

Graduate Program in IMMUNOLOGY



STUDENT AND FACULTY HANDBOOK

2009- 2010

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GENERAL INFORMATION

The Immunology Program offers a Ph.D. degree through the Rackham School of Graduate Studies. Students are admitted through the Program in Biomedical Sciences (PIBS) at the University of Michigan. The Immunology Program will give a foundation that will enable students to pursue a broad range of career choices spanning from academics to industry and from the theoretical to the translational.

This handbook outlines the steps necessary to complete the requirements for the Ph.D. degree in the Immunology Program.

TIMETABLE

A provisional timetable for completion of the program is provided, although each student will be guided through the program individually.

| Milestone | To be completed by |
|---|--|
| <u>PRE-CANDIDATE:</u> | |
| Lab rotations (2 mandatory; additional possible) | August 31 of year 1 (within PIBS) |
| Choice of Ph.D. Program | End of year 1 in PIBS (usually by June 1) |
| All course work | End of year 2 COMMENT: Journal Club (Immuno 815) is taken for credit in Fall and Winter semesters of year 2. Special Topics in Immunology (Immuno 851) is taken for credit in Fall semester of year 2. After year 2, Journal Club attendance is required every semester, and attendance in Immunology 851 is strongly encouraged. |
| Selection of thesis advisor (mentor) | By the end of year 1 for most students, with occasional exceptions |
| Preliminary Exam, oral and written, after which candidacy is achieved | End of year 2 |
| <u>CANDIDATE:</u> | |
| Completion of degree requirements | Usually about 5 years from time of entry into the PIBS-1 year |

A major asset of the Immunology Program is its flexibility. The Immunology Graduate Student Affairs Committee may on occasion consider petitions to alter any requirement of the training program outlined here when petitioned by an individual student.

IMMUNOLOGY ADVISORY COMMITTEE

The Immunology Advisory Committee consists of representatives from the founding departments of Surgery, Pathology, Microbiology and Immunology, and Internal Medicine. The charge of this committee is to meet with the Program Director as needed to discuss and/or resolve issues affecting the Program's progress or direction.

IMMUNOLOGY GRADUATE STUDENT AFFAIRS COMMITTEE

The role of the Immunology Graduate Student Affairs Committee is to advise students, address student concerns, facilitate Immunology admissions, approve thesis committee selections, and resolve issues concerning the Program's curriculum.

IMMUNOLOGY PROGRAM FACULTY

Immunology faculty from the School of Medicine and the College of Literature, Science and the Arts (LS&A) represent a broad range of expertise in basic, translational, and clinical immunology in transplantation, inflammatory diseases, infectious diseases, allergy, autoimmunity, aging, and cancer. Faculty members within the interdepartmental Immunology Program also have appointments in other centers. This allows pre-doctoral fellows additional exposure to cutting-edge immunological research. These include the Cancer Center, the Geriatrics Center, the Rheumatic Disease Core Center, the Transplant Center, the General Clinical Research Center, the Michigan Nanotechnology Institute for Medicine and Biological Sciences, the Center for Stem Cell Biology, the UM Multiple Sclerosis Center, the Center for Gene Therapy, and the Brehm Center for Type 1 Diabetes.

REQUIREMENTS OF THE IMMUNOLOGY PROGRAM

1. A minimum of 17 credit hours in didactic graduate-level course work (*course numbers designated 500 and above), excluding seminars and research, with not more than one grade of "B-" or below. Courses must be re-taken if a grade of "C" or lower is obtained, or if more than one B- is earned.
2. The course requirements outlined in the next section.
3. At least two laboratory research rotations.
4. Successful completion of the preliminary examination.
5. Successful completion of a research project and defense of a thesis.

* Exception: Immuno 440

COURSE REQUIREMENTS

Immunology Program students take formal graduate level courses in immunology, biochemistry, genetics and cell biology. Many of these courses will be completed during the first (PIBS) year. Required student seminars involve participation of both students and faculty members. At the end of coursework the preliminary examination contains both written and oral components, providing students an important opportunity to hone critical presentation skills.

