

# THE DEPARTMENT OF PHARMACOLOGY

**BAYLOR COLLEGE OF MEDICINE**

## **GRADUATE PROGRAM POLICIES**

THE POLICIES AND PROCEDURES SET FORTH IN THESE DEPARTMENTAL GUIDELINES ARE ADDENDA TO THE POLICY HANDBOOK, GRADUATE SCHOOL, BAYLOR COLLEGE OF MEDICINE.

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## **I. PURPOSE**

The Department of Pharmacology offers a graduate program leading to the Ph.D. degree. This program provides unique opportunities for education and creative research in an exciting environment. Graduates of the Department of Pharmacology are equipped with the tools and knowledge required to attack the unsolved problems of human diseases through investigation of drug action, drug-resistance mechanisms, gene regulation, and the development of new drugs and approaches to these medical problems.

The graduate program is coordinated by the Pharmacology Graduate Program Director. Graduate policy and curriculum are established by the Pharmacology Graduate Program Committee (PGPC). The policies and procedures set forth in these departmental guidelines are addenda to the Policy Handbook, Graduate School of Biomedical Science, Baylor College of Medicine. Departmental procedures may modulate or reinforce Graduate School policies, but do not supersede them.

## **II. GRADUATE PROGRAM DIRECTOR**

The Pharmacology Graduate Program Director is appointed by the Chair of the Pharmacology. The Director of Graduate Studies is responsible for coordination of the graduate program within the Department of Pharmacology. The Graduate Program Director serves as chair of the Pharmacology Graduate Program Committee. The Graduate Program Director is responsible for transmitting information between the Graduate School of Biomedical Sciences Office and the graduate students and faculty in the Pharmacology Department, as well as between the students and the faculty within the Department. The Graduate Program Director can be assisted in this function by the Pharmacology Graduate Program Coordinator.

The Pharmacology Graduate Program Director also represents the Department by serving as a delegate to the Executive Council of the Graduate School. The Graduate Program Director may also serve on other Graduate School Committees; however, it is expected that other faculty members within the Department will be available to serve on these committees as well. If the Graduate Program Director is selected to serve as a member of the administration of the Graduate School that person should resign from the directorship.

## **III. ADMISSION TO THE GRADUATE PROGRAM**

The requirements and procedures for admission are essentially those of the Graduate School of Biomedical Sciences. While the Pharmacology Graduate Program Committee conducts the initial reviews and interviews of applicants, the final acceptance of applicants is made by the Admissions Committee of the GSBS.

Candidates are selected by the Pharmacology Graduate Program Committee for approval by the GSBS Admissions Committee on the basis of their undergraduate academic record, scores on the Graduate Record Exam, scores on the Test of English as a Foreign Language (for foreign students), letters of recommendation and personal interviews. Undergraduate academic records must be complete and presented in the form of an official transcript mailed directly by the school to the Graduate School Admissions Office.

## IV. COMMITTEES

### Pharmacology Graduate Program Committee

The Pharmacology Graduate Program Committee (PGPC) is responsible for formulating and executing policies and practices dealing with graduate education in the Department of Pharmacology. The major areas of responsibility for the PGPC include: setting of recruitment and admissions guidelines, orientation of new students, establishment and review of curriculum, the monitoring of progress of students toward the Ph.D. degree and the assessment of students through qualifying examinations.

Members of the PGPC serve as the temporary advisory committee for the first year graduate students. The members counsel the graduate students through the early phase of their graduate program. The PGPC or Director should meet with the first year graduate students prior to registration for the second term and when needed for guidance until the Thesis Advisory Committee is approved.

The membership of the PGPC includes the Graduate Program Director, a minimum of four additional faculty representatives and one student representative. The student representative is chosen from students in good standing that have passed their qualifying exam. The tenure of a student representative is one year. The committee makes recommendations for new faculty members from the faculty to the Chairman of the Department who appoints new members to the Committee.

### Thesis Advisory Committee

**Major Thesis Advisor** - The Major Thesis Advisor is responsible for working with the student to maintain steady progress toward the degree. The Major Thesis Advisor and student select and plan the thesis research. It is the duty of the Major Thesis Advisor to guide the student in effective and maximal use of the faculty and other resources within the Department and the academic community to ensure that the student accomplishes their goals in a graduate program. The relationship between the Major Thesis Advisor and student should be established only after careful consideration by both student and prospective advisor. All full-time faculty who hold an appointment in the Department of Pharmacology at the rank of Assistant Professor or above may serve as Major Thesis Advisors for graduate students in the program in Pharmacology.

