

Temple University School of Medicine
Department of Microbiology & Immunology
Graduate Student Handbook

2011 - 2012

This handbook was prepared to supplement, but not to replace, *The Graduate School Bulletin* and *The Graduate Policies and Procedures*, which should be reviewed by all students. The Graduate School web site is www.temple.edu/grad. The Departmental web site is www.temple.edu/medicine/mi It is the responsibility of the student to ensure that he/she is in compliance with both Departmental and University requirements. It is the responsibility of the student to familiarize him/herself with any changes in requirements for graduate students.

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I. The First Year

- A. ***Getting Started*** - A successful applicant for the graduate program in Microbiology and Immunology generally receives two letters of acceptance - one from the Department and an official one from the Graduate School. These letters indicate the degree program to which the student has been admitted and the amount and type of financial support. Financial support can be from several sources: University, Medical School or Departmental funds, and training or research grants.

In the summer, the incoming student should receive a letter from the Chairperson of the Admissions Committee announcing the date (usually late August to early September), time and place for an orientation meeting. During the morning of the meeting, University and Department procedures are reviewed. Incoming students are given a tour of the facilities by current students. Students starting at a date later than the orientation meeting must meet with the chairpersons of the Graduate Program and Admissions Committees for orientation. In addition, all incoming students must undergo orientation on use of departmental equipment.

Incoming graduate students must report to the Chairperson of the Graduate Program Committee for the orientation meeting. The first rotation period will begin shortly thereafter. All incoming students will begin their rotations at this time. The third rotation period will usually end in March. To allow for an orderly completion of laboratory rotations, students may make their requests for a permanent advisor to the Chairperson of Graduate Program Committee I in February on a date to be specified by the Faculty. Similarly, faculty may not commit to a student as a permanent advisor prior to that date.

Students who successfully defend a Masters Degree in Microbiology and Immunology, and wish to obtain a Ph.D. degree, must apply to the Departmental Admissions Committee in order to be admitted to the Ph.D. program. The Departmental Admissions Committee must receive, and take into consideration, a letter of recommendation from the student's Research Advisory Committee in order to consider admission to the Ph.D. program. This letter must be signed by all members of the Research Advisory Committee, or a second letter representing a minority opinion must also be submitted to the Departmental Admissions Committee.

- B. ***Laboratory Rotations*** (Ph.D. students only; MS students generally do not perform laboratory rotations.)- The purpose of the laboratory rotation program is to acquaint the incoming student with the Department, students, faculty, and resources, which will give the student a better basis for choosing a research advisor. This is the first opportunity for the faculty to assess the research potential of the incoming student. Students are evaluated according to Rotation Evaluation Form #1.

Separate project rotations for each student in three different laboratories is the minimum requirement. Students select laboratories for rotation from the list of Departmental Graduate Faculty and Co-Advisors made available to them. Refer to the policy concerning Departmental Graduate Faculty and Co-Advisors. As an aid to selection, students are presented with written statements of the research in each laboratory. At orientation, the Chairperson of the Graduate Program Committee provides students with a list of the faculty able to take rotating students. The student returns the form listing the student's first, second and third choices by the date

specified at orientation. The Chairperson makes the final arrangements so that no faculty member has more than two rotating students during any particular period. As a rule, the time spent each day in the Rotation laboratory is a full day, excluding the time spent in classes. The projects are of eight full weeks duration during the Fall and Spring Semester (and of four full weeks if a rotation takes place in the summer when there are no didactic classes).

Each project should be completed within the allotted period. This requires that the student complete all experiments, notebook entries and calculations as required by the faculty member in charge of the rotation, so that the student can move on to the next rotation and give it the attention it deserves. The student must submit a written report about the rotation to the faculty advisor. The student is expected to present an oral report about the rotation project at a laboratory meeting. During the last week of the rotation, a student provides a Faculty Rotation Evaluation Form #1 to the faculty member in charge of the rotation. After this form is filled out, the faculty member reviews its contents with the student. It is the faculty advisor's responsibility to return Form #1 to the Administrative Coordinator (Chairperson's Office). It is the student's responsibility to return Form #1A, in which he/she evaluates the rotation experience, to the Administrative Coordinator within one month of the completion of the rotation.

Although students are encouraged to select an advisor after three rotations some students may elect to rotate in an additional one or two laboratories. This is encouraged for those students who remain undecided about the area of research and the laboratory in which they choose to work for their dissertation projects. A student may stop working in a laboratory upon completion of their rotations for a period of no more than four weeks to think about the choice of a permanent advisor (see C).

Non-Degree Students: Laboratory rotations are optional.

- C. **Research Advisor** - After completing the rotation program, a Ph.D. student has up to one month to choose a permanent research advisor. This research advisor must be in a position to support the student financially from his or her own research funds. The student **must not** negotiate directly with the advisor, but rather should make his/her choice known to the Chairperson of Graduate Program Committee I who then discusses the choice with the Chairperson of the Department and with the potential advisor. The research advisor must be a member of the graduate faculty, or a co-advisor with whom the student has had a laboratory rotation. When a faculty member agrees to be a research advisor, the student submits a letter to the Department Chairperson requesting approval for the research advisor of his/her choice. This choice must be approved by the Department Chairperson.

No faculty member shall accept more than two students from a single graduate student class. The total number of students in a given laboratory shall not be strictly limited. It is unusual that an individual laboratory will have more than four students.

- D. **Research Advisory Committee** - After choosing a research advisor, the student and advisor should agree on the composition of a Research Advisory Committee. The student should contact all members to obtain their agreement to serve and submit the list in writing to the Department Chairperson. The Department Chairperson approves the composition of the advisory committee.

