

**THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER
AT SAN ANTONIO GRADUATE SCHOOL OF BIOMEDICAL SCIENCES**

**GUIDELINES FOR THE GRADUATE PROGRAM IN
CELLULAR AND STRUCTURAL BIOLOGY**

The Graduate Program in Cellular and Structural Biology offers research training in the Biology of Aging; Cancer Biology; Cell & Molecular Biology; and Genetics, Genomics & Development. The curriculum is designed for those seeking Doctor of Philosophy degrees who intend to pursue a career in the academic community or industry. The graduate program also offers Master of Science degrees in the Anatomical Sciences and Biotechnology. The Graduate Program is overseen by the Committee on Graduate Studies (COGS). As described in Attachment A, COGS is comprised of a group of faculty selected to administer various aspects of the Graduate Program, including monitoring of student progress.

GENERAL REQUIREMENTS FOR GRADUATE STUDENTS

Requirements for Admission

Students beginning graduate study ordinarily matriculate during the fall session. Completed applications, including scores on the Graduate Record Examination Aptitude Test, certified transcripts of all college and/or postgraduate work, a letter from the applicant stating his/her objectives in graduate study, and three letters of recommendation, must be received before February 1st to be considered for admission the following August. January admission will not be considered except in very unusual circumstances. Applicants must possess a Bachelor's degree or an equivalent degree and must have credit for the following courses.

- Biology: Two years as required for science majors.
- Chemistry: One year of general inorganic and a course in organic chemistry.
- Physics: One year as required for science majors.

(N.B. The courses listed above should include laboratory experience.)

- Mathematics: At least one semester of calculus.

The Guidelines of the Graduate School of Biomedical Sciences recommends a minimum undergraduate GPA of 3.0 and a cumulative (Verbal plus Quantitative) GRE score of 1000. At the discretion of the Admission Committee and with approval from the Graduate Faculty Council, an admission requirement may be waived.

Admission of Graduate Students through Faculty Sponsorship

Recruitment of graduate students by the Admission Committee may be supplemented by selections initiated by faculty members of Cellular and Structural Biology. This procedure will enable individual faculty members to look for potentially good graduate students who are interested in the sponsor's particular line of research. The entering students selected by individual faculty members must meet the criteria for admission set up by the Graduate School and be approved by the Admissions Committee. Unlike the students selected by the Admission Committee, those recruited by individual faculty members will be supported by the sponsoring faculty's research grants from the beginning. The faculty sponsor is required to guarantee funding for at least one year. The students must satisfy all of the requirements outlined in the Cellular and Structural Biology Graduate Program Guidelines. A student will have the option to change his/her mentor. In the event that a student decides to leave the laboratory of the sponsoring faculty member, the original mentor will be under no further financial obligation to this student after the initial year of support. The student will have full responsibility for finding his/her own support for the ensuing years.

Financial Assistance

A Ph.D. student recruited by the Admissions Committee receives financial support for the first twelve months of study. At the end of the 12-month period, the responsibility for the student's stipend shifts to the laboratory in which he/she has selected to complete the dissertation research. If a student is still in the process of identifying a laboratory at the end of 12 months, he/she may petition COGS for up to a four-month extension of funding. However, an extension is not guaranteed and is dependent on availability of funds and final approval of the Chair of the Department. The amount of the yearly stipend shall be in accordance with the policies of the Department of Cellular and Structural Biology or the agency from which the fellowship is obtained. A graduate student cannot receive more than five years of financial support from a training grant stipend and regardless of the source of funds, will be urged to finish the Ph.D. degree within this time. Students are encouraged to seek and provide their own federally supported or private foundation fellowships to support their entire graduate training. Students on the M.S. track do not receive departmental stipends.

Course Requirements for Ph.D. and M.S. Candidates

Doctoral students in Cellular and Structural Biology are required to take a series of basic courses (designated the Core Curriculum) as described in the Catalogue of the Graduate School of Biomedical Sciences. Additional courses may be taken if desired by the student or at the request of the Supervising Professor and/or Qualifying Examination Committee. A typical course plan for Ph.D. students is included as Attachment B. The course requirements for Master's students will be determined on an individual basis; typical course plans for M.S. students are included in Attachment C.

