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*Master copies of these forms are included for making copies as needed.
A. ORGANIZATION

1. Introduction

The Graduate Program in Biochemistry is sponsored and administered by the Department of Biochemistry of The University of Texas Health Science Center at San Antonio. All graduate programs in the basic biomedical sciences are administered by components of the Graduate School of Biomedical Sciences. The UTHSCSA Catalog and the UTHSCSA Student Guide of the Graduate School contain information pertaining to the policies and procedures of the Graduate School. The organization, procedures, policies and operating guidelines of the Graduate Program in Biochemistry are presented in this document.

2. Committee on Graduate Studies (COGS)

The Committee on Graduate Studies administers policies and procedures of the Graduate Program in Biochemistry. This committee, consisting of members of the Biochemistry faculty and one student representative, coordinates activities in the Biochemistry Program and acts on such matters as curriculum, procedures, assignment of Supervising Professors, evaluation of students, and other pertinent policy considerations.

Faculty members of this committee are appointed by the Chair of the Department of Biochemistry for renewable, one-year terms. The Graduate Advisor serves as Chair of the Committee and is appointed by the Chair of the Department for a five-year term. The student representative is elected by the graduate students of the Program in Biochemistry and serves a one-year term. The student representative participates in all activities of the Committee except in evaluation of students in the Graduate Program.

The Graduate Advisor may make decisions consistent with well-established departmental policies of the Program. These decisions include the following: approval of rotation assignments, approval of the composition of student committees, approval of precedent course substitutions, advancement to candidacy, approval of dissertation and thesis proposals, approval of dissertation formats, placement on probation, and lifting of probation by completion of remedial requirements. It is the responsibility of the Graduate Advisor to keep the other members of COGS informed about the status of all graduate students. The Graduate Advisor should seek a majority vote of COGS members prior to any of the following: recommending dismissal of a student from the program,
granting unprecedented course substitutions, establishing new policies, denying petitions, assigning students permanently to Supervising Professors, granting a change of Supervising Professor, or waiving any departmental requirements.

The present members of COGS are listed in Appendix I.

3. **Admissions Committee**

   The Admissions Committee is charged with the following: publicizing the Graduate Program to prospective applicants, processing of applications, and recruitment of promising graduate student candidates. The Admissions Committee recommends applicants to the Associate Dean of the Graduate School for admission to the Graduate Program.

   The Admissions Committee is appointed by the Chair of the Department and consists of the Graduate Advisor, four other members of the faculty and one student. The Graduate Advisor serves as chair of the committee. **The Chair of the Department appoints one of the Admissions Committee members to be chair of that committee.** The faculty members are appointed for renewable, one-year terms. The student representative is elected by the graduate students and serves a one-year term.

   The present members of the Admissions Committee are listed in Appendix II.

4. **A list of the faculty members in the Department of Biochemistry is presented in Appendix III.**

**B. ADMISSION TO THE PROGRAM**

1. **Prerequisites**

   The minimal requirements for admission into the graduate program are the following: (a) a bachelor’s degree; (b) an undergraduate grade point average of “B” (3.0 in a 4.0 system) or greater; and (c) a total score (Verbal plus Quantitative) on the Graduate Record Examinations of at least 1000. Only in unusual circumstances will a student be admitted who has less than these minimal requirements. Undergraduate courses should have included one year each of biology, organic chemistry, physical chemistry, and mathematics. A deficiency in these recommended courses does not preclude admission into the program.

2. **Admissions Procedure**

   The Admissions Committee, by a majority vote, recommends admission to the Associate Dean of the Graduate School of Biomedical Sciences. If the Committee recommends admission without the minimal scores in either the GPA or the GRE, the
admission must be approved by the Graduate Faculty Council and the Associate Dean. The applicant is informed, in writing, by the Associate Dean of the Graduate School of Biomedical Sciences of the action taken.

C. Ph. D. PROGRAM
1. Curriculum and Supervision
   a. Course Program

The Graduate Advisor assists the student in planning an academic program for the first year or until the student selects a Supervising Professor. First-year course requirements include: Core I: Biochemistry; Core II: Molecular Biology; Core III: Cell Biology; Orientation to Biochemistry; Introduction to Biochemical Literature; Quantitative Biochemistry; and Biochemical Techniques Lab (laboratory rotations). The student also may take courses in molecular biology, microbiology, physiology, pharmacology, and cell biology.

For the laboratory rotations, the student works in four different laboratories, for a period of five weeks each, during the first year. A fifth rotation is optional upon approval by the Graduate Advisor. The first laboratory rotation is designated for each student by the Graduate Advisor. Each student selects, in consultation with the Graduate Advisor, the laboratories for the remaining three rotations. To assist students in choosing a laboratory, faculty members present a synopsis of their research to first-year students in the first six weeks of the fall semester. Faculty are available to provide additional information that will aid students in choosing. At least one week before the end of a lab rotation, the next laboratory should be selected and approved by the Graduate Advisor and faculty member selected. After completion of each laboratory rotation, the student may be asked to present a ten-minute talk in the Orientation to Biochemistry course. or the Introduction to Biochemical Literature Course. After completion of the rotations, the student selects a Supervising Professor who will supervise the student’s dissertation research and help plan the remainder of the student’s academic program.

In addition to the above, the following points are noted:
   i. Students are required to obtain credit for Biophysical Chemistry and six of the nine advanced biochemistry courses: Assembly and Function of Multimolecular Complexes; Cellular Signaling Mechanisms; Electron-transferring Proteins in Cellular Processes; Enzymology; Lipids; Molecular Genetics and Biotechnology; Molecular Targeting and Regulation; Nuclear Proteins; Protein Folding and Assembly, and Structure of Macromolecules. Protein Stability, Dynamics and NMR; and Protein Structure and Molecular Modeling. Instead of an advanced course, a student may substitute a full-semester course (at least 2

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credit hours in which they must obtain a minimum grade of B) in another department, if approved in advance by COGS. A maximum of two substitutions is permitted.

ii. Students are required to complete all the first-year courses and Biophysical Chemistry before attempting the advancement to candidacy examination. The student is expected to complete the 6 advanced courses by the end of the second year and before advancement to candidacy. If a student plans to defer any advanced courses past the second year, this plan must be submitted to COGS for approval.

iii. A student may be exempted from any of the Core I, II, or III courses if the student passes an exemption exam offered. A student may petition COGS for exemption from a required advanced course based on previous graduate work.

iv. Students are required to participate actively in departmental seminars.

v. The course program for a student depends on the year in which the student enters. The schedule of courses for three academic years is presented on the next two pages. The nine advanced courses are presented in an eighteen a twenty-four month cycle. Course offerings are subject to change. For detailed scheduling, students should consult the Graduate Advisor.

vi. The minimum full-time load is nine semester hours during the Fall and Spring and six semester hours during the Summer. Students enrolled in the Graduate Program in Biochemistry must participate on a full-time basis. Employment outside of the Department is strongly discouraged. Outside employment will not be permitted if it interferes with the student’s performance and obligations.

vii. Five years is the time normally required to complete the Ph. D. degree requirements in the Department of Biochemistry. A recent Board of Regents rule makes students who exceed 130 credit hours subject to non-resident tuition.

b. Teaching Requirement

Each student is required to participate in the teaching program of the Department of Biochemistry for a minimum of one semester: one semester hour of credit per semester of teaching, while enrolled in a special graduate course in Supervised Teaching (BIOC 6071). The student receives a grade from the faculty member(s) who serves as the Director of the course to which the student is assigned. Assignments to courses are made by the Committee on Graduate Studies. Students may be given assignments at any time during their matriculation.
# COURSE OFFERINGS

## 2000-01

### FALL

**Required Courses**
- Core I: Biochemistry (INTD 5005)
- Core II: Molecular Biology (INTD 5006)
- Biophysical Chemistry (BIOC 6028)
- Orientation to Biochemistry (BIOC 5074)
- Biochemical Techniques Lab (BIOC 5081)

### SPRING

**Required Courses**
- Core III: Cell Biology (INTD 5007)
- Special Topics in Biochemistry: Quantitative Biochemistry (BIOC 5091)
- Biochemical Techniques Lab (BIOC 5081)
- Ethics in Research (INTD 6002)

**Advanced Courses**
- Cellular Signaling Mechanisms (BIOC 6033)
- Molecular Genetics and Biotechnology (BIOC 6063)
- Special Topics in Biochemistry: Protein Structure and Molecular Modeling (BIOC 5091)
- Special Topics in Biochemistry: Protein Stability, Dynamics and NMR (BIOC 5091)

## 2001-02

### FALL

**Required Courses**
- Core I: Biochemistry (INTD 5005)
- Core II: Molecular Biology (INTD 5006)
- Biophysical Chemistry (BIOC 6028)
- Orientation to Biochemistry (BIOC 5074)
- Biochemical Techniques Lab (BIOC 5081)

### SPRING

**Required Courses**
- Core III: Cell Biology (INTD 5007)
- Special Topics in Biochemistry: Quantitative Biochemistry (BIOC 5091)
- Biochemical Techniques Lab (BIOC 5081)
- Ethics in Research (INTD 6002)

