



*Handbook of the*  
***Graduate Program in Physiology and Pharmacology***  
*Integrated Biomedical Sciences (IBMS)*  
*Graduate School of Biomedical Sciences*  
*The University of Texas Health Science Center at San Antonio*

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## Program Overview

The graduate program leading to the Ph.D. degree in Integrated Biomedical Sciences with a concentration in Physiology and Pharmacology is designed to provide a strong background in research methodology and experimental design necessary for a professional career in academia, industry, or governmental service. Generally, five years are required to complete the requirements for the Ph.D. degree.

Students are expected to complete the required coursework and the qualifying examination by the end of their second year. Following successful completion of all required courses, successful completion of the qualifying exam and satisfactory research progress, students are admitted to candidacy for the Ph.D. degree. During the third year, students are expected to develop a dissertation research proposal and present it in a seminar to students and faculty in the Physiology and Pharmacology Discipline. Students are encouraged to make presentations of their research data at national scientific meetings.

### Disclaimer

This handbook is designed to guide a student through his/her academic progression at the University of Texas Health Science Center (UTHSCSA). Further details of the basic procedures and regulations of the Graduate School of Biomedical Sciences at the UTHSCSA are found in the UTHSCSA catalog which can be viewed online at <http://catalog.uthscsa.edu/>.

The provisions of this Handbook do not constitute a contract, expressed or implied, between any applicant, student, or faculty member and the Department of Physiology, Department of Pharmacology, the Graduate School of Biomedical Sciences or the UTHSCSA. The UTHSCSA reserves the right to alter course offerings at any time or change the curriculum or any other procedures leading to the awarding of a degree and any other requirements affecting students. Changes will be effective whenever the proper authorities so determine and will apply to both prospective students and those already enrolled. The Handbook will be revised annually and published online via the Physiology and Pharmacology discipline website.

### Abbreviations and Terms Used in this Publication

SOC	Student Oversight Committee
Dean	Dean of the Graduate School of Biomedical Sciences
Faculty	Unless otherwise noted, the Graduate Faculty of the Departments of Physiology and Pharmacology
GFC	Graduate Faculty Council
eCOGS	Executive Council on Graduate Studies
GSBS	Graduate School of Biomedical Sciences
IBMS	Integrated Biomedical Sciences
UTHSCSA	University of Texas Health Science Center at San Antonio
PP	Physiology and Pharmacology Discipline
DD	Discipline Director(s)

### Student Oversight Committee

The PP SOC administers the graduate program in Physiology and Pharmacology. This committee is comprised of members of the Physiology and Pharmacology graduate faculty. The SOC is responsible for coordinating activities in the

PP discipline. Responsibilities include, but are not limited to, defining the curriculum, establishing procedures, evaluating students, and other pertinent policy matters.

The SOC is composed of 6 voting members made up of 3 graduate faculty from the Department of Cellular and Integrative Physiology and 3 graduate faculty from the Department of Pharmacology. SOC members are elected by the Physiology and Pharmacology graduate faculty to serve three year terms, however, during the initial development of the PP Discipline, some faculty will serve longer terms in order to establish an effective membership rotation schedule.

After the initial three years of the PP SOC, the faculty (one from Cellular and Integrative Physiology and one from Pharmacology) with the most seniority will rotate off the committee. The following year, the two faculty (one from each department) with the next highest seniority will rotate off. And, the following year, the two remaining founding members of the SOC will rotate off the committee. See example below.

Department	Name	Elected	Rotating Off
Physiology	Person A	2014	2017
Physiology	Person B	2014	2018
Physiology	Person C	2014	2019
Pharmacology	Person D	2014	2017
Pharmacology	Person E	2014	2018
Pharmacology	Person F	2014	2019

Each year, two new faculty members (one from Cellular and Integrative Physiology and one from Pharmacology) will be elected to serve a three year term. Every other year, one of the two newly elected members will be selected to serve as Chair-elect; this member will serve as the Chair of SOC during the final two years of their term.

The Chair of SOC is designated as the Graduate Advisor and is responsible for making decisions in accordance with established program policy. It is the responsibility of the chair to keep the committee informed of the status of all graduate students. The Chair should seek a majority vote of the committee prior to any of the following: recommending dismissal of a student from the program, granting unprecedented course substitutions, establishing new policies, denying petitions, granting a change to Supervising Professor, or waiving any program requirements.

## Program Faculty and Membership

It is understood that membership in the PP Discipline of the IBMS Graduate Program carries with it the agreement to contribute meaningfully to graduate education in the form of mentoring dissertation or thesis research, serving on research guidance committees, teaching in graduate courses, attending student seminars or other student presentations and/or participating in faculty committees relevant to the graduate program.

Each faculty member who wishes to participate in any of these activities must be a member of the IBMS graduate program. Faculty who wish to become approved members of the graduate program must submit a request to the GSBS. The form and guidelines can be found on the [GSBS website](#).

## Graduate Student Academic Standards

Students in the PP Discipline are expected to maintain a satisfactory grade in Seminar, Research, Dissertation and Special Topics and at least a letter grade of "B" in all other graduate courses.

GSBS guidelines state that a student must maintain a cumulative GPA of 3.0. A student whose cumulative GPA falls below 3.0 is automatically placed on probation by the Dean and warned that continuation in the graduate program is in

jeopardy. While on probation, the student must maintain at least a “B” average in all subsequent semesters for which he/she is registered. Failure to achieve a 3.0 in the coursework for any semester could result in the student being considered for dismissal from the Graduate School by the eCOGS and/or the Dean. A student will remain on probation as long as the cumulative GPA remains below 3.0. A student may not withdraw from any courses while on academic probation. **Students on probation are not eligible for Ph.D. candidacy.**

If a letter grade of C or U is received in any course required by the PP Discipline plan of study, the student will be referred to the SOC for consideration. Generally, the student will be required to repeat the course. A letter grade of C in two or more graduate courses or a letter grade of D in any graduate course could result in SOC recommending that the student be dismissed from the graduate program. The SOC will decide on the appropriate course of action following a review of each case.