CREDIT HOURS

All students who have not achieved candidacy enroll for a minimum of 9 units in each of the Fall and Winter terms. Candidacy students may only register for 8 units of Research 995 plus one “free class” per semester. **ADDITIONAL TUITION WILL BE ASSESSED IF THE CANDIDATE REGISTERS FOR MORE THAN 8 CREDITS.** The Rackham Fee Total (RFT) requirement is 36 RFTs to advance to candidacy; 68 RFTs for completion of degree. (See Rackham Graduate Student Academic Policies, Section 1.5, for more information – <http://www.rackham.umich.edu/policies/gsh>)

REQUIRED COURSES

Core course requirements for completion of the Ph.D. degree in Immunology are as follows:

PIBS 503 (1 credit) The PIBS seminar in the Fall term of the first year.

Students are required to take at least two of the three PIBS Core Courses in the Fall term of their first year. Many students choose to take all three of these Core Courses, sometimes taking all three in their first term, and sometimes postponing the third Core Course until the Fall of their second year. The three PIBS Core Courses are:

Biological Chemistry 550 Protein Structure and Function (3 credits)

Cell and Developmental Biology 530 Cell Biology (3 credits)

Human Genetics 541 Molecular Genetics (3 credits)

Students who take only two of the Core Courses in the first Fall term must take 3 units of electives. Elective courses may also be taken in the Winter term of the first year or the Fall of the second year. Students who need to strengthen their knowledge of fundamental immunology may take IMMUNO 440 (see next page) for graduate credit. See next page for other suggested elective courses.

Immunology:

Microbiology and Immunology 640 Molecular and Cellular Immunology (3 credits).

Fall term of first or second year.

Immunology 850 Experimental Immunology (2 credits)

Literature based immunology techniques course aimed at providing first year students with an understanding of the theory and application of common tools used in immunology. Winter term of first year.

Immunology 851 Special Topics in Immunology (2 credits).

Students enroll in this course during Fall of the second year. This is a literature based course consisting of didactic overview lectures on special topics not covered in Micro 640. The focus is on guided discussions of recent research papers in immunology. The goal of the course is to provide graduate students with practice and guidance in the explication of original research papers in Immunology, as well as with in-depth looks at selected research questions of current interest. Topic and instructors vary each semester.

Immunology 815 Journal Club and Research Seminar (2 credits - 1 credit for 2 semesters).

First year students are encouraged to attend this course if they are rotating in an Immunology Program laboratory. **Second year and later students are required to attend this course every semester, but will ordinarily only register for the two semesters of their second year.** The Journal Club is aimed at increasing the students' awareness of current areas of research in immunology and providing students with an opportunity to practice and improve their oral presentation skills. Students present the experimental findings of one or two recent scientific reports on a contemporary topic in immunology. The Journal Club Director and/or the student's mentor will provide verbal feedback of the presentation. Student presentations are critiqued on the basis of 1) style and clarity of the presentation 2) general knowledge of the topic as reflected by presentation of relevant background information and discussion of questions and 3) data interpretation. Senior graduate students are expected to present their own thesis research rather than recent literature. **The student's lab mentor (and thesis committee for research presentations) MUST BE PRESENT to provide support and feedback on the student's performance. It is expected that the student's mentor will introduce the student. It is the student's responsibility to ensure that the mentor (and committee) be present at the presentation. Each Immunology Program faculty member is alphabetically assigned to give a verbal critique to one trainee after their presentation.**

ELECTIVES

Immunology 440 Immunology (3 credits). This course will provide a broad overview of the rapidly advancing field of modern immunology in both the basic and clinical sciences. Lectures will emphasize experimental and clinical observations to highlight key concepts.

Other suggested elective courses include but are not limited to:

- Path 581 – Tissue, Cellular and Molecular Basics of Disease (4 credits)
- Micrbiol 504 – Cellular Biotechnology (3 credits)
- Micrbiol 607 – Microbial Pathogenesis (2 credits)
- Micrbiol 615 – Viral Pathogenesis (2 credits)
- Micrbiol 619 – Special Topics in Micro and Immuno (Fall: 1 credit; Winter: 1 credit)
- Physiol 555 – Integrative Genomics (3 credits)
- Biolchem 576 – Signal Transduction (1 credit)
- Biolchem 650 – Mechanisms of Eukaryotic Gene Expression (3 credits)

Total minimum didactic credits: excluding seminars (i.e. IMMUNO 815) and research (i.e. Immuno 990/995): 17

COURSE REQUIREMENTS FOR MSTP STUDENTS

MSTP students come into the Program with 18 credits toward their Ph.D. Once in the Program, the following courses are **required**:

Immunology 815 - Journal Club (2 credits - 1 credit for 2 semesters) Offered in the Fall and Winter.