The Committee consists of the student's faculty advisor and at least two other members of the Departmental Graduate Faculty. Additional members may be chosen from within the department, from another department of Temple University, or from another institution. If the additional member is not a member of the Graduate Faculty, a "nomination for Service on Doctoral Committee" form and a CV must be submitted to the Dean of the Graduate School. All changes to the Committee must be approved by the Department Chairperson and by the Associate Dean for Graduate Studies at the Medical School. This committee must meet at least once every year to review the progress of the student's research work. More frequent reviews may be required by the Research Advisory Committee. The process of selecting an advisory committee for an M.S. student is the same as for a Ph.D. candidate. It is the student's responsibility to see that the composition of his/her Research Advisory Committee is correct and up to date in the Departmental files.

The Doctoral Advisory Committee must include at least three Graduate Faculty who are resident in the Department of Microbiology and Immunology. By the end of the fourth year, the Doctoral Advisory Committee must also include a member who is from outside the Department (i.e., from another department of Temple University or from another institution). The Chair of the Doctoral Advisory Committee is usually the advisor or, in the case of co-advisors, a resident faculty member from within the Department of Microbiology and Immunology.

The committee is not only advisory but also forms the nucleus of the committee that conducts the examination (defense) of the Ph.D. dissertation or M.S. thesis.

- E. **Research Reviews** - No later than six months after the student has received the Chairperson's approval of permanent laboratory assignment, the student has his/her first Research Review. Here the student reports his/her research progress and plans for further work to the Research Advisory Committee. These reviews must be advertised in the Department and an abstract for the material to be presented must be circulated to the Faculty at least one week before the Research Review date. A review is to begin at the advertised time and is generally completed within 2 hours. At the completion of the review the faculty will complete a Research Evaluation Form #3 in the student's absence. When the form is completed, the student is called back into the room and the contents of Form #3 are reviewed with the student. The chair of the Committee returns Form #3 to the Administrative Coordinator (Chairperson's Office) and gives a copy to the student. The student has 24 hours to return Form 3A (in which he/she evaluates the Research Review session) to the departmental office.

All reviews must be scheduled at least six weeks in advance of the last day of

the one-year deadline. Failure to schedule a research review within the one-year deadline will affect the research grade, and may result in the student being placed on academic probation. It is the responsibility of the student to schedule research reviews in sufficient time to ensure that all members of the Committee are present. If a Committee member must cancel on short notice (for example, because of illness) the research review can still occur on the scheduled date, and the student should arrange within 5 working days of the research review to meet with that committee member. The Preliminary Examination does not substitute for a Research Review. However, with the agreement of the student's Research Advisory Committee, there can be a gap of up to six months between the Preliminary Examination and the next scheduled Research Review.

It is the student's responsibility to see that Research Reviews occur within one-year intervals until informed by his/her Advisory Committee that it is time to write the Ph.D. dissertation or M.S. thesis. Complete and finalized (ready for distribution) Research Review Abstracts are due in the office of the Chairperson of the Graduate Program Committee no later than 7 calendar days prior to the day of the Research Review. Students are responsible for distributing the Abstract to members of their advisory committee and to all resident departmental faculty.

- F. **Course Program** - During the Fall Semester, students take the following required courses: 8309 - Presentation of Scientific Information (1 s.h.); Foundations of Microbiology and Immunology (course is being renumbered by the Graduate School)(4 s.h.) (consists of two parts: 5301, Microbial Physiology & Genetics, and 5302, Fundamentals of Immunology); and 5351 - The Cellular and Molecular Basis of Host-Pathogen Interactions (3 s.h., in alternate years).

During the Spring Semester, students have the following required courses: 8351 – Molecular Approaches to Research (3 s.h., in alternate years); 8203 - Fundamentals of Biochemistry (4 sh, every year) (Note that course 8204, Macromolecules, can substitute for 8203, with the prior agreement of the student's Faculty Advisor). During the Spring Semester of their first year, and in subsequent semesters, students may also take additional courses. The minimum course requirements for the M.S. and Ph.D. degrees and the courses offered are listed on Page 13.

Graduate students must have a GPA of 3.0 at the end of their first calendar year (excluding research credits) and must maintain a 3.0 GPA (including research credits) throughout the program. Students are, however, expected to maintain a GPA of 3.25 in order to assure continued financial support. Students who are dissatisfied with their grade can appeal in writing to the Course Director and to the Chair of the Department.

- G. **Scientific Integrity** - The attendance of students at all Scientific Integrity classes is mandatory.
- H. **Seminars** - There is an extensive program of seminars at the University to supplement

classroom and laboratory teaching. The departmental seminars and the graduate student seminars (courses 8300-8350) are the most pertinent. It is expected that all students will attend graduate student seminars and all general departmental seminars unless there is a direct conflict with formal classes. Attendance at seminars in the departmental seminar program is mandatory; failure to attend will affect the research grade of the student. In addition, very useful information can be gained from seminars held in other departments. An up-to-date list of seminars is posted on the Department of Microbiology and Immunology bulletin board.

The Department also sponsors a one-day departmental research conference (Morton Klein Student Conference). At this Departmental conference, several students describe their research programs in general terms with a view to increasing general awareness and interest in the various research programs in the Department.

- I. ***Journal club.*** The Department has a very active journal club. Students are required to attend meetings of the journal club throughout their time in the graduate program. Attendance of at least 75% of the journal club presentations is required and failure to attend will affect the research grade of the student. As they progress through the program students are expected to participate in, and occasionally lead, the discussions.
- J. ***Outside Employment*** - Being a graduate student is a full-time occupation, and students are strongly advised against obtaining outside employment. Some sources of funding for graduate students explicitly prohibit outside employment.