**Advanced Courses**
- Nuclear Proteins (BIOC 6026)
- Molecular Targeting and Regulation (BIOC 6027)
- Enzymology (BIOC 6054)
- Assembly and Function of Multimolecular Complexes (BIOC 6032)

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Courses for Scientific Writing (BIOC 0003), Research (BIOC 6097), Thesis (BIOC 6098),
and Dissertation (BIOC 7099) are offered every semester. Supervised Teaching (BIOC 6071) is given each fall semester for teaching assistants.

c. **Dissertation Supervising Professor**

Before selection of the Supervising Professor, the student must become familiar with the research interests of the faculty. This is one objective of the laboratory rotation course requirement of the Program in Biochemistry curriculum. A student is normally expected to select a Supervising Professor from among the four faculty with whom the student has rotated. If a student can not select a Supervising Professor following the fourth rotation, one additional rotation may be scheduled following approval by the Graduate Advisor. Selection is made after completion of the fourth rotation in late February in the Spring semester. Requests for early selection after completion of four rotations, but before the usual selection date, will be considered by COGS. Within one week following completion of laboratory rotations, the student must submit to the Graduate Advisor a list of three faculty, in order of preference, with whom the student wishes to work. Before submitting this list, the student must confirm that the faculty chosen are both willing and able to support the student’s dissertation research. It is the responsibility of a faculty member to accept students only if certain of the ability to support the student’s stipend and research expenses for the duration of a Ph. D. project. After the Graduate Advisor consults with each student and the faculty members on each list, COGS will appoint the Supervising Professors.

The Department of Biochemistry provides stipends for first-year students. As funds are available, second-year students may be supported from departmental funds, but it is expected that second-year students be supported from research grants of the Supervising Professor. This limited source of student support by departmental funds is predicated on the fixed number of available departmental stipends and on the number of new students entering the Graduate Program. The Chair of the Department will notify Supervising Professors when they will be required to provide stipends for students in their laboratories. The Department will make every effort to provide stipends to graduate students should a loss of grant funds occur.

The final decision concerning graduate student stipends will be made by the Chair of the Department of Biochemistry.

d. **Ad hoc Supervising Committee**

Within three months after the student has selected a Supervising Professor, an ad hoc Supervising Committee is formed to assist the student in formulating a dissertation research project. The ad hoc Supervising Committee will consist of the Supervising
Professor and at least two other faculty members, one of whom may be from another department. The Supervising Professor requests in writing to the Graduate Advisor approval of the composition of the ad hoc Supervising Committee and indicates that each of the prospective members has agreed to serve. The ad hoc Supervising Committee functions until the student’s Dissertation Supervising Committee and dissertation proposal are approved. Members of the ad hoc Supervising Committee may become members of the Dissertation Supervising Committee.

e. Evaluation of Students

Each semester, grading period, a grade of satisfactory or unsatisfactory for research credits is given by the Supervising Professor. In addition, research progress is evaluated at semi-annual meetings of the student with the ad hoc Supervising Committee or Dissertation Supervising Committee. The first such meeting is held in the first semester after formation of the ad hoc Supervising Committee. Thereafter, a meeting is held before the completion of each semester. A progress report is submitted to each member of the Supervising Committee at least one week before the meeting. A recommended format for the report is described in Appendix IV. Faculty expect that by the fourth year of matriculation, students will have completed a sufficient portion of their dissertation work to comprise a complete manuscript and should write the progress report in the form of a manuscript for journal publication. However, those portions of the dissertation research that have not been completed to the stage of a full manuscript should still be in manuscript format for the progress report.

The schedule for submission of progress reports and meeting of research committees is:

<table>
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<th>Year of student in program</th>
<th>Fall semester</th>
<th>Spring semester</th>
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<td>Fourth and beyond</td>
<td>September</td>
<td>February</td>
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<tr>
<td>Third</td>
<td>October</td>
<td>March</td>
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<tr>
<td>Second</td>
<td>November</td>
<td>April</td>
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An exception to this schedule occurs in the Fall semester for fourth year students completing requirements for the dissertation research proposal as described in Section C. 3.

At the progress meeting, the student summarizes in 10 minutes the results obtained since the previous meeting. During the oral presentation the student should be prepared to summarize relevant published work, especially publications since the previous committee meeting that have significant impact on the student’s research. The student presents experimental results, as well as other findings made during the semester. Emphasis in this discussion is placed on: (1) how the results affirm or are inconsistent with hypotheses that
have been formulated by the student; and (2) the student’s understanding of the scientific literature. The oral presentation concludes with a discussion of specific aims for the next report period.

Each member of the Supervising Committee evaluates both the oral presentation and the progress report on one of the forms that is contained in Appendix V:A-D. It is the student’s responsibility to provide the Committee members with the forms along with the progress report. The student collects and collates the forms after the meeting. The student provides a copy of the completed forms to each member of the Supervising Committee and the Graduate Advisor.

The Graduate Advisor issues a grade of Satisfactory or Unsatisfactory in Scientific Writing, based on the majority opinion of the Supervising Committee. In the case of a tie grade, the grade given by the Supervising Professor prevails. If a grade of Unsatisfactory is due to a defect that can be easily corrected, the grade will be changed to satisfactory when the student makes the change to the satisfaction of the majority of the committee. **If a student fails to complete a progress report and have a research committee meeting before the end of a semester, a grade of Unsatisfactory will be issued for both Research and Scientific Writing.** A final grade of Unsatisfactory in Scientific Writing or in Research will result in the student being placed on academic probation.

All students are required to maintain the following minimum academic standards:

1. At least a B in each biochemistry course and in Core I, II, and III courses.
2. At least a 3.0 GPA in all courses.

If a student gets a C or less in a biochemistry course or in Core I, II, or III courses, the student must remediate the course. Remediation may consist of retaking the course or other process (e.g., re-examination or writing a paper) designated by the course director. The student will be on academic probation until the-less-than B grade is remediated. If the student fails to remediate to at least a B grade, the student will be subject to dismissal from the Ph. D. program. (If the student retakes a course, the original grade remains on the transcript, but only the grade from the repeat course is included in the GPA. If the student remediates by another process, the original grade is changed to the grade achieved by remediation.)

Any student receiving a second grade of C or less in a biochemistry course or in Core I, II, or III courses will be subject to dismissal from the Ph. D. program.

If a student gets a C or less in a course outside the Department of Biochemistry, the course may not be counted as a substitute for a biochemistry course and another biochemistry course will be required. If remediation is available for the course, the student may remediate for the purpose of maintaining a minimum GPA of 3.0.

Students are not allowed to drop the Core I, II, or III courses or the Biophysical Chemistry course at any time after enrollment. Other courses may be dropped if the student has at least a B grade.
An I (Incomplete) grade will be issued when a student has not completed all the assignments or examinations before the conclusion of the course and when the course director has decided that there is a reasonable basis for the incompletion. All work must be completed within one year, at which time the I grade will be changed to the appropriate letter grade. The course director will provide COGS with a brief description of the assignment to be completed and the time scheduled for completion to aid COGS in evaluation of the student.

f. Academic Probation

A student is placed on academic probation for failure to meet any of the requirements of the program. The Graduate Advisor notifies the student in writing the basis for the probation, the requirements to rectify the probation, and the time allowed to complete these requirements (usually one semester). A student on academic probation is not allowed to advance to candidacy. A student who fails to meet the probationary requirements, or who fails to satisfy a second requirement while on probation is subject to dismissal from the Ph. D. program. COGS may recommend to the Associate Dean of the Graduate School the dismissal of a student at any time for failure to make satisfactory progress. A majority vote of the members of COGS is required for a recommendation of dismissal.

2. Advancement to Candidacy

In order to advance to candidacy for the Ph. D., a student must: (a) complete all courses specified in section C.1.a.; (b) pass an advancement to candidacy examination described below; (c) resolve any probationary requirements; and (d) obtain the Supervising Professor’s certification of potential for productive and independent investigation.

a. Completion of Course Work

Students are expected to have completed all required Core Courses and Advanced Biochemistry courses by the end of their second academic year prior to taking the advancement to candidacy exam. The advancement to candidacy exam must be taken on schedule even if there are still outstanding course requirements, unless a postponement is granted by COGS. Petition for a postponement must be made at least two months prior to the deadline for completion of the advancement to candidacy exam. Concomitantly with considering a petition for postponement, COGS may choose to place the student on academic probation, and stipulate conditions to resolve the probation.

If a student who has not finished a required course takes and passes the advancement to candidacy exam, the student may not advance to candidacy until the
requirement is completed, unless COGS grants an exception. COGS may stipulate a time limit for the completion of the missing requirement. If the student is delaying completion of a requirement in order to substitute an outside course offering, a petition for approval of that substitution must be made to COGS at this time unless approval has already been obtained.


