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I. BIOLOGY DOCTORAL DEGREE PROGRAM AREAS

The Department of Biology of the University of Texas at San Antonio provides opportunities for advanced study and research leading to the Doctor of Philosophy degree in Biology. There are two Biology Ph.D. programs; one has an emphasis in Neurobiology and the other has an emphasis in Cell and Molecular Biology (CMB). The Ph.D. degree is awarded to candidates who have 1) displayed an in-depth understanding of the subject matter and 2) demonstrated the ability to make a significant contribution to knowledge in their field of specialty. This document describes the Academic Policies and Procedures for the CMB emphasis.

II. GRADUATE FACULTY IN THE CMB PH.D. PROGRAM

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James P. Chambers, Ph.D. Martha J. Lundell, Ph.D. Andrew Tsin, Ph.D.
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M. Neal Guentzel, Ph.D. Clyde Phelix, Ph.D.
Luis S. Haro, Ph.D. Robert Renthal, Ph.D.
Brian Hermann, Ph.D. Stephen Saville, Ph.D.
Hans W. Heidner, Ph.D. David M. Senseman, Ph.D.
See attachment entitled: "CMB Faculty Research Interests"

III. ORGANIZATION AND ADMINISTRATION OF THE CMB DOCTORAL PROGRAM

The CMB doctoral program in the Department of Biology at UT San Antonio is administered by the CMB Doctoral Studies Committee (CMB-DSC). The CMB-DSC is comprised of seven members from the Department graduate faculty who are active in the CMB program, five elected by CMB faculty members and two appointed by the Department Chair. In addition, each cohort of CMB doctoral students elects a liaison to the CMB-DSC. Student liaisons can be asked to be available for discussion of program policy, but should never be present during a discussion on the status or progress of an individual student. The CMB-DSC elects its own chairperson, who is then appointed by the Department Chairman to be the Graduate Advisor of Record (GAR) for the CMB Ph.D. Program. The CMB-DSC recommends admission of students into the program, recommends and monitors degree requirements on behalf of the Graduate faculty, recommends students for admission to candidacy for the Ph.D. degree and recommends students to whom the Ph.D. degree is to be conferred upon satisfactory completion of all requirements.

Once a student has advanced to candidacy, the Dissertation Committee, chaired by the student's Dissertation Advisor, has the responsibility of monitoring the student's research progress through the program in a timely manner. For a description of the Dissertation Committee, see page 7.

The Graduate Advisor of Record for the CMB-Ph.D. Program advises all CMB doctoral students, supervises the maintenance of records, and represents the Biology Department in most matters relating to CMB doctoral students. Questions about degree requirements and academic policies should be directed to the CMB Graduate Advisor of Record. The CMB Ph.D. Program final authority rests with the Office of the Provost and Vice President for Academic Affairs.

IV. CMB DEGREE REQUIREMENTS AND PROCEDURES

ADMISSION. All prospective students must have a B.A. or a B.S. degree (preferably in Biology or a related discipline) from an accredited university and should normally have a GPA of 3.3 in upper-division and/or graduate work. In addition, applicants are required to submit recent scores from the Graduate Record Examination (GRE) (quantitative and verbal) and three letters of recommendation. Applicants whose native language is not English must score at least 600 on the TOEFL. A doctoral student must satisfy any deficiencies, as noted by the CMB-DSC and approved by the Department Chairman, during the first year of study.
GRADUATE FELLOWSHIPS. Unless declined by the student, every student accepted into the CMB doctoral program will receive University support of $21,000 per year; this stipend has both research and teaching responsibilities. Students supported by NIH or other extramural grants or an independent income source are not required to teach except for the required supervised teaching course. After the first year, students not supported by extramural funding may be required to serve as a teaching assistant for up to two courses/semester. The University will typically support students financially for no more than 5 years. Students must be registered full time = 9 credit hours/semester (fall and spring) and 3 credit hours/summer, while supported by the University. Outside employment is not permitted, except under conditions of substantiated hardship. Approvals for outside employment must be obtained from the Dissertation Supervisor, the CMB-DSC, the Department Chairman and the Office of the Provost and Vice President for Academic Affairs. Students receiving financial support from sources outside the University typically will not receive the University stipend.

REGISTRATION. Rules recommended by the CMB-DSC and approved by the CMB graduate faculty, the Department Chairman, the Graduate Council and the Office of the Provost and Vice President for Academic Affairs govern the registration of doctoral students. The CMB Graduate Advisor of Record must approve all classes prior to registration. The student should discuss selection of lecture courses with the CMB graduate advisor and with his/her Dissertation Advisor, once this faculty member is selected.

COURSE REQUIREMENTS. The doctoral degree requires a minimum of 85 hours beyond the Baccalaureate Degree. The Program of Study includes a Core Curriculum (21 hours), Elective courses that support the emphasis in CMB (9 hours), Colloquia (10 hours minimum) and Doctoral Research (45 hours minimum). Graduate courses in which a grade lower than "B" is received, or remediation course work at the undergraduate level, will not be counted toward the required 85 hours.

PROGRAM OF STUDY

A. Core curriculum (18 semester credit hours required):
   BIO 5113 Principles of Biochemistry
   BIO 5123 Principles of Molecular Biology
   BIO 5133 Principles of Cell Biology
   BIO 7143 Principles of Biological Scientific Writing
   BIO 7113 Supervised Teaching in Life Sciences
   BIO 7571/2 Experimental Techniques in the Life Sciences (3 hour minimum)

B. Colloquia (1/semester throughout tenure in program – minimum of 10):
   BIO 7041 Qualifying Exam Colloquium (3 semester credit hours during 1st year of study)
   BIO 7041 Biology Colloquium (7 semester credit hours minimum during 2nd-5th years of study)

C. Doctoral research (48 semester credit hours):
   BIO 7212/3 Doctoral Research (10 semester credit hours minimum)
   BIO 7315/8 Doctoral Dissertation (35 semester credit hours minimum)

D. Elective courses (9 semester credit hours minimum):
   These are any three credit hour 5000-7000 level lecture courses in Biology or in other departments that are approved by the CMB program or the CMB-DSC.

The Final Program of Study must be approved by the student's Dissertation Committee, Dissertation Advisor, the CMB-DSC and submitted via the Department Chair to the Office of the Provost and Vice President for Academic Affairs (Form P2).

RESEARCH ROTATIONS. All first year CMB students must participate in Experimental Techniques in Life Sciences: Research Rotation (BIO 7571/2), in which students will perform research for 10 weeks each in each of at least three different faculty laboratories. Rotations provide an opportunity for the students to become acquainted with the various mentors and research areas. Students must complete a minimum of three rotations. If necessary, a fourth rotation may be completed during the summer following year 1 in the program. The supervising professor of each rotation designs a research project in consultation with the student. The student must submit a report on each rotation project to the CMB-DSC. This report will include an assessment by the supervising professor of the student’s performance during the rotation.

Course of Study for the Cell and Molecular Biology Ph.D. Program
<table>
<thead>
<tr>
<th>Year</th>
<th><strong>Fall Semester</strong></th>
<th><strong>Spring Semester</strong></th>
</tr>
</thead>
</table>
| 1    | Bio 5113 Principles of Biochemistry (3hrs)  
Bio 5000-7000 level lecture elective course (3hrs)  
Bio 7041 Biochem QE* Colloquium (1hr)  
Bio 7572 Research Rotation (2hrs)  
*Qualifying Exam | Bio 5123 Principles of Molecular Biology (3hrs)  
Bio 7041 Mol Bio QE* Colloquium (1hr)  
Bio 5133 Principles of Cell Biology (3hrs)  
Bio 7041 Cell Bio QE* Colloquium (1hr)  
Bio 7571 Research Rotation (1hr) |
| 2    | Bio 7143 Principles of Scient Writing (3hrs)  
Bio 7113 Teaching in Life Sciences* (3hrs)  
Bio 7041 Colloquium (1hr)  
Bio 7212 Doctoral Research (2hr)  
*Can be taken in fall or spring semester | Elective (3 hrs)  
Elective** (3 hrs)  
Bio 7041 Colloquium (1hr)  
Bio 7212 Doctoral Research (2hrs)  
**Can be taken during fall or spring semester or deferred until Year 3. |
| 3    | Elective (3 hrs)  
Bio 7313 Doctoral Dissertation (3hrs)  
Bio 7312 Doctoral Dissertation (2hrs)  
Bio 7041 Colloquium (1hr) | Bio 7313 Doctoral Dissertation (3hrs)  
Bio 7313 Doctoral Dissertation (3hrs)  
Bio 7312 Doctoral Dissertation (2hrs)  
Bio 7041 Colloquium (1hr) |
| 4    | Bio 7313 Doctoral Dissertation (3hrs)  
Bio 7313 Doctoral Dissertation (3hrs)  
Bio 7312 Doctoral Dissertation (2hrs)  
Bio 7041 Colloquium (1hr) | Bio 7313 Doctoral Dissertation (3hrs)  
Bio 7313 Doctoral Dissertation (3hrs)  
Bio 7312 Doctoral Dissertation (2hrs)  
Bio 7041 Colloquium (1hr) |
| 5    | Bio 7313 Doctoral Dissertation (3hrs)  
Bio 7313 Doctoral Dissertation (3hrs)  
Bio 7312 Doctoral Dissertation (2hrs)  
Bio 7041 Colloquium (1hr) | Bio 7313 Doctoral Dissertation (3hrs)  
Bio 7313 Doctoral Dissertation (3hrs)  
Bio 7312 Doctoral Dissertation (2hrs)  
Bio 7041 Colloquium (1hr) |

**Written Qualifying Requirement to be completed by May 30th.**  
*Student selects a Dissertation Laboratory no later than August 20th, but preferably by June 1st.*  
*If necessary, a final research rotation can be done during the summer.*  
*All students must submit progress report by May 30th.*

**SUMMER COURSEWORK:** Students will enroll for 3 hours of Doctoral Research (Bio 7213) during summers following years 1 and 2, and 3 hours of Doctoral Dissertation (Bio 7313) following years 3 and 4 and, if necessary, 5.

**SPECIALIZED TRACKS.** There are two specialized tracks within the CMB Ph.D. program – the Molecular Microbiology & Immunology Track and the Stem Cell Biology Track. Descriptions of each track are appended to this document. Students enrolled in the CMB Ph.D. program may opt to follow either specialized track, or may choose not to follow a specialized track. Both tracks require the same standard core requirements of the CMB.
Ph.D. program. Each track requires that students following that track take electives and colloquia focused on the topic area of the relevant track and pursue their dissertation research on a topic related to the relevant track (see appended details for each track).

MEETING REQUIREMENTS. In order to promote general awareness of research activities and to share ideas among members of the CMB program, all students and faculty are expected to regularly attend CMB sponsored functions. Attendance is required at three CMB events:
1. CMB Orientation Meetings – One-time event at beginning of each Semester.
2. CMB Spring Symposium – One-time event every Spring Semester.
3. CMB Seminar Series – weekly during the Fall and Spring Semester.

NON-CREDIT REQUIREMENTS. The following is a list of requirements that must be completed although no formal course credit is received. See descriptions below for greater detail.
- Attendance at weekly CMB Seminars.
- Written Qualifying Requirement during the first year (9 QEs passed with a B average).
- Selection of Dissertation Laboratory by August of the first year (preferably by May).
- Oral Qualifying Exam by May 30th of the second year.
- Approval of dissertation proposal by June of the second year.
- CMB Spring Symposium - All CMB students must attend, presentations will be by 2nd, 3rd and 4th-year students.
- Completion of Annual Progress Reports by May 30th each year.
- Biannual reviews with Dissertation Committee and completion of evaluation forms for each meeting during years 2 - 5 or until dissertation is completed.
- Completion of written dissertation.
- Presentation of a full-length seminar in the CMB or STCEID series.

TRANSFER OF CREDITS. Students are normally expected to complete all coursework at UTSA. Exceptions require approval of the CMB-DSC and the Office of Graduate Studies. Students may petition the CMB-DSC to transfer into their program of study credit earned for coursework taken prior to entering the CMB Ph.D. program only if that coursework was not used to satisfy requirements for a prior degree.

SELECTING A DISSERTATION ADVISOR. During the first semester of residence, students are required to attend a series of introductory orientations to learn about research opportunities in individual faculty laboratories and are urged to meet with individual faculty to discuss research interests. In addition, all new doctoral students must participate in Research Rotations (BIO 7572). Preferably by May, but at the latest by August following the first year, every student should have identified a faculty member who is willing to advise the student and to supervise and sponsor research for the dissertation. In order to make appropriate progress toward completion of the Ph.D., it is important that the student initiate dissertation research as early during their tenure in the Ph.D. program as possible, but no later than the beginning of the second year.

A student must submit to the CMB Graduate Advisor of Record in writing his or her choice of a Dissertation Advisor with the signed consent of that faculty member and the Department Chair (Form P1). All students are expected to have been approved to pursue dissertation research in the laboratory of a particular supervisor by the beginning of the fall of the second year. If extenuating circumstances have prevented a student from arranging a Dissertation Advisor by that time, the student can petition the CMB-DSC for up to a maximum of one semester of additional rotation time. A student who is not awarded additional rotation time or who has not been approved for a Dissertation Advisor following completion of the additional rotation time will not be continued in the Ph.D. program. The student may then petition the Biology Chairman for approval to transfer to a Masters program. See Master’s Degree Option.