Immunology 850 – Experimental Immunology (2 credits) Offered in the Winter semester.

Immunology 851 - Special Topics in Immunology (2 credits) Offered in the Fall semester.

PIBS 503 - Research Responsibility and Ethics (1 credit) Offered in the Fall semester.

Microbiology and Immunology 640 - Molecular and Cellular Immunology (3 credits) Offered in the Fall semester.

Since MSTP students have had coursework in human genetics, microbiology and cellular biology, the following courses are **waived**:

Biological Chemistry 550 - Macromolecular Structure and Function (3 credits)

Cell and Developmental Biology 530 - Cell Biology (3 credits)

Human Genetics 541 - Molecular Genetics (3 credits)

TRANSFER STUDENTS

Graduate students who wish to transfer to the Immunology Program from other Departments/Programs within the University's Horace Rackham School for Graduate Studies should first contact the Immunology Program Director, who will then bring up the matter with the Graduate Student Affairs Committee. The Program Director will also request that the student's academic file be provided for review. If the transfer is approved, the student will be responsible for completing all Immunology Program requirements, as detailed in the Program's Handbook, including enrolling for the required credits in the Immunology Journal Club (IMMUNO 815; 2 semesters), Special Topics in Immunology Course (IMMUNO 851, 1 semester) and Experimental Immunology (IMMUNO 850, 1 semester).

IMMUNOLOGY SEMINAR SERIES

www.med.umich.edu/immunoprog/seminars

The Immunology Seminar Series, held during the Fall and Winter terms, include formal presentations by speakers from outside the University. Speakers for the 2008-2009 year included:

Xiao-Hong Sun (Oklahoma Medical Research Foundation), Charles L. Sentman (Dartmouth Medical School), David Nemazee (Scripps Research Institute), Avinash Bhandoola (University of Pennsylvania), Dario A. Vignali (St. Jude Children's Research Hospital), Mary Crow (Hospital for Special Surgery), Anita S. Chong (University of Chicago), and David H. Raulet (University of California Berkeley).

The following speakers are scheduled for the 2009-2010 year:

Matthias Wabl on 9/16/2009 (University of California, San Francisco), Lawrence Steinman on 10/7/2009 (Stanford University), Karsten Sauer on 11/4/2009 (Scripps Research Institute), Marilyn Diaz on 12/16/2009 (NIEH - NIH), Mary L. (Nora) Disis on 2/10/2010 (University of Washington), Chuxia Deng on 3/17/2010 (NIDDK - NIH), E. John Wherry on 4/7/2010 (Wistar Institute), and Douglas Green on 4/21/10 (St. Jude Children's Research Hospital).

Immunology students are expected to attend these noon seminars, as well as to participate in selected luncheons with speakers throughout the academic year.

THE MILLER FUND AWARD FOR INNOVATIVE IMMUNOLOGY RESEARCH

The Miller Fund is a philanthropically endowed fund at the University of Michigan Medical School dedicated to the support of innovative research in immunology. A single \$20,000 award is currently available. Each year's recipient will be announced at the Immunology Program retreat in the spring. This is a one-year non-renewable award. Recipients are ineligible to apply again. Applications may be submitted by Immunology Program faculty on behalf of their trainee. Funds may be used to support pre-doctoral trainees in the Immunology Program who have achieved Ph.D. candidacy or post-doctoral fellows in the labs of Immunology Program faculty. **All applicants must submit an abstract for presentation at the annual Immunology Retreat.**

Format

A one-page single-spaced description of the research project is required. A second page should be devoted to presentation and justification of the budget. If the funds are to be used to support a pre-doctoral or post-doctoral trainee, this budget can include funds to defray part of the cost of student tuition, stipend, laboratory supplies or equipment needed for the dissertation project, and educational funds for journals, other educational materials, and travel to scientific meetings. At least \$1,000 must be budgeted for trainee travel to a scientific meeting. The mentor must also provide a statement outlining the trainee's qualifications for this award and an explanation of how these funds would enhance the trainee's training and dissertation work. In addition, please provide a CV, and a one paragraph explanation of the research project, designed to be read and understood by a layperson's. **Applicants must submit an abstract for presentation at the retreat.**

Review and rating of the applications will be conducted by the Immunology Program's Graduate Student Affairs Committee, based on the following points:

1. Scientific originality and scientific strength of the proposal
2. Qualifications of the trainee applicant, including scientific progress on the trainee's dissertation work.
3. Anticipated impact of the awarded funds on the trainee's training experience

Deadline

Applications must be submitted by Wednesday, MARCH 24th.