### Appeal Process

A student may appeal to the SOC to reconsider any policy decision that may affect the student’s progress or tenure in the Physiology and Pharmacology graduate program. In those cases where dismissal is recommended to the Dean, the student may appeal to the SOC to reconsider its recommendation for dismissal. If the SOC still recommends dismissal from the graduate program, then the student may appeal to eCOGS to reconsider the recommendation.

## Course Work and Laboratory Rotations

### Required Courses

All students enrolled in the Ph.D. program in Physiology and Pharmacology are required to take the following courses:

IBMS	5000	Fundamentals of Biomedical Sciences (required for all GSBS students)
IBMS	5008	IBMS Laboratory Rotations
PHAR	5013	Principles of Pharmacology and Physiology
PHAR	5014	Integrative Physiology and Therapeutics
PHAR	5020	Basics of Research Design
TSCI	5070	Responsible Conduct of Research
CSBL	5095	Experimental Design & Analysis (Statistics)
PHAR	5092	Research Practicum
IBMS	6090-8PP	Departmental Seminar (Physiology and/or Pharmacology departmental seminars)
IBMS	7010-8PP	Student Journal Club and Research Presentations
IBMS	7001-8PP	Qualifying Exam
IBMS	6097-8PP	Research
IBMS	7099-8PP	Dissertation

### Electives (must take at least 4 hrs. and can include any courses offered at the UTHSCSA)

#### Frequent options include:

INTD	5040	Fundamentals of Neuroscience I: Molecular, Cellular, Developmental	1.0 hrs.
INTD	5043	Fundamentals of Neuroscience II: Systems	2.0 hrs.
INTD	7074	Topics in Translational Medical Product Development	1.0 hrs.
PHAR	5091	Micro electives (Seminar-style specialized courses)	1.5 hrs.
	5091-1	Monoaminergic Neurotransmission and Transporters	1.0 hrs.
	5091-2	Drug Discovery: Nuts & Bolts	1.0 hrs.
	5091-3	Historical Perspectives of Receptor Theory	
	5091-6	Serotonin- Soup to Nuts	
	5091-8	Neural Substrates of Regulated Behaviors	

	5091-10	Appetite Control: Adiposity Hormones & Neuropeptides	
	5091-11	Fundamentals of Behavioral Pharmacology	
	5091-18	G protein-coupled receptor heteromers: pharmacological and physiological relevance	
PHYL	5041	Excitable Membranes	
	6091	Selected Topics	
	6091-2	Calcium Signaling	
	6091-3	Cell Biology in Neural Science	2.0 hrs.
	6091-7	Ion Channels in Disease	
BIOC	5091	Special Topics in Biochemistry	
BIOC	6035	Biochemistry of Multimolecular Complexes	2.0 hrs.
BIOC	6010	Gene Expression	1.0 hrs.
BIOC	6043	Structure and Function of Membrane Proteins	2.0 hrs.
BIOC	6033	Cellular Signaling Mechanisms	2.0 hrs.
CSBL	6048	Biology of Aging	2.0 hrs.
CSBL	6021	Animal Models	2.0 hrs.
CSBL	6064	Genetics	3.0 hrs.
CSBL	6020	Concepts in Vertebrate Development	3.0 hrs.
PHAR	7003	Electrophysiology in Neuroscience Research	3.0 hrs.
PHAR	6027	Fundamentals of Neurotics	3.0 hrs.
PHAR	7002	Bridging the Gap from Bench to Bedside: Pharmacology Clinical Practicum	1.5 hrs.
			1.0 hrs.

**The following modules will be offered as electives for other disciplines:**

PHAR	5021	Autonomic Control and Therapeutics (0.5 SCH)
PHAR	5018	Cardiovascular, Renal and Respiratory Physiology and Therapeutics (2.0 SCH)
PHAR	5019	Metabolism, Hormones, GI Physiology and Therapeutics (2.0 SCH)

**Exemptions**

An exemption from any of the courses listed above may be requested if the student has taken similar courses and received at least a letter grade of "B". The student should petition the SOC as soon as possible after admission to the graduate program for exemption from a given course.

**Typical Course Schedule**

**Year 1, Fall semester**

IBMS 5000 - Fundamentals of Biomedical Sciences (required for all GSBS students)	8.0 SCH
TSCI 5070 - Responsible Conduct of Research	2.0 SCH
IBMS 5008 - Laboratory Rotations (3 rotations, 5 weeks each)	3.0 SCH
	<b>TOTAL 13.0 SCH</b>

**Year 1, Spring semester**

PHAR 5013 – Principles of Pharmacology and Physiology	3.0 SCH
CSBL 5095 – Experimental Design and Data Analysis (Statistics)	3.0 SCH
IBMS 7010 – Student Journal Club and Research Presentations.	1.0 SCH
IBMS 6090-8PP – Pharmacology and/or Physiology Departmental Seminars	1.5 SCH

IBMS 6097-8PP – Research (Hours are adjustable)	X SCH
** ELECTIVE COURSES FROM PHYS/PHARM or OTHER DISCIPLINES	X SCH
	<b>TOTAL 12.0 SCH</b>