FOREIGN LANGUAGE REQUIREMENT. There is no foreign language requirement for the Ph.D. degree in Biology.

ATTENDANCE REQUIREMENT. Students must attend classes as required. For Research Rotation and Doctoral Research a minimum of 9.0 hours per week per rotation is required. Students are allowed two weeks of vacation per year as long as it does not disrupt their participation in the required curriculum. All vacation time requires approval of the student's Doctoral Advisor and notification to the graduate student administrative assistant. Additional vacation or leave time will require approval by both the Doctoral Advisor and the CMB-DSC. If a student cannot attend classes or fulfill laboratory commitments and does not notify the Doctoral Advisor, then their stipend may be suspended, and procedures will begin to ascertain whether or not the student should be dropped from the Doctoral Program.
ANNUAL PROGRESS REPORT. To assess student progress toward the CMB degree, an annual written progress report will be submitted to the CMB-DSC by the student and the Dissertation Advisor (Form C9). This report should be submitted by May 30th and will be immediately reviewed by the CMB Advisor of Record.

TEACHING REQUIREMENT. Beginning during the second year in the program, in order to receive the full University stipend ($21,000) doctoral students not supported by extramural funding may be required to serve as a teaching assistant for up to two courses/semester. In addition, all doctoral students are required to participate in the supervised teaching course (Bio 7113) during the 2nd year of study. For BIO 7113, students will typically be expected to serve as instructors for Biology Laboratory courses, unless given permission by the CMB-DSC chair and the Department Chair to fulfill this requirement by instructing in another course. The faculty supervisor for each course in which CMB Ph.D. students participate as TAs will recommend the grade for Bio 7113 and will notify the CMB Advisor of Record accordingly.

THE QUALIFYING EXAMINATION. The purpose of the Qualifying Examination is to determine if the Ph.D. student has acquired the knowledge expected of a doctoral candidate in the area of Cell and Molecular Biology. The Qualifying Exam has two components; a written component which tests the student’s breadth of knowledge in the fields of Cell and Molecular Biology, and an oral defense of a written research proposal and related topics. The written comprehensive requirement is designed to test the student’s ability to apply information learned from core coursework (particularly courses 5113, 5123 and 5133) and will specifically test: 1) a depth of knowledge on specific topics beyond that required on a standard course exam, 2) the ability to synthesize answers to complex questions by drawing upon multiple sources of information, and 3) the ability to demonstrate problem-solving skills. The three core courses are each taught by a minimum of three instructors. During the progression of these courses each instructor will meet with CMB doctoral students for 1 additional hour/week to examine selected topics in greater detail. Based on these interactions and relevant material from the appropriate core course, each instructor will administer a “qualifier” exam (QE) covering one third of each core course. These QEs will be in the form of a written exam given at a special time (other than a regular class period) during a 2 hour period at the discretion of each individual instructor. Each QE will be given during or within one week following each instructor’s part of each course. These written QEs will be graded by the instructor and reported to the CMB-DSC within two weeks following administration of the exam, and the CMB-DSC Chair or the CMB program administrator will inform each student of their grade. The QE scores do not contribute to the actual grade earned for the core course. However, at the end of the spring semester, the CMB-DSC will average the grades from the nine separate QEs to derive an average QE grade. An overall average grade of “B” (3.0) or better for the written QEs will be required for students to satisfy the written qualifying requirement and remain in good standing in the CMB Doctoral Program. There will be no other written qualifying exam and there will be no opportunity to retake any individual QE.

The second component of the Qualifying Exam will be an oral exam based on a written dissertation proposal prepared by the student. The format of the dissertation proposal should follow that of a standard NIH RO1 or NSF research grant application. The written research proposal should describe the student’s proposed dissertation research. The Oral Qualifying Examination will be scheduled during the second year of study, and must be completed no later than May 30th of year 2. The student in consultation with his/her Dissertation Advisor will select the Oral Qualifying Examination Committee (QEC). The QEC will include 5 members, a Chair (other than the dissertation supervisor), the dissertation supervisor, and three tenured/tenure track CMB graduate faculty. It is recommended that the QEC be composed of faculty who will subsequently become part of the student’s Dissertation Committee. The chair of the QEC must be a faculty member other than the Dissertation Advisor. One member of the QEC can be from a different institution if approved by the CMB-DSC. Final approval of the membership of the QEC must be given by the CMB-DSC (Form P3).

Members of the QEC will be presented with a completed form of the proposal at least two weeks prior to the scheduled oral exam. Each committee member will test the student on the proposal and the student will be required to defend it. A majority passing vote by the committee is needed for the student to pass. The QEC may also suggest remediation steps to be taken by the doctoral student to correct deficiencies perceived during the oral portion of the exam. These will be put into written form and the student’s mentor/Dissertation Committee, and the CMB-DSC will oversee progress with a final report being sent to the QEC upon completion. If the student does not pass, the student may be allowed to retake the exam one time within the next 3 months, but no later than August 30th of the student’s second year in the program. The student also may pass conditionally, in which case the student may be required to take additional coursework or satisfy other requirements. Typically, students who have not passed both the written and oral components of the qualifying examination will not be allowed to progress to Ph.D. candidacy or into the third year of the Ph.D. program. See attachment entitled: “Guidelines for Advancement to Candidacy for the Ph.D. Degree”

MASTER’S DEGREE OPTION. A doctoral student who has failed either component of the qualifying examination or the dissertation defense may petition the Biology Chairman to transfer to the MS Program in Biology or Biotechnology, to receive a Masters Degree. The student must complete all degree requirements for the MS
degree, including the oral comprehensive examination and thesis defense (if applicable) as described in the UTSA graduate catalog.

ADVEMENT TO YEAR 2 OF THE CMB PROGRAM. Upon completion of the core courses (BIO 5113, 5123 and 5133) with grades of B or better in each course, and having earned an average grade of B (3.0) or better on the 9 QEs combined, and upon identifying a CMB program faculty member’s lab in which to pursue his/her dissertation research, the CMB-DSC will approve progression of a student into Year 2 of the program. In the event that a student has not met these requirements for progression into Year 2 of the program, the CMB-DSC will have the option to require a student to re-take one or more core courses or one or more written QEs. In cases where a student fails to achieve a grade of B or better in each core course and fails to achieve an average grade of 3.0 or better on the 9 QEs combined, the student will be subject to dismissal from the CMB Ph.D. program at the discretion of the CMB-DSC.

ADVEMENT TO CANDIDACY FOR THE Ph.D. DEGREE. Upon completion of The Oral Qualifying Examination and receipt of the signed Approval/Disapproval statement from the QEC and Dissertation Supervisor, the CMB-DSC will make a decision by majority vote to recommend, or not to recommend, that the student be advanced to candidacy for the Ph.D. degree (Forms P5, P6). The CMB-DSC Chairperson will notify the student of his/her advancement to candidacy. If an unfavorable recommendation is made, the student will be notified by the CMB-DSC within two days, and the student may make a written appeal to the CMB-DSC within two weeks of the CMB-DSC’s recommendation.

As soon as the student is notified of his/her advancement to candidacy, the student should apply for advancement to candidacy. The application forms (Application for Candidacy: Doctoral Degree; Form P6) can be obtained from Graduate Studies Secretary in the Biology Department Office. The criteria for admission to candidacy are:

1. Completion of all required course work with the exception of colloquia, Supervised Teaching, Doctoral Research, and Doctoral Dissertation classes. Note that in certain cases, a student can be advanced to candidacy before completing all three elective course requirements. Typically, the student should have completed at least two of the three required electives before being advanced to candidacy.
2. Successful completion of both the written and oral components of the Qualifying Exam.
3. Identification of a CMB faculty member’s lab in which to pursue dissertation research and from which support for that research and the stipend will be forthcoming.
4. Approval by the CMB-DSC, the Department Chairman, and the Office of the Provost and Vice President for Academic Affairs.

Any student who is admitted to the program to earn the Ph.D. should be advanced to candidacy within two years after enrollment. Any student who has not been advanced to candidacy within two years may continue in the program only after individual review and recommendation by the CMB-DSC to the Department Chairman, and the Office of the Provost and Vice President for Academic Affairs.

DISSERTATION COMMITTEE. The Dissertation Committee has the responsibility for general supervision of the student's research and ultimately for certifying to the Office of the Provost and Vice President for Academic Affairs that an acceptable dissertation has been submitted and, in conjunction with the CMB-DSC, certifying that all degree requirements have been completed. The committee is selected by the student in consultation with his/her Dissertation Advisor and with approval of the CMB-DSC, the Department Chairman, and the Office of the Provost and Vice President for Academic Affairs and should be appointed soon after the Qualifying Examination is passed. The dissertation committee consists of five faculty members: three must be tenured/tenure track graduate faculty from the Department of Biology and one must be a Ph.D. faculty member from an academic institution other than UTSA. The fifth committee member can be either from the Department of Biology, another department at UTSA or a second outside member. The Dissertation Advisor chairs the committee. The formal approval of the Dissertation Committee is included in the Application for Advancement to Candidacy (Forms C1 - C3).

Although the supervising professor provides day-to-day guidance to the student, all members of the committee are available for consultation, and the student should feel free to ask for advice from any of the committee members. The Dissertation Committee also has general responsibility for monitoring the student's research progress whereas the CMB-DSC will continue to monitor progress through the Program of Study. The student is required to meet with the Dissertation Committee at least two times per year. During these reviews the student will give an oral progress report to the Dissertation Committee. The dissertation committee will provide written feedback and suggestions to the student about his/her progress and submit a report (Form C10) to the CMB-DSC for each of these meetings. It is sometimes necessary to change the membership of the Dissertation Committee prior to completion of the dissertation. This procedure involves a petition to the CMB-DSC and
approval through administrative channels. The student should consult with the Graduate Advisor of Record before initiating any action. Changes in the committee should be completed well in advance of the final defense of the dissertation.

**DISSERTATION PROPOSAL.** After passing the Qualifying Examination, the student must present a dissertation proposal to the Dissertation Advisor, Dissertation Committee and CMB-DSC for approval. The dissertation proposal will in most cases be substantially similar to the proposal written for the oral component of the qualifying examination, with revisions as suggested by the QEC. The Dissertation Research Proposal should include a title/signature page, abstract, specific aims page, background and significance with hypotheses to be tested, preliminary data, experimental design and methods including data acquisition and analyses, and expected results. A timeline should also be included in the section before the list of cited references. The student should follow the format for preparing an NIH or NSF grant proposal when preparing the dissertation proposal. The Dissertation Committee must sign the title/signature page of the approved Dissertation Research Proposal. This signed form page is submitted along with the Dissertation Proposal, the signatures of the CMB-DSC Chair, and the Department Chair, to the Office of the Provost and Vice President for Academic Affairs (Form C4).

**PRESENTATION OF A FULL-LENGTH, FORMAL SEMINAR.** Prior to the oral defense of the dissertation, each CMB Ph.D. candidate is required to present a full-length, formal seminar describing his/her dissertation research. This seminar can be presented in either the CMB or STEICD seminar series. The student should work with the coordinator of the appropriate seminar series to schedule this seminar during the fall or spring semester prior to the dissertation defense.

**FINAL ORAL EXAMINATION (DISSERTATION DEFENSE).** When the dissertation is in final form, (in compliance with instructions and formatting requirements provided by the Office of Graduate Studies), it is circulated to the Dissertation Committee. When all members of the committee agree, the final oral exam (defense of dissertation) should be scheduled. Note that the final draft of the dissertation is to be circulated to members of the Dissertation Committee at least two weeks prior to the defense date. The request for scheduling of the final oral exam is to be submitted to the CMB-DSC at least two weeks prior to the exam.

The defense of the doctoral dissertation consists of two parts. The first is a public oral summary of the dissertation research. The program administrator posts notices of the defense at least one week prior to the exam. Immediately following the oral presentation, the student meets privately with the Dissertation Committee to be examined on the dissertation and related topics. Once the dissertation is approved by the Dissertation Committee, the committee chairperson notifies the CMB-DSC, Department Chair and the Office of the Provost and Vice President for Academic Affairs of successful completion of the exam (defense) and that all degree requirements have been met (Form C8). This must be done no later than three weeks prior to the end of the semester.

The Office of Graduate Studies within the Office of the Provost and Vice President for Academic Affairs provides guidelines on the format of the dissertation and all signature pages and forms for notification of successful completion of all degree requirements and submission of dissertation to the library. See attachment entitled: “Procedures for Submitting a Doctoral Dissertation.”

**PROGRESS TOWARD THE DEGREE.** All students are expected to make reasonable progress toward the degree in a timely fashion (see Course of Study for the Cell and Molecular Biology Ph.D. Program on page 5, the Recommended Sequence of Events for Completion of Ph.D. Requirements below, and the Program Milestones Agreement appended). Each year the student and Dissertation Advisor must submit an annual written progress report by May 30th (Form C9), and once a student has been advanced to candidacy for the Ph.D., the student must schedule biannual Dissertation Committee meetings (Form C10).

If the student has not completed the dissertation within five years of admission to candidacy, the CMB-DSC will recommend what actions, if any, are required and will then transmit its recommendations to the Department Chairman and the Office of the Provost and Vice President for Academic Affairs who will decide the actions that need to be taken, if any.