Award Requirements

At the end of the funding period, August 1, the faculty and trainee recipient of this award will be required to submit a report describing progress on the project. The report must be written in layperson's language. Additionally, the Herman and Dorothy Miller Award must be acknowledged as a source of support in generated works presented and published from use of the funds.

THE MONTE V. HOBBS STUDENT AWARD

The Monte V. Hobbs Student Award was established through the generous contributions of friends, family and colleagues to honor the memory of Monte V. Hobbs, a leader in research of the aging process in immunology and a pioneer in the development and implementation of the RNase protection assay to study cytokines.

Only students in the Graduate Program in Immunology are eligible to apply. Previous recipients are ineligible to apply. Up to two cash awards of \$500 each will be given to students who have presented abstracts at scientific meetings during the 2009-2010 academic year. The awards will be presented at the Immunology annual retreat in the spring. All applicants, including the awardees, will give an oral presentation of their work at the retreat.

The student should submit:

- One page abstract
- Cover letter indicating at which meeting the abstract was presented and the dates, and whether it was an oral or poster presentation
- CV

Deadline

Applications must be received by Friday, March 26th.

IMMUNOLOGY RETREAT

In the spring, the Immunology Program sponsors an off-campus retreat, which highlights selected research within the program. Only graduate students in the Immunology Program and research fellows from the labs of Immunology Program faculty will have the opportunity to present their work. No more than two speakers from an Immunology faculty member's lab should submit an abstract, will be allowed to present. The Retreat Committee, under the guidance of the Immunology Program Director, makes the decision as to who is selected to present at the retreat. **John J. O'Shea, M.D. (NIAMS – NIH)** will be the keynote speaker for the 2010 retreat.

Previous keynote speakers include:

2009 - **John J. O'Shea, M.D. (NIAMS – NIH)**

2008 - Ulrich von Andrian (Harvard Medical School)

2007 - Richard Flavell (Yale University School of Medicine)

2006 - Gary Koretzky (University of Pennsylvania School of Medicine)

2005 - Abul Abbas (University of California, San Francisco)

2004 - Steven Reiner (Abramson Family Cancer Research Institute, University of Pennsylvania)

2003 - Leo Lefrancois (UCONN Health Center)

2002 - Philippa Marrack (University of Colorado Health Sciences Center)

STUDENT ADVISORS

During the student's first year in PIBS, the academic advisor for the Immunology Program is D. Keith Bishop (kbishop@umich.edu) for 2009-2010. After the first year, the student's mentor will serve as advisor, in conjunction with the Immunology Graduate Office. Any questions or problems regarding funding or course requirements can be directed to Zarinah Aquil.

Keith Bishop – kbishop@umich.edu, 734-763-0326

Zarinah Aquil – zaquil@umich.edu, 734-615-4846

LAB ROTATIONS

During the first year, under the auspices of PIBS, each student participates in research by completing at least two laboratory rotations (Fall and Winter terms). The two laboratory rotations should be completed during the first 12 months of enrollment and must be completed prior to the selection of a mentor. For the Fall and Winter rotations students enroll in PIBS 600. Students may also do a lab rotation in the Summer term prior to their first year in the PIBS program, and students who have not yet selected a mentor following their Fall and Winter rotations may also wish to do a rotation in the Summer following the PIBS-1 year (with special permission). PIBS students have the option of doing two shorter rotations per term in the Fall and Winter (subject to permission of the mentor). Full term rotations are still strongly encouraged. See PIBS for details.

MSTP students entering the program will have completed two lab rotations, with a possible third, during the summers.

New students are urged to become acquainted with the research interests of the Immunology Program Faculty before they arrive in the Fall of their first year. These are detailed in the Immunology Program brochure and at the Immunology website (www.med.umich.edu/immprog/).

IMMUNOLOGY TRAINING GRANTS

Second year graduate students are usually funded from a NIH T32 Training Grant, "Research Training in Experimental Immunology" (project director Steven Kunkel).