**Year 2, Fall semester**

PHAR 5020 – Basics of Research Design	2.0 SCH
PHAR 5014 – Integrated Physiology and Therapeutics	4.5 SCH
PHAR 5092 – Research Practicum	1.0 SCH
IBMS 7010 – Student Journal Club and Research Presentations.	1.0 SCH
IBMS 6090-8PP – Pharmacology and/or Physiology Departmental Seminars	1.5 SCH
IBMS 6097-8PP – Research (Hours are adjustable)	X SCH
** ELECTIVE COURSES FROM PHYS/PHARM or OTHER DISCIPLINES	*** SCH
	<b>TOTAL 12.0 SCH</b>

**Year 2, Spring semester**

IBMS 7010 – Student Journal Club and Research Presentations.	1.0 SCH
IBMS 6090-8PP – Pharmacology and/or Physiology Departmental Seminars	1.5 SCH
IBMS 6097-8PP – Research (Hours are adjustable)	X SCH
IBMS 7001-8PP - Qualifying Exam	1 SCH
** ELECTIVE COURSES FROM PHYS/PHARM or OTHER DISCIPLINES	*** SCH
	<b>TOTAL 12.0 SCH</b>

**Years 3 through completion ~ each semester**

IBMS 7010 – Student Journal Club and Research Presentations.	1.0 SCH
IBMS 6090-8PP – Pharmacology and/or Physiology Departmental Seminars	1.5 SCH
IBMS 6097-8PP – Research	X SCH
ADVANCED ELECTIVE COURSES FROM PHYS/PHARM or OTHER DISCIPLINES	X SCH
	<b>TOTAL 12.0 SCH</b>

**Years 4 through completion ~ each semester**

IBMS 7010 – Student Journal Club and Research Presentations.	1.0 SCH
IBMS 6090-8PP – Pharmacology and/or Physiology Departmental Seminars	1.5 SCH
IBMS 6097-8PP – Research	X SCH
IBMS 7099-8PP – Dissertation FROM PHYS/PHARM or OTHER DISCIPLINES	3.0 SCH
	<b>TOTAL 12.0 SCH</b>

*\*Students will enroll in both Dissertation and Research starting in the fall of the 4<sup>th</sup> year (contingent upon approval of the Dissertation Proposal during the 3<sup>rd</sup> year).*

### **Full-Time Status**

The minimum full-time course load for the Fall/Spring semester is 12 credit hours. Graduate students are required to maintain full-time status until the completion of their graduate studies.

A student in the last semester of study may enroll in “Final Hours” which allows him/her to enroll in 3 credit hours of Dissertation. See page 15 for more information on Final Hours.

### **Adding/Dropping Courses**

Students may add/drop courses during the official add/drop days as designated by the Registrar’s Office each semester. Student are not permitted to add/drop courses after the census date. The academic calendar for the Graduate School can be found on the UTHSCSA [website](#).

100% of tuition and fees will be refunded for courses dropped prior to the census day of the term provided the student remains enrolled in the institution for that term. No refunds will be made for courses dropped following the census day of the term unless the student withdraws from the university. The Fee Refund Schedule will be used to determine refund eligibility. For more information, contact the Bursar Office.

### **Laboratory Rotations**

Laboratory rotations should be completed as required by the IBMS program.

### **Stipend Support**

The Graduate School of Biomedical Sciences (GSBS) offers financial assistance in the form of teaching and research assistantships to full-time students admitted to the IBMS doctoral program. The annual salary is \$26,000. Tuition and fees will also be paid for the student. This financial support is provided by the GSBS in year one and by the supervising professors beginning in year two and through completion of the program. Students may also apply for stipend support from training grants associated with specific areas of research.

### **Selection of the Supervising Professor**

After completing the required IBMS lab rotations, students are required to select a faculty member who will serve as the Supervising Professor for his/her dissertation research. This faculty member must be a member of the graduate faculty and will be with whom the student works during the Research Practicum at the end of their first year (see description below).

The student is required to obtain approval from the SOC for the proposed dissertation Supervising Professor. The Supervising Professor must have an active research lab, be willing to serve as the student’s dissertation supervisor, and must have funds to support the student’s stipend and research activities beginning in the fall of the second year in the program and continuing for the entire time required to complete the dissertation project (usually 3-4 years). SOC will not approve a Supervising Professor who does not have the funds to support the student’s research and stipend and/or has not been approved as a member of the graduate faculty. Before choosing faculty members for rotations, the student should confirm with the faculty member about his/her capacity to serve as a dissertation supervisor.

### **Research Practicum (PHAR 5092)**

Students must complete one research practicum with a member of the Physiology and Pharmacology graduate faculty, typically the student’s chosen Supervising Professor. This is a research experience during the summer following the first

year (due to the “super semester” schedule, the practicum takes place at the end of spring term and beginning of fall term). Successful completion of the research practicum is a requirement for admission to candidacy. **A report by the Supervising Professor that the student has clearly demonstrated the potential for productive and independent investigation is a requirement for admission into candidacy.**

At the beginning of the research practicum, the Supervising Professor will discuss the criteria (below) that will be used to evaluate the performance of the students during the laboratory rotation. The PP Discipline Program Coordinator will provide a written copy to all students as well as faculty members at the beginning of the practicum.

Students are required to write a report and to present a 15-minute talk following the completion of the research practicum. Students are strongly encouraged to work with the Supervising Professor in preparation and organization of the oral presentation. The length of the talk is strictly limited to 10 minutes, thereby allowing 5 minutes for questions.

At the end of the research practicum, students write a short report (about 10 double-spaced, typewritten pages) in journal style (i.e. Introduction, Methods, Results and Discussion). One copy of the report is given to the mentor for evaluation and grading (see below), and a second copy is given to the Program Coordinator to serve as a file copy.

The mentor must be selected from the Graduate Faculty of the Physiology and Pharmacology Discipline.