Core Curriculum:

Fundamentals of Biomedical Sciences- taken in the Fall Semester of the first year

Graduate Colloquium – taken in the Spring Semester of the first year

Track-specific Core Course – taken in the Spring Semester of the first year

Ethics in Research - taken in the Spring Semester of the first year

Experimental Design and Data Analysis - taken in the Fall Semester of the second year

Scientific Writing - taken in the Fall Semester of the second year

Two electives from an approved list

Seminar Course:

The student is required to register for and attend Seminar (CSBL 6090) every fall and spring semester that he/she is enrolled in the Graduate Program. The Seminar Course is organized by the Student Seminar Chair, a faculty member selected by COGS. All students are expected to attend departmental seminars and a journal club in addition to the other activities, detailed below:

1. Research Seminar

Each Ph.D. student is required to present an oral seminar based on research conducted at this institution in the second and all subsequent years. Student research seminars are designed to ensure that students receive adequate opportunity to communicate and defend their research results. Guidelines for student seminars are included as Attachment D.

2. Seminar Course Grading

Letter grades in the seminar course will be given for student attendance and participation in seminars and in journal clubs based on attendance. Students participating in joint programs with a clinical department may file for exemption from seminar during semesters with heavy clinical loads. Each student in a clinical program is limited to two semesters of exemption.

3. Journal Club

A Ph.D. student must attend either the Departmental Journal Club or, with prior approval from COGS, another weekly journal club may be substituted. Each student is required to present a Journal Club presentation on a paper of his/her choice in the first and second years

Laboratory Rotations:

During the first year of graduate study, each predoctoral student must participate in research with three different investigators in the graduate program. These "laboratory rotations" begin in the fall semester and **must** be completed by the end of the second semester. Rotations are intended to: a) acquaint the student with specific research topics in the graduate program, b) introduce students to technique(s) which may prove useful in their dissertation research and c) allow an opportunity for the student to assess whether he/she is compatible with the mentor and his/her laboratory personnel. The three laboratory rotations will each be 6 to 8 weeks in duration. These are **not** intended to result in a manuscript. Choice of the laboratories for rotation should be made based upon the student's specific research interests and in consultation with the Student Advisor. A proposed list of rotations will be prepared and given to the Student Advisor prior to beginning the first rotation. The evaluation form to be completed by the faculty member following completion of each rotation is included in the Guidelines as Attachment G. A grade of "Unsatisfactory" (U) for 50% or more of the semester hours applied to this requirement shall be grounds for dismissal from the Program. Once rotations are completed, the student will choose a laboratory for completion of his/her research. The form for mentor selection (Attachment F) must be signed by both student and the proposed advisor and submitted for COGS approval prior to completion of the student's first year.

Grade Requirements

A minimum of a 3.0 cumulative grade point average must be maintained in order to remain in good academic standing. If a student receives a "D" or "F" in any course or a final grade of "C" in a Core Course, he/she may be subject to dismissal from the Program. If the cumulative grade point average drops below 3.0, the student shall be placed on academic probation. While on probation, a student must maintain a "B" average in all registered courses. If the grade point average drops below 3.0 in any semester during the probationary period or remains below 3.0 for one calendar year, the student may be dismissed from the Program. A 3.0 grade point average is required for graduation.

Exemptions from Required Course Work

Requests for exemptions for any of the required course work must be submitted in writing to the Chair of COGS and must be approved by COGS.

Exemptions for Double Degree, Transfer and Advanced Students

Students enrolled concurrently in medical or dental school, those transferring from another graduate program and ones with Master's degrees who have been admitted to the Graduate Program in Cellular and Structural Biology may petition COGS for exemption from one or more of the courses within the Core Curriculum. Exemption will only be considered if a grade of "B" or better was obtained in an equivalent course. If letter grades are not available, the student's numerical average must be at or above the class average. Master's candidates can usually transfer up to six semester hours of course work, while the number of semester hours for which predoctoral students may obtain transfer credit will not be subject to a predetermined limit.