**RECOMMENDED SEQUENCE OF EVENTS FOR COMPLETION OF PH.D. REQUIREMENTS:**
The following sequence summarizes some of the landmarks of progress that should be followed as closely as possible.

**Year One:**
1. Arrival at UTSA.
2. Attend CMB program orientation at beginning of fall semester.
3. Meet Department Chair, CMB-DSC Chair and members of the CMB-DSC.
4. Meet CMB faculty and hear about faculty research programs at beginning of semester.
5. Submit any graduate level classes to be considered by the CMB-DSC for potential transfer into the student’s program of study, and take placement exams (if necessary).
6. Complete requirements for unconditional admission (if necessary).
7. Complete core course requirements by end of Spring Semester with grades of B or better in each core course.
8. Take 9 written “qualifier” exams by end of Spring Semester and accumulate an average grade of 3.0 or better.
9. Complete research rotations and select Dissertation Professor preferably by May, but by August at the latest.
11. Submit annual progress report by May 30th.

Year Two:
1. Complete 2nd-year course work.
2. Continue to enroll in one colloquium per semester.
3. Prepare dissertation proposal during fall semester (in writing class).
4. Complete the supervised teaching requirement.
5. Complete at least two elective courses with grades of B or better.
6. Submit dissertation proposal as application for extramural funding by end of Spring Semester.
7. Schedule, take and pass Oral Qualifying Examination based on dissertation proposal and administered by Qualifying Examination Committee by June 30th.
8. Be recommended for Advancement to Candidacy by the CMB-DSC.
9. Form Dissertation Committee - 5 members, including one external member.
11. Submit annual progress report by May 30th.

Year Three:
1. Complete any remaining required course work including electives.
2. Pursue dissertation research.
3. Schedule two Dissertation Committee meetings (one during the fall semester and one during the spring semester).
4. Continue to enroll in one colloquium per semester.
5. Present in Spring Symposium.

Years Four & Five:
1. Continue to meet with Dissertation Committee twice yearly.
2. Submit annual progress reports by May 30th.
3. Complete colloquia requirements.
5. Present in Spring Symposium (Year 4).
6. Present full-length CMB or STCEID seminar (Year 5).
8. Complete dissertation, and obtain Dissertation Committee approval that the dissertation is ready to be defended.
10. Notify Office of the Provost and Vice President for Academic Affairs and publish the time, date, place and title of Defense.
12. Submit required and personal copies of dissertation for binding.

MILESTONES AGREEMENT. Each student will be required to sign a copy of the CMB Ph.D. Program Milestones Agreement at the beginning of each academic year. This agreement details the requirements of CMB Ph.D. students during each year of the CMB Ph.D. program and documents that each student has been made aware of those requirements at the beginning of each year in the program.

V. GENERAL ACADEMIC REGULATIONS

Rules concerning registration, late registration, adding classes, dropping classes, and auditing classes are all found in the Graduate catalog or in the schedule of classes. Academic standing, cancellation of enrollment, withdrawal procedures, reinstatement in the University and student classification are also addressed in the Graduate catalog.
VI. APPENDICES

Guidelines for the Advancement to Candidacy for the Ph.D. Degree

Procedures for Submitting a Doctoral Dissertation

FORMS

CMB Faculty Research Interests

Specialized track in Molecular Microbiology & Immunology

Specialized track in Stem Cell Biology

GUIDELINES FOR ADVANCEMENT TO CANDIDACY FOR THE CMB Ph.D. DEGREE – PROCEDURES FOR THE QUALIFYING EXAMINATION

I. Chronology of Events

The Qualifying Examination is based on a set of written comprehensive examinations that test the breadth of the student's knowledge in Cell and Molecular Biology and the student's oral defense of a written research proposal. The written examinations will be administered in conjunction with the core courses taken in the first year. The written exam is to be completed within the first year of study. The oral exam is to be completed within the second year of study, no later than May 30th. The normal chronology of events is:

1. The written qualifying requirement, as described below, should be completed by May of the first year of study.

2. The Doctoral Studies Committee will review the student's graduate record, including their performance (grades) in the three core courses (BIO 5113, 5123, 5133) and on the nine written qualifier exams and make a decision by majority vote to recommend, or not recommend, that the student is prepared to progress to the second year of study.

3. After advancing to the second year of study in the CMB Ph.D. program, the student will prepare a proposal based on dissertation interests and discussions with the supervising professor regarding general feasibility and relevance to the research program in the supervisor's laboratory. They will then discuss potential faculty members for the oral qualifying examination committee. The oral qualifying examination committee will consist of 4 CMB graduate faculty members plus the dissertation advisor (or, if feasible, 3 CMB graduate faculty members plus the dissertation advisor plus a faculty member from another institution. It is recommended that the qualifying examination committee be composed primarily of faculty who will become part of the student's Dissertation Committee (though if the oral exam committee does not already include a member from a different institution, one will need to be appointed to the dissertation committee in lieu of one of the UTSA faculty members). The chair of qualifying examination committee must be a faculty member other than the Dissertation Advisor.

4. The student should contact members of the student's qualifying committee to obtain their agreement to serve and then submit these names to the CMB-DSC for approval.

5. The student prepares a draft of the written dissertation proposal and distributes copies to the committee members. An optional meeting of the student with the oral exam committee is recommended at this point to ensure that the committee members do not have serious concerns about the research proposed for the dissertation. The committee members should inform the chair of the committee within three days of any significant reservations about the proposal. The student should consult with the chair of the committee after the third day to finalize a plan for the dissertation proposal prior to the oral qualifying exam.

6. The student should then finalize the full proposal taking into consideration any of the initial concerns of the committee members.

7. The student should distribute the full proposal to the committee members. Within seven days after receipt of the proposal the committee members should inform the chair of the committee regarding whether or not
the proposal is acceptable for the purpose of the oral examination. The student should then consult with the chair to finalize the proposal. If the original proposal is not generally acceptable to the committee members, the student should re-write the proposal based on recommendations from each of the committee members.

8. Once the committee unanimously agrees that the proposal is acceptable, the committee members will sign the cover sheet and the student will forward the signed proposal to the CMB-DSC to schedule the oral examination. The student may discuss with the committee members areas of knowledge for which he/she will be held responsible during the examination.

9. During the oral examination, the committee will examine the student on the written proposal and related areas to assess the breadth of knowledge he/she possesses as a doctoral student. The supervising professor is present as a non-voting member of the committee during the examination, and may contribute to the discussion when appropriate, but should NOT answer the questions in lieu of the student doing so.

10. Approval by a majority of the committee members is required for the student to pass the oral examination. Advancement to candidacy also requires approval of the supervising professor who substantiates the student's potential for independent and productive research. The supervising professor must make this determination by the time of the completion of the oral exam. Signatures of the committee members and the supervising professor are required on the Approval/Disapproval statement.

If the student fails the oral examination, he/she will be allowed to repeat the examination one time. The chair of the committee will give the student a written explanation of the basis of the failure and will 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 (but no later than August 30th of the student’s second year in the program). If the student fails the re-examination, he/she will be dismissed from the Ph.D. program. The CMB-DSC will decide whether the student will be permitted to proceed toward a Master's degree.

11. Upon completion of the Qualifying Examination and receipt of the signed Approval/Disapproval statement from the examination committee and supervising professor, the CMB-DSC will make a decision by majority vote to recommend, or not to recommend, that the student be advanced to candidacy for the Ph.D. degree. With the approval of the CMB-DSC, the chairperson will notify the student of his/her advancement to candidacy. If an unfavorable recommendation is made, the student will be notified by the CMB-DSC within two days, and the student may make a written appeal to the CMB-DSC within two weeks of the CMB-DSC recommendation.

II. The Written Comprehensive Requirement

The written comprehensive requirement is designed to test the student’s ability to apply what they learned from their core coursework (especially courses 5113, 5123 and 5133) and will specifically test: 1) a depth of knowledge on a specific topic beyond that required to respond to standard course exam questions, 2) the ability to synthesize answers to complex questions by drawing upon multiple sources of information, and 3) the ability to demonstrate problem-solving skills. The three core courses are each team-taught by a minimum of three instructors. During the progression of these courses each instructor will give the CMB Ph.D. students a “qualifier” exam covering the material they have presented in the core class and especially the material covered during the additional 1 hour/week when the instructor meets with the PhD students. These “qualifiers” will be in the form of a written exam given at a special time (other than a regular class period) during a 2-hour period (at the discretion of each individual instructor). Each “qualifier” will be given during or within one week following each instructor's part of each course. These written “qualifiers” will be graded by the instructor and reported to the CMB-DSC within two weeks from the date of the exam, and the students will then be informed of their grades by either the Chair of the CMB-DSC or the program administrator. These “qualifier” scores will not contribute to the actual grade earned for the core course which will be determined on the basis of exams given to all students taking each core course. At the end of the spring semester, the CMB-DSC will average the grades from all of the separate “qualifiers” to derive an average “qualifier” grade. An overall average grade of “B” (3.0) or better for the written qualifiers will be required for students to remain in the CMB Doctoral Program. There will be no other written qualifying exam and there will be no opportunity to retake any individual “qualifier” exam.

III. The Student’s Written Proposal

The student's written research proposal will be in the same area as his/her dissertation studies. The student should develop an original interpretation or a re-interpretation of literature data, and then propose a series of experiments to test a novel hypothesis and/or present a new theoretical approach to a problem. The format of the proposal should follow that of a standard NIH or NSF research grant proposal.

The proposal should have a cover page with a title and names of the student, dissertation professor, and committee members. When the committee has agreed that the proposal is acceptable for oral examination, the
student should give a copy of the proposal with the cover page containing the signatures of the committee members to the CMB-DSC along with the date scheduled for the oral examination. The proposal format should be similar to that outlined in the application packet for Public Health Service Grants. In the proposal, the cover page should be followed by an abstract, statement of the hypothesis to be tested, specific aims, background information from the literature, preliminary studies (if applicable), research design and methods to test the hypothesis, and a discussion of potential experimental outcomes of significance to the hypothesis. A bibliography should be included. Only background information and references most relevant to the proposal should be included. The complete written proposal should be limited to 10-12 single-spaced, typewritten pages excluding the cover page and bibliography. The bibliography should include titles and inclusive page numbers, and it may be typed single-spaced.

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 hypothesis, and significance rests completely with the student. The student prepares the written proposal entirely by him- or herself. The student may ask the supervising professor to read the proposal prior to submission to the examination committee. The supervising professor may suggest changes with respect to general organization of the document, English (grammar, spelling, etc.), and general aspects of the science. It is the responsibility of the examination committee to evaluate the scientific merits of the proposal.

IV. The Oral Examination

The oral examination begins with a thirty-minute presentation by the student in which he/she summarizes the proposal. Department of Biology faculty, staff and students may attend this oral presentation in addition to the members of the Oral Qualifying Exam Committee. The summary presentation is followed first by any questions from those in attendance other than the committee members. Subsequently all except the student and the examining committee will be excused. This will be followed by questions from the committee members until they decide they have thoroughly evaluated the student's performance. The written proposal and related scientific areas will be the basis for the committee's questions. The supervising professor should not ask questions during the exam but may interact with committee members. A three-hour period should be scheduled for the examination.

V. Possible Outcomes of the Qualifying Examination

Unconditional Pass: For an unconditional pass the student must pass the written comprehensive requirement and there must be a majority passing vote by the entire 5-member QEC on the oral exam.

Pass with Conditions: The student also may pass conditionally, in which case the student may be required to take additional coursework or satisfy other requirements. The QEC may suggest remediation steps to be taken by the doctoral student to correct deficiencies perceived during the oral portion of the exam. These will be put into written form by a report from the Chair of the QEC to the CMB-DSC and the student. The Dissertation Supervisor will oversee progress along with the student's Dissertation Committee and the Doctoral Studies Committee with a final report being sent to the QEC upon completion. Application for Advancement to Candidacy will not be permitted until all conditions have been satisfied.

Fail: At the end of the first year the CMB-DSC will compute an overall average grade for the written comprehensive requirement as described above. Students that fail the written portion of the qualifying exam will be dismissed from the program. Students should complete the oral examination by the end of their second year. If the student does not pass the oral exam he/she will be allowed to repeat the examination within 90 days. The Chair of the QEC will give the student a written explanation for the basis of the failure and provide guidelines to prepare for the re-examination. If the student fails the oral exam on a second attempt, he/she will be dismissed from the Ph.D. program. Any student dismissed from the CMB Doctoral Program may petition the CMB-DSC to be permitted to pursue a Master's degree.

VI. Responsibilities of the Student

1. Pass written qualifying requirement.
2. Request that the CMB-DSC review his/her graduate record for approval to take the oral examination.
3. Discuss ideas about a proposal and potential faculty members for a qualifying examination committee with the supervising professor.
4. Submit the names of the qualifying examination committee to the CMB-DSC for approval.
5. Write an abstract and outline of a proposal for initial approval by the examination committee.
6. Write a complete, original proposal that is approved by the examination committee in terms of its acceptability for an oral examination.

7. Present a copy of the proposal with a signed cover page to the chairperson of the CMB-DSC only after the QEC committee has approved the proposal.