An oral examination based on an original, written research proposal is to be completed by September 30th in the fall semester of the 3rd year for students who enter the program in August or by February 28th in the spring semester of the 3rd year for students who enter the program in January. (See Appendix VI-A for detailed instructions on the preparation of this proposal and a description of the conduct of the examination.) The Examination Committee consists of three members from the Biochemistry faculty, one of whom will be designated to chair the committee by the Graduate Advisor, and one from another department in the Health Science Center. The latter cannot be a cross-appointed faculty member in the Department of Biochemistry. The Supervising Professor is responsible for submitting the names of these individuals to the Graduate Advisor for approval. Examination Committee members should be chosen on the basis that their expertise is in the area of the research proposed. The student’s Supervising Professor is present during the examination as a non-participating and non-voting member.

Scheduling of all activities relating to this examination is the responsibility of the student. The student should consult the chronology of events in Appendix VI-A and start the written proposal well in advance of the deadline to allow for required revisions and approval by the examination committee. When the committee members approve the written proposal, they sign the Petition for Oral Examination Form (Appendix VI-B). The student forwards the signed form and a copy of the proposal to the Graduate Advisor. At this time, the student schedules the oral examination. In the case of failure to obtain approval of the written proposal in time to meet the examination deadline, COGS usually considers the exam to have been failed. Only in exceptional cases involving circumstances beyond the student’s control will COGS consider granting a postponement.

If one of the Examination Committee members fails to appear for the oral exam, the chair of the committee may decide whether to proceed or postpone the exam. Either postponement of the exam by the committee or absence of the committee chair are considered circumstances beyond the student’s control. If the exam proceeds without one examiner, the rule that two dissenting votes are required for failure still holds. The missing examiner is counted as a passing vote.
The chair of the Examination Committee submits the results of the examination to the Graduate Advisor immediately after the test on GSBS Form 32 (see Appendix VI-C). Two or more dissenting votes indicate failure. In case of failure, the student is allowed to repeat the examination with the same committee ONCE. However, if the student is on probation for failure to complete the advancement to candidacy exam by the scheduled deadline and then fails the exam, COGS will decide if the student is allowed to repeat the examination or is subject to dismissal from the Ph. D. program. The chair of the committee gives the student a written explanation for the basis of the failure and provides guidelines to prepare for the re-examination. However, the re-examination will not be limited to the specific subjects or questions suggested by the committee as areas for improvement. The re-examination must be completed within three months of the first examination. Postponements can only be granted by petition to COGS and only for circumstances beyond the student’s control. Failing the re-examination will be cause for dismissal from the Ph. D. program. The student may petition COGS for admission to the Master’s degree program.

c. Resolution of Probationary Requirements
A student may not advance to candidacy while on academic probation. Academic probation can be the result of unsatisfactory performance in course work, unsatisfactory grades issued by the Supervising Professor or the ad hoc Supervising Committee, or failure to complete program requirements on time, such as failure to take the advancement to candidacy exam on time. Normally, the requirements to remediate an academic deficiency and the time period during which remediation is expected are stipulated when COGS places the student on probation. Upon receiving the result of the advancement to candidacy exam, COGS reviews the student’s academic record for any outstanding remediation requirements. If COGS finds outstanding remediation requirements, the student is informed in writing including a specification of the time allowed to complete those requirements. This review occurs after either a pass or a failure of the advancement to candidacy exam. Failure to complete probationary requirements in the allotted time usually results in dismissal from the program.

d. Certification of Potential for Productive and Independent Investigation
Advancement to candidacy requires that the Supervising Professor certify that the student has potential for productive and independent investigation. Such certification may occur at the time of the advancement to candidacy exam by signing GSBS Form 32 (see Appendix VI-C). Alternatively, the Supervising Professor may defer certification until the student demonstrates further progress in research. If the Supervising Professor declines to certify the potential of the student by the end of the semester, then an
unsatisfactory (U) grade is entered on the student’s record for scientific research, and the rules regarding academic probation and unsatisfactory grades apply.

e. **Review of the Student’s Graduate Record by COGS**

Following successful completion of the advancement to candidacy examination, the Committee on Graduate Studies reviews the student’s graduate record. If any conditions for advancement to candidacy are not met, the student must be notified in writing of the reasons, any conditions to be met for advancement to candidacy, and the time within which these conditions must be met. The notification will state both a date by which COGS will conduct another review of the student’s record and any contingencies that might lead to the student’s dismissal from the Ph. D. program. The COGS review will be completed within two weeks of the exam deadline each semester. The student will be allowed two weeks to submit a written appeal to the committee. The COGS review will include a determination of whether the student was given a fair opportunity to remediate any deficiencies. COGS may revise any remedial requirements that it feels have become impossible or irrelevant for reasons beyond the student’s control.

Similarly, after a failed attempt in an advancement to candidacy exam, COGS reviews the student’s record as well as the conditions for re-examination provided by the chair of the exam committee. COGS notifies the student of any additional requirements for advancement to candidacy beyond passing the second attempt at the advancement of candidacy exam. If a student is on probation, and has not completed the required remediation in the allotted time, COGS may recommend dismissal.

When all conditions for advancement to candidacy are met, COGS will recommend to the Graduate Faculty Council that the student be admitted to candidacy for the Ph. D. degree.

f. **Action by the Associate Dean of the Graduate School**

Upon a favorable review by the Committee on Graduate Studies, the recommendation for admission to candidacy is forwarded to the Associate Dean of the Graduate School of Biomedical Sciences. Upon approval by the Associate Dean of the Graduate School, the student is admitted to candidacy.

3. **Dissertation Research Proposal and Proposal Seminar**

By March 1 of the sixth semester, the student submits a draft of a proposal for dissertation research to the Supervising Professor for review. The student presents a departmental seminar based on his/her dissertation research proposal early in the seventh
semester (beginning of the fourth year). The student submits the research proposal to the dissertation supervising committee (except for the external reviewer) one week prior to the seminar and meets with the supervising committee within one three weeks after the seminar (immediately after the seminar would be ideal). However, it is strongly recommended that the meeting be held as soon after the seminar as possible. A meeting held immediately after the seminar would be ideal. The student submits the dissertation research proposal, revised if necessary, and an abbreviated version of the research proposal to the dissertation supervising committee for approval prior to submission to COGS. The student submits the dissertation research proposal, the abbreviated version of the research proposal, a petition-for-dissertation-proposal-approval form (Appendix VII-A), and the proposed membership of the dissertation supervising committee (Appendix VII-DC; GSBS Form 30) to the Graduate Advisor for approval by COGS no later than the end of the seventh semester. The full dissertation research proposal and the abbreviated research proposal are to be written according to the guidelines presented in Appendix VII-B-A and Appendix VII-CB, respectively.

If a student is unable to submit the specified documents to COGS by the end of the seventh semester, the student must seek the approval of COGS for a postponement. The student should submit a letter to the Graduate Advisor stating the reason for seeking the postponement and stating a proposed date for submission of the documents. The letter must be signed by all members of the proposed dissertation Supervising Committee, except the external examiner, to indicate their agreement with the reason for seeking a postponement.

The dissertation research seminar serves as the student’s seminar during the fourth year. The committee meeting after the seminar serves as the student’s committee meeting for the semester and the dissertation research proposal serves as the student’s progress report for the semester.

4. Dissertation Supervising Committee

At the same time that both forms of the dissertation research proposal described in Section C.3 are submitted to the Committee on Graduate Studies, the Supervising Professor and the candidate propose members of the Supervising Committee for the dissertation research to the Committee on Graduate Studies. The Supervising Committee must consist of at least five persons as follows:

a. The Supervising Professor, designated as Supervising Professor and chair of the Supervising Committee;
b. One member, designated as the external reviewer, must be from outside the Health Science Center and must be an expert in the field of the proposed dissertation. The member will provide unbiased perspective and critique; therefore, active collaborators of the Supervising Professor should be excluded. A person that is a prospective postdoctoral mentor of the student should also be excluded.

c. Two members, who must be Graduate Faculty members of the Biochemistry Program;

d. One member who must be a faculty member in the Health Science Center in an area outside Biochemistry (not a cross-appointee in the Department of Biochemistry) but need not be a member of the Graduate Faculty.

The names of the proposed Supervising Committee members, with the Supervising Professor as chair, shall be submitted on GSBS Form 30 (Appendix VII-D). The Committee on Graduate Studies must approve both forms of the dissertation research proposal and the membership of the Supervising Committee prior to submission of these documents to the Graduate Faculty Council.

If a change in the membership of the dissertation Supervising Committee is necessary after formal approval of the membership by the Graduate Faculty Council, the change must be approved by the Committee on Graduate Studies. The Supervising Professor should submit a letter to the Graduate Advisor stating the name of the deleted committee member and the reason for the proposed change. If the proposed change is approved by the Committee on Graduate Studies, the Graduate Advisor will notify the Associate Dean of the Graduate School of the change.