Student Evaluations

The Student Advisor will conduct semiannual evaluations of each student for the purpose of following his/her progress throughout the tenure of the graduate program. These evaluations are to take place at the end of the fall and the spring semesters of each academic year. A grade of satisfactory (S) or unsatisfactory (U) shall be given by the Student Advisor and will be reported as the grade for Research/Dissertation/Thesis. For the first two years, the grade will be based on reports from the laboratories in which the student has done rotations or from his/her chosen mentor and on student participation in required course work, seminars, journal clubs and other departmental activities. After appointment of the dissertation/thesis supervising committee, the Research grade will be based on reports from the committee members after semiannual committee meetings, research evaluations based on the student's annual seminar and participation in departmental seminars, journal clubs and other activities. The forms for committee and rotation progress reports are appended as Attachment G. If a committee meeting has not been held within 6 months, a grade of "U" will be given for research progress that semester. However, if the student has already scheduled a committee meeting, the Student Advisor has the option of giving a grade of "I". Failure of a student to show satisfactory progress toward his/her degree goal based on the outcome of these evaluations may be grounds for dismissal from the Cellular and Structural Biology Graduate Program.

SPECIFIC DEGREE REQUIREMENTS

MASTER OF SCIENCE DEGREE

The program of graduate study leading to the Master's Degree will depend on the student, the area of specialization, and the professional career for which the student is preparing. A typical program is outlined in Attachment C. A minimum of 30 semester hours of graduate credit is required for the Master's degree. Twelve of these hours must be completed in courses other than Seminar, Supervised Teaching and Research. COGS requires a thesis and an oral examination.

Procedural Sequence for Students Working Toward the M.S. Degree

During the first year of study, the Student Advisor will serve as academic advisor. During this time, each student shall take at least 12 hours of courses other than seminar, supervised teaching, and research/thesis. Members of the Supervising Committee (see below) may also be selected during the latter part of the first year so that they may assist in formulation and review of the thesis project. The thesis proposal should be prepared early in the second year (Attachment H for guidelines). After the supervising professor and members of the Supervising Committee have approved the final draft of the proposal, the student will present the proposal to the members of COGS in a short (10-15 minute) talk to be given no later than the end of the first semester of the second year. Three items must be given to the Chair of COGS a minimum of one week prior to the presentation: i) a copy of the final thesis proposal, ii) a signed copy of the committee proposal approval form (attachment J), and iii) the Recommendation for Approval of Thesis Proposal and Supervising Committee Form (included as an item under Attachment K). Copies of the proposal will be distributed to all members of COGS such that it can be read prior to the defense. After the presentation, members of COGS will ask the students questions about the proposal. They will then vote to accept the proposal and committee or recommend changes.

The student and advisor will provide COGS the names of the members of the student's Supervising Committee. The Supervising Committee shall consist of the Supervising Professor (research advisor) who shall act as the chair, at least two additional members of the Graduate Faculty in Cellular and Structural Biology, and one individual who is a member of another Ph.D.-granting graduate program from within the Health Science Center (this individual may also serve on the CSB graduate faculty, but it may not be his/her primary appointment). Once this Committee has been approved by COGS, the student will be automatically recommended to the Dean of the Graduate School for Admission to Candidacy. Any exceptions to the defined committee structure require COGS approval. After admission to candidacy the student must register for at least one semester of Thesis prior to graduation. The Committee shall then guide the student in selection of any additional courses and in research or library activities.

After the proposal has been approved and the student admitted to candidacy, the Supervising Committee shall hold regularly scheduled meetings with the candidate at least twice a year (or more often if needed) to determine progress on the project. The Committee shall evaluate work conducted to date and recommend any additional studies to be undertaken. Each member shall complete an evaluation form for M.S. students (see Attachment G). It is the student's responsibility to give the Student Advisor the completed forms. If a member of the Committee is absent from a meeting, he/she must be apprised of the student's progress by the Supervising Professor. When the Supervising Committee is satisfied that the research is near completion, it shall permit the writing of the thesis; it will be defended in a seminar-type presentation scheduled through the Graduate School Office. Stipulations regarding preparation of the thesis and its final approval are identical to those described for the doctoral dissertation and are included (Attachment I).