SELECTION OF A MENTOR

Each student will select a mentor from the Immunology Faculty to guide his or her dissertation research. As soon as possible after completion of the laboratory rotations, the student should submit his/her choice of mentor to the Program in Biomedical Sciences (PIBS) and the Immunology Program Student Services coordinator. The selection of a mentor should generally occur by the end of the first year of study.

PRELIMINARY EXAMINATION

The student must pass the preliminary examination before achieving candidacy. Generally, the preliminary examination is to be completed by the end of the student's second year (see page 1, Timetable). Preliminary examination guidelines follow:

A. Timeline and Checkpoints

To facilitate preparation of a focused proposal, students should consult with their mentor/examining committee for feedback at the following stages according to the estimated timeline shown.

| | Reviewed By | Time for Submission |
|-----------------------------------|----------------------------|----------------------------|
| Topic Selection | Thesis Mentor | December 3* |
| Topic Approval | Preliminary Exam Committee | December 17 |
| Abstract/Specific Aims Submission | Thesis Mentor | January 21** |
| Abstract/Specific Aims Approval | Preliminary Exam Committee | January 29 |
| Submit Written Proposal | Individual Exam Committee | February 25*** |
| Written Proposal Approval | Individual Exam Committee | March 11**** |
| Oral Exam | Individual Exam Committee | By March 31***** |

The topic must be distinct from an area of ongoing research in the thesis mentor's lab. This must be verified by the mentor.

*Topic descriptions should NOT be more than 4 sentences in length: a sentence or 2 for background, a sentence stating the general hypothesis or question to be asked, and a sentence regarding what system (i.e. animal model, etc.) in which the experiments will be conducted.

A **one-page, single-spaced abstract/specific aim must be approved and signed by the mentor and turned in to the Preliminary Exam committee by January 21st. The abstract should be in NIH style, present a hypothesis, and have no more than two specific aims. A brief description of how experiments will be performed should also be included. Abstracts should be no more than one page.

***When the proposal is completed it should be **hand delivered** to each member of the examining committee on or before February 25th by 3:00 p.m. Please also provide one copy to the Immunology Program Graduate Office.

****The individual exam committee is only required to read and offer feedback of the student's written proposal once. Thereafter, the student should consult with his or her mentor for additional guidance. Changes suggested by the individual exam committee members should be addressed by the student.

*****The student will schedule the oral preliminary exam with his/her individual committee by the end of the first week in April (at the very latest).

B. Written Proposal

Students are strongly encouraged to meet with each of their preliminary committee members prior to submitting their written proposal to them so that the student may informally explain and receive feedback regarding their project. Prior to the oral exam (by February 25th), the student must make available to the examiners a written proposal of not more than ten typewritten pages, excluding references. This proposal should be distinct from the student's thesis research or other research projects that are ongoing in the mentor's lab. It should contain background information and a brief summary of an ORIGINAL experimental approach to a scientific problem of current interest in immunology. This proposal will form the basis for the upcoming oral exam.

A format similar to an NIH grant should be followed:

- 1 page hypothesis and specific aims;
- 3-4 pages significance and rationale, including pertinent background;
- 5-6 pages experimental design and methods, including controls, alternative approaches, order of experiments, justification for approach taken, and interpretation of possible results. A preliminary data section is not necessary.

Proposals should be written using 1 inch borders on all sides in Times 12. Figures and Tables should be neatly prepared and embedded within the text. No more than 50 citations can be included with the proposal. A total of 10 pages, excluding references. No appendix. Proposals that do not conform to these requirements will be returned unread for revision.

When writing the proposal and preparing an oral presentation, students should consult peers and faculty for advice on execution of specific techniques or specific interpretation of published work. Faculty members are encouraged to suggest reading materials when possible, but should avoid taking an active part in experimental design. Others can also help proofread the proposal. The student is responsible for INDEPENDENTLY deciding on the problem and devising logical and convincing experimental approaches. When in doubt about appropriate boundaries of advice from others, the student should consult members of their individual examining committee.

C. Composition of Individual Exam Committees

The Preliminary Exam Committee consists of 12 faculty members who serve as potential examiners for a two-year period. This ensures that individual student exams are as uniform as possible. Individual Exam Committees consist of 3 faculty who are selected by the Program Director based on the topic of the written proposal. One of these members will serve as the Chair of the Committee, and will oversee and direct the oral exam. The student's mentor will not serve on the exam committee. Students will be expected to schedule the oral preliminary exam with their individual committees.