5. Submission of the Dissertation Research Proposal and Membership of the Dissertation Committee to the Graduate Faculty Council

After approval by the Committee on Graduate Studies, the student submits an abbreviated form of the dissertation research proposal (see Appendix VII-C) and the proposed membership of the Dissertation Supervising Committee (on GSBS Form 30, Appendix VII-D) to the Associate Dean of the Graduate School. The timetable and procedure for obtaining approval from the Graduate Faculty Council are described in detail in Appendix VII-C, but the student should check with the Associate Dean for current deadline dates. Briefly, the student and Supervising Professor will attend a meeting of the Graduate Faculty Council, which convenes on the second Friday of each month. The Council requires three weeks prior to the meeting for review of the proposal and committee composition. At the meeting, the rationale for the composition of the Supervising Committee and a brief description of the proposed research are presented by the Supervising Professor.
Professor. The student answers questions from the Graduate Faculty Council about the proposal. The Council then votes to approve or disapprove the research proposal and the membership of the dissertation Supervising Committee.

6. Dissertation

Within 90 days after approval of the dissertation research proposal and the Dissertation Supervising Committee by the Graduate Faculty Council, the Supervising Professor convenes a meeting of the Supervising Committee with the student to discuss the research problem chosen for the dissertation and proposals for its solution. At least twice a year, no later than the first Friday of May and the second Friday of December, according to the schedule stated in Section C. 1. e., the student meets with the Supervising Committee to report progress of the research. The committee evaluates the student’s performance on the appropriate form (Evaluation by the Committee Members, Appendices V-A to V-D).

The role of the external reviewer is to evaluate the scientific merit of the completed dissertation and to participate in the Final Oral Examination. The external reviewer is not expected to participate in the semi-annual meetings of the Supervising Committee with the student. Transmission of progress reports by the student to the external reviewer is optional.

When the student seeks permission to stop experimental work and to write the dissertation, the student should submit a copy of the dissertation outline and data, in the form of figures and tables, to members of the Supervising Committee. When the Supervising Committee deems that all experimental work has been completed and that the data are of sufficient quality and quantity to constitute an acceptable dissertation, formal permission is granted to the student to stop performing experimental work and to begin the actual process of assembling the dissertation. The dissertation should include original data and results for publication in peer-reviewed, scientific journals. The Supervising Professor notifies the Graduate Advisor in writing that the student has been given formal permission to stop experimental work and to write the dissertation. Before any dissertation draft is written, the student must meet with the Supervising Committee to determine the detailed format of the dissertation and to reach a mutual understanding concerning submission deadlines. A chapter format, based on manuscripts, for the dissertation requires approval by both the Supervising Committee and COGS. In any case, the dissertation draft must conform to the general guidelines of the Graduate School (see Appendix VIII). The Supervising Professor must approve a draft of the complete dissertation before the student submits it to the other members of the Supervising Committee. The Supervising Professor will signify to the other committee members that he/she has read the submitted draft by signing the title page of the dissertation draft. It is not permissible to submit a dissertation in partially completed sections to the Supervising Committee. The Supervising Committee
is entitled to a three-week period to evaluate the complete dissertation and to determine if it is suitable for defense.

7. Final Oral Examination

When the dissertation Supervising Committee judges the dissertation to be suitable for defense, the student submits a Request for Final Oral Examination (GSBS Form 40, Appendix IX-A) to the Associate Dean of the Graduate School for approval of a date for the exam. Public announcement of the Final Oral Examination is made by the Associate Dean of the Graduate School. This Examination is conducted by the dissertation Supervising Committee with the Supervising Professor as chair. All interested persons may attend the public defense and have the right to question the candidate. After the public defense, the dissertation Supervising Committee meets with the candidate in executive session to administer an intensive and detailed oral defense of the dissertation. The Supervising Committee members vote on the candidate’s success or failure on the Final Oral Examination; more than one vote for failure signifies failure on the examination. The Supervising Committee members also vote for approval or disapproval of the final copy version of the dissertation.

The members indicate their vote by signing the Report on Final Oral Examination Form (GSBS Form 43, Appendix IX-B). Should there be extensive revisions of the dissertation required by the Supervising Committee, the Graduate Advisor will withhold submission of the Report on the Final Examination until the Supervising Professor and the student certify that all necessary changes in the dissertation have been accomplished. Each member of the Supervising Committee will inform the Supervising Professor if they want to review the changes in the dissertation prior to the certification of the final draft. Thus, the student’s graduation will be postponed pending completion of the dissertation and the signing of the final report.

The Supervising Professor submits the report of the Final Oral Examination to the Committee on Graduate Studies. If the student failed, the Supervising Committee also submits a recommendation regarding remedial action; in such a case, the Committee on Graduate Studies decides on the recommendation or other action to be taken. If the student passes the examination, the Committee on Graduate Studies votes on whether to approve the recommendation by the Supervising Committee for granting the degree. Upon favorable review by COGS, the Graduate Advisor forwards the Committee’s recommendation to the Graduate Faculty Council. When the dissertation meets the approval of the Supervising Committee, the student submits the dissertation approval page to the Office of the Graduate Dean for signature by the Dean. Approval of these recommendations by the Graduate Faculty Council is required before the degree is awarded.
D. M. S. PROGRAM

The Graduate Program offers a Master of Science Degree in Biochemistry.

1. Curriculum and Supervision

   The Graduate School of Biomedical Sciences requires a minimum of 30 semester credit hours for the M. S. degree, with at least 18 credit hours in course work in addition to credit hours that may be accrued in Research and Thesis. Three years is the time normally required to complete the M. S. degree requirements in the Department of Biochemistry. The curriculum for the M. S. program is outlined on a following page.

   The procedure for the appointment of a thesis Supervising Professor is the same as that for the Ph. D. program (see Section C.1.c) except the student does two laboratory rotations prior to selection of a Supervising Professor. The Supervising Professor should be selected by the end of the first semester.

   The ad hoc Supervising Committee will consist of the Supervising Professor and two additional faculty members from the faculty of the Biochemistry Program. The Supervising Professor will be the chair of the committee. Additional ad hoc Supervising Committee members are optional. The ad hoc Supervising Committee should be formed within one month of selection of the Supervising Professor. The ad hoc Supervising Committee should meet with the student once each semester to evaluate the progress of the student. The student is required to submit a research progress report to the ad hoc Supervising Committee prior to each committee meeting.

2. Advancement to Candidacy for the Masters Degree

   A written research proposal and an oral defense of the proposal for advancement to candidacy for a Master of Science degree are optional. The ad hoc Supervising Committee determines whether the written and oral examinations are waived. Certification by the Supervising Professor of the student’s potential for productive and independent research is required. The Supervising Professor submits the petition for admission to candidacy on GSBS Form 31 (Appendix X-A) to the Graduate Advisor for approval by COGS.
## PROGRAM FOR THE MASTER OF SCIENCE DEGREE IN BIOCHEMISTRY

### Year 1

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core I: Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>Biophysical Chemistry or</td>
<td>3</td>
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<tr>
<td>Core II: Molecular Biology</td>
<td>4</td>
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<tr>
<td>Biochemical Techniques Lab</td>
<td>2</td>
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<tr>
<td>Orientation to Biochemistry</td>
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Selection of Supervising Professor by end of the first semester.

#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core III: Cell Biology</td>
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</tr>
<tr>
<td>Introduction to Biochemical Literature</td>
<td>1</td>
</tr>
<tr>
<td>Special Topics in Biochemistry: Quantitative Biochemistry</td>
<td>1</td>
</tr>
<tr>
<td>Advanced Course</td>
<td>2</td>
</tr>
<tr>
<td>Scientific Writing</td>
<td>1</td>
</tr>
<tr>
<td>Research</td>
<td>3</td>
</tr>
<tr>
<td>Ethics in Research</td>
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</table>

Selection of ad hoc Supervising Committee and Advancement to Candidacy.

#### Summer

<table>
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</tr>
<tr>
<td>Research</td>
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</tr>
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</table>

Approval of thesis proposal and thesis Supervising Committee by COGS by end of summer term.

### Year 2

#### First Semester

<table>
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<th>Course</th>
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</thead>
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</tr>
<tr>
<td>Scientific Writing</td>
<td>1</td>
</tr>
</tbody>
</table>

Approval of thesis proposal and thesis committee by the Graduate Dean at the beginning of the semester.

#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>8</td>
</tr>
<tr>
<td>Thesis</td>
<td>1</td>
</tr>
</tbody>
</table>

Completion and defense of thesis

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3. Thesis Supervising Committee
The Supervising Professor will form a thesis Supervising Committee after the student is admitted to candidacy for the M. S. degree and by the end of the third semester after matriculation. The thesis Supervising Committee will consist of the Supervising Professor, two additional faculty members from the faculty of the Biochemistry Program, and one faculty member from another department within the UTHSCSA who is not a cross-appointee in the Department of Biochemistry. The latter member need not be a member of the graduate faculty. The Supervising Professor serves as chair of the committee.

The Supervising Professor submits the membership of the thesis Supervising Committee on GSBS Form 42 (Appendix X-B) to the Graduate Advisor for approval by COGS for subsequent admission to the Associate Dean of the Graduate School. This form requires the signatures of the Supervising Committee members. A copy of the thesis proposal (see below) must accompany this form for submission to the Associate Dean of the Graduate School.

The thesis Supervising Committee will evaluate the progress of the student in the same manner as did the ad hoc Supervising Committee.