II. The Second Year

- A. ***Teaching Responsibilities*** - As part of their graduate training, students may have some teaching experience. This usually does not start until the second year. All students may be required to assist as instructors in the course given for medical students. In some cases, students may be asked to act as conference leaders in that course. Opportunities to gain teaching experience may continue in the third and subsequent years depending on the interest of the individual students.
- B. ***Course Program*** - During the Fall and Spring Semesters, students take as many courses as needed to fulfill the Department requirements for graduation. Refer to the separate section of this handbook stating the minimum course requirements for the Ph.D. and M.S. degrees and the courses offered.
- C. ***Preliminary Examination*** - After 2 years of matriculation in this Department, students enrolled in the Ph.D. program are required to take this examination. The policy and procedures for the preliminary examination are in the latter part of this handbook.

III. Third through Final Years

A. ***Elevation to candidacy.*** After passing the Preliminary Examination, students must apply to the Graduate School for Elevation to Candidacy. The form "*Dissertation Proposal Transmittal for Elevation to Candidacy*" can be found on the Graduate School website, www.temple.edu/grad. A 5-page proposal, approved by the student's advisor, must be completed within three months of passing prelims and given to the Graduate School Coordinator (Chairperson's Office), along with the transmittal form, for submission through the Coordinator of Graduate Student Services at the School of Medicine to the Dean of the Graduate School.

B. ***Research***

The progress of the student's dissertation research will continue to be monitored by Research Reviews, which are ordinarily held at yearly intervals (see Page 3). Before the end of the fourth year, the composition of the advisory committee should be expanded and must include a member from outside the Department.

C. ***Dissertation - Thesis***

Ph.D. students - have seven years from the time of matriculation to complete and successfully defend a dissertation.

M.S. - usually complete and successfully defend a thesis within three years, but must do so within one year after the Advisory Committee directs the student by letter to write a thesis.

General style for dissertation and thesis - refer to "Dissertation Handbook," available from the graduate office.

The research conducted for the purpose of constructing the Ph.D. Dissertation must be carried out while the student is enrolled in the doctoral program, and must be the product of the dissertation study and must not have been used to obtain another degree. In addition, only those portions of co-authored papers, which were written by and contain relevant research conducted by the dissertation candidate may be included. Work already published by the candidate must be logically connected and integrated into the dissertation. Simply binding reprints or collections of publications together is not acceptable as a dissertation.

D. ***The Final Examination*** - At least 3 weeks in advance, the student should notify the Chairperson of the Department in writing about the date and place of the final examination and the examiners for the final examination. This announcement must be provided at least 10 working days in advance to all members of the Department of Microbiology and Immunology, and to the Dean of the Graduate School, and must be posted in the Medical School. A public presentation of the student's work is required for Ph.D. candidates, but not for M.S. candidates. The Doctoral Dissertation Examining Committee is composed of all members of the Advisory Committee *and* an additional member who is not a member of the Advisory Committee *and* who is not a member of the Department of Microbiology and Immunology. Since the Advisory Committee must include an "outside" member, this means that two "outside" members must be a part of the Doctoral Dissertation Examining Committee. The Chairperson of the Doctoral Dissertation Examining Committee will be selected by majority vote of the Examining Committee and shall not be the student's major advisor. Five is the minimum number of qualified examiners for the defense of a Ph.D. dissertation. For

defense of the M.S. thesis an outside member is not required, and three is the minimum number of qualified examiners. The chairperson of the Department of Microbiology and Immunology shall approve the composition of the Doctoral Dissertation Examining Committee. Approval by the Graduate School is required for any Committee Member who is not Temple University Graduate Faculty; the Graduate School requires at least four weeks advance notice of any outside members. Approval of the Graduate School should be sought after obtaining all Departmental approvals. Students must make sure that they are familiar with, and in compliance with, all departmental and graduate school requirements. They should do so well in advance of the proposed date of their defense.

It is expected that the thesis supervisor will receive the thesis in a timely fashion, and will review the thesis to ensure it is in presentable form before it is submitted to the examining committee.

At least three weeks in advance of the examination, all examiners must receive a typed copy of the dissertation or thesis in its final form. These copies should nevertheless not be permanently bound, in order to allow for changes that might be suggested or required by the examiners.

A majority vote plus one is required of the Doctoral Dissertation Examining Committee in order to pass the Dissertation defense. The major advisor must vote in the majority in order for the student to pass the defense. In the event of a failure, a report in writing must be provided to the student by the Doctoral Dissertation Examining Committee. A dissenting report may be filed by one or more members of the Doctoral Defense Examining Committee and forwarded to the Dean of the Graduate School for review and action.

- E. *Deadlines for Graduation*** - Approximate deadline dates for a May graduation are: 1st week in February for filing an application of intent to graduate; mid-April for bound copies of thesis and an abstract. Refer to the "Instruction Sheet - Graduation - Doctor of Philosophy" for exact deadline dates and other details. This instruction sheet is available on-line from the Graduate School.

IV. Academic Standards

A. Annual Student Evaluation

Since the Department accepts students, provides student financial aid, and recommends the granting of the graduate degree, it is the Department's responsibility to keep track of its students and to determine that they are making progress in their graduate training. Compliance with all Departmental, Graduate School, and University regulations, as well as satisfactory research progress, is assessed throughout the student's participation in the program. This assessment is done as follows: There is an ongoing evaluation of students throughout the year. For first year students, initial evaluations of research are done at the end of each laboratory rotation.