All faculty who wish to serve as Major Thesis Advisors must show evidence of being established principal investigators with sources of research support. A Major Thesis Advisor is required to assume financial responsibility for the student during their tenure in the advisor's laboratory. Incoming graduate students are given a list of faculty who meet the above criteria and who are willing to serve as Major Thesis Advisors

When the selection of the Major Thesis Advisor is made, the corresponding form must be submitted to and approved by the Pharmacology Graduate Program Committee by the beginning of the student's second year. Upon appointment of the Major Advisor, the student and their Major Advisor should review and sign the Compact between Students and Their Mentors Form and return a signed copy to the GSBS.

**Membership of Thesis Advisory Committee** - The Thesis Advisory Committee for each student consists of the student's Major Thesis Advisor and at least three additional faculty

members, two with appointments in the Department of Pharmacology and one member from outside of the department.

The Major Thesis Advisor serves as chair of the student's Thesis Advisory Committee. The Major Thesis Advisor counsels the student in the selection of the remaining members of the Thesis Advisory Committee. The student may select the outside member from other departments at Baylor College of Medicine, as well as from neighboring institutions (e.g., Rice University, The University of Texas Medical School, and The University of Texas - Graduate School of Biomedical Sciences).

The Thesis Advisory Committee is to be selected after passing qualifying exams and no later than the third term of the second year. After approval by the student's Major Advisor and the Graduate Program Director, the Appointment of Advisory Committee form must be submitted to the Graduate School. The student's advisory committee is then appointed by the Dean of Graduate School.

The student must maintain contact with all members of the Thesis Advisory Committee for advice and counsel not only in regard to thesis research but also to the character and progress of the student's total graduate program. Changes in the Major Thesis Advisor and/or Thesis Advisory Committee must be approved by the GSBS.

#### Examination Committees

**Qualifying Examination Committee** - The composition of the Qualifying Examination Committee will be formulated by the Pharmacology Graduate Program Committee and Director. The Committee will consist of five members, four members with appointments in Pharmacology and one from outside of the Department. The student's advisor may not serve on their Qualifying Examination Committee. The members will be listed on the Qualifying Examination Date Form and approved by the GSBS. If any member of the Qualifying Examination Committee cannot be present at the Qualifying Exam, they must notify the Dean in writing prior to the date.

**Dissertation Examining Committee** - The examining committee is appointed by the Major Advisor in consultation with the Program Director and is approved by the Dean in Defense of Dissertation Date form turned in to the GSBS. The Dissertation Examining Committee is composed of the student's Advisory Committee and any additional ex-officio members deemed appropriate by the Major Advisor and Program Director.

## V. COURSE OF STUDY

### Curriculum

**Required Courses** – Students should complete the required courses and a minimum of 4 lab rotations by the end of the fifth term of the first year.

#### FIRST TERM

GENETICS A (2 HRS)  
MOLECULAR METHODS (3 HRS)  
ORGANIZATION OF THE CELL (2 HRS)  
ROTATION (VARIABLE HRS)

#### SECOND TERM

CANCER (1 HR)  
IMMUNOLOGY (1 HR)  
SCIENCE AS A PROFESSION – ETHICS (1 HR)  
ROTATION (VARIABLE HRS)

#### THIRD TERM

GENE REGULATION (3 HRS)  
MOLECULAR INTERACTIONS (2 HRS)  
ROTATION (VARIABLE HRS)

#### FOURTH TERM

GENERAL PHARMACOLOGY (3 HRS)  
STRUCTURE OF MACROMOLECULES (3HRS)  
ROTATION (VARIABLE HRS)

**Elective Courses** - Students are required to complete a minimum of 60 term hours of course work, of which 30 term hours must be in courses that either have a letter grade assignment or are specifically designated by the Graduate School as “approved pass/fail” graded courses (e.g. Method and Logic in Molecular Biology and Research Design). Selection of elective courses will be made in consultation with the Pharmacology Graduate Program Committee.