4. **Thesis Proposal**

Thesis research will be experimental research that can be completed in approximately two years. A thesis proposal should be approved by the proposed thesis Supervising Committee by the end of the third semester. The thesis proposal should adhere to the guidelines for preparation of a Ph. D. dissertation research proposal, but on a smaller scale. A copy of the thesis proposal approved by the thesis Supervising Committee and the composition of the thesis Supervising Committee (on GSBS Form 42 with signatures, Appendix X-B) are submitted to the Graduate Advisor for approval by COGS. The documents are submitted to the Associate Dean of the Graduate School after being approved by COGS.

The thesis proposal and thesis Supervising Committee do not require approval by the Graduate Faculty Council. Consequently, the student is not required to prepare an abbreviated version of the thesis proposal for submission to the Associate Dean for the Graduate School.

5. **Thesis and Final Examination**

The Supervising Professor and thesis Supervising Committee will determine when the research is sufficient for a thesis. The thesis should include original data and results for publication in peer-reviewed, scientific journals. The student should obtain instructions for preparation of the thesis from the Office of the Graduate Dean. After the Supervising Professor and thesis Supervising Committee approve the thesis for defense,
the Supervising Professor submits a Request for Final Oral Examination on GSBS Form 40 (Appendix IX-A) to the Associate Dean for approval to schedule the final oral examination. The Supervising Professor and thesis Supervising Committee have the option of holding a formal (open to all interested persons) or an informal (without public notification) final oral examination as described in the UTHSCSA catalog. The thesis Supervising Committee members vote on the student’s performance on the examination. More than one dissenting vote will indicate failure. In case of failure, the committee will decide on whether to give another examination. The Supervising Professor submits the Report on Final Oral Exam on GSBS Form 41 (Appendix X-C) to the Graduate Advisor for approval by COGS. The Report on Final Oral Exam is submitted to the Associate Dean of the Graduate School for final approval.

E. FINANCIAL SUPPORT

Students who matriculate in the Ph. D. program are supported by a teaching assistantship from the Department of Biochemistry in the first year. After the first year, the Supervising Professor is expected to provide support for the graduate student through research grants. Students in the M. S. program are not supported by the department. The Supervising Professor may or may not provide support for a M. S.-degree student. Although no guarantee of financial support can be made to students enrolled in the Graduate Program in Biochemistry, every effort will be made to aid the student financially.

The annual support for a student who matriculates in the Ph. D. program is $15,000 for the first year, $15,500 for the second year, and $16,000 for the third and subsequent years.

F. GRADUATE STUDENT PERSONAL LEAVE POLICY

The policy of the Graduate Program in Biochemistry and the Department on personal leave for graduate students is as follows:

Owing to the unique relationship between a graduate student's responsibilities as a full-time student and as a half-time employee (in most cases) of the University of Texas, each student will be allowed 10 working days (two weeks) leave per calendar year. Requests or an accounting for leave time will be handled as for any regular employee of the University. The granting of leave time will be the responsibility of the Graduate Advisor for students until they have a Supervising Professor and by their Supervising Professor in the remainder of their program. This Leave may only be taken during periods of time when the student is not matriculated for graduate credit. Thus, leave may only be taken during inter- or intra-semester breaks, as designated by the University, and only with approval of the Supervising Professor. In addition, students will be allowed all official UTHSCSA employee holidays. Such holidays do not include days between semesters, or between semesters and summer term and Spring Break in which the
students are not enrolled in courses. Exceptions to this policy will be dealt with on a case-
by-case basis by COGS. Sick leave and maternity leave will be handled on a case-by-case
basis and will take into account the course work and other requirements which must be
made up during an absence due to illness or maternity. Payment of stipends during a
prolonged absence will be the decision of the Chair of the Department of Biochemistry in
consultation with the student’s Supervising Professor and the Graduate Advisor.

G. MISCONDUCT

The graduate program in Biochemistry adheres to the Procedures and Regulations
Governing Student Conduct and Discipline as stated in the UTHSCSA Student Guide,
(Appendix XI).

Students who matriculate in the Fall 1994 semester and thereafter will enroll in Ethics
in Research (INTD 6002). This is a required course, based on policy of the Graduate
School of Biomedical Sciences.

All students are required to enroll in Ethics in Research (INTD 6002) based on
policy of the Graduate School of Biomedical Sciences.
APPENDICES
APPENDIX I

Members of the Committee on Graduate Studies
2000-01 Academic Year

Larry D. Barnes, Chair and Graduate Student Advisor
Martin L. Adamo
Andrew P. Hinck
Lee McAlister-Henn
Merle S. Olson (ex officio)
Neal C. Robinson
Rui J. Sousa
Lai Wang, Student Representative

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APPENDIX II

Members of the Admissions Committee
2000-01 Academic Year

Peter John Hart, Chair
Martin L. Adamo
Larry D. Barnes
Jean X. Jiang

Eileen Lafer
L. M. Fredrik Leeb-Lundberg

Feng Liu
Lawrence J. Mandarino
Barry T. Nall
Susan T. Weintraub

Veronica Contreras, Student Representative
Graduate Faculty in the Department of Biochemistry:

Martin L. Adamo, Associate Professor; Ph. D., University of Houston, 1986. Regulation of insulin-like growth factor-I biosynthesis and signaling in conditions of normal and pathological growth.

Larry D. Barnes, Professor; Ph. D., University of California, Los Angeles, 1970. The role of diadenosine oligophosphates in cellular regulation in budding and fission yeasts; Fhit tumor suppressor; enzymology.

**Lynda F. Bonewald, Professor; Ph. D., Medical University of South Carolina, 1984. The role of transforming growth factor β, of leukotrienes and osteocytes in bone remodeling.

*Barbara D. Boyan, Professor; Ph. D., Rice University, 1974. The role of membranes in the mineralization of bones and teeth and their regulation by steroid hormones and growth factors.

****Michael G. Brattain, Professor; Ph. D., Rutgers University, 1974. Mechanisms of tumor suppression by transforming growth factor β and elucidation of mechanisms contributing to growth regulatory aberrancies in human cancer cells.

**John M. Chirgwin, Professor; Ph. D., University of California, Riverside, 1974. Sorting of proteins to lysosome and into the nonclassical secretory pathway. Roles of PTHrP, autocrine motility factor, and TGFβ signaling in metastasis by breast and prostate cancers.

Jeffrey C. Hansen, Associate Professor; Ph. D., University of Wisconsin, Madison, 1986. Chromatin structure and function; macromolecular interactions in eukaryotic transcription; analytical ultracentrifugation of macromolecular assemblies.

Stephen C. Hardies, Associate Professor; Ph. D., University of Wisconsin, Madison, 1979. Molecular genetics of a mammalian transposon; genome mapping.

Peter John Hart, Assistant Professor; Ph. D., University of Texas at Austin, 1993. Metalloprotein structure, action, and redesign; role of copper-zinc superoxide dismutase in Lou Gehrig’s disease, structural biology of metal trafficking; blue copper proteins; protein crystallography.

Andrew P. Hinck, Assistant Professor; Ph. D., University of Wisconsin, 1993. Solution NMR spectroscopy of proteins and nucleic acids; transforming growth factor β and its interaction with the ligand binding domain of the TFG-β type I and type II receptors; protein-RNA interactions.

Paul M. Horowitz, Professor; Ph. D., University of Chicago, 1968. Dynamic aspects of protein conformation; protein folding; fluorescence spectroscopy.

Jean X. Jiang, Assistant Professor; Ph. D., State University of New York at Stony Brook, 1991. Gap junction mediated cell-to-cell communication and intercellular signaling mechanisms.

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Eileen Lafer, Associate Professor, Ph. D., Tufts University, 1983. Basic biology of the synapse and basic mechanisms underlying neurotransmission.

John C. Lee, Professor; Ph. D., Purdue University, 1966. Structure, function, and regulation of assembly RNA-protein complexes; regulation of eukaryotic gene expression by peptide growth factors.

L. M. Fredrik Leeb-Lundberg, Professor; Ph. D., University of California, Riverside, 1981. Structure, function, and regulation of seven transmembrane-domain, G-protein-coupled receptors.

Feng Liu, Assistant Professor; Ph. D., Iowa State University, 1990. Receptor tyrosine kinase signal transduction and regulation. Structure and function studies of protein kinases and signaling molecules.

Richard F. Ludueña, Professor; Ph. D., Stanford University, 1973. Structure of tubulin; biochemistry of microtubules; tubulin isotypes.

Lawrence J. Mandarino, Associate Professor; Ph. D., Arizona State University, 1978. Regulation of glucose and fat metabolism in human muscle; interaction of muscle contraction and insulin signaling.

Bettie Sue Siler Masters, The Robert A. Welch Foundation Professor in Chemistry; Ph. D., Duke University, 1963. Structure-function studies of FAD- and FMN-containing enzymes, specifically NADPH-cytochrome P450 reductase and the three isoforms of nitric oxide synthase: neuronal, endothelial, and inducible. The studies include various biophysical techniques, including rapid reaction kinetics, EPR, ENDOR, NMR, and x-ray crystallography with a cadre of expert collaborators.