Subsequently, all students present research progress reports (oral research reviews) at least every year, at which time they are evaluated by their Research Advisory Committee. The faculty evaluations of the Research Reviews are reported and discussed at Departmental faculty meetings. Students making unsatisfactory progress will be considered on academic probation. Criteria for placement on Academic Probation will include (but are not limited to):

1. GPA < 3.0.
2. Failure to schedule research reviews on time.
3. Less than adequate progress toward the degree as determined by the research advisory committee.

Terms for removal from academic probation will be determined by the Graduate Program Committee after consultation with the advisory committee and Department Chairperson. It should be noted that a student who remains on Academic Probation at the end of two consecutive semesters (excluding summers) will be **dismissed** from the Program.

B. Withdrawal from courses

Withdrawal from a course during the first two weeks requires permission from the Instructor. Withdrawal after the first two weeks requires a written justification by the student and approval by the Graduate Program Committee; it also requires approval by the Graduate School.

V. General Considerations

A. *Travel Money for Scientific Meetings*

Departmental policy is to encourage students to attend scientific meetings, especially in the final years of study. Travel funds are generally in short supply, and the current view is that departmental support should be supplemental to support from other sources, either from research grants or personal funds. Students presenting papers are given top priority. Available travel funds will be allotted to graduate students from Training Grants and from other funds. In general, the Department tries to provide an equal amount to all students. Each student planning to travel to attend a meeting must submit a travel-request form to the Chairperson of the Department.

In any fiscal year (July 1 - June 30), all requests for travel should be made as early as possible, so that plans to arrive at an equitable distribution of the available travel funds can be made.

B. *Vacations*

Students are permitted to take vacations. For first year students, permission must be granted at least 2 weeks **in advance** by the Graduate Program Committee Chairperson. For students who have chosen a permanent advisor, vacations should be arranged between the student and the faculty advisor.

C. *Department*

Students should regularly check their e-mails and mailboxes for

communications about the program. Students should promptly notify the Chairperson's Office of any change in their address or other particulars.

**SUMMARY OF REQUIREMENTS
FOR PH.D. AND M.S.* STUDENTS**

(*Requirements #2, 5 and 6 refer only to Ph.D. students)

To maintain good standing in the program, students must:

1. Attend orientation meeting.
2. Participate in a minimum of 3 laboratory rotations for which 3 individual rotation evaluation forms should be submitted to the Administrative Office within 7 days of completion of each individual rotation. M.S. students generally do not perform rotations.
3. In consultation with proposed advisor, submit letter to the Chairperson of the Department requesting that the advisor be appointed dissertation (or thesis) advisor.
4. Have a research review with the research committee within 6 months of Chairperson's written approval of advisor. This committee must have a minimum of 3 faculty members of this department (including advisor). An abstract and announcement of the review must be circulated to the faculty seven days prior to the review. Subsequent reviews must be scheduled with a maximum interval of 1 year. These reviews continue until the research committee indicates that the work is ready to be written and submitted as an M.S. thesis or a Ph.D. dissertation. The Chair of the Research Review Committee will submit the evaluation forms to the Administrative Office.
5. (Ph.D. candidates) Pass the Preliminary Examination taken at the end of the second year. Students wishing to take the examination must have completed at least 1 year in residence, and have taken all required didactic courses plus one elective course.
6. Within one month of passing the Preliminary Examination, apply to the Graduate School for Elevation to Candidacy.
7. Before the defense of thesis or dissertation, have completed the course requirements, which for the M.S. and Ph.D. degrees are 15 and 23 semester hours, respectively, of departmental approved didactic and seminar course work.
8. Complete and successfully defend a Ph.D. dissertation within 7 years from the time of matriculation and within 5 years of being elevated to candidacy. Master's Thesis must be submitted and defended within 1 year of being directed by the advisory committee to do so. The composition of the Examining Committee must be approved by the Chairperson of the Department and by the Graduate School. At least 3 weeks in advance of the final examination (defense) all examiners must receive a typed copy of the dissertation or thesis in near final form. At least 3 weeks in advance of the final examination, the student must receive approval from the Chairperson of the Department about the date and place of the examination.
9. This announcement must be provided at least 10 working days in advance to all members of the Department and to the Dean of the Graduate School, and must be posted in the School of Medicine.
10. Submit signed copies of the thesis or dissertation and relevant forms to the Department and Graduate School as described by current Graduate School policy.

**Temple University School of Medicine
Department of Microbiology & Immunology**

**POLICY CONCERNING DEPARTMENTAL GRADUATE FACULTY
AND Co-ADVISORS**

A student's dissertation research must be performed with a Research Advisor who is a member of the Graduate Faculty of Temple University and whose primary academic appointment is in the Department of Microbiology and Immunology, with the approval of the Department Chairperson. (See list of Department Graduate Faculty on Page 12.)

It is also possible for a student to do any portion of their dissertation in the laboratories of one or more Research Co-Advisors who carry secondary appointments or primary Dean's appointments in the Department of Microbiology & Immunology

Before selecting a permanent Research Advisor, a student must spend time doing research under the supervision of at least 3 potential Research Advisors (see Laboratory Rotation Procedures for details). A student may spend part or all of the rotation period in the laboratory of a potential Co-Advisor(s). However, if the student chooses to work permanently in the laboratory of a Research Co-Advisor, he or she must also identify a departmental Advisor. The research topic must be of mutual interest to both the departmental Advisor and the Co-Advisor. The Departmental Advisor carries the responsibility for the Department of supervising overall research progress and quality.