D. Timeline for MSTP Students

MSTP students entering the Immunology Program are considered to be at the same level as students entering the Program after 1 year in PIBS. It is encouraged that MSTP students take their prelims by September 10 following their first year as a Ph.D. student. However, if agreed by the student and mentor, they may wait until Spring of their second year as a Ph.D. student. In this case, the mentor must notify the Graduate Student Affairs Committee by October 1st of their student's first year as a Ph.D. student, and indicate the proposed timeline for completion of the exam. Mentors should be aware that tuition support for pre-candidates is more costly than for candidates, especially for non-Michigan resident students.

E. Oral Exam

1. Focus

The oral exam tests the student's ability to reason analytically and to develop ideas and defend them in front of others. Thus, the emphasis is on hypothesis testing and experimental design, as well as general knowledge in the field of Immunology. The student should be familiar, however, with the key past

experiments performed that led to the hypothesis and the important basic concepts of the approaches to be used. The committee members will expect students to be familiar enough with each technique proposed to understand its theoretical basis, as well as its appropriateness and limitations in addressing the hypothesis being tested.

However, detailed knowledge of such things as buffer ingredients and incubation times are less important, unless they are vital to the interpretation of the results. For example, if one proposes to use ELISPOT technology to measure cytokine levels, one should know how the assay works, whether the necessary starting materials are available, whether ELISPOT is the best approach to address the question being asked, and the limitations of using ELISPOT measurements. One does not need to know things like the exact ions needed for the ELISPOT buffers or the incubation time of a particular step (unless it is a critical parameter for the assay in question). In contrast, if one were studying ion channels, one would be expected to know the ion concentrations in the buffers to be used to measure ion transport.

2. Format

At the start of the examination the student will be asked to leave the room for a few minutes while the examining committee has a chance to discuss the student's record, how they wish the examination to proceed, and to bring up any potential problems. The student will then be asked to give a 15 minute overview of the proposal. This presentation should focus on the hypothesis, specific aims, and the significance of the proposal. Emphasis should be on the experimental approaches to be taken to address the hypothesis. The members of the committee may ask for points of clarification during the student's presentation, but should allow the student to complete his/her overview prior to in-depth questioning.

While questions will likely center around the proposal, questions pertaining to general knowledge of the field of Immunology should be anticipated by the student. Hence, the student should have a good grasp of immunology in general. It is highly recommended that the student be familiar with all topics listed in the Immunology Review Outline, which is provided by the program. A minimum of 15-30 minutes of the exam will be devoted toward questioning of the student's understanding of immunologic principles. When all committee members have had the opportunity to ask all the questions they wish, the student will be asked to leave the room while the committee reaches a consensus opinion.

3. Evaluation

The committee can decide to pass the student unconditionally, to fail the student unconditionally, or something in between. The committee may allow a student to retake the examination with the same problem, with a different problem, or rewrite all or part of the written proposal. In addition, the committee may also recommend other remedies for a less than satisfactory performance (e.g., assign additional class work). For example, should a student perform poorly on the general immunology portion of their exam, the committee will likely recommend that the student take IMMUNO 440. The committee and student should remember that the oral examination is primarily a learning experience and that students who are asked to retake the examination usually improve immensely the second time. If there is a serious question as to whether the student should pass, it is recommended that the student be asked to retake the examination. A student will be dismissed from the Immunology Program if he or she fails either the written or oral portion of the examination a second time.

4. Summary

After the examination, the chair of the individual student's committee will advise the Student Services Coordinator and the Program Director of the results. Upon successful completion of the exam, and assuming all other requirements are met, the Program Director will sign the student's Advancement to Candidacy form, which will be sent to Rackham.

SELECTION OF DISSERTATION RESEARCH TOPIC

Students and their respective mentors are expected to design research projects related directly to questions in basic or applied immunology. There may be instances where an Immunology Program mentor also serves as a faculty member in other Programs/Departments as well. Research directions in the laboratories of these particular mentors may include scientific projects unrelated in scope to basic or applied immunology. For this reason, students who are concerned that their planned project might not meet the topic requirement should discuss the matter early on with the Program Director, who may at his or her discretion refer the question to the Graduate Student Affairs Committee for resolution. The responsibility for choosing a dissertation research topic rests jointly with the mentor and student, and it should be their priority to see that a project(s) is selected that meets the topic requirement.