SPECIFIC DEGREE REQUIREMENTS

DOCTOR OF PHILOSOPHY DEGREE

The program of graduate study leading to the degree of Doctor of Philosophy will depend on the student, the area of specialization, and the professional career for which the student is preparing. A typical program is outlined in Attachment B.

Procedural Sequence for Students Working Toward the Ph.D. Degree

During the first year, the Program Student Advisor shall serve as the academic advisor for each beginning graduate student. In the first year, beginning graduate students shall take the Core Curriculum and the Core Course specific for his/her chosen track. During this same time, these students should be involved in research activities in the laboratory of at least three research advisors and may take any additional courses of interest as listed in the Graduate Catalogue. By Spring of the first year of graduate study, each student should select a research track and a research mentor.

I. Qualifying Examination

Note: The format for the written part of the Qualifying Examination and the Dissertation Proposal are identical, however there can be no overlap in topics. All Ph.D. students in the Cellular and Structural Biology Graduate Program are required to pass an oral Qualifying Examination. The Qualifying Examination shall consist of the student's writing and then publicly defending a research proposal. It should be written in the format of an NIH-postdoctoral grant application (NIH form PHS 416-1; Rev 10/2005 <http://grants1.nih.gov/grants/funding/416/phs416.htm>) having a limit of 10 single-spaced pages (not less than 11 font) to describe Specific Aims & Hypothesis, Background & Significance, Research Design, Methods & Expected Results. The section on Literature Citations is not included in the 10 page limit. The specifics of the qualifying exam will be determined by the track. The purpose of the Qualifying Examination is to test the ability of the student (1) to formulate an original hypothesis, (2) to design feasible experiments to test that hypothesis, and (3) to defend the resulting proposal. Individual tracks will be responsible for evaluating the

grant proposal and defense. The student's dissertation advisor cannot be a member of the Qualifying Examination Committee, but should attend the defense.

II. Formal Approval of Dissertation Committee

After completion of the Qualifying Examination, the student, with the help of his/her advisor should choose a Dissertation Committee. The Dissertation Committee must consist of:

- i) at least three faculty members from the chosen track
- ii) one faculty member from another graduate track within the University of Texas Health Science Center, San Antonio
- iii) one member from outside of the institution; this individual should not be a close collaborator on the proposed research project.

Any exceptions to this prescribed committee structure must be justified in a memo to the Chair of COGS from the student and mentor. These requests will then be reviewed by COGS and a vote of approval/disapproval taken.

The first duty of this committee will be to assist the student in the planning of his/her dissertation project and in the writing of the dissertation proposal. It is the responsibility of the Dissertation Advisor to present the list of committee members to the COGS Chair and to the Seminar Chair for presentation to the Cellular and Structural Biology COGS.

The Dissertation Committee shall meet as a group with the candidate at least twice a year. No later than one week prior to each meeting, the student shall submit to the Dissertation Committee a report of progress on the dissertation research work, including statements of objectives of the research, methods, major results obtained, conclusions drawn, and proposed direction of future work. The Committee shall evaluate the progress made by the student and agree on the direction of future work to be undertaken. Each member shall complete an evaluation form for Ph.D. students (see Attachment G). It is the student's responsibility to give the Student Advisor the completed forms. The Dissertation Committee shall decide when the student's progress is sufficient to permit writing the dissertation.

III. Presentation of Dissertation Proposal

Note: The format for the written part of the Qualifying Examination and the Dissertation Proposal are identical, however there can be no overlap in topics. All Ph.D. students in the Cellular and Structural Biology Graduate Program are required to write and defend a Dissertation Proposal. The Dissertation Proposal shall consist of the student's writing and then publicly defending their research proposal. It should be written in the format of an NIH-postdoctoral grant application (NIH form PHS 416-1; Rev 10/2005 <http://grants1.nih.gov/grants/funding/416/phs416.htm>) having a limit of 10 single-spaced pages (not less than 11 point) to describe Specific Aims & Hypothesis, Background & Significance, Research Design, Methods & Expected Results. The section on Literature Citations should not exceed two pages. The specifics of the Dissertation Proposal will be determined by the track.