After a permanent Advisor is selected by the student and approved by the Chairman of the Department of Microbiology & Immunology, the same relationship between Advisor and Co-Advisor(s) is maintained in directing and supervising the work performed by the student.

**Temple University School of Medicine
Department of Microbiology & Immunology**

**RESIDENT FACULTY WITH PRIMARY APPOINTMENTS IN
MICROBIOLOGY & IMMUNOLOGY**

Ganea, Doina, Ph.D., Professor and Chairperson

Buttaro, Bettina A., Ph.D., Associate Professor

Chan, Marion M., Ph.D., Associate Professor

Chin, Mario, Ph.D., Assistant Professor

Eisenstein, Toby K., Ph.D., Professor

Gallucci, Stefania, M.D., Associate Professor

Henderson, Earl E., Ph.D., Professor

Jensen, Liselotte, Ph.D., Assistant Professor

Long, Walter K., Ph.D., Associate Professor

Monestier, Marc, M.D., Ph.D. Professor

Piggot, Patrick J., Ph.D., Professor

Skorski, Tomasz, M.D., Ph.D., Professor

Tsygankov, Alexander Y., Ph.D., Associate Professor

Tükel, Çagla, Ph.D., Assistant Professor

Xiao, Weidong, Ph.D., Associate Professor

EMERITI

Cundy, Kenneth R., Ph.D., Professor Emeritus

Pakman, Leonard M., Ph.D., Professor Emeritus

Willett, Norman P., Ph.D., Professor Emeritus

Zubrzycki, Leonard J., Ph.D., Professor Emeritus

MINIMUM COURSE REQUIREMENTS FOR THE M.S. DEGREE IN MICROBIOLOGY & IMMUNOLOGY

Temple University School of Medicine

15 semester hours of didactic and seminar courses, including “Foundations of Microbiology and Immunology” (4 sh; being renumbered by the Graduate School), 5351, and 8351, two semester hours of 8300, 8310, 8320, 8330, 8340, or 8350, and one elective course. The Course “Foundations of Microbiology and Immunology” corresponds to courses 5301 + 5302; consequently, until it has a course number, students should register instead for both 5301 and 5302. Students are expected to take the available elective course most closely related to their research. Students working toward a M.S. Degree should realize that whenever they choose to omit an elective course, they might be handicapping themselves should they later continue toward a Ph.D. degree.

MINIMUM COURSE REQUIREMENTS FOR THE PH.D. DEGREE IN MICROBIOLOGY & IMMUNOLOGY

Temple University School of Medicine

Required courses: 23 semester hours of didactic and seminar courses.

Temple University School of Medicine has developed an Interdisciplinary Biomedical Sciences Program. In it students are required to take two “Foundations of Biosciences” courses, two “Integrated Biosciences” courses, a course in “Scientific Communication” and a course in “Scientific Integrity and Bioethics.” For details, see Graduate Program, which comes under Education in the School of Medicine web site on-line. Several of the requirements are met by courses offered by the Department of Microbiology and Immunology

Specific required didactic and seminar courses:

Foundations of Microbiology and Immunology. A Foundation of Biosciences Course, (4 sh, every year, Fall). This course is being renumber by the Graduate School. It corresponds to courses 5301 + 5302; consequently, until it has a course number, students should register instead for both 5301 and 5302.

5351 Cellular and Molecular Basis of Host-Pathogen Interactions. An Integrated Biosciences Course (3 sh, every other year, Fall)

8203 Fundamentals of Biochemistry. A Foundation of Biosciences Course (4 sh, every year, Spring). Note that course 8204 (Macromolecules) can substitute for 8203, with the prior agreement of the student’s Faculty Advisor

8351 Molecular Approaches to Research. An Integrated Biosciences Course (3 sh, every other year, Spring)

5001 Scientific Integrity and Bioethics (1 sh, every year)

8309, Presentation of Scientific Information. A Scientific Communication Course (1 s.h., every year, Fall)

8300, 8310, 8320, 8330, 8340, or 8350. Microbiology and Immunology Graduate Student Seminar (4

s.h.) [A presentation at the annual Morton Klein Student Conference, or equivalent departmental conference, can substitute for 1 s.h. of seminar credit.]

For M.D./Ph.D. program requirements, please see Page 22.

†(Note: 5301 PLUS 5302 constitute a combined course “Foundations of Microbiology and Immunology” which is one of the “Foundation of Bioscience” courses – course number to be decided).

In addition to the above listed required courses, at least 3 semester hours of elective courses are required for graduation. Elective courses offered by the Department include:

- 9301 Comprehensive Immunology (3 sh, every other year, Spring)
- 9303 The Infectious Process (3 sh, every other year, Spring)
- 9307 Virology (3 sh, every other year, Spring)

Students must have taken at least 6 s.h. credits of 9999, Dissertation Research, in order to graduate.

Ph.D. candidates are encouraged to enroll for additional courses both within and outside the Department of Microbiology and Immunology, in consultation with their advisor and research advisory committee.

Students admitted to the Ph.D. program with graduate credits already earned as a non-degree student at Temple University or at another institution, may apply for transfer of credit up to a maximum of 12 s.h.

Please consult the Graduate School Bulletin for additional information.

Department of Microbiology and Immunology

COURSE DESCRIPTIONS

Courses at the 9000 level are usually offered in alternate years. Courses indicated below with one, two, or three asterisks meet the requirements of the newly developed Interdisciplinary Biomedical Sciences Program. (See Page 13, "item 2" for the course breakdown.)