8. Make sufficient progress in research to warrant a positive recommendation from the supervising professor.

9. Present a full-length, formal seminar describing the dissertation research.


VII. Responsibilities of the Supervising Professor

1. Provide the student with general guidance in preparation of his/her proposal.

2. Attend the oral examination of the student as a voting member of the committee. The Dissertation Supervisor is NOT allowed to ask questions of the student during the Oral Exam but may interact with the QEC members.

3. Participate in the evaluation of the student for Advancement to Candidacy by substantiating, or not substantiating, the student's potential for independent and productive research.

VIII. Responsibilities of the Examination Committee

1. The qualifying examination committee will consist of 4 CMB graduate faculty members plus the dissertation advisor. It is recommended that the qualifying examination committee be composed primarily of faculty who will become part of the student's Dissertation Committee. The chair of the qualifying examination committee must be a faculty member other than the Dissertation Advisor.

2. The committee will determine the initial feasibility of the proposal based on the student's abstract and outline. The chair will inform the student of the committee's decision within three days after receipt of the abstract and outline by the committee members.

3. The committee will determine the acceptability of the complete written proposal for the oral examination. The chair will inform the student of the committee's decision within seven days after receipt of the written proposal by the committee members. If the committee decides the proposal is not acceptable, the student must re-write the proposal based on recommendations from each member of the committee.

4. The committee will examine the student on the written proposal and related areas. The chair of the committee will act as moderator for the examination.

5. Upon completion of the examination, the committee will evaluate the performance of the student and decide whether or not the student has passed the examination. Passage of the exam requires a positive vote from a majority of the committee members. Advancement to candidacy also requires approval of the supervising professor.

6. The chair of the committee will inform the student of the committee's decision immediately after the committee's deliberations.

7. The chair of the committee will inform the chairperson of the CMB-DSC of the committee's decision and give him/her the signed Approval/Disapproval statement.
PROCEDURES FOR SUBMITTING A DOCTORAL DISSERTATION

The following are the steps to be followed by doctoral students in submitting a doctoral dissertation. Students should visit The Graduate School’s Thesis/Dissertation webpage (http://graduateschool.utsa.edu/current-students/category/thesis-dissertation/) for current formatting requirements, including templates, formatting workshops, deadlines, preliminary draft process, and final submission requirements.

1. After passing the qualifying exam, the student should begin working with his/her Dissertation Supervisor and Dissertation Committee. The criteria for the membership of the committee are outlined in the Academic Policy and Procedure booklet. The student is eligible at this time to begin his/her doctoral dissertation research. He/she should enroll in the appropriate doctoral research courses with the Dissertation Supervisor as the instructor.

2. The student should enroll in a total of at least twelve semester credit hours of the appropriate doctoral dissertation course with the Dissertation Supervisor as the instructor over the total time that the student works on the dissertation. Students should enroll in at least one doctoral dissertation course each semester that they are working on the writing of the dissertation itself. Students are required to be enrolled in a doctoral dissertation course the semester in which the dissertation is defended and submitted for final approval. The final transcript will have a grade for only 12 hours of doctoral dissertation, no matter how many additional hours the student takes.

3. The student should submit a preliminary draft of the dissertation on regular paper to The Graduate School by the preliminary draft deadline for certification that the dissertation conforms to the format prescribed in the Guide for the Preparation of Doctoral Dissertations at The University of Texas at San Antonio and the formatting template. The preliminary draft deadline and process is posted on The Graduate School's website.

4. The student should successfully defend the dissertation. He/she should allow at least a month before the end of the semester to deal with any changes or corrections to the dissertation requested by the Dissertation Committee, and then arrange with the Graduate Secretary in the Biology Department Office to process the necessary paperwork. The date and time of the dissertation defense must be announced at least one week prior to the scheduled defense of the dissertation.

5. The student must obtain the required signatures, except for the Dean of The Graduate School’s signature, on the signature page of each copy of the dissertation prior to submitting the final printed copies to The Graduate School. At this time the signatures of all Dissertation Committee members should also be obtained on the Certification of Completion of Dissertation Requirements for Doctor of Philosophy Degree.

6. The student must make any required format changes to the dissertation and complete The Graduate School’s final requirements:

   a. **Two Final Printed Copies:** The two required final copies of the dissertation must be printed on paper that meets the following guidelines: plain white, 100% cotton, acid free, 20 or 24 pound weight (a guide to paper sources can be found on The Graduate School’s website). Other copies, which the student will present to his/her Dissertation Supervisor or Committee members, may either be originals or copies. A signed signature page with original signatures must be included with each final printed copy submitted to The Graduate School.

   b. **ProQuest Electronic Copy:** The student must submit one electronic copy of the dissertation to the ProQuest website — more information on the electronic submission is available on The Graduate School website. Please note that the ProQuest electronic copy does not require signatures on the signature page.

   c. **Survey of Earned Doctorates:** This survey is required of all students earning a Ph.D. and must be completed online. The link is available on The Graduate School’s website.

   The two final printed copies, ProQuest electronic copy, and confirmation of the Survey of Earned doctorates must be submitted to The Graduate School no later than 5:00 p.m. on The Graduate School’s final submission deadline. Please visit The Graduate School’s website for current semester deadlines and requirements, as well as contact information for the Thesis/Dissertation Officer.

7. The student should then take the "Certification of Completion of Dissertation Requirements" to the Department Office to be placed in the student’s file.
CMB PH.D. PROGRAM FORMS
**CHECKLIST**
**P forms – Pre-Candidacy**
**C forms - Candidate**

**Administrative Requirements for Doctoral Program**

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<tbody>
<tr>
<td>P1</td>
<td>Selection of advisor</td>
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<td>P2</td>
<td>Interim Program of study*</td>
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<td>P3</td>
<td>Selection of Qualifying Committee members</td>
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<td>P4</td>
<td>Qualifying exam proposal* (signature page)</td>
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<td>P5</td>
<td>Completion of Qualifying Exam</td>
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<td>P6</td>
<td>Application for Graduate Faculty membership</td>
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<tr>
<td>P7</td>
<td>Outside member &amp; tentative dissertation title approval by graduate council</td>
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<tr>
<td>P8</td>
<td>Appointment of Dissertation Committee*</td>
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<td>P9</td>
<td>Application for Candidacy</td>
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<td>C1</td>
<td>Dissertation proposal approval* (signature page)</td>
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<td>C2</td>
<td>Dissertation title, Defense date and Approval</td>
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<td>C3</td>
<td>Application for graduation</td>
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<td>C4</td>
<td>Certification of completion of dissertation requirements*</td>
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<td>C5</td>
<td>Official program of study*</td>
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<tr>
<td>C6a</td>
<td>Annual Report for 1” year students</td>
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<tr>
<td>C7b</td>
<td>Annual Report for 2&quot;d-5th year students (one for each year)</td>
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<tr>
<td>C8a</td>
<td>Dissertation Committee Reports (one for each meeting)</td>
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<td>Send draft dissertation to Graduate School*</td>
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<td>All copies of dissertation, UMI form to Graduate School*</td>
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* Indicated Graduate School approval
Memorandum

Date: ____________________________

To: CMB Doctoral Studies Committee

From: ____________________________

Student

Proposed Supervisor

RE: REQUEST TO APPROVE DOCTORAL SUPERVISOR

I wish to inform the CMB - Doctoral Studies Committee that I have chosen _____________________ for my supervising Professor with his/her consent.

Signature ____________________________

Ph.D. Student

Approved by: _________________________

CMB-DSC Chair

P1 Form
THE UNIVERSITY OF TEXAS AT SAN ANTONIO
Interim Program of Study for the Doctor of ____________________________

Student Name ____________________________________________ Student ID _____________________

Program of Study for Doctor of ____________________________________________
Catalog 20 _________   Major ________________________   Concentration ________________________

The following courses are required for the degree indicated below:

<table>
<thead>
<tr>
<th>Discipline and Number</th>
<th>Course Title</th>
<th>Sem. Hr. Credit</th>
<th>Grade</th>
<th>When and Where Completed</th>
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<tr>
<td><strong>CORE COURSES</strong> (22 hrs. required)</td>
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<tr>
<td>BIO 5113</td>
<td>Principles of Biochemistry</td>
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<td>BIO 5123</td>
<td>Principles of Molecular Biology</td>
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<td>BIO 5133</td>
<td>Principles of Cell Biology</td>
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<td>BIO 7143</td>
<td>Principles of Biological Scientific Writing</td>
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<td>BIO 7413</td>
<td>Research Ethics and Responsible Conduct in Research</td>
<td>3</td>
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<td>BIO 7113</td>
<td>Supervised Teaching in Life Sciences</td>
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<td>BIO 7572</td>
<td>1. Experimental Techniques in the Life Sciences x 3</td>
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<td><strong>COLLOQUIA</strong> (10 hrs required)</td>
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<td>BIO 7101</td>
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<td>2. Colloquium x 9</td>
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<td><strong>DOCTORAL RESEARCH</strong> (49 hrs maximum)</td>
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<td>BIO 7211-3</td>
<td>Doctoral Research (37 hrs maximum)</td>
<td>3 x 12 + 1</td>
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<tr>
<td>BIO 7313</td>
<td>Doctoral Dissertation (12 hrs credit)</td>
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<tr>
<td><strong>ELECTIVES</strong> (9 hrs minimum)</td>
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<td>BIO 1.</td>
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<td>BIO 2.</td>
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<td>BIO 3.</td>
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<td><strong>Minimum of 90 hours of courses with B or above.</strong></td>
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<tr>
<td><strong>Indicate course used towards MS degree (maximum of 30 hours, comparable to core and elective courses).</strong></td>
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Upon completion of the above requirements, in addition to meeting the University-wide requirements for all Doctoral degrees, the above named student has satisfied all requirements for Doctor of ____________________________.

Supervising Professor’s Signature ____________________________________________ Date _____________________
Advisor of Record’s Signature ____________________________________________ Date _____________________
Signature ____________________________________________ Date _____________________
Doctoral Program Committee Chairman

Signature ____________________________________________ Date _____________________
Dean of Graduate Studies

NOTES:
Dissertation Committee : Chair: _____________________________   Member: _____________________________
   Member: _____________________________   Member: _____________________________
   Member: ____________________________   Outside Member: __________   Member: ____________________________

THE ORIGINAL COPY OF THIS FORM MUST BE FILED WITH THE REGISTRAR

Applied for degree __________ Time Limit (8yr) __________ Hours of A __________ x 4 __________
Advanced to Candidacy __________ Comprehensive Exam __________ B __________ x 3 __________
Admission Cleared __________ Dissertation Filed __________ C __________ x 2 __________

P2 Form
Memorandum

Date: __________________________

To: CMB-Doctoral Studies Committee

________________________________________
Supervising Professor

________________________________________
Ph.D. Student

RE: PROPOSED MEMBERS OF QUALIFYING COMMITTEE

We are requesting that the following members be assigned to the qualifying exam committee.

________________________________________
Member

________________________________________
Member

________________________________________
Member

________________________________________
Member

________________________________________
Member

____ Approved

____ Denied

Approved by: ______________________________________

CMB-DSC Chair

P3 Form
Qualifying Exam Proposal
Title

A Proposal by:

__________________________________________
Name

Supervising Professor:

__________________________________________  ____________________________  __________
Supervisor  Signature  Date

Qualifying Committee Members:

__________________________________________  ____________________________  __________
Member  Signature  Date

__________________________________________  ____________________________  __________
Member  Signature  Date

__________________________________________  ____________________________  __________
Member  Signature  Date

__________________________________________  ____________________________  __________
Member  Signature  Date

___ Qualifying Proposal is also Dissertation Proposal

P4 Form
# COMPLETION OF THE QUALIFYING EXAM

Completion of the Qualifying Exam for the Doctor of

## STUDENT INFORMATION

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree/Program</th>
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## UTSA ACADEMIC RECORD:

Semester of entry into program (semester/year): ________________

Total number of semester hours completed: ________________

Cumulative GPA: ________________

All required courses completed: □ Yes □ No

Passed Qualifying Exam: Written: ________________ Date ________________

Oral: ________________ Date ________________

## SIGNATURES OF QUALIFYING EXAM COMMITTEE:

<table>
<thead>
<tr>
<th>Exam Committee Chair</th>
<th>Date</th>
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<td>Exam Committee</td>
<td>Date</td>
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## SUPERVISING PROFESSOR

_________________________________________ Date ________________

## GRADUATE ADVISOR OF RECORD AND CHAIR DOCTORAL PROGRAM COMMITTEE

_________________________________________ Date ________________

## DEAN OF COLLEGE

_________________________________________ Date ________________

## THE GRADUATE SCHOOL

Vice Provost and Dean of The Graduate School, Dr. Dorothy Flannagan Date ________________
APPLICATION FOR GRADUATE FACULTY SPECIAL MEMBERSHIP

APPLICANT

Full Name: ________________________________  UTSA Department: ________________________________

Requesting College: ________________________________  Current or Proposed UTSA Position/Title: ________________________________

Status:  
☐ Initial Appointment as a Special Member to the Graduate Faculty
☐ Reappointment as a Special Member to the Graduate Faculty

Date of initial appointment: ________________________________

Teaching:  
☐ Not applicable
☐ Application to teach at the Master’s level
☐ Application to teach at the Doctoral level and Master’s level

Service:  
☐ Not applicable
☐ Application to serve on Master’s committee(s)
☐ Application to serve on Doctoral and Master’s committee(s)

Student’s Name: ________________________________  ☐ Thesis  ☐ Dissertation

Student’s Name: ________________________________  ☐ Thesis  ☐ Dissertation

Period:  
☐ Application for a three (3) year period of Special Membership
☐ Application for a shorter period of Special Membership because of extraordinary department or program need, or because the individual does not possess the terminal degree in a discipline or field of inquiry directly associated with the requesting department.