The following courses are approved by the Pharmacology Graduate Program Committee as electives:

#### FIRST TERM

ADVANCED TOPICS IN STRUCTURAL & COMPUTATIONAL BIOLOGY (1 HR)  
CELLULAR AND MOLECULAR BIOLOGY OF DISEASE (2 HRS)  
COMPUTATIONAL MOLECULAR BIOPHYSICS & STRUCTURAL BIOLOGY (6 HRS)  
METHOD & LOGIC IN MOLECULAR BIOLOGY (3 HRS)

#### SECOND TERM

ADVANCED TOPICS IN STRUCTURAL & COMPUTATIONAL BIOLOGY (1 HR)  
CELL DIVISION (2 HRS)  
GENETICS B (2 HRS)

#### THIRD TERM

COMPUTER-AIDED DISCOVERY METHODS (2 HRS)

#### FOURTH TERM

BIOINFORMATICS & GENOMIC ANALYSIS (3 HRS)

BIostatISTICS FOR TRANSLATIONAL RESEARCHERS (3 HRS)

CELLULAR SIGNALING (3 HRS)

INTRODUCTION TO MOLECULAR CARCINOGENESIS (3 HRS)

INTRODUCTION TO STATISTICAL COMPUTING & MODELING (3 HRS)

PRACTICAL INTRODUCTION TO PROGRAMMING FOR SCIENTISTS (3 HRS)

#### FIFTH TERM

BIostatISTICS (3 HRS)

PROTEOMICS & FUNCTIONAL GENOMICS (3 HRS)

**Faculty Research Presentations** – Each faculty member is given the opportunity to make a short presentation to the first year students describing their overall research program. These are informal talks and should last only around 20 minutes. Two faculty members will present once a week for during the First Term. Attendance is mandatory for first year students.

**Research Rotations** - The primary goals for the research rotations are twofold: First, rotations allow new students to become familiar with research conducted in the laboratories of Pharmacology faculty members. Second, rotations allow students to familiarize themselves with laboratory procedures, approaches and a variety of research projects.

The student will select their Major Thesis Advisor primarily based on these rotations. All students are required by the department to complete four rotations in the first four terms. Students will select laboratories of professors with primary or secondary appointment in the Department of Pharmacology for rotation. At the fifth term, students will either choose their lab of study for their thesis work or participate in one more rotation.

Research Rotation credit hours are considered course hours (370-549) by the GSBS and contribute to the total of 60 credit hours that are required for graduation. For every credit hour of laboratory rotation for which a student is enrolled, they are expected to work a minimum of 3 hours per week in the laboratory. Some rotations may require more effort for limited periods of time (evenings or weekends). However, students are NOT expected to be full-time laboratory personnel.

In order to make the best of the research rotation for both the student and the faculty, they should meet before the rotation begins. If the faculty member will not be the direct supervisor for experimentation, the laboratory supervisor must be present at this meeting and understand the guidelines and requirements for the student's lab rotation. Both the faculty member and student should discuss and sign the Goals for Research Rotation Form and submit it to the PGP Director. The form will go into the student's program file. The form is due by the end of the first week of rotation.

The rotation period ends when classes end at the beginning of the study period preceding exams. At that time, the student and the faculty member should meet again. In consultation with the faculty member, the student is to write a one-page description of the rotation. This will be attached to the Evaluation of Research Rotation Form (from PGP) which is filled out by the faculty member and discussed with the student. Both the faculty mentor and student

sign the form indicating that they have discussed it. The form should be submitted to the department by the end of the corresponding term's exam week. The grade of Pass/Fail is given for a rotation by the faculty mentor.

**Research Hours** - All students must register for some form of research throughout their graduate career. First year students who are rotating through labs should register for Research Rotation (370-549). Students who have joined a laboratory, but have not yet been admitted to candidacy should register for Special Projects (370-435). Students who have been admitted to candidacy should register for Dissertation Research (370-550). The total number of hours of research and course credits each term should be at least 12. If the student is not taking courses during a term, they will register for 12 research hours.

**Journal Club** – Students will participate in a monthly journal club, led by faculty members. They will be notified of the dates and time by the Graduate Program office.