### **Research Practicum Project Criteria**

#### **A. The Objective**

The objective of the research practicum is two-fold:

1. To give students an opportunity to develop research skills and aid them in finalizing selection of a laboratory in which to pursue their dissertation research.
2. To permit faculty to evaluate the laboratory skills and potential research aptitude of the student.

#### **B. The Project**

The design of the research project is the responsibility of the mentor and should be done prior to accepting a student in the laboratory. It is critical that the mentor develop a concise and well-defined project for the student. The project should satisfy the following criteria:

1. The project should be hypothesis-driven.
2. The methodology required to complete the project should currently be in use in the laboratory.
3. There should be a reasonable expectation of some success within the allotted time.

#### **C. The Evaluation**

The student will be evaluated on the following criteria:

1. Technical competence
2. Motivation
3. Understanding of the techniques and instrumentation used in the research
4. Understanding of scientific concepts and principles pertinent to the project
5. Ability to read and critically evaluate literature

## 6. Ability to work, think, and write independently

The mentor should meet regularly with the student to discuss the student's performance based on the above criteria. At the end of the research practicum, an evaluation form will be sent to the mentor, who will give the student an A (excellent), B (average) or C (unsatisfactory) grade for each criterion.

The mentor must meet with the student to discuss the evaluation and have the student sign the evaluation form to indicate that he/she has had the opportunity to review and discuss the evaluation with the mentor. The evaluation is then submitted to the PP Program Coordinator to be reviewed by SOC. These evaluations are then placed in the student's file and are available for review by the faculty.

### **D. The Written Report**

The report is to be given to the mentor before the end of the fall semester. The written report is to follow the format of a short research communication (about 10, double-spaced, typewritten pages) consisting of the following parts:

1. Introduction
2. Methods
3. Experimental Results
4. Discussion
5. Summary and Conclusions
6. References

Each student should prepare two copies of the written report; one copy is to be given to the PP Program Coordinator to be kept as a file copy and the other copy is to be graded by the mentor.

### **E. The Post-Practicum Talk**

Students are required to give a brief (10 minutes, followed by 5 minutes for questions) post-practicum talk to the members of the Physiology and Pharmacology Discipline on the research project that should state the hypothesis tested, cite specific objectives, give a brief discussion of the methodology employed, and summarize and interpret the results obtained in the study. Among those in attendance, members of the Department will be asked to complete Seminar Speaker Critique forms (page A-2) to provide constructive criticism to the student speakers. In addition, the presentations will be video-recorded. The recordings will be provided to the mentor for him/her to review and discuss with the student along with the speaker critique forms.

### **F. The Grade**

Students receive a letter grade (A, B, or C as defined earlier) for PHAR 5092 Research Practicum that is based equally upon the evaluation of the student's performance in the laboratory and on the written report.

## **Qualifying Exam (IBMS 7001-8PP)**

Passing the Qualifying Examination (QE) is one of the steps required for advancement to candidacy. The examination includes both a written and an oral component. The other steps are satisfactory completion of all required courses (average GPA of at least 3.0) and certification by the Supervising Professor that the student has demonstrated the potential for productive and independent investigation in the laboratory.

The objectives of the Qualifying Exam (QE) are to evaluate the research potential of the student, to evaluate the student's progress towards becoming a scientist, and to evaluate the student's understanding of and ability to integrate physiology and pharmacological principles.

### **Composition of the QE Committee**

The QE Committee is responsible for overseeing and administering the QE. The QE committee will comprise of four graduate faculty members from the Physiology and Pharmacology Discipline and one graduate faculty member from another discipline within the Integrated Biomedical Sciences Program at the UTHSCSA. The QE committee will be chosen by the discipline Student Oversight Committee (SOC) who will select one of the four members from the Physiology and Pharmacology Discipline to serve as chairperson. The composition of the QE committee is partly guided by the subject matter of the specific aims of the student's proposal, so as to assemble faculty with appropriate expertise. The student's Supervising Professor may not serve on that student's QE Committee, either as a standing or *ad hoc* member.

### **Responsibilities of the QE Committee**

- Determine the initial feasibility of the proposal based on the student's outline
- Determine if the written proposal provides an adequate basis for an oral examination
- Provide the student with written comments/recommendations (in the event that the initial written proposal is not deemed suitable for defense)
- Provide the student, SOC Chair and Program Coordinator written verification (email) that the student has passed the written exam and may proceed to the oral examination
- Conduct the oral examination
- Determine whether or not the student has satisfactorily defended his/her written proposal
- Sign the "Form 32: Petition for Admission to Candidacy" via IMPACT website or, in the event that the defense has been deemed unsatisfactory, provide the student with feedback that outlines specific aspects of the student's performance that need improvement in a second examination.

### **Responsibilities of the Student**

- Write and submit to the QE Committee a specific aims page
- Write and submit to the QE Committee an original proposal
- Present a copy of the proposal to the Program Coordinator when the QE Committee has approved the proposal
- Inform the SOC Chair and Program Coordinator of the date of the oral examination
- Defend the proposal to the QE Committee in an oral examination
- Consult with the Supervising Professor regarding the commitment of time and insure that all other research and academic responsibilities are met

### **Scheduling/Timeline**

The QE will be given to doctoral students after completion of the second year of coursework, but prior to **June 1** of that year. The qualifying exam includes both a written component and an oral examination. To pass the QE, the student must meet benchmark deadlines (described below) throughout this examination process, including those for the specific aims page, the full written proposal, and the oral examination. Requested corrections to specific aims or written proposal must be accomplished in two weeks. Delays are grounds for failing the exam. Any deviation from this schedule must be approved in advance by the Examination Committee and the SOC chair.