DISSERTATION COMMITTEE

The dissertation committee guides the research project of the student. This committee will supervise dissertation activities and will serve as a resource throughout the period of research and writing. The committee also reviews the thesis progress. Frequent interactions with these committee members are designed to assess efforts toward thesis research as well as forge informal collaborations that mature throughout the student's future professional career. It is required that the committee meet within six months after the student passes the qualifying exam, and at least once each year thereafter until the defense.

Upon a student's satisfactory completion of the preliminary examination, the student's mentor should provide to the Program's Graduate Student Affairs Committee, via the Immunology Program's Student Services Coordinator, a list of potential faculty members to serve on the student's dissertation committee. The dissertation committee is to be comprised of at least 5 members, including the chair. At least 3, and preferably more, members must be Immunology Program faculty. The proposed members should be tenured-track faculty chosen by the mentor in consultation with the student and they should reflect appropriate expertise in the areas covered by the dissertation research. If a committee member is not affiliated with a Ph.D. granting program, a copy of his/her CV should be submitted for consideration. The Graduate Student Affairs Committee will review the list and contact the mentor, via the Immunology Program's Student Services Coordinator, about the proposed selections. Mentors are encouraged to review the Rackham Graduate School policy on "Guidelines for Dissertation Committee Service", which can be obtained through Rackham's website: (<http://www.rackham.umich.edu/downloads/oard/forms/disscommitteeguidelines.pdf>).

TRAINING IN ETHICAL ISSUES IN SCIENCE

On entering the Graduate Program through PIBS, students are issued copies of the Rackham Graduate School "Student Handbook" and the University of Michigan Medical School "Guidelines for Responsible Conduct of Research." The former addresses the standards of student behavior expected of all members of the graduate community. The latter discusses in depth the responsibilities of a Ph.D. mentor, appropriate methods of data collection and analysis, guidelines for manuscript authorship and issues pertaining to relationships between industry and academic institutions. During the first year, graduate students attend a 6 session seminar series in Ethics in Research prepared and presented as part of PIBS 503.

RESEARCH OPPORTUNITIES

Due to the broad range of expertise of the Immunology Program faculty, a wide array of basic, translational/applied/clinical research opportunities are available for Ph.D. students:

Basic studies:

- Adhesion Molecules
- Antigen Processing/Presentation
- Apoptosis
- Cell Homing/Trafficking
- Cell Signaling
- Cytokine Networks
- Hematopoiesis
- Immunoglobulin Switching
- Immune Suppression
- Innate Immunity
- Macrophage Biology
- MHC Class I and II Molecules
- T Cell Activation
- T Cell Biology

Translational/Applied Immunology:

- Animal Models of Disease
- Ex Vivo Cell Expansion
- Gene Delivery
- Vaccine Development

Conditions:

- Aging
- Allergy
- Arthritis
- Autoimmunity
- Bone Marrow Transplantation
- Cancer
- Diabetes
- Inflammation/Tissue Repair
- Lupus
- Multiple Sclerosis
- Organ Transplantation
- Pulmonary
- Trauma/Burn
- Viral Infections

STUDENT FINANCIAL AID

All students in good standing will be provided with a monthly stipend, comprehensive health care coverage, and coverage of tuition and fees. For the first year, PIBS will cover all expenses. In year two, the student will be supported by a combination of individual fellowships, pre-doctoral training grant funds, institutional funds and research grants. Once a mentor has been selected and the student has passed the preliminary examination at the end of year 2, funding will be provided by the mentor's laboratory unless training grant support or other fellowships are available. Immunology faculty members who accept Immunology students must send the Immunology Program the source of funding (include the grant number) that will support that student in the years that the graduate student is a member of their lab.

Should the mentor not be able to meet the financial responsibility for any Immunology student in his or her lab, the financial obligation for the student falls on the mentor's primary department. The chair of the mentor's primary department must sign the letter of financial responsibility.

STUDENT EMPLOYMENT OUTSIDE THE PROGRAM

The faculty of the Immunology Program believes that Ph.D. training is a full-time endeavor. Outside employment subtracts from the time and mental energy a student can devote to his or her research. In addition, it is an NIH policy that students who are supported by a PHS training grant may not be employed outside their training program. For this reason, students are forbidden to engage in outside employment.