5006 Molecular Basis of Microbiology and Immunology (4 s.h.)

Dr. Patrick J. Piggot, Dr. Doina Ganea and staff

Lecture course that includes the nature and structure of microorganisms; microbial physiology, biosynthesis of macromolecules, microbial growth, microbial and molecular genetics; fundamental principles of immunobiology and immunochemistry. Course for Post-baccalaureate students.

Foundations of Microbiology and Immunology (4 s.h.)

Dr. Patrick J. Piggot, Dr. Doina Ganea and staff

Lecture course that includes the nature and structure of microorganisms; microbial physiology, biosynthesis of macromolecules, microbial growth, microbial and molecular genetics; fundamental principles of immunobiology and immunochemistry. Corresponds to courses 5301 + 5302. Foundations of Biosciences course, required for Microbiology and Immunology graduate students. Course being renumbered by the Graduate School; in the interim, students should register for both 5301 and 5302.

5301 Microbial Physiology and Genetics (2 s.h.)†

Dr. Patrick J. Piggot and staff

Lecture course that includes the nature and structure of microorganisms, microbial physiology, biosynthesis of macromolecules, microbial growth, microbial and molecular genetics.

5302 Fundamentals of Immunology (2 s.h.)†

Dr. Doina Ganea and staff

Prerequisite: Permission of Instructor. Lecture course that emphasizes the fundamental principles of immunobiology and immunochemistry.

† Note that 5301 plus 5302 constitute a combined course "Foundation of Microbiology and Immunology."

5351 Cellular and Molecular Basis for Host-Pathogen Interactions (3 s.h.)

Dr. Toby K. Eisenstein, Dr. Bettina A. Buttaro, and staff

An introduction to the cellular and molecular basis for pathogenesis, and to host defense mechanisms. Selected microorganisms will be covered as models of experimental infectious diseases. Examples will be drawn from all major groups of pathogens, including bacteria, fungi, protozoa and viruses. A core course (Integrated Biosciences). Required for all Microbiology and Immunology graduate students.

8300-8350 Microbiology and Immunology Graduate Student Seminar (1 s.h. each)

Dr. Alexander Y. Tsygankov and staff

Graduate students present seminars to the department. Four s.h. required for Ph.D. students and two s.h. for M.S. students. (Course numbers: 8300, 8310, 8320, 8330, 8340, and 8350)

8309 Presentation of Scientific Information (1 s.h.)

Dr. Walter K. Long

Presentation of scientific information is discussed in conference. Students learn to give and to critique scientific presentations. Required for all Microbiology and Immunology graduate students.

8351 Molecular Approaches to Research (3 s.h.)

Dr. Tomasz Skorski and staff

Prerequisite: 5006 or Permission of Instructor. An in-depth analysis of recombinant DNA technology and its application to basic problems of biology; limitations of the methodologies; role of classical microbiology, virology, nucleic acid chemistry, and biochemistry in the developments of the methodologies, vectors, cloning, blotting, sequencing and others. A core course (Integrated Biosciences). Required for all Microbiology and Immunology graduate students.

8360 Infectious Process Seminar (1 s.h.)

Dr. Toby K. Eisenstein, Coordinator

Prerequisite: 9303 or equivalent or Permission of Instructor. Student presentations and discussions of selected topics from current literature in the area of infection and host defenses.

9301 Comprehensive Immunology (3 s.h.)

Dr. Marc Monestier and staff

Prerequisite: 5006 or Permission of Instructor. Lecture course on advanced topics of immunology.

9302 Growth and Control (1 s.h.)

Department of Microbiology and Immunology Faculty

Prerequisite: 5006 or Permission of Instructor. Lecture and conference course that is focused on the analysis of cell growth and its control through molecular mechanisms.

9303 The Infectious Process (2-3 s.h.)

Dr. Toby K. Eisenstein, Dr. Bettina A. Buttaro and staff

Prerequisite: 5006 and 5351 or Permission of Instructor. Lecture and conference course on molecular mechanisms of microbial pathogenesis and host response. Microbial toxins and their action, microbe-phagocyte interactions with PMNs and macrophages, genetic basis of host resistance, and microbial products as regulators of the immune response.

9304 Microbial Genetics (3 s.h.)

Dr. Patrick J. Piggot and staff

Prerequisite: 5006 or Permission of Instructor. Lecture and conference course that emphasizes analysis of the regulation of gene expression in simple and complex systems.

- 9305 Molecular Immunology (2 s.h.)**
Dr. Marc Monestier and staff
Prerequisite: 5006 or Permission of Instructor. Lectures, student presentations and discussions of topics in molecular immunology, including T-cell receptors, tumor antigens, structure, organization and rearrangement of immunoglobulin genes, signal transduction and cytokines.
- 9306 Neuroimmunopharmacology (2 s.h.)**
Dr. Toby K. Eisenstein and staff
An interdisciplinary course that explores pathways, receptors, and mediation connecting the neural and immune systems.
- 9307 Virology (3 s.h.)**
Dr. Earl E. Henderson and staff
Prerequisite: 5351 or Permission of Instructor. Lecture and conference course with emphasis on recent advances in acute and chronic viral infections including malignancy.
- 9310 Topics in Clinical Immunology (1 s.h.)**
Department of Microbiology and Immunology Faculty
Prerequisite: 5006 or Permission of Instructor. Lectures, student presentations and discussions of selected topics of advanced areas of human immunology.
- 9312 Critique of Scientific Information (1 s.h.)**
Dr. Walter K. Long
This course is designed to teach graduate students to evaluate critically scientific publications. The students will be given scientific articles and asked to evaluate the data.
- 9391 Research in Microbiology (1 s.h. - 9 s.h.)**
Research course for students prior to taking Preliminary Examination.
- 9991 Research (1 s.h. - 6 s.h.)**
Research course (one semester) for students who have taken and passed the Preliminary Examination, but have not had Dissertation Proposal approved and have not been elevated to Candidacy.
- 9994 Preliminary examination preparation (1 s.h.)**
In certain circumstances, for students who have completed many of their didactic courses, and typically are in their second year, but have not taken the preliminary examination.
- 9996 Master's Thesis (1 s.h. - 9 s.h.)**
Registration for this course occurs in the semester in which the student will defend a Master's Thesis (mandatory registration) in accordance with the Policies and Procedures of the University.
- 9998 Post Candidacy Research (1 s.h.)**
Course (one semester) for students who have taken and passed the Preliminary Examination, but have not had Dissertation Proposal approved and have not been elevated