A specific aims page (due February 1) is submitted to the discipline director. QE committee members and chair are then selected and approved by the SOC. The QE committee will then provide feedback regarding whether the specific aims (1) indicate an appropriate proposal for defense, or (2) require changes that can be included within the full QE proposal or (3) require significant changes that will be resubmitted within two weeks. The full written research proposal will be submitted to the Chair of the QE Committee **no later than April 15, 5:00pm CST. After the written proposal is submitted, the student should contact the QE committee to schedule a date for the oral presentation and examination, prior to June 1.**

If the written proposal is deemed insufficient or unsatisfactory, the QE Committee will provide generalized feedback to the student to facilitate editing/rewriting. The revised proposal will be re-submitted as soon as possible, but no later than two weeks after feedback from the QE Committee Chair is received by the student. Only one revision/resubmission will be accepted within the examination process.

Summary: Start early! Submit your specific aims by February 1, and the written exam as soon as possible, but before the **April 15** deadline. Except under special circumstances, approved by the SOC, the oral examination must be completed by **June 1** of the second academic year. **The student is responsible for scheduling all activities related to the examination.**

Contingent upon the decision of the Examination Committee, you will be asked to:

- Revise your written proposal and resubmit.
- Schedule your oral exam. The oral examination must be completed by June 1. Remember this is the LATEST date. Your goal should be to successfully put the QE behind you as soon as possible.

### **Format of the Qualifying Examination**

The examination will consist of a written research proposal of no more than 10 total pages (references excluded; details on this are given below), in conjunction with a 15-20 minute oral presentation of the proposal, followed by an oral examination phase and a closed evaluation phase.

The **written research proposal** will be used to measure the student's independent thinking and writing abilities. Thus, significant and specific help from faculty and peers should be restricted. The student is free to discuss his/her ideas with peers and mentors and to receive generalized criticisms from these sources during the development of the proposal, and is encouraged to do so. It is permissible for the student to choose a topic in the area in which he/she plans to do his/her dissertation studies. However, the final proposal must be an independent product of the student and may not share one or more Specific Aims with any grant written by the mentor. Mentors and students should be guided by the idea that the proposal is the student's, not the mentor's, and the student will have to defend it during the examination period. The proposal must include hypothesis-guided experiments. The experiments should be designed to produce results, which clearly support or reject the associated hypotheses. It is not acceptable to propose experiments that are likely to yield equivocal results that will not discriminate between the truth and fallacy of the hypothesis. Developing methodology (e.g., inventing an assay or making a transgenic mouse) will not be sufficient.

In general, the line of questioning during the **oral examination phase** will be derived from the subject matter of the written research proposal, but the questions may be broad in scope, to allow the committee to evaluate fully the student's knowledge of basic physiological and pharmacological principles. The Supervising Professor may be present as a silent observer during the oral examination phase.

The oral examination phase will be followed immediately by a **closed evaluation phase**, during which the examination panel will discuss and evaluate the student's performance. The student's Supervising Professor will be present for the closed evaluation phase (during which the pass/fail/incomplete decision is discussed and rendered). At the request of

the QE Committee, the Supervising Professor will be asked to comment on the student's performance in the laboratory, specifically during the Research Practicum, and the student's potential for productive and independent investigation in the laboratory.

### **Format of the Written Research Proposal**

The proposal will be written as a single-spaced document that is a **maximum of 10 pages** (exclusive of references) and includes the following sections (modified from NIH pre-doctoral NRSA guidelines). Use Arial or Helvetica font with a minimum of 11 point text and 12 point line spacing. Margins should be 0.5 inches on all sides. You may include figures plus figure legends in the text, but these count toward the page limits. They should be clearly visible and readable. If you need to reproduce a figure from the literature, make sure it is labeled as "reproduced from..." The font of figure legends may be less than 11 point, provided it remains clearly legible.

#### Specific Aims

- State the problem/s that will be addressed.
- State the goals and overarching hypothesis of the proposed research.
- List the specific objectives or aims of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, or challenge an existing paradigm or clinical practice.
  - List the experiments conducted and approaches that will be used within each aim described above.
- Indicate the impact of the proposed research on the scientific field, and how it will benefit society.
- Specific Aims are limited to one page.
- 
- A useful guide (there are many to be found online): <http://www.biosciencewriters.com/NIH-Grant-Applications-The-Anatomy-of-a-Specific-Aims-Page.aspx>

#### Research Strategy

Organize the Research Strategy in the specified order using the instructions provided below.

Start each section with the appropriate section heading — Significance, Approach. Cite published experimental details in the Research Strategy section and provide the full reference in the Bibliography and References Cited section.

Preliminary data are not explicitly required but may be used to strengthen the proposal.

##### *(a) Significance*

- Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.
- Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
- Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.
- Explicitly address the biomedical relevance of the proposed research, and its relation to human physiology or disease.

##### *(b) Approach*

- Describe the overall strategy, experimental procedures, methodology, and analyses including statistical tests, to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted.

- Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
- If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.
- Point out any procedures, situations, or materials that may be hazardous to personnel and precautions to be exercised.

If a proposal has multiple Specific Aims, then the student may address Significance and Approach for each Specific Aim individually, or may address Significance and Approach for all of the Specific Aims collectively.

#### Bibliography and References Cited

List complete citations with all authors and titles. No page limit.

#### **Pass/Fail/Incomplete and re-examination:**

The student will pass the QE Examination if no more than one member of the QE Committee dissents. Conditional pass and pass with remediation will not be allowed; however, one re-examination may be allowed at the discretion of the committee for students that fail. A re-examination of the QE shall be conducted by the Examination Committee as comprised at the time of the initial examination. Reexamination must be completed within 3 months of the original oral examination.