Lee McAlister-Henn, Professor; Ph. D., The University of Texas Southwestern Medical Center, 1980. Molecular genetic analysis of central metabolic pathways in eukaryotic cells.

Sanford A. Miller, Professor and Dean; Ph. D., Rutgers University, 1957. Regulation and control of metabolism.

Barry T. Nall, Professor; Ph. D., Stanford University, 1976. The effect of mutations on protein structures and folding; mechanism of protein folding.

Jonathan S. Nishimura, Professor; Ph. D., University of California, Berkeley, 1959. Differential reversal of autoinhibition in the three isoforms of nitric oxide synthase by various compounds.

Merle S. Olson, Professor and Chairman, Ph. D., University of Minnesota, 1966. Inter- and intracellular signaling mechanisms; mechanisms of action of lipid and peptide mediators.


Philip Serwer, Professor; Ph. D., Harvard, 1973. Genetics of the assembly of multimolecular particles (bacteriophages); dynamics of DNA conformation; fluorescence microscopy of single event-metabolism.
Rui J. Sousa, Associate Professor; Ph. D., University of Pittsburgh, 1991. Structures and mechanisms of nucleic acid polymerases.

Susan T. Weintraub, Professor; Ph. D., The University of Texas Health Science Center at San Antonio, 1979. Structure, elucidation and quantification of natural and synthetic compounds of biological interest, in particular, phospholipids, peptides, proteins, transition metal complexes and anti-inflammatory agents derived from plants.

*****Jan M. Woynarowski, Associate Professor, Cancer Therapy and Research Center, Institute for Drug Development, Ph. D., Technical University, 1977. Mechanisms of apoptosis in normal and tumor cells, induction and repair of DNA damage, effects of drug on cells at the level of DNA.

*Primary appointment in the Department of Orthopedics

**Primary appointment in the Department of Medicine

***Primary appointment in the Department of Pharmacology

****Primary appointment in the Department of Surgery

*****Primary appointment in the Cancer Therapy and Research Center, Institute for Drug Development

The following individuals maintain adjunct appointments in the Department of Biochemistry:

James P. Chambers, Professor; Division of Life Sciences, University of Texas at San Antonio; Ph. D., The University of Texas Health Science Center at San Antonio, 1975. Ca\(^{2+}\) homeostasis in Alzheimer’s disease: [Ca\(^{2+}\) + Mg\(^{2+}\)]-dependent ATPase, dihydropyridine-sensitive Ca\(^{2+}\) channels and molecular motor (dynein & kinesin) function in NGF, brain homogenate-treated PC12 cells. Biosensor development: the use of gpIII displayed bacteriophage epitopes as artificial sensing elements.

Stephen A. Harvey, Research Associate Scientist; Division of Life Sciences, University of Texas at San Antonio; Ph. D., St. Bartholomews Hospital Medical School, London 1982. 1) Cellular signaling by endothelin and platelet-activating factor; 2) Electrophysiological and molecular studies of the mechanisms which underlie learning and memory.

Allison M. Kitten, Assistant Professor; Department of Biology, Trinity University; Ph. D., The University of Texas Health Science Center at San Antonio, 1993. Molecular physiology: osteoblast differentiation; endothelin-1 expression in bone; bone morphogenetic proteins.

Robert D. Renthal, Professor; Division of Life Sciences, University of Texas at San Antonio; Ph. D., Columbia University, 1972. Protein chemistry: bacteriorhodopsin proton pump mechanism; structure and function of retinal rod cell cytoskeleton; insect pheromone-binding proteins.
APPENDIX IV

Guidelines for Preparation of Research Progress Reports:

a. Title Page

b. Abstract (200 words or less)

c. Introduction with a brief background including a statement of hypothesis, where appropriate, and specific aims for this time period

d. Results, including methodology
   Data should be included in the form of figures and tables with appropriate legends and footnotes, respectively.

e. Discussion with conclusions

f. References in dissertation style format

g. Publication/manuscripts

h. Specific aims for the next time period.

The progress report should be sufficiently thorough to permit evaluation of progress but not too lengthy. The student should pay particular attention to stating hypotheses and whether the experiments described constitute tests of the hypotheses. It is suggested that the report should be 5-10 double spaced typewritten pages. The report will be distributed to members of the Supervising Committee a week before the meeting.
APPENDIX V-A

Evaluation by the Committee Members
Second Year Student

Student Name:
Month/Year Started Program:
Date of Meeting:

Student should fill out this section and use a cover page for the progress report. Report should have specific aims for next semester on a separate page, and a photocopy of specific aims from last period.

Committee Member: Please circle or comment on issues that particularly need improvement.

Was the progress report distributed a week before the meeting?

For last semester:
    Was there an adequate explanation as to why the experiments are being conducted?
    Was an identifiable hypothesis being tested?
    Was there an intelligible interpretation of the meaning of the results?

For next semester:
    Is there an identifiable experimental plan?
    Is there a logical rationale for doing these experiments?

Regarding the student’s responses to questions and discussion:
    Are the responses clear?
    Are the responses to the point?
    Is the student well informed?

Additional comments:

Committee Member Name:

Overall evaluation of research progress:
    U    Unsatisfactory
    P    Progress demonstrated, but not up to expectation for a student at this point in the program.
    S    Satisfactory for this point in the program
    E    Excellent

Scientific writing grade: Satisfactory    Unsatisfactory
    Grade to be issued after another meeting this semester.
    Grade to be issued after the student rewrites specific aims for next period.
APPENDIX V-B

Evaluation by the Committee Members
Third Year Student

Student Name:
Month/Year Started Program:
Date of Meeting:
Has preliminary exam been taken?
Has dissertation proposal been approved?
Student should fill out this section and use as a cover page for the progress report. Report should have specific aims for next semester on a separate page, and a photocopy of specific aims from last period.

Committee Member: Please circle or comment on issues that particularly need improvement.

Was the progress report distributed a week before the meeting?
Was the written progress report thorough and understandable?
Was the oral presentation thorough and understandable?
Does the student have command of the literature?
Can the student draw on relevant information from class work?
Have at least some experiments been done thoroughly and finished?
Does the dissertation project and its associated experiments appear to be well thought out?
Are the student’s responses to the questions clear and to the point?
Is the student applying personal initiative to the project?

Additional comments:

Committee Member Name:

Overall evaluation of research progress:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>P</td>
<td>Progress demonstrated, but not up to expectation for a student at this point in the program.</td>
</tr>
<tr>
<td>S</td>
<td>Satisfactory for this point in the program</td>
</tr>
<tr>
<td>E</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Scientific writing grade: Satisfactory Unsatisfactory

_____ Grade to be issued after another meeting this semester.
_____ Grade to be issued after the student rewrites specific aims for next period.

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APPENDIX V-C

Evaluation by the Committee Members
Fourth Year Student

Student Name:
Month/Year Started Program:
Date of Meeting:
Has preliminary exam been taken?
Has dissertation proposal been approved?
Written progress:  Present a paper or poster at national meeting?  ____
                   Contribute to writing a paper or review?  ____  ____
                   Authored his/her own paper?  ____  ____

Student should fill out this section and use a cover page for the progress report. Report should have specific aims for next semester on a separate page, and a photocopy of specific aims from last period.

Committee Member:  Please circle or comment on issues that particularly need improvement.

Was the progress report distributed a week before the meeting?
Were the written and oral presentations done well?
Is the work sufficiently thorough, timely, and valid to form a basis for publication?
Is the student adequately focused on a specific plan for finishing the dissertation?
Has the student thoroughly considered the meaning of his/her results?
Is the student's dept of knowledge and facility to deal with problems characteristic of an expert in his/her chosen field?

Additional comments:

Committee Member Name:

Overall evaluation of research progress:

U  Unsatisfactory
P  Progress demonstrated, but not up to expectation for a student at this point in the program.
S  Satisfactory for this point in the program
E  Excellent

Scientific writing grade:  Satisfactory  Unsatisfactory

_____ Grade to be issued after another meeting this semester.
_____ Grade to be issued after the student rewrites specific aims for next period.
APPENDIX V-D

Evaluation by the Committee Members
Fifth Year Student and Beyond

Student Name:
Month/Year Started Program:
Date of Meeting:
Has preliminary exam been taken?
Has dissertation proposal been approved?
Written progress: Present a paper or poster at national meeting? ______
Contribute to writing a paper or review? ______
Authored his/her own paper? ______
Target date for graduation? ______

Student should fill out this section and use a cover page for the progress report. Report should have specific aims for next semester on a separate page, and a photocopy of specific aims from last period.

Committee Member: Please circle or comment on issues that particularly need improvement.

Was the progress report distributed a week before the meeting?

Were the written and oral presentations done well?

Is the work sufficiently thorough, timely, and valid to form a basis for publication?

Is the student adequately focused on a specific plan for finishing the dissertation?

Is the student's dept of knowledge and facility to deal with problems characteristic of an expert in his/her chosen field?

Is the student likely to graduate by the target date listed above?