to Candidacy.

9999 Dissertation Research (1 s.h. - 6 s.h.)

Research course for students who have passed Preliminary Examination and have had both Dissertation Proposal and Candidacy approved. Students must have obtained 6 credits in order to obtain a Ph.D.

Note that students registered for courses 9994, 9998 and 9999 are considered full-time even when registered for 1 credit (1 sh).

PRELIMINARY EXAMINATION POLICY AND PROCEDURES

Purpose

The purpose of the preliminary examination is to evaluate the ability of potential Ph.D. candidates to carry out original dissertation research towards the completion of the Ph.D. program. It is expected that students will demonstrate their knowledge of specific detail in their major field by the successful completion of the required course work prior to taking the preliminary examination. The first part of the preliminary examination will test the candidates' knowledge of general concepts and their ability to critically apply information learned in required courses. The second part will test the candidates' understanding of their dissertation research project.

Requirements to Take the Preliminary Exam

All required didactic courses plus one elective course must be completed prior to taking the preliminary examination. The preliminary examination must be taken by all qualified Ph.D. students finishing their second year.

The Preliminary Examination

To be elevated to candidacy a student must pass both parts of the Preliminary Examination described below. The Preliminary Examination will normally be held in June and July of their second year. A maximum of 8 h is allowed for taking Part I. It is anticipated that there will be a gap of one month between passing part one and taking Part II.

Part I

1. Questions that cover concepts taught in the list of Required Courses will be sought from members of the Graduate Faculty by members of the Preliminary Examination Committee. For this examination to be successful, the committee will be expected to begin constructing the examination approximately two months in advance of the time it is given.
2. The Preliminary Examination Committee will use these questions as a basis to design an examination consisting of six questions of which each student will answer four.
3. Part I of the Preliminary Examination will stress the understanding of concepts, experimental design and analysis of data. Compare and contrast, or discussion questions will be accepted only under unusual circumstances. Questions will be selected and combined to stress multi-disciplinary approaches. The intention is that the examination will be a test of the student's ability to apply information learned in required courses to the experimental situation.

Questions will usually cover material presented to students in the required graduate courses, with emphasis on principles covered in those courses. Students should understand that critical thinking skills will be tested, and that developing those skills is greatly aided by attendance at the seminars and journal clubs of the Department. Each seminar and journal club can be used as preparation for the student's exam. For example, each can be critiqued by the student with the following questions: i) Are the most effective methods

being applied to the problem? ii) Are the conclusions drawn appropriate to the data? iii) What would be a better experimental means to attack the problem?

4. It is anticipated that the examination will be submitted to the Faculty by the Preliminary Examination Committee for comments, suggested changes, and approval during a regular faculty meeting.
5. The Preliminary Examination Committee will solicit from each author of the preliminary exam questions a brief outline, which should provide the minimal basis for an acceptable answer to the question. The Preliminary Examination Committee will appoint in advance two designated Graduate Departmental Faculty members to independently grade each question. In some exceptional cases, it may be necessary that faculty members be required to grade more than one question. The two faculty graders will independently, and without any consultation, grade the exam question on a scale of 0-10, with a score of "10" representing an "exceptional" performance, and "7.0" representing a "barely adequate" or "borderline" score. Graders may use half-point grades. Those answers which do not receive scores which average a "7.0" or above, will be graded independently, and without consultation, by a third faculty grader (to be appointed by the Preliminary Examination Committee). Also, if the difference in the two scores is greater than 2, a third grader will be used, and the third score will be averaged with the first two scores.

In order to pass Part I of the Preliminary Examination, a minimum of three scores of "7.0" or better must be achieved for the four answers. In addition, the Preliminary Examination Committee will assemble the scores for each of the four answers provided by a student, and will further consider the "best" three averaged scores from each student. The averaged scores for each of these three answers must total "22.0" or more, or the student receives a "failing" grade for the Preliminary Exam. Those students who receive a failing grade must take a re-examination. No conditions may be attached to a passing grade.

Re-examination

If a student fails Part I, (s)he is allowed to retake the examination. If a re-examination is required, it must be taken within two weeks of notification of the official result (which is provided in writing). A student is allowed to retake the examination no more than once. The re-examination will be taken as an oral examination, unless justification for a written examination is provided. This re-examination will be given by a committee consisting of an author of each of the four questions that had been answered by the student, plus at least one additional faculty member to be appointed by the Preliminary Examination Committee. In the oral re-examination questions will emphasize, but will not be absolutely limited to, the subject matter covered by the four questions answered by the student in the initial examination.