The Chair of the Examination Committee will report, by memorandum, the outcome of the qualifying examination to the SOC and Program Coordinator.

Failure of the QE Examination and re-examination will result in SOC recommendation to Dean of the Graduate School that the student be dismissed from the PhD program.

## **Admission to Candidacy**

### **Requirement for Admission to Candidacy**

During the Year 2 Spring semester, and after passing the QE, a student must petition, via the student's discipline executive committee, approval by the IBMS eCOGS for Admission to Candidacy for the Ph.D. degree. The approval process is accomplished via the PhD Candidacy Form located on the IMPACT website. See Program Coordinator for instructions regarding submitting the petition. Approval by eCOGS for Admission to Candidacy is based on 3 criteria:

1. Successful completion of the Qualifying Examination (evidenced by approval indicated by members of a student's QE committee).
2. A positive endorsement of the student's potential for performing successful independent research (indicated by the online approval by the Dissertation Mentor).
3. Verification of satisfactory academic standing, including the maintaining of a 3.0 grade point average in course work. Students cannot advance to candidacy while on academic probation.

When all criteria are met, IBMS eCOGS will recommend to the Dean of the GSBS that a student be admitted to candidacy. Admission to Candidacy requires final approval by the Dean. If approved, the student receives an official notification of admission to candidacy from the Dean of the Graduate School (GSBS Form 35).

## **Dissertation Research and Student's Dissertation Supervising Committee**

## Formation of the Dissertation Supervising Committee

Immediately following approval for Admission to Candidacy, and in consultation with his/her Dissertation Mentor, a student is to form a Dissertation Supervising Committee. This committee, whose membership must be approved by the student's discipline leadership, must provide the expertise necessary to ensure appropriate scientific and academic guidance to a student by monitoring research activities and by reporting, at least once per semester, research progress demonstrated. **Prior to the last day of the Year 2 Spring semester** of the IBMS program, a student is expected to request approval from the student's discipline executive committee for the membership of a Dissertation Supervising Committee (DSC). Except for the Dissertation Mentor, the faculty membership of the original committee need not be retained. The DSC serves as an important resource of scientific expertise, assists the student in furthering the development of the dissertation research project, and is responsible for certifying to eCOGS and the GSBS that a student has carried out meritorious research of the caliber appropriate for a Ph.D. dissertation. The DSC is expected to assess the student's research progress (at least once per semester).

### DSC membership

The membership of a student's Dissertation Supervising Committee should provide the expertise necessary to ensure appropriate scientific and academic guidance to the student. Membership must be approved by the student's discipline executive committee, the Graduate Faculty Council and by the Dean of the GSBS. The minimum composition of student dissertation committees should reflect the following:

1. The student's Dissertation Mentor, now to be referred to as the Supervising Professor.
2. Two members from the IBMS Graduate Faculty with primary affiliations in any IBMS discipline.
3. One member from the IBMS Graduate Faculty with a primary affiliation in a discipline other than that of the student's chosen discipline.
4. One member from an institution of higher education or research institute approved by the student's discipline and holding no faculty appointment at the UTHSCSA.

Students can email the selection of members, along with a brief explanation of choices, to the PP SOC chair and Program Coordinator for approval. See Program Coordinator for appropriate form.

Changes in the membership of the DSC are allowed at any time but are subject to the approval by the discipline's executive committee and the Graduate Faculty Council.

### Preparation of the Dissertation Proposal

Approval of the Dissertation Research Proposal should be obtained **before the end of the Year 3 Fall semester**. The student should prepare his/her dissertation proposal in the format of a National Research Service Award (NRSA) grant proposal and submit the proposal to the Dissertation Supervising Committee for approval. The format for an NRSA is presented below. Additional information on NRSAs can be obtained from the NIH's website ([www.nih.gov](http://www.nih.gov)).

Students should include sufficient information in their proposal to permit an effective review without reviewers needing to refer to the literature. Brevity and clarity in the presentation are considered indicative of a student's approach and ability to conduct a superior project. The entire proposal is **not to exceed 10 pages including all tables and figures**. The format for the proposal is as follows:

1. Specific Aims - State the specific purposes of the research proposal and the hypotheses to be tested.

2. Background and Significance - Sketch briefly the background to the proposal. State concisely the importance of the research described in this application by relating the specific aims to broad, long-term objectives.
3. Research Design and Methods - Provide an outline of:
  - o Research design and the procedures to be used to accomplish the specific aims;
  - o Tentative sequence for the investigation;
  - o Statistical procedures by which the data will be analyzed.
4. Potential experimental difficulties should be discussed along with alternative approaches that could achieve the desired aims.

Students are required to meet with their Supervising Committee at least once prior to the oral dissertation proposal, so that they can discuss and provide feedback regarding student's proposal. Once the dissertation committee approves the written proposal, the student will present the proposal to the SOC as an open seminar. The student will provide an electronic version of the written proposal to the Program Coordinator who will distribute it to each member of the SOC at least one week in advance of the presentation of the dissertation research proposal. The student should see the Program Coordinator for the specific administrative details of the dissertation proposal.

After the dissertation proposal and meeting with SOC, the student must submit Form 30 via IMPACT to the GSBS Dean requesting approval of both the membership of the student's Dissertation Supervising Committee (including the official naming of the Supervising Professor) and an electronic version of the Dissertation Proposal. This process occurs concurrently. See Program Coordinator for instructions on submitting Form 30 via IMPACT.