Period of time applicant will teach: ________________________________

Period time applicant will serve on a committee: ________________________________

JUSTIFICATION

Explanation of the department need for this Special Membership in the UTSA Graduate Faculty:
CURRICULUM VITA

*Please attach a copy of a current Curriculum Vita.

________________________________________________________________________
__________________________                                ________________
Current Non-UTSA Position/Title (if applicable)                                      Current Non-UTSA Affiliation/Employer (if applicable)

a) Highest Degree Earned: ____________________________________________________

b) When and Where Obtained: ________________________________________________

c) Area of Specialization: ___________________________________________________

d) Does the applicant hold a terminal degree in the field of this application?  [ ] Yes  [ ] No

Explanation of the applicant’s qualification for this special membership if the applicant does not currently possess a terminal degree in the field of this application:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

e) Is the applicant currently a degree-seeking student?  [ ] Yes  [ ] No

Explanation of the department need for this special membership if the applicant is currently pursuing a graduate degree at UTSA or another institution:

________________________________________________________________________

________________________________________________________________________

SIGNATURES & RECOMMENDATIONS

_________ Number of Department Graduate Program Committee members

_________ Vote (for/against)

_________ Date of Vote

__________________________ ___________________________  [ ] Approve  [ ] Disapprove
Graduate Program Chair, Type name here  Date

__________________________ ___________________________  [ ] Approve  [ ] Disapprove
Department Chair, Type name here  Date

__________________________ ___________________________  [ ] Approve  [ ] Disapprove
Associate Dean, Type name here  Date
# Appointment of Doctoral Dissertation Committee

Please Choose One: □ New appointment of committee □ Change of committee member(s)

## Student Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Student ID</th>
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<tr>
<th>Department</th>
<th>College</th>
<th>Date Student Completed Qualifying Exam</th>
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## Proposed Dissertation Committee

**Chair:**

<table>
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<th>Name</th>
<th>Department</th>
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**Member:**

<table>
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<th>Name</th>
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**Member:**

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**Member:**

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<th>Department</th>
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**Outside Member:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
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**Supervising Professor:**

<table>
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<th>Name</th>
<th>Department</th>
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## Changes in Committee

**New Member:**

<table>
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<th>Name</th>
<th>Department</th>
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**Remove:**

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<th>Department</th>
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## Doctoral Program Committee Recommendations

- □ We recommend that the Dissertation Committee be approved
- □ We do not recommend that the Dissertation Committee be approved

- Department Ph.D. Advisor,
- Chair, Doctoral Program Committee,
- Department Chair,
- Associate Dean of the College,

**Date**

**THE GRADUATE SCHOOL**

Based on the College's recommendation, I hereby □ Approve □ Disapprove Dissertation Committee.

**Vice Provost and Dean of The Graduate School, Dr. Dorothy Flannagan**

**Date**

**Attachment:** Curriculum Vitae of Outside Member
APPLICATION FOR CANDIDACY FOR THE DOCTORAL DEGREE

STUDENT INFORMATION

Name

Student ID

Anticipated Graduation Date

Degree Sought

Program of Study

Title of Dissertation (Subject to Change)

Signature

Date

☐ Level of English proficiency is satisfactory

☐ Scholarship to date is satisfactory

☐ Program of Study is satisfactory

☐ Qualifying exam administered

Supervising Professor for Dissertation,

Date

Dissertation Committee Member,

Date

Dissertation Committee Member,

Date

Dissertation Committee Member,

Date

Dissertation Committee Member,

Date

Outsider Examiner,

Date

Supervising Professor,

Date

DOCTORAL PROGRAM COMMITTEE RECOMMENDATIONS

Based upon this student’s performance to date and the attached Program of Study:

☐ We recommend that the student be advanced to candidacy

☐ We do not recommend advancement to candidacy at this time

Chair, Doctoral Program Committee,

Date

Department Chair,

Date

Dean of College,

Date

THE GRADUATE SCHOOL

Based on the College’s recommendation, I hereby ☐ Approve ☐ Deny Candidacy.

Vice Provost and Dean of The Graduate School, Dr. Dorothy Flannagan

Date
# DISSEPTION PROPOSAL APPROVAL FORM

## STUDENT INFORMATION

Name: ____________________________  
Student ID: ____________________________

Department: ____________________________  
College: ____________________________

Title of Dissertation Proposal: ____________________________

## DISSERTATION COMMITTEE MEMBERS

Chair: ____________________________  
Department: ____________________________

Member: ____________________________  
Department: ____________________________

Member: ____________________________  
Department: ____________________________

Member: ____________________________  
Department: ____________________________

Outside Member: ____________________________  
Department: ____________________________

Outside Member: ____________________________  
Department: ____________________________

## DOCTORAL PROGRAM COMMITTEE ACTION

Doctoral Program Committee Review Date: ____________________________

Doctoral Program Committee, Chair: ____________________________

Department Chair: ____________________________

Dean of College: ____________________________

## THE GRADUATE SCHOOL

Based on the College’s recommendation, I hereby  
  □ Approve  □ Disapprove Dissertation Proposal.

Vice Provost and Dean of The Graduate School, Dr. Dorothy Flannagan  
Date: ____________________________

Attachments:  
1) Dissertation Proposal  
2) Approval of Doctoral Dissertation Committee Form
Dissertation Title

__________________________

Date

By:

_____________________________
PhD Student

Supervising Professor:

__________________________
PRINTED NAME, SUPERVISOR DATE

Dissertation Committee Members:

Chair

__________________________
PRINTED NAME / SIGNATURE

Member

__________________________
PRINTED NAME / SIGNATURE

Member

__________________________
PRINTED NAME / SIGNATURE

Member

__________________________
PRINTED NAME / SIGNATURE

Member

__________________________
PRINTED NAME / SIGNATURE

Member

__________________________
PRINTED NAME / SIGNATURE

Outside Member

__________________________
PRINTED NAME / SIGNATURE

My committee has approved a defense date of:

__________________________
Ph.D. Student Signature Date
Please print in ink or type all information
Submit Application for Graduation, Graduating Student Survey and $30 application fee to Fiscal Services
Retain last (gold) copy for your records and reference

**IMPORTANT INFORMATION**

There are commencement ceremonies at the close of each semester. Information about the commencement ceremonies will be sent to you approximately mid-way through the semester in which you are a candidate. *Inclusion in the commencement program or participation in commencement exercises does not signify completion of degree requirements or actual awarding of the degree.*

Degrees will be posted to transcripts and diplomas will be mailed approximately 45 days after the end of your graduating semester. Diplomas will list your degree, major and final honors (Cum Laude, Magna Cum Laude or Summa Cum Laude), if applicable. A minor, concentration, emphasis, specialization or option will appear on your official transcript. These notations **will not** appear on your diploma.

A Letter of Degree Awarded may be obtained after the date of the commencement ceremony and prior to the posting of degrees to the transcripts. These letters are not available once the degrees have been posted to the transcripts.

Students who are taking courses concurrently at another university must inform their advisor upon registration. The Office of the Registrar **must** receive an official transcript within two weeks after the end of UTSA’s term.

1. Name ___________________________________________________________ Student ID Number @ ________________
   Last First Middle

2. Date of Birth __________________________ 3. Sex: ☐ Male ☐ Female
   Month Day Year

4. PRINT your name (first middle last names) exactly as you wish it to appear on the diploma as well as the commencement program: ____________________________________________________________

5. Degree Sought: ☐ BACHELOR’S ☐ MASTER’S ☐ DOCTORAL

6. *Major(s)_______________________________________________________________

7. *Concentration/Specialization/Emphasis/Option (if any)________________________

8. *Minor(s) (if any)_______________________________________________________

9. *Catalog of Graduation __________

10. Concurrent enrollment during graduation term? ☐ Yes ☐ No If yes, institution or school ________________________________

11. TERM OF GRADUATION: Year_____________ ☐ Spring (May) ☐ Summer (August) ☐ Fall (December)

12. Diplomas will be mailed to the address given below. If you move, please notify the Graduation Coordination Office in writing.

   Street Address or Post Office Box
   __________________________
   City State Zip Code

13. Your current mailing address

   Street Address or Post Office Box
   __________________________
   City State Zip Code

14. Telephone Number (______)______________________ Email __________________________

   Area Code Number

15. Signature ___________________________________ Date __________________________

   * (This information must match your official record.)

   Payment of Fee Validation
   __________________________
   __________________________

   Distribution: white- Registrar; yellow and pink- Advising Center to Dean; gold- Student

MacintoshHD:teaching/services:second emphasis:Application for Graduation.doc (011303)
CERTIFICATION OF COMPLETION OF DISSERTATION REQUIREMENTS FOR DOCTORAL DEGREE

TO: Registrar

This is to certify that the student named below has completed all requirements for the dissertation associated with the degree indicated and that the dissertation has been filed with this office.

STUDENT INFORMATION

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Middle Name</th>
<th>Student ID</th>
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</table>

Dissertation Title (as it is to be listed on the student's official records)

Semester hours of credit to be awarded for dissertation: ______________________

Grade to be awarded for dissertation credit: ______________________

Date dissertation approved by committee: ______________________

Degree to which dissertation applies (Ph.D., Ed.D; area and concentration):

DISSERTATION COMMITTEE MEMBERS

<table>
<thead>
<tr>
<th>Chair</th>
<th>Date</th>
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<th>Outside Member</th>
<th>Date</th>
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DEPARTMENT

Department Chair, ________________________ Date ________________________

COLLEGE

Associate Dean, ________________________ Date ________________________

THE GRADUATE SCHOOL

Based on the College’s recommendation, I hereby □ Approve □ Deny the request.

Vice Provost and Dean of The Graduate School, Dr. Dorothy Flannagan Date ________________________

OFFICE OF THE REGISTRAR

A) Credit and grade entered on student’s record? ________ B) Dissertation title entered on student’s record? ________________________

C) Graduation check updated? ________ D) Student notified? ________ E) Notes ________________________
THE UNIVERSITY OF TEXAS AT SAN ANTONIO

Program of Study for the Doctor of Philosophy

Student Name:                        Student ID:
Program of Study for Doctor of Philosophy
Catalog: 2011 - 2013            Major: Biology            Concentration: Cell & Molecular Biology
The following courses are required for the degree indicated below:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of Biochemistry</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Principles of Molecular Biology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Principles of Cell Biology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Supervised Teaching in Biology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Principles of Biological Scientific Writing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Research Ethics &amp; Responsible Conduct in Research</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Research Rotation</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Experimental Techniques</td>
<td>2</td>
<td></td>
</tr>
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</table>

Total Credits:

Colloquia and Seminars (10 credit hours required)

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Grade</th>
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<tbody>
<tr>
<td>BIO 7041</td>
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<tr>
<td>BIO 7042</td>
<td>1</td>
<td></td>
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<tr>
<td>BIO 7043</td>
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<td>BIO 7044</td>
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<tr>
<td>BIO 7045</td>
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<tr>
<td>BIO 7046</td>
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</tbody>
</table>

Total Credits:

Doctoral Research and Dissertation (45 credit hours required)

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<thead>
<tr>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>Doctoral Research</td>
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<tr>
<td>Doctoral Research</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Doctoral Research</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Doctoral Dissertation</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Doctoral Dissertation</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Doctoral Dissertation</td>
<td>3</td>
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</tbody>
</table>

Total Credits:

Electives (9 credit hours required)

<table>
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<tr>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Grade</th>
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</table>

Total Credits:

TOTAL DEGREE CREDITS:

*Minimum of 85 hours of courses with B or above.
**Indicates course used towards MS degree (maximum of 30 hours, comparable to core and elective courses).

Upon completion of the above requirements, in addition to meeting the University-wide requirements for all Doctoral degrees, the above named student has satisfied all requirements for Doctor of ________________

Supervising Professor’s Signature       Date

Advisor of Record’s Signature           Date

Signature                                Date

Doctoral Program Committee Chairman     Date

Dean of College of                       Date

Dean of Graduate School                  Date

NOTES:
Dissertation Committee: Chair: ________________ Member: ________________

Member: ________________ Member: ________________

Member: ________________ Out Side Member: ________________

THE ORIGINAL COPY OF THIS FORM MUST BE FILED WITH THE REGISTRAR.

Applied for degree                       Time Limit (8yr)          Hours of A - x 4
Advanced to Candidacy                    Comprehensive Exam           B - x 3
Admission Cleared                        DissertationFiled             C - x 2

Total: GPA (3.0 min)

Revision date: 8/8/12
CMB Graduate Student Annual Progress Report
FIRST Year Students
9/1/___ - 8/30/___
(Due August 1st)

Part I: To be completed by Ph.D. student:

Name ______________________________________

Courses completed this year:

Meetings attended this year:

Abstracts published this year:

Manuscripts published this year:

Append copies of the completed Rotation Reports for each rotation.