RESPONSIBILITIES OF STUDENTS FOR THEIR PROGRESS THROUGH THE PROGRAM

In addition to fulfilling the above requirements of the Immunology Program, students are responsible for:

1. Ensuring that the preliminary written proposal and oral exam are completed in a timely fashion.
2. Ensuring that the thesis advisor and dissertation committee are chosen in a timely fashion and according to the guidelines of the program. The first committee meeting must be held within 6 months of achieving candidacy.
3. Scheduling thesis committee meetings at least once a year and submitting progress reports following each committee meeting.
4. Making timely progress toward completion of the Ph.D. and giving careful and timely consideration to further career goals (post-docs, jobs, etc.).
5. Ensuring that Rackham requirements for the dissertation, defense and graduation are met.
6. Actively participating in the weekly Journal Club/Research Seminar Series, Annual Program Retreat, the PIBS annual recruitment weekends, and the Fall Program Student Reception.
7. Serving as a student representative for the Immunology Program.

RESPONSIBILITIES OF IMMUNOLOGY FACULTY

1. Serving on committees as asked, particularly on preliminary examination committees, which calls for mandatory participation for a term of two years (on a rotating basis), and on dissertation committees.
2. Should a faculty member lose their funding or for any reason is unable to support their student, the student's financial support will be the responsibility of the faculty member's primary department.
3. Monitoring and assuring timely progress through the Immunology Program of students in their laboratories. Should the mentor, for any reason, leave the University or be unable to continue to serve as a student's mentor, it is the responsibility of the mentor to resolve and document the following issues for Immunology students in the lab:
 - A. What experimental aims must be completed to finish the student's thesis, and what is the anticipated time frame for completion of these studies?
 - B. How frequently will the student's Committee meet?
 - C. What will be the source of the student's individual financial support, and how will the student's research be supported?
 - D. In which lab will the student's research be performed?
4. Submitting required reports in a timely fashion (rotation evaluations, thesis progress evaluations).
5. Ensuring timely scheduling of the organization of dissertation committees for their trainees, and scheduling of thesis committee meetings and dissertation defenses.
6. Active participation in the weekly Journal Club/Research Seminar Series (each faculty member is alphabetically assigned to give a verbal critique to one trainee after their presentation), the Special Topics in Immunology course, the Annual Program Retreat, the PIBS annual recruitment weekends, and the Fall Program Student Reception.
7. Serving as a faculty representative for the Immunology Program.
8. Taking on needed roles in administering the Program.

USEFUL ON-LINE RESOURCES

The following on-line resources will be invaluable for students during their time as Ph.D. students in the Immunology Program.

- Graduate Student Handbook Policies and Procedures, Horace H. Rackham School of Graduate Studies (<http://www.rackham.umich.edu/policies/article/gsh>)
- Dissertation Handbook: A Guide to Preparing and Submitting your Doctoral Dissertation [<http://www.rackham.umich.edu/downloads/oard/forms/DissertationHandbook.pdf>]
- PIBS Curriculum Bulletin (<http://www.med.umich.edu/pibs/current/curriculum.htm>)
- Gradtools - Rackham (www.gradtools.umich.edu)

This is a special set of on-line tools in the CTools environment to help Rackham doctoral students as they work toward their degrees. Included is a Dissertation Checklist. Students are encouraged to make use of this helpful resource.

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2009-2010**

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Cailin Wilke

Postdoctoral Fellow representatives:

Megan Ballinger
Yu Liu
Thornik Reimer

Faculty representatives:

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Cheong-Hee Chang
Jeffrey Curtis
Yasmina Laouar
Yang Liu
Nicholas Lukacs
Ivan Maillard
David Markovitz
Bethany Moore
Thomas Moore
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PRELIMINARY EXAM COMMITTEE: (Year of service)

| | |
|------------------|---|
| Jeffrey Platt | 2 |
| Bruce Richardson | 2 |
| Benjamin Segal | 2 |
| Lloyd Stoolman | 2 |
| Joel Swanson | 2 |
| Peter Ward | 2 |
| James Baker | 1 |
| Kathleen Collins | 1 |
| James Ferrara | 1 |
| David Irani | 1 |
| Christiane Wobus | 1 |
| Yi Zhang | 1 |

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D. Keith Bishop (2009-2010)

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Graduate Program in Immunology - www.med.umich.edu/immprog/

PIBS – <http://www.med.umich.edu/pibs>

Rackham – http://www.rackham.umich.edu/doctoral_students/