### **Responsibilities of the Supervising Professor and Supervising Committee**

The student who has formed his/her Supervising Committee shall meet with his/her committee at least once each semester, **beginning the fall of the student's 3<sup>rd</sup> year.** The Supervising Committee has the responsibility of reading and approving the dissertation proposal, supervising the research and evaluating the student's progress, reading and approving the written dissertation, and conducting the final oral defense.

Research progress is evaluated at the semi-annual meetings of the student with the Supervising Committee. After each committee meeting, each member of the Supervising Committee evaluates both the oral presentation and the progress of the student. The student should ask each committee member to complete the Progress Evaluation Form (see Program Coordinator for form). Once the student has the form from each member, he/she submits them to the Program Coordinator, and Coordinator will forward to IBMS Department.

### **Responsibilities of the Student**

It is the student's responsibility to schedule the committee meetings each semester, provide each committee member with the appropriate form, collect the forms following the meeting, and submit them to the Program Coordinator. Failure to coordinate the committee meeting and/or submit the committee report forms by the deadline provided each semester by the Program Coordinator will result in the student receiving an "Incomplete" grade for IBMS 6097-8PP Research/IBMS 7099-8PP Dissertation.

Major changes in the research status of the candidate, such as the selection of a new supervising professor, new supervising committee members or a substantive change in research direction, must be submitted to the SOC for approval.

## Registration for Dissertation

Students on the Ph.D. degree track may register for the Dissertation course (IBMS 7099-8PP) after the following actions have been taken:

- Approval of admission to candidacy for the Ph.D. degree by the Dean
- Approval of the dissertation research proposal by SOC and the Dean
- Approval of the membership of the candidate's Supervising Committee by SOC and the Dean

A candidate for the Ph.D. degree must register for at least two terms of Dissertation credit hours, beginning in the 4<sup>th</sup> year.

## Final Hours and Graduation Application

A student must be registered for final hours during the semester in which he/she graduates. If a student is registering for only final credit hours in preparation of a dissertation defense and registers for no other courses, he/she is exempt from the minimum tuition requirement and pays only tuition based upon the number of credit hours for which he/she registers. Such registration shall be considered a full-time course load. The minimum number of final credit hours for the Ph.D. degree is three. A student may register for final credit hours only once. If a student enrolls in final hours but does not graduate, he/she must enroll in a full 12 credit hour course load the following semester. A student registered for final hours is expected to continue to attend departmental seminars for his/her own professional development.

International students must obtain approval from the Office of International Services (OIS) before registering for less than a full course load by completing and submitting a Request for Authorization to Reduce Course Load form (available in OIS).

Students are required to apply for graduation with the Office of the Registrar during the semester prior to the defense. Please contact the Office of the Registrar for specific deadlines. Submission of the Application for Graduation will prompt an audit of your academic record to ensure you are eligible to graduate and have completed all requirements to receive your degree.

## Preparation of the Dissertation

When the data collection is complete or close to completion, the student will request permission from the Supervising Committee to stop collecting data for the dissertation and begin writing. The student should follow the formatting guidelines set forth by the Graduate School of Biomedical Sciences. The process for writing and defending your dissertation may be found on the GSBS [website](#). The student should coordinate closely with the Program Coordinator to ensure all administrative guidelines and deadlines are met.

## Final Oral Exam

When the supervising committee judges the dissertation to be suitable for defense, the student shall submit a Request for Final Defense & Oral Examination Form ([GSBS Form 40](#)) signed by all committee members to the Chair of COGS for her/his signature. The signed request form, together with 3 copies of the abstract and the student's curriculum vita, must be submitted to the office of the GSBS at least two weeks prior to the scheduled date of the final oral examination. In addition, one copy of the entire dissertation should be electronically submitted to the GSBS for the formatting to be checked.

## Granting of the Degree

If SOC approves the recommendation of the supervising committee, then the Chair of SOC signs and submits the Report on Final Oral Examination ([GSBS Form 43](#)) and the Dissertation Approval Page signed by all of the supervising committee

members, to the Dean. The student will then electronically submit the final version of the dissertation to the Dean's Office.

The Chair of SOC reviews the academic performance of the candidate as well as her/his performance on the final oral examination. The SOC Chair certifies that the candidate has satisfied all of the requirements for the degree of Doctor of Philosophy and recommends to the GFC that the candidate be granted the degree. If the GFC approves the recommendation, then the Dean will notify the President of the Health Science Center that the candidate has fulfilled all requirements of the GSBS for the Ph.D. degree. Upon the candidate's certification by the President, the degree is conferred by the University of Texas System Board of Regents. If the GFC does not approve the recommendation, it will refer the matter to eCOGS with a recommendation for remedial action.

### **Procedures for Dissertation Binding**

In the preparation of dissertations, students should follow the *Instructions for Preparation and Submission of Electronic Theses, Dissertations, and Dissertation Abstracts*, which can be found on the [GSBS website](#).

In addition to the electronic version of the dissertation required by the GSBS, the student should print three paper copies. The Department of the supervising professor will cover the cost of having these bound. One copy will be retained by the Department, one copy will be given to the student, and the third copy will be given to the Supervising Professor. If the student desires additional bound copies, he/she will be responsible for the costs of copying and binding. The binding process can take several months.

Please refer to the above-mentioned GSBS website for more specifics on binding, publishing, and optional copyrighting of the dissertation.

### **Clearance Procedures**

It is the responsibility of the student to coordinate with the Supervising Professor to determine the last date of employment as a GRA. Once a date of termination is agreed upon, the Supervising Professor should notify the Program Coordinator and Department Administrator. The student is required to checkout with the Department on his/her last date of employment (turn in keys, lab coat, ID badge, etc.).

