weeks before the thesis defense.

The External Reviewer should be determined by the Research Advisor, student, and the Research Advisory Committee. It is advisable to assemble a list of at least three potential reviewers in case the request for review is denied by one or more. Any potential reviewer should be involved in a current graduate program and have had (or currently have) a graduate student in her or his laboratory. The Program Director will request the review. The review should be 1-2 pages long and comment on the overall merit of the thesis work as well as on specific concerns on the thesis content. The reviewer should also comment regarding whether, in his or her opinion, the quantity and quality of the research presented represents sufficient progress to merit the issue of the Ph.D. degree. Two weeks before the final examination the committee will meet with the student, review the external and internal thesis evaluations and brief the student on changes that may be needed. See the “JGSBS Guide to the PhD Degree and Thesis Manual” for details regarding submission of final thesis copies and additional required documents after the defense.
The PhD Thesis Manual contains the JGSBS requirements for the successful completion of the PhD degree from the time you matriculate until you complete your degree and can be found at [http://www.tju.edu/Biomedical_Sciences/policies/](http://www.tju.edu/Biomedical_Sciences/policies/). These are minimal requirements that are supplemented and expanded by IMP Program specific requirements and instructions.

Highlights from the PhD Thesis Manual which are important to your progress:

- **page 6: Formation of the Research Committee**
  - JGSBS minimum - research advisor and 2 graduate faculty; formed in consultation with the advisor and the Program Director
  - Chairman of committee – a member other than the thesis advisor
    - IMP – permanent thesis advisor and at least three other members of the graduate faculty; two of them should be members of the IMP program. One member can be from outside of the Program (or a faculty from another institution with the appropriate credentials). The Program Director is an ‘ex-officio’ member of each student’s committee and should be notified of date and time of each meeting but will not necessarily attend each meeting
    - IMP – the student forms the Research Committee before the end of the semester in which the thesis advisor is selected

- **page 6-7: Monitoring Progress**
  - 2 committee meetings per year, each year of research activity
  - Use forms for reporting results: report from each committee member plus chairperson’s report – both available at [http://www.tju.edu/Biomedical_Sciences/policies/](http://www.tju.edu/Biomedical_Sciences/policies/)
    - IMP – return all forms to Training Programs Office, 910 BLSB for required distribution
  - Yearly meeting with Program Director
  - Semi-Annual Report to JGSBS from student

- **page 7: Thesis Proposal**
  - May be part of Comprehensive Exam

- **page 8: Comprehensive Examination**
  - IMP - holds these during Fall semester of third year of study.

- **page 9: Readiness to write**
  - Determined by Research Committee; JGSBS notified by use of Chairperson’s report (see above)
  - Designate format of thesis: Traditional or Manuscript

- **page 10-12: Final Examination Committee and Defense of Thesis**
  - Candidate must present an open seminar of thesis work followed by a private defense before his/her Examining Committee
  - By the time of the thesis defense, the research work performed by the student should generally have reached a stage of completion such that at least one paper, representing work to which the student has been a primary contributor (though not necessarily sole first author), has been published or accepted for publication in a respected peer-reviewed journal.
    - IMP – In order to provide objectivity in evaluation of the student's thesis it will need to be evaluated by a scientist/faculty member at a University or other entity distinct from Thomas Jefferson University. This outside reviewer should submit a written report to the Program Director two weeks before the thesis defense.
      - Committee Membership: Research Committee; Program Director; JGSBS Dean
      - Arrange defense date with Dean’s Office at least one month prior to planned defense by contacting Lisa DiCampli at 3-8982 or Lisa.DiCampli@jefferson.edu
        - IMP – notify Training Program Office of date and time in order to arrange room and AV equipment for open seminar
      - One month prior to defense request letter from Program Director to JGSBS denoting readiness to defend
- IMP – contact Training Programs Office to request this letter; 3-6687 or Joanne.Balitzky@jefferson.edu
  - page 13: Format of Thesis – Model 1, Traditional
  - page 22: Format of Thesis – Model 2, Manuscript

**Application for Degree/Certificate:** This is available on Pulse to all registered students. Candidates for degree must complete this form and return to University Office of the Registrar. Deadline is usually December 31 of year prior to desired commencement.

PhD Degree Completion Checklist: Found at [http://www.tju.edu/Biomedical_Sciences/policies/](http://www.tju.edu/Biomedical_Sciences/policies/)