Part II

Within one month of passing Part I of the Preliminary Examination, the student will take Part II. Part II is an examination of a research proposal on the student's area of research, and related areas. As part of this examination, the student prepares an original research proposal of about 10 pages (double spaced) delineating specific aims (about 1 page), background and significance (about 5 pages) and experimental plan (about 4 pages) for their research. The student will distribute the proposal to departmental Faculty at least one week before the scheduled examination. The Examination Committee for Part II will be specially constituted for each student. It consists of the student's Research Advisory Committee to which has been added one or more designees of the Preliminary Examination Committee who have been approved by the Chair of the Department. The student will give an oral presentation of this proposal to the Examination Committee. The presentation of the proposal is not intended to include an extensive description of the student's data, and is expected to last about 20 min. The student will then be questioned about the proposal by the members of Examination Committee. The student will be expected to demonstrate understanding of his/her research, and of the background and significance of the research. The student's performance will be evaluated using a Research Proposal Examination Form. On the form, Examiners score six categories with scores of 1.0, 1.5, 2.0, 2.5 or 3.0, where 1.0 is excellent and 2.0 is acceptable for a Ph.D. student. The six categories are given equal weight and the scores averaged. A final score greater than 2.00 is considered a fail. A student is allowed to retake the examination no more than once.

RESEARCH PROPOSALS FOR ELEVATION TO CANDIDACY FOR THE Ph.D. DEGREE

After passing the Preliminary Examination, students must apply to the Graduate School for Elevation to Candidacy. Graduate students who are applying for candidacy for a Ph.D. degree are required to write proposals describing the research they are performing for their Ph.D. dissertation. The form “*Dissertation Proposal Transmittal for Elevation to Candidacy*” can be found on the Graduate School website, www.temple.edu/grad. A 5-page proposal, approved by the student’s advisor, must be completed within one month of passing prelims and given to the Graduate School Coordinator (Chairperson’s Office), along with the transmittal form, for submission through the Coordinator of Graduate Student Services at the School of Medicine to the Dean of the Graduate School.

Proposals are to be about five pages in length and to contain the following components:

1. a statement of the problem;
2. background information describing how the student's project fits within the context of the general field of research;
3. a summary of what the student has done so far;
4. a brief description of the plans for future research, including the methodology to be employed; and,
5. references.

As students prepare their proposals, they should adhere to this outline. The proposal for elevation to candidacy for the Ph.D. Degree must describe the student's laboratory research project that will form the basis for the written Ph.D. dissertation.

DEPARTMENT OF MICROBIOLOGY & IMMUNOLOGY REQUIREMENTS FOR M.D./Ph.D. STUDENTS

Coursework

In addition to the Medical School curriculum, Course 8351 plus at least one advanced elective course must be completed in the basic sciences. The course must be offered through, or approved by, the Department of Microbiology and Immunology. In addition, students should take at least one s.h. of the Departmental graduate student seminar course.

Preliminary Examination

In order to be evaluated for admission to candidacy, students are required to take a preliminary examination. The examination is taken after the student has passed Part I of the National Board Examination and before the beginning of the 9th semester in the M.D./Ph.D. program (which is the 6th semester in the Graduate program). Students who achieve a score of 200 or greater on Part I of the National Boards will take an examination on a research proposal as outlined below. Students who achieve a score of less than 200 will be expected to pass a written examination in specified subjects before proceeding to the examination on a research proposal.

1. The Preliminary Examination Committee for the research proposal will consist of at least 5 members, as follows: i) the members of the Graduate Faculty who are Members of the student's Research Advisory Committee; ii) a member from outside the Department who has been approved by the Chairperson of the Department; and iii) a member designated by the Preliminary Examination Committee (who is not a member of the Research Advisory Committee). The Chairperson of the Examination Committee will be designated by the Preliminary Examination Committee, with the approval of the Departmental Chair.
2. The student will circulate to Departmental Faculty and to members of the Preliminary Examination Committee a summary statement about his/her research project. This will outline the objectives and specific aims of the research; the background and significance of the research; and the experimental approaches to be adopted. The summary statement is expected to be 3 to 5 pages in length, double-spaced.
3. The student will use the summary statement as the basis for an oral presentation to the Preliminary Examination Committee. The presentation should be made 1 to 4 weeks after the distribution of the summary statement. The student's presentation should not exceed 20 minutes. The summary statement and the oral presentation will be used as the basis for the examination.
4. The examination will follow immediately after the oral presentation. **The examiners will explore the student's general knowledge and understanding of the research area.** The examiners may test the student's understanding of results that he or she has obtained, but will not evaluate the student's technical skills or the amount of data obtained.
5. To pass the examination, no more than two members of the Preliminary Examination

Committee may give the candidate a grade of "fail". No member may abstain from voting, and the only outcomes of the examination are either that the student passes without condition, or that the student fails.

6. The Research Proposal Examination can only be taken twice.
7. All examinations in this Department are administered under the Honor Code of Temple University School of Medicine.

Temple University School of Medicine HONOR CODE

All examinations in this Department are administered under the Honor Code of Temple University School of Medicine.

- A. No student may receive help from any unauthorized source in answering questions on any evaluation or examination. Such unauthorized help includes: copying answers to any examination question from other students, use of any note or text in a closed-book examination, use of references specifically not permitted by the course instructor in open-book examinations, discussion of examination questions with any other person during an examination, and obtaining copies of examination questions prior to the time they are to be released by the course instructor.

- B. No student may interfere with the activities of other students preparing for or taking examinations. Such interference includes: tampering with materials being used on practical examinations, creating a disturbance in examinations (loud conversation, etc.), removing reference material from the library for periods of time longer than permitted by library regulations, removal of publicly posted class notes, diagrams, references, etc.

- C. No student may in any way assist another to violate this Honor Code.