C9a Form
Part II: ROTATION REPORT

(To be completed and submitted by first-year CMB Doctoral Students immediately following each laboratory rotation)

Part A: To be completed by the student:

For each laboratory rotation (8 weeks or full semester) provide the following information:

1. List the name of the supervising professor and the dates you rotated in that lab.
10. List the objectives of the rotation project.
11. Give a summary of the experimental procedures, results and conclusions.

B: To be completed by each rotation supervisor:

Provide a brief evaluation of the student’s performance during the rotation and list any areas that need improvement. This evaluation is to be shared with the student.
Second-Fifth Year Students
9/1/___ - 8/30/___
(Due August 1st)

Part I: To be completed by Ph.D. student:

Name ________________________________

Credit hours of Research Rotation (7572) completed this year. __________
Credit hours of Doctoral Research (7211-9) completed this year. __________
Credit hours of Doctoral Dissertation (7313) completed this year. __________

Other courses completed this year:

Courses taught this year:

Meetings attended this year:

Abstracts published this year:

Manuscripts published this year:
Part II

A: To be completed by 2\textsuperscript{nd}-5\textsuperscript{th} year students:

Attach a brief review of research progress over the past year (maximum two pages)

B: To be completed by dissertation supervisor:

Give a brief evaluation of the student’s performance over the past year and list any areas that need improvement. This evaluation is to be shared with the student.

Student

Dissertation Supervisor

CMB-DSC Chairman

C9b Form
Cell and Molecular Biology Graduate Program  
Evaluation by the Committee Members - Third Year Student

Student Name: ____________________________
Month/Year Started Program: ____________________________
Date of Meeting: ____________________________
Has qualifying exam been taken? ____________________________
Has dissertation proposal been approved? ____________________________
*The student should complete the information above and distribute forms to faculty at his/her scheduled committee meeting.*

Committee member: Please comment on issues that particularly need improvement.
Was the presentation thorough and understandable?

Does the student have the appropriate command of the literature?

Have at least some experiments been done thoroughly and finished?

Do individual experiments appear to be well planned with appropriate controls?

Does the student understand the limits of his/her experiments?

Is the dissertation project feasible in a reasonable period of time?

Are the student's responses to the questions clear and to the point?

Is the student applying personal initiative to the project?

Addition comments:

Committee Member Name: ____________________________

Overall Evaluation of research progress (*Please circle*):

<table>
<thead>
<tr>
<th>U</th>
<th>Unsatisfactory</th>
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<tbody>
<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>
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</tbody>
</table>

*After each committee member has completed the evaluation, the student should collect the evaluations, review them with his/her supervising professor and then make two copies. One copy should be kept by the student and one copy should be given to the graduate secretary for inclusion in the student's file.*

*C10a Form – Third Year*
Cell and Molecular Biology Graduate Program
Evaluation by the Committee Members - Fourth Year Student

Student Name:
Month/Year Started Program:
Date of Meeting:
Has qualifying exam been taken?
Has dissertation proposal been approved?
Written progress: Presented a paper or poster at national meeting? _____
Contribution to writing a paper or review? ______
Authored his/her own paper? ______

The student should complete the information above and distribute forms to faculty at his/her scheduled committee meeting.

Committee member: Please comment on issues that particularly need improvement.

Was the presentation done well?

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

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 depth of knowledge and facility to deal with problems characteristic of an expert in his/her chosen field?

Addition comments:

Committee Member Name:
Overall Evaluation of research progress (Please circle):
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

After each committee member has completed the evaluation, the student should collect the evaluations, review them with his/her supervising professor and then make two copies. One copy should be kept by the student and one copy should be given to the graduate secretary for inclusion in the student’s file.

C10b Form – Fourth Year

Cell and Molecular Biology Graduate Program
Evaluation by the Committee Members - Fifth (or beyond) Year Student

Student Name:
Month/Year Started Program:
Date of Meeting:
Has qualifying exam been taken?
Has dissertation proposal been approved?

Written progress: 
- Presented a paper or poster at national meeting? ______
- Contributed to writing a paper or review? ______
- Authored his/her own paper? ______
- Target date for graduation: ______

The student should complete the information above and distribute forms to faculty at his/her scheduled committee meeting.

Committee member: Please comment on issues that particularly need improvement.

Was the presentation done well?

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

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

Is the student's depth 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 (Please circle):

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

After each committee member has completed the evaluation, the student should collect the evaluations, review them with his/her supervising professor and then make two copies. One copy should be kept by the student and one copy should be given to the graduate secretary for inclusion in the student's file.

C10c Form – Fifth Year
Milestones Agreement Form
UTSA Doctoral Program in Cell and Molecular Biology

Student:______________________________________________________

Year in CMB PhD program:

Advisor:_________________________________________________________________

This form is provided for the purpose of informing students about the academic milestones that they will be expected to reach in order to earn their Ph.D. degree as well as when they are expected to complete these milestones. Students are expected to reach each milestone within the specified time period in order to make satisfactory progress through the program. Students who are not making satisfactory progress may lose funding, be placed on academic probation, or be dismissed from the program.

Academic Advising
Upon entering the UTSA Doctoral program in Cell and Molecular Biology, all students will be assigned an advisor. The advisor will be a member of the program department. During the first year in the program the student’s advisor will be the Graduate Advisor of Record (GAR) for the Cell and Molecular Doctoral Program (= the Chair of the CMB Doctoral Studies Committee). Once the student has selected a PI in whose lab he/she will pursue their dissertation research (selection to be made by the end of the first year in the program), that individual will become the student’s advisor, but the GAR and the CMB-DSC will still monitor progress of all program students as well.

Academic advising includes the following elements that are designed to ensure that students remain in good academic standing and make satisfactory progress through the program. Advisors are responsible for the following:

- Ensuring that semi-annual reviews between student and advisor and/or supervising committee occur. All program students will attend mandatory orientation sessions at the beginning of each semester. In addition, all program students will meet individually with the GAR to obtain approval of course enrollment forms for each semester and each summer session. Note that program students who have selected a dissertation advisor will obtain that advisor’s approval of their course enrollment form before meeting with the GAR.
- A student’s selection of a dissertation advisor must be approved by the CMB-DSC and the Department Chair.
- Upon advancement to candidacy, program students will have convened a Dissertation Committee, and will meet with that committee twice each year – once during the fall semester and once during the spring semester. Each member of the Dissertation Committee will complete a progress evaluation form following each meeting of the committee. The student will be asked to review the forms with his/her dissertation advisor and then submit the forms to the program administrator so that they can be placed in the student’s file.
• Each program student will be required to complete and submit an annual progress report to the program administrator prior to May 30th of each calendar year and that report will be placed in the student’s file.
• Program students will follow the curriculum order outlined in the CMB PhD Program Policy and Procedures Manual unless approved by the GAR to do otherwise.
• Program students are normally expected to complete the CMB PhD program within five years. Requests to extend this period of matriculation must be approved by the student’s dissertation advisor, the members of the Dissertation Committee, the CMB-DSC and the Department Chair.

Annual Milestones to be completed by CMB PhD Program students:

Year 1 –
• Attend weekly CMB seminar
• Complete three core courses – BIO 5113 (Principles of Biochemistry), BIO 5123 (Principles of Molecular Biology) and BIO 5133 (Principles of Cell Biology) and earn a grade of B or better in each of these courses.
• Complete three qualifying exam colloquia (BIO 7041) associated with the three Principles courses and take a total of nine qualifier exams and earn an average grade of 3.0 or better (note – this constitutes the written qualifying exam requirement for this program).
• Complete three research rotations of 10 weeks each in laboratories of three different program faculty.
• Complete the Research Ethics and Design course (BIO 7413) with a grade of B or better.
• Select a dissertation advisor in whose lab the student will pursue his/her dissertation research.
• Perform Doctoral Research for academic credit (BIO 7213) during the summer.

Year 2 –
• Attend weekly CMB seminar
• Complete at least two elective courses (= graduate level lecture courses in Biology or related area) and earn a grade of B or better in each of these courses.
• Complete the Principles of Scientific Writing course (BIO 7143) and in so doing, prepare a draft of the dissertation proposal.
• Complete the Teaching in the Life Sciences requirement (BIO 7113).
• Complete two colloquium courses (BIO 7041).
• Perform Doctoral Research for academic credit (BIO 7212).
• Present synopsis of dissertation project in the Annual CMB Spring Symposium.
- Convene an Oral Qualifying Exam Committee and pass the oral qualifying exam no later than May 30th of the second year in the program.
- Advance to candidacy.
- Perform Doctoral Research for academic credit (BIO 7213) during the summer.

Year 3 –
- Attend weekly CMB seminar
- Complete remaining elective courses to a total of three courses taken, and earn a grade of B or better in each of these courses.
- Complete two colloquium courses (BIO 7041).
- Convene a Dissertation Committee and have this approved by the CMB-DSG and the Graduate School.
- Perform Doctoral Research for academic credit (BIO 7315-8).
- Meet once during each semester with the Dissertation Committee and have committee members complete and submit progress evaluation forms.
- Present synopsis of dissertation project progress in the Annual CMB Spring Symposium.
- Perform Doctoral Research for academic credit (BIO 7213) during the summer.

Year 4 –
- Attend weekly CMB seminar
- Complete two colloquium courses (BIO 7041).
- Perform Doctoral Dissertation for academic credit (BIO 7318).
- Meet once during each semester with the Dissertation Committee and have committee members complete and submit progress evaluation forms.
- Present synopsis of dissertation project progress in the Annual CMB Spring Symposium.
- Perform Doctoral Research for academic credit (BIO 7213) during the summer.

Year 5 –
- Attend weekly CMB seminar
- Complete two colloquium courses (BIO 7041).
- Perform Doctoral Dissertation for academic credit (BIO 7318).
- Meet once during each semester with the Dissertation Committee and have committee members complete and submit progress evaluation forms.
- Present a full-length public seminar in either the Cell and Molecular
Biology Seminar Series or the South Texas Center for Emerging Infectious Diseases Seminar Series.

- Defend the doctoral dissertation to the satisfaction of the Dissertation Committee.

**Degree Completion Checklist for Students**

- Maintain active student status by registering for courses every fall and spring semester and summer session.
- Complete, have approved by the student’s advisor and the GAR, and submit to the program administrator, the Annual Report showing adherence to the *Annual Milestones* detailed above no later than May 30th of each year.
- Complete all required coursework as detailed above.
- Schedule and successfully complete required written and oral qualifying exams as detailed above.
- Form your dissertation committee in consultation with your advisor and the GAR.
- Have your committee approved by the CMB DSC and the Graduate School
- Prepare and successfully defend your dissertation proposal as part of the oral qualifying exam requirement.
- Apply for Advancement to Candidacy upon completion of the required core course work and completion of the written and oral qualifying exams with passing grades.
- Enroll in required dissertation hours and complete your dissertation.
- Successfully defend your dissertation to the satisfaction of the Dissertation Committee.
- Submit required documentation to the Graduate School for completion and graduation.

I have read this form and have had the opportunity to discuss the information contained in it with my advisor. I understand the academic milestones that I am expected to reach in order to successfully complete the UTSA Cell and Molecular Doctoral program, as well as the expected timeline for completing these milestones. I also understand that failure to meet these milestones according to the schedule shown may result in loss of stipend funding, placement on academic probation, or dismissal from the program.

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**CMB FACULTY RESEARCH INTERESTS**

**DR. BERNARD P. ARULANANDAM, Professor of Immunology**

His research program is focused on understanding host-microbe interactions and identifying approaches to induce optimal mucosal protection and immunity. His current research efforts in the laboratory include: intranasal based vaccine approach against genital *Chlamydia trachomatis* infection and respiratory defenses against pulmonary tularemia. They are characterizing novel antigens as potential vaccine candidates against *C. trachomatis* genital infection and characterizing the use of a defined *Francisella tularensis* mutant as a live attenuated vaccine candidate against pneumonic tularemia. Additionally, they are examining the feasibility of using locally administered combinatorial immunotherapy against aerosolized tularemia.

**DR. EDWIN J. BAREA-RODRIGUEZ, Professor of Neurobiology**

The focus of his research is on the neurobiology of aging. The central hypothesis of his aging research program proposes that aged related impairments in cognition and synaptic plasticity share similar underlying cellular and molecular mechanisms. According to his model, oxidative stress causes impairment in neuronal excitability and maintenance of long-term potentiation (LTP), a form of synaptic plasticity believed to mediate learning and memory processes. The impairment in these physiological processes ultimately impairs spatial learning and memory in aged animals.

**DR. ASTRID CARDONA, Assistant Professor of Immunology**

The research in my laboratory utilizes experimental autoimmune encephalomyelitis (EAE) as a mouse model to investigate pathological events related to Multiple Sclerosis. The primary focus is to determine the contribution of the fractalkine receptor (CX3CR1) to disease severity. The ligand fractalkine and CX3CR1 are highly abundant in the central nervous system but they are also expressed by circulating cells. In humans, a polymorphic variant of CX3CR1 is adhesive defective and was associated with heart disease and age related macular degeneration. Therefore, our long term plan is to clarify the role of fractalkine/CX3CR1 in the brain and in the periphery using CX3CR1-deficient mice, and in Knock-in expressing the human receptors. Some of the questions we are addressing include: Does CX3CR1 play a role in the trafficking of microglial precursors? Does CX3CR1-deficiency on microglia or peripheral cells enhance neuronal/axonal pathology? Does CX3CR1-deficiency alter CNS T cell and/or monocytes functions?, and most importantly we intend to define the role of human wild type and variant CX3CR1 during brain inflammation.