After the written version is completed, the student shall present the proposal to the program in a seminar to be given no later than the end of the summer semester of the 2nd year. The proposal must first be approved by all local members of the student's committee. Two weeks before the seminar, the student shall provide a written copy of the proposal (Format described above) and the signed Recommendation for Approval of the Dissertation Research Proposal and Supervising Committee form (one of the items in Attachment K) to the Seminar Chair who will make copies of the proposal available to the graduate faculty for critical review.

After the student has completed his/her presentation, the Seminar Chair will open the meeting for questions from the audience. After all questions have been exhausted, all in attendance, exclusive of the graduate faculty, shall be asked to leave and the Seminar Chair will open the meeting for the discussion of the proposal. At the end of the discussion, the COGS shall vote for approval or disapproval of the dissertation proposal. A majority vote shall determine approval or disapproval. The composition of the Dissertation Supervising Committee will then be discussed and approved by vote of the COGS.

In the case of disapproval, the Chair of the COGS and the Seminar Chair will meet with the student and the dissertation advisor to present the reasons given for this decision. Based on this input, the student shall present a revised or new proposal to the COGS within three months.

IV. Admission to Candidacy

After the student has passed the Qualifying Examination and has successfully presented a dissertation proposal to COGS, and removed all grades of "I" (Incomplete) from his/her record, the forms recommending his/her admission to candidacy (Attachment K) will be submitted to the Dean of the Graduate School. The student will then register for Dissertation (CSBL 7099) instead of Research hours. A student must register for Dissertation at least twice prior to graduation. He/she shall remain in residence in the Program and participate in all activities normally required of full time graduate students until the dissertation is completed and the Final Oral Examination has been conducted.

V. The Final Oral Examination

The instructions for preparation and submission of the dissertation should be obtained from the Graduate Dean's Office. The student may opt to utilize either the traditional dissertation format or the optional chapter format. The Final Oral Examination shall be conducted by the Dissertation Committee. All interested persons may attend. Ordinarily the examination will be preceded by a seminar-type presentation of the research findings by the candidate. This presentation should not exceed 50 minutes. Immediately following the presentation, the members of the audience, exclusive of the Supervising Committee, shall be given the opportunity to ask questions. After these questions have been exhausted or within a reasonable length of time, the audience is to be excused. The examination shall continue with the Supervising Committee and the candidate only. Following completion of the examination, the Supervising Committee shall vote on the candidate's performance. More than one negative vote shall constitute failure. In the event of a failing performance, the Committee in consultation with COGS, shall decide on the appropriateness of another exam.

VI. The Dissertation

The typing of drafts and the final copy, collating and proofreading of the dissertation are the responsibility of the student. The departmental secretarial staff shall not perform any of the above as part of its regular duties. A final copy of the dissertation must be submitted to the Chair of COGS of the Graduate Program in Cellular and Structural Biology.

VII. Awarding of the Degree

Once all requirements for the Ph.D. have been satisfied, the relevant paperwork will be given to the Chair of COGS for processing and presentation to Graduate Faculty Council (GFC). After the Chair of COGS has approved the dissertation, the student must submit the final copy of the dissertation and all other supportive information to the Graduate Dean's Office. The recommendation of COGS is then presented to GFC.

VIII. Time to Completion of Degree Requirements

Ph.D. students are usually expected to complete all degree requirements, including the dissertation defense, in approximately five years of full-time studies. If a student has not defended his/her dissertation before completing six years of full-time studies, he/she is subject to dismissal from the Program for lack of progress. A student may request that COGS extend the limit of six years for degree completion.

Guidelines approved by COGS 6/1/84. Amended by COGS 1/9/85; 3/21/85; 6/3/85; 11/5/85; 1/8/88; 07/19/88; 02/17/89; 03/27/90; 12/19/91; 03/20/94; 07/01/94; 08/13/98; 6/10/99; 11/01/01; 06/20/02; 09/24/03, 08/14/07.