Additional comments:

Committee Member Name:

Overall evaluation of research progress:

U Unsatisfactory
P Progress demonstrated, but not up to expectation for a student at this point in the program.
S Satisfactory for this point in the program
E Excellent

Scientific writing grade: Satisfactory Un satisfactory

_____ Grade to be issued after another meeting this semester.

_____ Grade to be issued after the student rewrites specific aims for next period.
APPENDIX VI-A

GUIDELINES FOR ADVANCEMENT TO CANDIDACY
FOR THE Ph. D. DEGREE

I. Chronology of Events

The oral examination based on a written research proposal is to be completed by September 30th in the fall semester of the 3rd year for students who enter the program in August or by February 28th in the spring semester of the 3rd year for students who enter the program in January. Since several revisions may be required, the student is advised to start several months before the deadline. The chronology of events is as follows:

1. Student decides upon the general topic of a proposal and discusses it with the Supervising Professor in terms of general feasibility and potential faculty members for the examination committee.

2. The Supervising Professor contacts potential members of the committee to obtain their agreement to serve and then submits the names to the graduate advisor. It is advisable, but not required, that at least some of the examination committee members will also be members of the Supervising Committee.

3. The graduate advisor approves or disapproves the committee members and appoints one of the committee members from the Department of Biochemistry to serve as chair of the examination committee. The graduate advisor notifies the Supervising Professor and student of the approved committee and committee chair.

4. The student writes an abstract (maximum of 200 words) and an outline (maximum of one page) of the proposal and distributes copies to the committee members. The hypotheses and specific aims should be apparent from these two documents. The chair solicits the opinions of the committee members. The student consults with the chair of the committee about the committee’s evaluation after three days. The chair either advises the student to write a full proposal, or advises the student that the topic or specific aims do not form an adequate basis for a proposal. In the latter case the student may submit a different abstract and outline for consideration. The preparation of an acceptable proposal is the responsibility of the student.

5. Upon being advised to proceed the student writes the full proposal taking into consideration any initial concerns of the committee members.

6. The student distributes the full proposal to the committee members. The committee members inform the chair of the committee whether or not the proposal is approved for defense. The student consults with the chair after seven days. If the proposal is not approved, the student re-writes the proposal on a new topic or a modification of the original topic based on requirements of the committee. A proposal may be defensible, i.e., based on a testable hypothesis, but still be deficient (e.g., in experimental design or in scientific writing) such that a re-write is required. The student and not the committee is responsible for an acceptable proposal. If serious flaws persist in the re-written proposal, the committee may “approve” the proposal for oral exam, and then question the student on the deficiencies in the oral examination. Thus “approval” of the proposal does not guarantee that its content will be sufficient to pass the exam.
7. When the committee members approve the written proposal, they sign the Petition for Oral Examination Form (Appendix VI-B). The student forwards the signed form and a copy of the proposal to the graduate advisor. At this time, the student schedules the oral examination. The committee is entitled to a two-week period between approval of the written proposal and the oral examination. The student may consult with committee members about the material to be covered in the examination.

8. The committee examines the student on the proposal and related areas covered in the student’s course work. The Supervising Professor is present as a non-participating, non-voting observer during the examination.

9. Approval of all but one of the four committee members is required for the student to pass the advancement to candidacy examination. Both the written proposal and oral examination require formal approval by the deadline stated at the beginning of these guidelines. Advancement to candidacy also requires approval of the Supervising Professor who judges the student’s potential for independent and productive research. However, the Supervising Professor does not have to make this determination by the deadline for completion of the oral exam. Signatures of the committee members and the Supervising Professor are required on the Petition for Admission to Candidacy Form (GSBS 32, Appendix VI-C).

The student will be allowed to repeat the examination with the same committee one time if the student fails. The chair of the committee shall confer with the committee, the graduate advisor, and the Supervising Professor to construct requirements for the re-examination. They should agree on some format for a re-examination designed to give the student practice in those areas in which the student is deficient. The format may be a written follow-up only with no oral exam, a repeat oral examination with no further writing, or both a re-write and a repeat oral examination. However, the re-examination will not be limited to specific subjects or questions suggested by the committee as areas for improvement. Within one week the chair of the committee will give the student and graduate advisor a written explanation for the basis of the failure and provide guidelines to prepare for the re-examination. Unless there are unusual circumstances, the re-examination must be completed within three months of the first examination. If the student fails the re-examination, the student will be dismissed from the Ph.D. program. If the student is already on probation for failure to complete the advancement to candidacy exam by the scheduled deadline (see Section C.2.b), the student will be not be allowed to repeat a failed examination and will be dismissed subject to dismissal from the Ph. D. program. COGS will decide whether the student will be permitted to proceed towards a Master’s degree.

10. Upon completion of the advancement to candidacy examination and receipt of GSBS Form 32 from the examination committee, COGS will decide whether to recommend to the Associate Dean of the Graduate School that the student be admitted to candidacy for the Ph. D. degree. The Associate Dean makes the final decision on admission to candidacy for the Ph. D. degree.

II. Responsibilities of the student

1. To discuss your ideas about a proposal and potential faculty members for an examination committee with your Supervising Professor.
2. To write an abstract and outline of a proposal for initial approval by the examination committee. For both steps 2 and 3 the student is advised to obtain an opinion from the Supervising Professor before distributing the documents to the committee. The Supervising Professor should not discuss specific deficiencies in the proposal, but may advise the student if the document is not ready for distribution. The Supervising Professor’s approval is optional, but recommended.

3. To write a complete, original proposal that is approved by the examination committee.

4. To present a copy of the proposal with a signed Petition for Oral Examination form to the graduate advisor when the committee has approved the proposal and inform the graduate advisor of the date of the oral examination.

5. To successfully defend the proposal in an oral examination by the committee.

6. To make sufficient progress in research to convince your Supervising Professor that you have potential for productive and independent research.

7. To schedule the time and place of all meetings with committee members, and to provide committee members with written notification of all meetings.

8. The preparation of the written proposal and study for the oral examination should not interfere with the student’s responsibilities for research and classroom studies. Each student should consult with the Supervising Professor concerning commitment of time.

III. Responsibilities of the Supervising Professor

1. To provide your student general guidance in preparation of the proposal. The Supervising Professor may suggest changes with respect to general organization of the document, English (grammar, spelling, etc.), and general aspects of the science. The Supervising Professor should not comment on the detailed scientific matters of the proposal. It is the responsibility of the examination committee to evaluate the scientific merits of the proposal. However, the Supervising Professor should advise the student if the proposal is generally not ready for distribution (i.e., not thorough, not well researched, not generally accurate, etc.).

2. To contact potential members of the examination committee to determine if they are willing to serve, and to submit names of the potential members to the graduate advisor.

3. To attend the oral examination as a non-participating, non-voting observer.

4. To participate in evaluating the student for advancement to Ph. D. candidacy based on the student’s potential for independent and productive research. You do not have to sign by the same deadline as completion of the oral exam. It is your prerogative to withhold your signature from GSBS Form 32 until you can make this evaluation. Your signature is required on this form for your student to advance to Ph. D. candidacy. Failure to sign the form by the end of the semester will be taken as an unsatisfactory grade in Research (BLOC 6097).
IV. Responsibilities of the Examination Committee

1. The examination committee is composed of three members from the faculty of the Department of Biochemistry and one faculty member from another department in the UT Health Science Center. The latter should not have a cross-appointment in the Department of Biochemistry. The committee will be appointed by the graduate advisor, in consultation with COGS as needed, and one of the members from the Department of Biochemistry will be appointed chair.

2. The committee determines the initial feasibility of the proposal based on the student’s abstract and outline. The chair solicits the opinions of the committee members within three days of receipt of the abstract and outline. The chair informs the student of the committee’s evaluation after the third day. If the committee rejects the topic or specific aims, they should be prepared to evaluate a resubmitted abstract and outline. The student is responsible for preparing an acceptable proposal.

3. The committee determines if the complete written proposal provides a reasonable basis for an oral examination. The chair informs the student of the committee’s decision within seven days after receipt of the written proposal by the committee members. If the committee does not approve the proposal or decides that it should be improved, the student must re-write the proposal based on recommendations from each member of the committee. Committee members may consult individually with the student, but the committee chair should take care that the student is not dealing with conflicting demands. The committee chair should ensure the student understands that requests from committee members supersede all guidelines for format or page length. The chair should try to bring this phase of the exam to a close after one re-write, although individual committee members may interact further if they wish. If weaknesses persist through the second re-write, the chair should ensure the student understands that the examination may cover the weak points.

4. When the committee agrees to conduct the oral exam, they will sign the Petition for Oral Examination (see I. 7 above).

5. The committee examines the student on the written proposal and related areas of biochemistry. The chair of the committee acts as a moderator for the examination. In the case where one committee member is absent, the chair decides whether or not to proceed with the examination or grant a postponement.

6. The committee decides whether or not the student passed the examination. Passage of the exam requires a positive vote from all but one of the committee members present. The chair of the committee will inform the student of the committee’s decision immediately after the committee’s deliberations. If the performance is unsatisfactory, the chair tells the student the reasons for the failure and specifies what aspects of the performance must be improved in a second exam. This may or may not include a rewrite of the proposal, or even a switch in the topic. Advancement to Ph.D. candidacy also requires approval of the Supervising Professor. Details about passage/failure of the exam are described above in section I. 9. The chair of the committee is responsible for preparing a copy of GSBS Form 32 and bringing it to the oral exam.