**DR. AARON CASSILL, Associate Professor of Cell & Molecular Biology**

His research laboratory is interested in the mechanism of signal transduction in the Imported Fire Ant olfactory system. His laboratory is currently using molecular biology techniques to isolate odorant binding proteins and serine/threonine protein kinases which might regulate the system.

**DR. JAMES P. CHAMBERS, Professor of Biochemistry**

The focus of his research is on the characterization of calcium binding proteins in the cell and in particular the kinetic analysis of the \([\text{Ca}^{2+} + \text{Mg}^{2+}]\) - dependent adenosine-triphosphatase. His research focuses on the regulation of intracellular free calcium and its maintenance at extremely low concentrations (submicromolar), which is one of the main tasks of cells.

**DR. G. JILANI CHAUDRY, Assistant Professor Cell and Molecular Biology**

Anthrax toxin is secreted by *Bacillus anthracis*, the bacterium that causes anthrax. The toxin comprises three distinct proteins: protective antigen (PA), edema factor (EF), and lethal factor (LF). EF and LF are the toxic components, and their targets are inside cells. PA is nontoxic, but crucial because it delivers EF and LF to cytosol. To do that, PA uses two cell surface receptors, tumor endothelial marker 8 (TEM8) and capillary morphogenesis gene 2 protein (CMG2). On their own, EF and LF cannot get into cells.

Multiple projects are underway in my lab, and all employ various genomic, biochemical, molecular genetic, cell biological, and bioinformatics techniques: 1) Identification and characterization of novel mammalian genes whose products anthrax toxin needs to intoxicate cells. To that end we have identified a number of candidate genes, and have confirmed the relevance of some. 2) Mutational analysis of the toxin receptors. We use cloned receptor genes to make mutations in them. 3) Identification of cellular proteins that interact with TEM8 and CMG2. We use the yeast 2-hybrid system.
for this work. 4) Expression analysis of TEM8 and CMG2. By nested PCR we have determined the expression levels of all forms of the two genes in nearly 40 human tissues and cell lines. We are also doing this analysis in patient-specific paired normal vs. cancerous prostate tissues. The natural function of TEM8 and CMG2 remains unclear. However, both proteins appear important for new blood vessel formation (angiogenesis). Notably, TEM8 may be crucial for tumor angiogenesis.

A related project aims to identify genes that may confer drug resistance in mammalian cells. Acquisition of resistance to drugs is a serious hindrance to treating certain diseases. Using the drug thapsigargin as a model, we have identified several candidate genes that may confer resistance to it.

**DR. GARRY T. COLE, Professor of Medical Mycology**

Research in his laboratory is focused both on the development of human and veterinary vaccines against fungal diseases, and investigations of virulence mechanisms of medically-important fungi. His approach to vaccine development has been to apply methods of immunoproteomics and bioinformatics to identify vaccine candidates.

**DR. JURGEN ENGELBERTH, Associate Professor**

The major focus of his research program is on the metabolic analysis of signaling compounds and their molecular regulation within plants under insect herbivore attack. His studies of the metabolic analysis of signaling compounds include: insect-derived elicitors; production of proteins that block digestion or disrupt intestinal tissue; the production of defense-related secondary metabolites, which directly or indirectly affect the herbivore performance; lipid-derived compounds (oxylipins); and the regulation of the pathway leading to the production of jasmonic acid (JA).

**DR. THOMAS FORSTHUBER, Professor of Immunology**

His research interests focus on cellular immunology, T cell immunity, and autoimmune diseases. He focuses on “humanized” HLA-DR Tg mice as translational models for the investigation of human autoimmune diseases and the cytokine differentiation of autoimmune T cells using cytokine ELISPOT assay.

**DR. GARY Q. GAUFO, Associate Professor of Biology**

His research interest focuses on elucidating the mechanisms necessary for wiring the central and peripheral nervous systems, which include neural stem cell differentiation, migration, and axon pathfinding. These processes are also critical for neurogenesis and nerve regeneration in the adult nervous system. He is specifically investigating the transcriptional regulation of various sensory-motor circuits in the vertebrate head. His laboratory utilizes a host of genetic and cellular techniques, such as in vitro organ culture, genome-based microarray, RNA in-situ hybridization, immunohistochemistry, and fluorescent labeling, to study mice harboring genetic mutations for genes that code for transcription factors critical for neural development and disease.

**DR. M. NEAL GUENTZEL, Professor of Microbiology**

The main focus of his research is on bioremediation, which involves the use of microorganisms for removing toxic contaminants from the environment through metabolic activity. In addition to bioremediation, the laboratory also focuses on health effects studies and investigations into virulence factors of the human pathogens *Candida albicans* and *Vibrio cholerae*.

**DR. LUIS S. HARO, Professor of Cell & Molecular Biology**

His research program has centered on the identification, isolation and characterization of pituitary and placental hormones; and the isolation and biochemical characterization of prolactin receptors, growth hormone receptors, and insulin receptors. He is also investigating the roles of growth hormone antagonists in blocking breast cancer and the influence of growth hormone on the growth and physiology of brain cells.

**DR. HANS HEIDNER, Professor of Microbiology**

The primary focus of his research laboratory is the design and development of alphavirus-based vectors for vaccine and cell targeting applications. Alphaviruses are small RNA viruses that are transmitted to humans and other vertebrate hosts through the bites of infected mosquitoes. The alphavirus genome can be easily manipulated and this has led to the development of genetically modified alphaviruses capable of expressing foreign genes of interest in cultured cells or within living animals. They are using recombinant Sindbis viruses to evaluate new strategies for targeting alphavirus vectors to specific cell types that play an important role in the immune system. These efforts are intended to improve the immunogenic properties of alphavirus based-vectors that have been designed for use as vaccines. Their research also
may lead to the development of modified viruses that can specifically target and eliminate tumor cells.

**DR. BRIAN HERMANN, Assistant Professor of Stem Cell Biology**
Our laboratory studies the basic biology of spermatogonial stem cells (SSCs), which are adult-tissue stem cells responsible for sperm production in the mammalian testis and which are essential for male fertility. Ongoing studies in the lab are focused on 1) determining how these cells are regulated and behave like stem cells, 2) how we can prevent SSC loss due to chemotherapy, 3) how SSCs are involved in male infertility, and 4) how does the male germline age. The approaches we use in the lab are multidisciplinary, including animal models (rodents, primates), human tissues, and an in vitro SSC culture system, an in vivo transplantation assay for stem cells, various wide-field microscopy techniques, as well as conventional and high-throughput molecular biology and genomic approaches. Thus, our work has potential implications for basic stem cell biology, reproduction, as well as translational significance for treatment and prevention of male infertility.

**DR. KARL E. KLOSE, Professor of Microbiology**
His lab is interested in bacterial pathogenesis -- how bacteria cause disease. He has worked most extensively with *Vibrio cholerae*, the bacterium that causes cholera; and is also researching *Francisella tularensis*, the bacterium that causes tularemia, or rabbit fever. His lab is working to identify genetic factors responsible for *F. tularensis* to cause disease and to develop suitable vaccine candidates to protect against tularemia infection.

**DR. RICHARD G. LeBARON, Associate Professor of Cell & Molecular Biology**
The focus of his research is on how humans make and keep organs (kidney, heart, brain) and appendages (fingers, arms, legs) healthy. For example, organs are built much like one might build a simple computer. We know that to build organs, cells work together to make a three-dimensional "matrix." Science prefers to use the term "extracellular matrix" (ECM) because cells make hundreds of small parts of the matrix, then cells put together the parts together to form a matrix -outside- of the cell. This ECM offers framework and scaffolding for millions of cells to translocate into the new ECM in order to form communities that operate organs and appendages. We have previously focused on engineering three-dimensional matrices that help cells construct new organs and appendages. We are now complementing this approach, focusing on a special ECM protein named BIGH3. Our recent matrix investigations discovered that BIGH3 carries a license to kill; when BIGH3 and cells make contact, BIGH3 activates a program in the cells genes that within hours cause cell death. Probes designed to look deep into the matrix have discovered that actually, BIGH3 can work with us and against us, depending on the disease. For example, occasionally a cell is converted into a cancer cell. BIGH3 can kill the cancer cell; that is a good outcome. However, type II diabetes sends a signal allowing BIGH3 to kill good cells; that is a bad outcome likely leading to human diabetic complications including kidney, heart and ocular failure. Regarding exactly how BIGH3 carries out its cell-death missions is under intense investigation. We believe we are hot on the trail, and expect that we will soon understand how to control BIGH3, meaning we can help treat cancer and diabetic patients.

**DR. CHIN-HSING ANNIE LIN, Assistant Professor of Cell and Molecular Biology**
Our research is focused on the stem cell and cancer biology. Ongoing studies in the lab related to stem cell biology include 1) understanding how stem cells in adult brain migrate and homing to their final destination to generate functional neurons, 2) how we can apply stem cells to the regenerative medicine for treating stroke, trauma, spinal cord injury, and neurological disorders. On the other hand, if neural stem cells did not make their commitment properly that potentially could cause brain tumor. Our research related to cancer biology is to dissect out the fine tuning process between normal and cancer stem cells. Thus, our work has potential implications for basic stem cell biology as well as translational significance for treatment and prevention of diseases. The approaches we use in the lab including animal models (rodents, primates), human tissues, various molecular biology techniques, as well as high-throughput genome-wide analyses.

**DR. JOSE L. LOPEZ-RIBOT, Professor of Microbiology**
The focus of his research is on the opportunistic pathogenic fungus *Candida albicans*. Studies in his laboratory try to integrate virulence and host immune responses to better understand and offer a more global perspective of *C. albicans* pathogenesis. Some of the highlights of his research program are: i) study of *C. albicans* biofilms, ii) development of novel immune-based therapies to combat candidiasis, and iii) role of morphogenetic conversions in the pathogenesis of candidiasis. Other areas of interest include genomics and proteomics, cell wall and adhesion, antifungal drug resistance, development of diagnostic techniques for candidiasis, and high throughput screening of small molecule libraries to study complex processes during candidiasis (with an emphasis on filamentation and biofilm formation).
DR. MARTHA J. LUNDELL, Associate Professor of Molecular Biology
The research interests in her laboratory focus on elucidating mechanisms that specify cell fate during neurogenesis. In particular, they are examining the developmental pathway of neurons that synthesize serotonin in the Drosophila CNS. By using a combination of genetics, molecular biology, immunohistochemistry and confocal microscopy, they have characterized a number of genes that are essential in the progression of the lineage from the progenitor neuroblast to the differentiated serotonin cells. They are investigating the hierarchy of genetic interactions necessary to specify cell fate. Their characterization of genes important in the differentiation of these neurons will provide molecular tools that can be used to investigate the physiological function of serotonin in a genetically tractable organism.

DR. JOHN McCARREY, Professor of Cell and Molecular Biology
Research in my laboratory is centered on the development, differentiation, and epigenetic regulation of mammalian germ cells - the cells that form the gametes (sperm in males and eggs in females) and stem cells (cells that have the ability to give rise to other types of cells). Our primary experimental system is the mouse, however we also conduct studies in baboons, opossums, and other mammalian species. We are interested in 1) regulation of gene expression in germ cells, 2) X-chromosome activity and inactivity in germ cells, 3) genomic imprinting and how this becomes established during gametogenesis, 4) developing the baboon as a nonhuman primate model for studies of stem cell-based therapeutic approaches, 5) environmentally-induced epimutations and the manner in which the organism corrects these abnormalities, and 6) maintenance of enhanced genetic integrity in germ cells and stem cells and the manner in which this is mechanistically related to pluripotency.

DR. PAUL R. MUELLER, Assistant Professor of Cell & Developmental Biology
Our lab is interested in understanding how organisms balance the rate of cell proliferation with other events that take place during early embryonic development. All eukaryotic cells, from yeast to human, proliferate by following a series of events known as the cell cycle. The cell cycle includes the key phases of the cell division process including growth (G1 and G2 phases), duplication of the genome (S phase), and separation of the duplicated genome to daughter cells (mitosis or M-phase). This process of one cell becoming two is repeated throughout development as the zygote, or a fertilized egg, divides into the trillions of cells that make up a complete organism such as ourselves. While simple in principle, the actual process and regulation of the cell cycle complex. For example, the cell cycle of a normal cell must stop or slow its progression in response to specific developmental signals or perceived damage to cellular components. When this regulation fails, developmental abnormalities and disease states such as cancer can arise. In our research, we use the model system Xenopus (African clawed frog) to study how the cell cycle is regulated. Xenopus offers the advantage of combining both biochemical and developmental approaches. For example, the cell cycle can be reconstituted with Xenopus egg extracts, thus providing a powerful assay for studying the action of recombinant or purified cell cycle regulators. In addition, Xenopus embryos are easily obtained and cultured, and their size and external development makes them ideal for developmental studies. Finally, due to the highly conserved nature of the cell cycle regulatory apparatus, it is possible to use complementation of more genetically tractable organisms (fission and budding yeast) to study the action of Xenopus proteins. Thus, our lab utilizes a multifaceted experimental approach to elucidate how various developmental and cellular cues regulate progression through the cell cycle.