**Student Presentation** – All students who have passed their Qualifying Exams are required to make a formal presentation each academic year. These should be oral talks, not posters. Proof should be given to the Pharmacology Program Office. If the student is nearing the end of the academic year without having presented a talk, then they will be scheduled to do a departmental talk before the end of the year.

**Departmental Retreat** – The Department of Pharmacology participates in an annual retreat with the Department of Biochemistry and Molecular Biology. The research efforts of the faculty, post-doctoral researchers and graduate students are discussed at the retreat. Students are expected to participate in the departmental retreat. First year graduate student participation will be funded by the department.

### Qualifying Examination

The purpose of the qualifying examination is to assess the student's eligibility for admission to candidacy for the Ph.D. degree. Eligibility is determined by examination of the student's capacity for originality and scientific approach to research as well as his/her knowledge of the core curriculum of Pharmacology. All students must complete the Qualifying Examination processes by the end of their second year of enrollment.

**Abstracts** – Each student is expected to submit one abstract to the Qualifying Examination Committee by August 1 of their second year. The abstract should cover a topic that the student is considering for development into a dissertation project. Students should submit an electronic document containing the following to the Program office:

1. Background and Significance – Introduce the proposed research problem and highlight the gap in the field that the research proposal would fill. ~ 1 page
2. Hypothesis to be Tested – Clearly define the specific hypothesis that the proposal will address. ~ 1 paragraph
3. Specific Aims – List the specific question that the proposal will address and basic statement of the experimental procedures you plan to utilize to pursue answer to the hypothesis. ~ 3 to 5 Specific Aims
4. Literature Cited – Cite all material referenced in the abstract. Student must use a consistent format from the journal of their choosing.

The committee will return the abstract to the student by August 15. The student will use this abstract to write the proposal which is to be defended at the Qualifying Examination.

**Proposal** – The proposal will be prepared in the spirit of an NIH-R01 grant proposal and will include the following sections:

1. Specific Aims: Each aim should present a concise overview that places the proposed research in context, briefly describes its significance, states the main hypothesis to be tested and summarizes the experimental approach and expected outcomes. Students should try to be as innovative as possible. ~ 1 page
2. Background and Significance/Preliminary Studies: Briefly discuss the literature relevant to the proposal and provide a critical evaluation of the current state of knowledge. The student will be expected to have read any papers cited in this section. This section will also address the crucial gaps in the current knowledge and how this proposed research will fill that gap. ~ 3 pages
3. Research Design and Methods: Describe the detail of the research design, referring to published protocols when possible. This section should also discuss the potential difficulties and limitations of the procedures and the alternative approaches that could be used to overcome these limitations. ~ 7-9 pages
4. Literature Cited: Students may pick any journal format and consistently use it. This section is not applicable to the page limit.
5. Figures: Should be included in sections when needed to clarify the descriptions in the text. They also do not contribute to page limit.

The preparation of the proposal is intended to model the preparation of a NIH grant proposal; therefore, students are expected to take full advantage of all available resources, including the research literature, online databases, Thesis Advisor's grants, and experts in the field of study. Students are encouraged to discuss the proposed research with their Thesis Advisor, other students, staff and faculty. The student should inform any faculty that the advice being sought concerns an qualifying exam proposal to avoid potential inappropriate communication. The proposal should be the work of the student with only advisory input from other people. No part of the proposal should be copied from other published or unpublished material without giving proper acknowledgement.

A copy of the proposal should be forwarded to a person designated by the Qualifying Examination Committee Chairman by October 1. The Chair will consult with the examiners and Advisor and the student will be notified of the exam date and time within two weeks of the submission. The student should stand for the Oral Qualifying Exam by November 15. The student is responsible for submitting the Qualifying Examination Date form to the GSBS.

**Oral Presentation/Defense** - The Qualifying Examination Committee evaluates not only the quality of the student's written NIH-style grant proposal and the ability to defend this proposal in an oral examination but also the student's basic knowledge of the biological sciences and pharmacology. The examination is not open to the public. The proceedings are confidential.

**Results** - The student's performance is evaluated by the Qualifying Examination Committee in the absence of the student and the advisor. Based on the criteria outlined

above, the three outcomes of the Examination are Pass, Incomplete or Fail. The details of each are detailed in the GSBS Policy Handbook.