7. The chair of the committee will inform the graduate advisor of the committee’s decision and give him the signed GSBS Form 32.
V. Responsibilities of COGS

The responsibilities of COGS are stated above in I. 10.

VI. The Student’s Written Proposal

The faculty strongly emphasizes that the responsibility for the quality of the proposal in terms of originality, approach to solving the problem or testing the hypotheses, and significance rests completely with the student. The student may give an original interpretation or a re-interpretation of literature data; propose a series of experiments to test a hypothesis; or present a new theoretical approach to a problem. The student should ask the Supervising Professor to read the proposal prior to submission to the examination committee (see III. 1 above).

The following are general guidelines for the preparation of the written proposal to be used as the basis of the oral examination for advancement to Ph. D. candidacy in Biochemistry. (These guidelines are based, in part, on instructions for preparation of a NIH grant.)

1. Topic
   a. The research proposal may be written in the area of biochemistry in which the student has chosen to pursue dissertation studies; however, the specific research problem to be used for the dissertation is excluded. The problem must demonstrate the student’s capability to propose original approaches to solve a particular problem. During the exam, the student will be expected to demonstrate a knowledge of the alternative methods/strategies that could have been chosen, and to be able to evaluate the relative merits of the alternatives.

   b. The student need not restrict the proposal to the dissertation area. The same constraints discussed above still apply. The chosen area must fall within aspects of biochemistry taught in our program.

   c. The examination committee will be the final arbiter of whether or not the chosen area is appropriate. The committee will inform the student if the topic is appropriate based on this abstract and outline (see 1.4 and II. 2 above).

2. Scope
   a. The proposal must test one or more hypotheses when appropriate. The experiments should cleanly support or reject the associated hypotheses. The experiments need not prove the hypothesis, but in the case where the results support the hypothesis, that support should significantly improve confidence in the hypothesis. It is not acceptable to propose experiments that will likely yield results that do not discriminate between the truth or fallacy of the hypothesis. It is not acceptable to list a hypothesis that one cannot imagine to be false. It is not acceptable to propose purely descriptive experiments (i.e., I’ll do this and see what happens.).

   b. The proposal should be suitable for one person to execute in about two years of work. It should be about the scale of a dissertation proposal, or of a postdoctoral fellowship.

   c. The experiments proposed should be the logical next steps in some area, or should reinforce and extend recent advances in the area.
3. **Format**

a. The total text should be no more than 10 double-spaced typed pages, accompanied by no more than 4 pages of figures and tables, and no more than 2 pages of references. No preliminary results are expected. The proposal should have a cover page with a title and names of the student, Supervising Professor, and committee members. Page one will be an abstract. A suggested breakdown for the rest of the text is:
   - page 2 - specific aims with hypotheses
   - pages 3-5 - background and significance
   - pages 6-10 - experimental design and methods

b. Observe the margins indicated on the NIH continuation page (Appendix VI-D). Number and place your name on all pages. The font should be 10 - 12 characters per inch if fixed spacing, or should average not more than 15 characters per inch if proportional spacing. The text should be double spaced. Figure legends may be single spaced to accommodate placing them on the same page as the figures. References should be cited from the text by author and year, and references may be single spaced. Figures and tables should be cited from the text by number.

c. The student may exceed the page limits if directed by the examination committee to include additional information. All directions given by the exam committee supersede these guidelines. The exam committee is the final arbiter of an acceptable proposal.

d. The proposal will not contain text that is extensively quoted or paraphrased from any other work. Figures may be copied or modified from other works with attribution. Figure legends may contain quoted or paraphrased material, but should be customized by the student to support the points of the proposal as much as possible. Any quoted material must be given proper attribution.

4. **Content of Sections**

a. *Abstract* - The abstract should encapsulate the significance, aims, and key experimental approaches of the proposal. It should be 1/2 to 1 page long.

b. *Specific Aims* - Break the plan into 2-4 specific steps. Each should be summarized in a single-numbered, explicit sentence associated with a short explanatory paragraph. At least one aim should be in the form: “Aim x -- To test [hypothesis] by [experimental strategy].” Multiple aims could test the same hypothesis by different approaches, or test different hypotheses with the same collection of data. Some aims may be preparatory (i.e., to prepare a mutant protein, or to establish the power of a method on some test material, or to clone a gene). However, all of the aims cannot be preparatory, since they do not test hypothesis.

c. *Background and Significance* - Briefly sketch the background to the proposal, critically evaluate existing knowledge, and specifically identify gaps which the project is intended to fill. State concisely the importance of the research to longer term objectives. An exhaustive survey of the literature and a lengthy bibliography is not required as part of the written proposal, although the student will be expected to demonstrate a thorough understanding of the relevant literature during the oral defense. In the written document, include only that information that defines what the problem is and argues that the proposed work should be done.
d. **Experimental Design and Methods** - Discuss the experimental design and the procedures to be used to accomplish the specific aims of the project. Include the means by which the data will be analyzed and interpreted. Describe any new methodology and its advantage over existing methodologies. Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the aims. Experimental Design deals with issues like how many samples will be needed, what controls will be needed, and exactly what measurements will tell if the hypothesis is true/false, or that the aim has been completed. Experimental Design is best organized according to the aims. Methods deal with exactly how an experiment is to be carried out. Methods may be included within the Experimental Design section; however, since the same methods are often used in several aims, it is often more convenient to split Methods into a separate section. Do not include fine details for methods; rather give the name and purpose of the method, the reference you would follow, and a brief discussion of how you will deal with any aspect of the method that you feel is vulnerable to failure. Do not invent new methods unless this is an explicit aim of the proposal. During the oral exam, the student will be expected to demonstrate a knowledge of the theory behind the methods.

e. **Literature Cited** - For each citation, provide the names of all authors, the article title, the name of the book or journal, volume number, page numbers, and year of publication. Arrange in alphabetical order by first author. If you cite it, we expect you to have read it and understood it.

The committee may request inclusion of a recent MedLine, or the equivalent, literature search in addition to the cited literature.

f. **Figures and Tables** - Figures should have a title and a legend. Tables should have a title and explanatory footnote. Figures and tables should be numbered as referenced from the text. Include attribution in the legend if a figure has been copied from elsewhere. Hand drawn diagrams are acceptable so long as they reproduce legibly. Figures may be annotated to make your point more clear.

VII. **The Oral Examination**

The examination begins with a ten-minute presentation by the student that summarizes the proposal. The student should obtain approval from the chair of the committee to use slides, transparencies, or models other than previously presented in the written proposal, during the summary presentation or examination. The summary presentation is followed by questions from the committee members until they decide they can evaluate the student’s performance. The written proposal and related scientific areas will be the bases for the committee’s questions. The Supervising Professor is not allowed to ask (or answer) questions during the exam. A three-hour period should be scheduled for the examination.

VIII. **Criteria for Evaluation of the Advancement to Candidacy Exam**

The committee should consider the following criteria when evaluating a student’s advancement to candidacy exam performance. The overriding consideration is whether the student has demonstrated a sufficient basis of knowledge, a sufficient command of the scientific method, and sufficient originality to suggest a likelihood of success at independent investigation.
1. **Basis of knowledge:**

   a. Does the student possess sufficient knowledge in the area of the examination? Note that in the absence of remembering details, a perspective on what is known, where it might be found, and how it might be applied usefully to the problem should be considered favorably as a basis of knowledge.

   b. Has the student researched the specific background of the proposal well enough to understand the overall theory governing the work in this area? Can the student state how unexpected results would affect the current theory?

   c. Does the student have an understanding of the theory underlying the specific methods proposed?

2. **Command of the scientific method:**

   a. Can the student distinguish a hypothesis from a belief (a statement that the student cannot imagine being wrong)?

   b. Can the student recognize when an experiment clearly rejects or supports a hypothesis? Does the student appreciate the difference between a positive and negative result?

   c. Can the student correctly identify and deal with at least some of the vulnerabilities of the proposed methods? Does the student rely on controls to deal with experimental vulnerabilities? Note: recognizing that the best experiment that they can think of still has weaknesses should be evaluated favorably.

3. **Originality:**

   a. Can the student demonstrate that personal choices of the experimental approach have been made by discussing the relative merits of alternative methods?

   b. Can the student discuss what future direction should be taken given some specified outcome of the proposed experiments?
APPENDIX VI-B

Department of Biochemistry
University of Texas Health Science Center at San Antonio

Petition for Oral Examination for
Advancement to Ph. D. Candidacy

_________________________________ __________________________
Name of Student Date

Approval of written examination (the written proposal)

Signatures of members of examination committee:

____________________________
Chairman

____________________________
____________________________
____________________________
____________________________

Signatures of the committee members certifies that the written proposal is satisfactory and student may take the oral examination for advancement to Ph. D. candidacy.

Please return the completed form to the graduate advisor.