## **Miscellaneous**

### **Time to Degree**

A minimum of 72 semester credit hours is required for a Ph.D. degree. It is expected that full-time Ph.D. candidates will complete the requirements for the Ph.D. degree within a maximum of six years or within 130 credit hours. If a student is unable to complete the requirements for the degree within this time period, the student and the supervising professor may petition SOC for an extension. SOC will make a determination based upon evidence of adequate progress that would justify an extension. The Physiology and Pharmacology Discipline and/or the Supervising Professor has no obligation to financially support a graduate student for more than six years. In addition, students enrolled for more than 130 credit hours may be required to pay nonresident tuition for all subsequent semesters.

### **Health Insurance**

All UTHSCSA students are required to maintain health insurance. A student health plan is available for purchase. Fees for this plan will be assessed on the student's tuition statement. Students are required to "declare" their health insurance provider during course registration each semester. Students should contact the [Office of Student Life](#) with any questions or concerns related to health insurance.

## Travel Support for Graduate Students

The Department of Cellular and Integrative Physiology will grant travel awards to eligible students to present their research at national scientific conferences. Applications for the competitive award will be evaluated in two cycles: Fall semester (due September 1) and spring semester (due February 1). One award of up to \$1000 will be granted each cycle, for a total of two awards per year. Students should apply for the award during the cycle closest to their travel. The award can be given after travel has occurred (i.e. the student could travel in July and be presented the travel award in September).

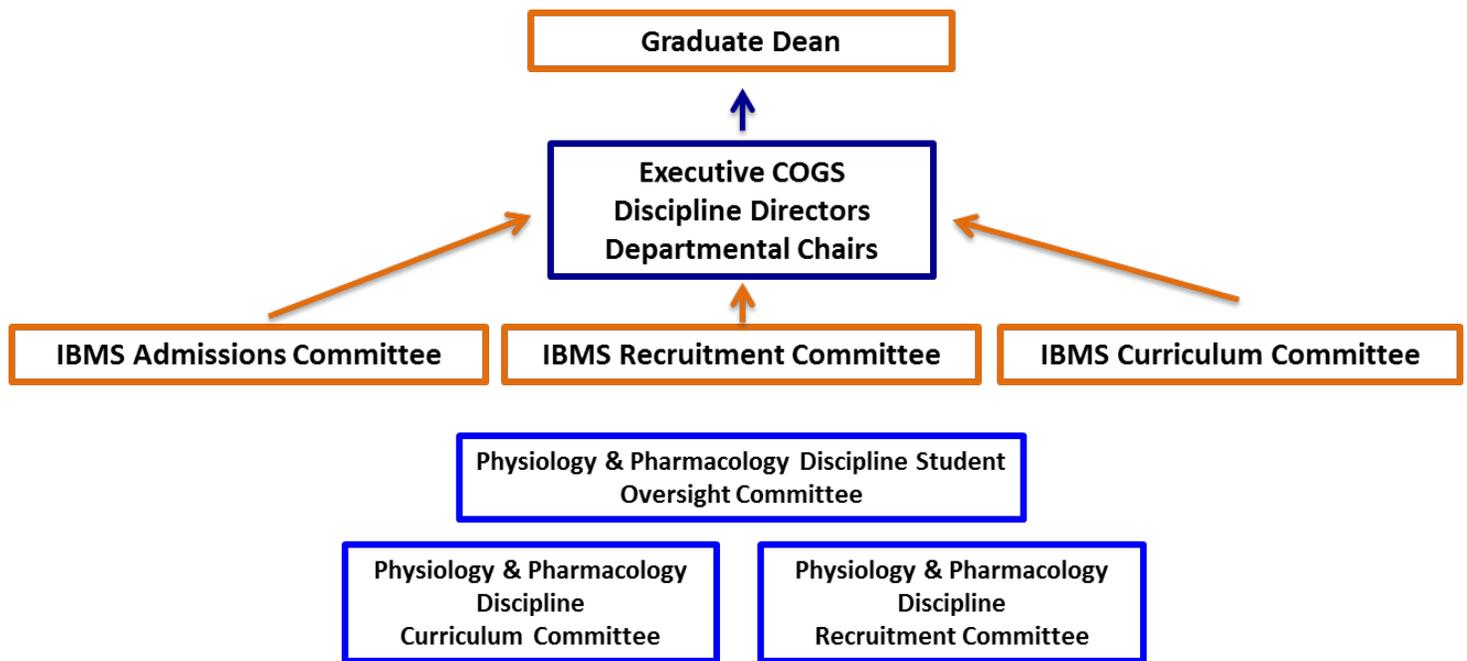
To be eligible for the travel award, a student must be:

1. A Physiology track student, Physiology/Pharmacology discipline student, or a non-Physiology track or Physiology/Pharmacology discipline student working in the lab of a Cellular and Integrative Physiology primary faculty member
2. In good academic standing
3. Presenting author on a scientific abstract at the meeting for which you are requesting the award

The Program Coordinator provides application instructions to the students each semester. **The travel award is in honor of Vernon S. Bishop, Ph.D., Chairman of the Department of Physiology from 1992-2003.**

## Appendices

### Appendix I - Structure of the IBMS Program



### Appendix II – Committee Memberships

#### Student Oversight Committee

Robert Brenner, Ph.D., Department of Cellular & Integrative Physiology – Chair

Francis Lam, Pharm.D., Department of Pharmacology

Peter Hornsby, Ph.D., Department of Cellular & Integrative Physiology

Lisa Gerak, Ph.D., Department of Pharmacology

Feng Liu, Ph.D., Department of Pharmacology

Jason Pugh, Ph.D., Department of Cellular & Integrative Physiology

#### Discipline Directors

Robert Brenner, Ph.D., Department of Cellular & Integrative Physiology

Francis Lam, Pharm.D., Department of Pharmacology