**Candidacy** - Upon successful completion of all credit requirements and the qualifying exam a student may be admitted to candidacy provided that all other requirements have been met as outlined in the GSBS Policy. Admission to candidacy must be approved at least nine months prior to the expected date of graduation. The Admission to Candidacy Form will require approval of the Pharmacology Graduate Program Director and the Dean of the Graduate School.

### Status Reports

Status Report policies are thoroughly covered in the GSBS Policy handbook. Beginning in the second year, progress reports are due to the GSBS on the first Mondays of May and December. The graduate student is responsible for arranging a meeting of their Advisory Committee, gathering signatures and submitting the reports to the Pharmacology Graduate Program Director. The Director will review the Status Report and forward it to the GSBS.

Three members constitute a quorum and a quorum must be present for all Status Report meetings. Late penalties will be assessed if Status Report deadlines are not met; therefore, it is important to arrange meetings and get the reports signed in a timely manner.

### Dissertation

**Permission to Write** - When the thesis research is nearing completion, and it is anticipated that the student will defend his/her thesis before the next status report is due, the student must formally request Permission to Write from their Advisory Committee. Two weeks before the meeting, the student should present a detailed outline of their thesis to the committee.

A notation must be made on the Status Report signature form if the purpose of the meeting is to seek Permission to Write. If the student plans to defend their thesis before the May Status Report is due, the student should use the December Status Report meeting as their Permission to Write meeting. A timeline for completion of the written thesis and the oral defense should be set at this time.

**The Dissertation** - The Ph.D. dissertation represents an authoritative contribution to scientific knowledge and demonstrates that the student has the intellectual and technical ability to conduct an independent and scholarly research project. The format of the dissertation is laid out in detail in the GSBS Policy Handbook as well as the Dissertation Instructions posted in the GSBS Forms.

**Defense of the Dissertation** - The student must submit the dissertation to the examining committee no less than two weeks prior to the defense.

The thesis presentation is public and the student, with the aid of the Pharmacology Graduate Program office, should post notices of the defense presentation. An oral defense of the thesis follows the presentation. This defense is closed to the public. The thesis Advisory Committee discusses the outcome in the candidate's absence and votes to pass or fail that candidate. One dissenting vote is enough to result in a failure. The student is

notified of the result of this vote on the day of the defense. The Defense of the Dissertation Results form must be submitted to the Graduate School Office following the exam.

Results are indicated by the signatures of the entire committee and the approval of the Dean. The defense of the dissertation must be completed at least one month before graduation.

## **VI. ACADEMIC REGULATION**

### Academic Performance

As stated in the GSBS Policy Handbook, graduate students are expected to maintain A and B averages. Grades of C, MP, F or I will subject a student to a review by the PGPC as well as the GSBS Promotions Committee. The student's Advisory Committee will convene and submit a plan of remediation to the Graduate School within two weeks of the notification.

The Promotions Committee will take one of the following actions when a student has unsatisfactory academic performance: Academic Warning, Academic Probation, Dismissal or another action deemed appropriate by the Promotions Committee. The details of these are outlined in the GSBS Policy Handbook. Also outlined are the processes that are available to students wishing to appeal Promotions Committee decisions.

### Withdrawal

Students may request to withdraw from the Graduate School or they may be withdrawn administratively. If the student submits a completed Request to Withdraw/Clearance Form to the GSBS, the student's academic status at the time of withdrawal will be reflected on the transcript. Students who fail to register during a term without specifically requesting leave or permission to withdraw shall be withdrawn administratively.

### Professional Conduct

Students are expected to perform their duties in a professional manner and abide by all of the policies of the College, the Graduate School and the Pharmacology Department. Any conduct not in keeping with the standards of Baylor College of Medicine is defined as professional misconduct. This includes, but is not limited to, actions of academic and scientific misconduct, violation of College policies and criminal acts. All of these are defined in the GSBS Policy Handbook.

## **VII. Residency**

All Ph.D. candidates are required to spend 15 terms (three academic years) in residency at BCM. Exceptions are made for candidates that have transferred credits as well as departure of the Major advisor. Exceptions such as Leave of Absence, Remote Student Status, Remote Advisor Status and Childbirth Accommodation must all be processed through the Graduate School.