DR. CHRISTOPHER NAVARA, Associate Professor of Reproductive & Developmental Molecular Biology
I have two central interests that I am pursuing in my on-going research. The first part of my research involves understanding the basic biology of embryonic stem cells and in particular their cell cycle regulation. These cells represent a unique stage of mammalian developmental and offer the possibility of greater understanding of embryogenesis, differentiation and pluripotency. Additionally based on my preliminary data I believe that these cells share many of the hallmarks of very early cancer cells (including, high telomerase activity, continued cell cycle progression and chromosome instability) and I believe that studying ES cell maintenance and differentiation can inform our knowledge of cancer and cancer progression. I am also interested in the practical application of these cells, specifically the use of non-human primate ES cells and non-human primates as preclinical models for stem cell derived therapies. We are currently pursuing the use of stem cells for repair of musculoskeletal injuries in this important model system.

DR. CARLOS PALADINI, Associate Professor of Neuroscience
The goal of his lab is to focus on and investigate 1) the effects of direct manipulation of the receptor
interactions on individual dopamine neurons to understand their normal physiology and function; and 2) the effects of drug self-administration on receptor interactions in dopamine neurons and whether these altered interactions can affect self-administration behavior. Through the combined effort of electrophysiological, imaging, pharmacological, and behavioral assays, his lab attempts to gain a better understanding of dopaminergic neuron function in both normal and pathological states.

**DR. GEORGE PERRY, Dean and Professor of Biology**

His studies are focused on the mechanism of formation and physiological consequences of the cytopathy of Alzheimer’s disease. He has shown that oxidative damage is the initial cytopathy in Alzheimer’s disease. His research is working to determine the sequence of events leading to neuronal oxidative damage and the source of the increased oxygen radicals. His current studies focus on (i) the mechanism for RNA-based redox metal binding; (ii) the consequences of RNA oxidation on protein synthesis rate and fidelity; (iii) the role of redox active metals in mediating prooxidant and antioxidant properties; (iv) the signal transduction pathways altered in Alzheimer’s disease that allow neurons to evade apoptosis; and (v) the mechanism of phosphorylation control of oxidative damage to neurofilament proteins.

**DR. CLYDE PHELIX, Associate Professor of Anatomy and Neurobiology**

Emphasis is on extrahypothalamic influences on hypophysiotropic and hypophyseal hormonal systems in CNS stress arcs. The majority of our anatomical work deals with chemical identification and morphological verification of brainstem and limbic afferents. Functional correlates involve neuroanatomical and pharmacological investigations of the role of neuronal pathways, between limbic-hypothalamic regions and brainstem cardiovascular regulatory centers in hemodynamic regulation during stress. The influences of environmental factors on gene expression in neuronal populations participating in the development of hypertension are a primary interest. Collaborations allow correlative investigations of chemoreceptive functions of area postrema, neurophysiological functions of transmitters in the hippocampus, and neurochemical effects of cocaine and other drugs of abuse on dopamine and serotonin in the basal forebrain.

**DR. ROBERT RENTHAL, Professor of Biochemistry**

His research laboratory focuses on two areas. 1) Insect Olfaction: How do odors and pheromones cause ion channels to open in olfactory receptor neuron membranes? How do ants use pheromones to organize their colonies? 2) Membrane Protein Folding. What are the forces that stabilize integral membrane proteins in compact structures? His lab uses techniques of biochemistry, molecular biology, proteomics, microscopy, and fluorescence spectroscopy.

**DR. STEPHEN SAVILLE, Associate Professor of Molecular Microbiology**

Research in this laboratory is centered primarily around the opportunistic fungal pathogen *Candida albicans* and in particular the role that morphogenetic and associated changes play in the virulence of the organism. Ongoing research in his lab involves (i) constructing genetically modified strains of *C. albicans* and testing their pathogenic potential in both animal and mucosal tissue culture models of disease, (ii) exploring the global gene expression changes that occur in the fungus as the disease progresses and (iii) screening small molecule compound libraries in an attempt to identify new potentially therapeutic compounds which prevent *C. albicans* filamentation.

**DR. DAVID M. SENSEMAN, Associate Professor of Neuroscience**

Research in his laboratory is focused on how visual information is processed within the vertebrate central nervous system to guide behaviors such as prey tracking and capture using turtles as an experimental model. A combination of experimental techniques including (1) high-speed voltage-sensitive dye imaging, (2) large-scale computational modeling, and (3) kinematic analysis combined with EEG and recordings form free-behaving turtles are being used to examine this problem. At present, the lab’s particular focus is on how visual information might be encoded in the dynamics of propagating cortical and tectal waves.

**DR. JANAKIRAM SESHU, Associate Professor of Microbiology**

His research interests focus on molecular microbiology and immunology of Lyme disease and Q fever. Lyme disease is the most prevalent tick-borne infection in the US and is caused by a spirochetal pathogen called *Borrelia burgdorferi*. His laboratory is interested in the various molecular mechanisms adopted by the *Borrelia burgdorferi* in the infectious processes that result in Lyme disease. Dr. Seshu employs several experimental tools in the fields of Microbiology, Molecular Biology and Biochemistry to find answers as to how this pathogen is able to cause disease. The lab is also interested in defining and modifying antigens from an intracellular, biodefense-related pathogen *Coxiella burnetii* that causes Q fever. There are several research opportunities for undergraduates who plan on majoring in Biology with
an emphasis in Microbiology and Immunology.

**DR. VALERIE SPONSEL, Professor of Plant Physiology**
Her research focuses on the gibberellin group of plant hormones (phytohormones) that control many phases of plant growth and development, either alone, or in conjunction with other phytohormones. Understanding how the level and location of bioactive gibberellin is regulated throughout a plant’s life cycle can lead to opportunities for manipulating plant growth and development for the enhancement of food, fiber or fuel production. Currently students in her laboratory are studying gibberellin-auxin crosstalk, using biochemical, molecular biological, and bioinformatics approaches. This work is being conducted in conjunction with Drs. Garry Sunter (Biology) and Jianhua Ruan (Computer Science). Additional research projects include work on medicinal plants, such as Artemisia annua, which produces a valuable drug for treating malaria. Quantitation of artemisinin levels in phytohormone-treated Artemisia plants is being conducted in collaboration with Dr. Stephan Bach (Chemistry).

**DR. GARRY SUNTER, Professor of Cell and Molecular Biology**
The main focus of his research is directed toward the study of plant gene expression, DNA replication and plant-pathogen interactions using single-stranded DNA plant viruses of the family Geminiviridae as a model system. His laboratory is particularly interested in two viral genes that are involved in replication and transcription of the viral genome. The coordinate regulation of these genes appears crucial to ensure correct timing of both replication and transcription and may well reveal novel mechanisms and insights into plant transcription mechanisms. The laboratory is also interested in the role of viral genes in host gene activation. They are interested in identifying cellular genes activated and/or represented by the virus and elucidating mechanisms by which the virus interacts with proteins required for DNA replication and cell cycle progression.

**DR. JUDY TEALE, Professor of Immunology**
The focus of her research is the immune response to infectious organisms. One of their major projects is a mouse model of the disease neurocysticercosis (NCC) which is caused by the larval form of a cestode parasite that infects the central nervous system. Their studies have concentrated on immune cells and cytokines elicited during infection and how such immune responses compromise the blood brain barrier. Another major study involves the immunopathogenesis associated with infection with the bacterium Francisella tularensis. Determining the molecular mechanisms associated with an ineffective innate immune response which leads to septic shock is underway. They are also studying infection with F. tularensis in elderly individuals as well as in young adults. These studies are designed to determine the underlying mechanisms related to the increased morbidity and mortality in elderly individuals to respiratory pathogens in general.

**DR. ANDREW T.C. TSIN, Professor of Biochemistry**
The focus of his vision research laboratory is to understand the biochemical and cellular/molecular events in the eye related to normal visual functions and to abnormal/disease conditions. A major emphasis of his laboratory is to investigate the mechanism of pigment regeneration in the cone visual system. An additional emphasis of his laboratory is to learn how hyperglycemia and/or insulin induce vascular endothelial growth factor (VEGF) secretion by retinal cells. Their long term goal is to learn how cytokines mediate angiogenesis leading to diabetic retinopathy or age-related macular degeneration.

**DR. YUFENG WANG, Associate Professor, Bioinformatics and Computational Biology**
Research in her laboratory focuses on the comparative genomics, molecular evolution, and systems biology of gene families. Approaches range from the use of cutting edge bioinformatic and genomic tools, to the statistical modeling and analysis based on evolution and population genetics theory. Her laboratory is particularly interested in (1) evolutionary mechanism and systems biology of infectious disease and (2) molecular evolution of vertebrate gene families. Her laboratory is using genomic and related data, coupled with other biochemical and microbiological information, to identify new therapeutic targets and to further study the underlying evolutionary mechanisms in diseases such as malaria. They are also interested in the association between sequence evolution and gene network regulation.

**DR. TAO WEI, Assistant Professor of Molecular Biology and Microbiology**
Our research interest is centered on basic and translational research of bacterial biofilm development. Our long-term goal is to develop effective strategies to disrupt biofilm formation of P. aeruginosa and A.
*P. aeruginosa* is focused on a question how exposure to antimicrobial therapy stimulates biofilm formation. Biofilm stimulation by certain antimicrobial agents may be launched via sophisticated mechanisms: the inhibitors trigger the SOS response to repair DNA damage, while the signaling pathway via bis-(3’-5’)-cyclic dimeric guanosine monophosphate (c-di-GMP) regulates biofilm formation to protect the biofilm cells. While mechanisms for biofilm induction remain unclear, our research aim is to elucidate such molecular mechanisms, which will help develop effective therapeutic strategies against the stress-inducible biofilm formation. Additionally, our research regarding *A. baumannii* is aimed at identifying proteins that can serve as potential targets of wound infection vaccines against *A. baumannii* biofilms. Our research goal is to develop an effective strategy for treatment of the bacterial infections without increasing the risk of antimicrobial resistance emergence.

**DR. FLOYD WORMLEY, Associate Professor of Microbiology & Immunology**

His research laboratory focuses on studies involving the use of Cryptococcus neoformans as a model organism to study host-fungal interactions for the purpose of developing novel immune therapies and/or vaccines to treat or prevent invasive fungal infections. Their ability to disrupt, introduce, and/or recover genes from *C. neoformans* coupled with the availability of effective animal model systems provides them with the capability to study both sides of the host/pathogen paradigm. They are able to study the effects of various genetic manipulations on the virulence of the yeast as well as the host immune response. Their expectation is that these studies will lead to the development of therapies and/or vaccines to treat or prevent fungal infections in immune compromised individuals.
Molecular Microbiology and Immunology Track

The primary objective of the track in Molecular Microbiology and Immunology is to provide graduates with advanced academic and research training in all aspects of Microbiology and Immunology, especially in those areas that pertain to infectious diseases. This track will provide expertise in bacteriology, virology, parasitology, mycology, immunology, vaccinology, biodefense, and molecular genetics. The information derived from research in this area has an enormous impact on biology and medicine.

Students in this track follow the regular core curriculum for the concentration in Cell and Molecular Biology; however, their Doctoral Dissertation topic, proposal and research need to be in an area related to Microbiology and Immunology. Likewise, students are also encouraged to select the majority of their elective courses and colloquia from those offered that are broadly related to the field of Microbiology and Immunology. The overall program of study for this track may differ by no more than 12 semester credit hours from the program of study for the regular concentration in Cell and Molecular Biology and must be approved by the student’s Dissertation Advisor and the Cell and Molecular Biology Doctoral Studies Committee.

Stem Cell Biology Track

Stem Cell Biology is a rapidly emerging field rooted in basic principles of Cell and Molecular Biology that has provided new avenues to investigate normal cellular and developmental processes as well as novel approaches to learning more about and/or treating complex diseases and other debilitating conditions. The Stem Cell Biology Track will allow students pursuing their doctoral degree in Cell & Molecular Biology the opportunity to focus on Stem Cell Biology, including topics related to the basic biology of stem cells (from any species) as well as those related to translational research involving potential contributions of stem cells to tissue engineering or other therapeutic approaches. This will include, but is not limited to, molecular biology of stem cells, cell biology of stem cells, epigenetic programming in stem cells, maintenance of genetic integrity in stem cells, and the use of stem cells to study disease etiology, and will be based on studies of embryonic stem cells, induced pluripotent stem cells, germline stem cells, neural stem cells, mesenchymal stem cells or other tissue-specific stem cells, as well as stem cells from non-mammalian organisms including lower vertebrates, microorganisms and/or plants.

Students in this track will follow the standard curriculum and program of study for the concentration in Cell and Molecular Biology; however, their Doctoral Dissertation topic, proposal and research must be in an area related to Stem Cell Biology. Among the three elective courses required for the standard CMB program of study, students in this track will be required to take two courses focused on Stem Cell Biology – “Cell Biology of Stem Cells” and “Molecular Biology of Stem Cells.” Finally, students in the Stem Cell Biology track will be required to enroll in colloquia that address topics related to Stem Cell Biology. The overall program of study for this track may differ by no more than 12 semester credit hours from the standard program of study for the concentration in Cell and Molecular Biology and must be approved by the student’s Dissertation Advisor, a subcommittee that will oversee the Stem Cell Biology Track, and the Cell and Molecular Biology Doctoral Studies Committee.