Division of Chemical Biology
and Medicinal Chemistry

GUIDE TO GRADUATE STUDY
COLLEGE OF PHARMACY

The University of Texas at Austin
(Revised August 15, 2019)
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I. Introduction

The “Division of Chemical Biology and Medicinal Chemistry Guide to Graduate Study” of the College of Pharmacy is intended to be an informative supplement to the “College of Pharmacy Guide to Graduate Study”. These guides are not intended to supersede University policy on graduate studies. Parts of the College guide are included here for emphasis and convenience. Substantial portions of this Guide have been taken verbatim (or modified appropriately) from other Division Guides and University web pages. We thank the divisions for allowing us to use these guides as the frameworks for this guide.

II. Advising and Admissions

A. ADVISING

The Graduate Advisor in the College of Pharmacy (Dr. Karen Rascati) has overall responsibility for graduate student recruitment and for the counseling and academic advising of graduate students in the College. Dr. Chris Whitman is the Academic Advisor for Chemical Biology and Medicinal Chemistry. Specifically, he helps students with course selection and programmatic progress and is available to handle grievances. The Graduate Coordinator is Char Burke who is the contact person for your application to graduate school in the College of Pharmacy. The Graduate Coordinator assists the Graduate and Division Academic Advisors with all administrative duties associated with graduate programs in the College. She is an excellent resource for information about the protocols involved in obtaining the Ph.D. degree, in choosing courses, and for answering other programmatic questions. Cathy Rodriguez is the Division Coordinator for Chemical Biology and Medicinal Chemistry and she can help you with GRA appointments, tuition, travel, and other logistics. After a student chooses a Supervising Professor, that professor, the student, and the Academic Advisor work together in making course selections and ensuring timely progress through the graduate program. Formal paperwork must still go through the office of the Graduate Advisor. The staff in the Office of the Dean of Graduate Studies (Main Building, Room 101) is also available to assist graduate students.

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B. ADMISSIONS

In addition to the requirements listed in the College Guide, there are three more specific requirements for admissions to the Chemical Biology and Medicinal Chemistry Ph.D. Program:

1. A bachelor’s or master’s degree or equivalent in pharmacy, chemistry, biochemistry, or a biological science. Pre-doctoral training includes coursework in organic chemistry, physical chemistry, biochemistry, and molecular biology.

   Applicants without the appropriate background may need to complete additional course work during their career within the College or as a condition for admissions. Applicants who are deficient in Physical Chemistry, for example, can enroll in two semesters of undergraduate Physical Chemistry.
2. Undergraduate laboratory experience (outside of class laboratories) is highly recommended. Applicants with laboratory research experience are generally preferred over those without this experience.

3. The three letters of recommendation should be from individuals who are well acquainted with the applicants’ academic work, character, and research experience. Letters from family friends, relatives, high school teachers and counselors are not useful.

The faculty reviews all completed applications, but applicants are not guaranteed admission even though they may meet these requirements.

**III. Laboratory Safety and Compliance – Dr. Whitman is happy to help with this!!!**

**A. LABORATORY SAFETY**

Safety is of paramount concern in laboratories. Students should constantly guard against injuries from cuts, fires, explosions, and hazardous chemicals. Safety glasses must be worn in the laboratory. Laboratory coats should be worn. Closed shoes are required. Sandals and flip-flops are forbidden. A sign should be posted when dangerous materials or explosive gases are being employed in a laboratory. Students should review the relevant safety information on the UT web site at EHS Assistant (https://ehs.utexas.edu/programs/labsafety/ehsassistant/). The available courses are shown under the training tab or (https://ehs.utexas.edu/training/lab-training-requirements.php). This link will redirect you to UTLearn (https://utlearn.utexas.edu/). If you login, it will show you what classes you need to take (“Your transcript”). **Copy and paste in the link and follow the instructions. If you have any questions, see Dr. Whitman. (Links change and UT moves things around!!)**

- OH 101 Hazard Communication (General)
- OH 201 Laboratory Safety
- OH 202 Hazardous Waste Management
- FF 205 Fire Extinguisher Training
- OH 207 Biological Safety
- OH 102 Hazard Communication (Site-Specific) - to be given by lab supervisor

There might be other courses depending on your specific work including OH 204 Compressed Gases, OH 218 Bloodborne Pathogens, OH 241 Cryogen Safety, and OH 301 Basic Radiological Health. Historically, CBMC student do not work with animals or human subjects (so don’t worry about the corresponding training).

Biosafety information: Additional biosafety information can be found at the link below. However, the Supervising Professor has generally submitted the appropriate forms. Please check with your Supervising Professor before submitting any of the paperwork described in the link (if the link doesn’t work, paste in the URL):

https://ehs.utexas.edu/programs/biosafety/

**After you have completed the safety courses, fill out the form in Appendix 1, have it signed by Dr. Whitman, and give it to Cathy (in the CBMC Office, BME 6.202)**
If you are injured or have an accident/fire/explosion while working in the research laboratory, you MUST contact your supervising professor, Dr. Whitman, or call EHS (512-471-3511). At night and on weekends, call the Campus Police (512-471-4441) and the police will refer you to the proper emergency responder. Generally, your supervising professor or Dr. Whitman will call EHS so you can attend to your injuries. You should report to the Student Health Services for treatment. A written report should be made within 24 hours to EHS (again, this can be done by your supervising professor with your input). This report should detail the time, date, place, and circumstances of the accident.

In the event of fire, serious injury, or other life threatening situations, call 911.

Lights, water, steam and gas should be turned off when leaving the laboratory, unless special arrangements are made to have them remain on. Be particularly careful that water does not overflow and cause damage in the building.

No University equipment (including computers) or glassware/materials should be removed from the building without permission of the supervising professor and the Dean's Office. All laboratories and offices should be closed and locked when personnel are not present.

Students must complete and document all laboratory and university safety requirements in a timely manner. Overall, the student must take personal responsibility for all lab safety and training. In addition, the student is responsible for reporting any observed safety violations and accidents.

Unsafe conduct can result in dismissal from the program.

B. COMPLIANCE

1. Compliance: Students must complete any and all compliance training required by the University and the College. As part of this process, students are required to read this entire handbook and certify that they have read and understand all of the contents. Students must sign the certification on page 2 of this handbook and turn it into the Academic Advisor (Or Cathy in the CBMC office) at the time of matriculation.

2. Conflict of Interest: You must complete the following conflict of interest training so that your vast personal wealth and your significant holdings in biotechnology and/or other pharmaceutical companies do not cloud your objectivity in research! After you have completed the training, send the email to Jennifer Bindel. (If the link doesn’t work, paste in the URL).

https://research.utexas.edu/ors/conflict-of-interest/

IV. THE DOCTOR OF PHILOSOPHY DEGREE

A. OVERVIEW

Progression through the Chemical Biology and Medicinal Chemistry Ph.D. program involves the satisfactory completion of 8 didactic courses, 2-3 research laboratory rotations, participation in the seminar series including the presentation of a departmental seminar, two long semesters as a teaching assistant, a two-part qualifying examination, the development and execution of a
successful original research project under the supervision of a faculty member, a written dissertation, and the defense of the dissertation. These requirements are described in detail in this section, and in all cases, are dependent upon approval from the appropriate advisors. In brief:

a) Students are required to take four core courses (Physical Organic Chemistry, Biochemistry, Molecular Biology, and Medicinal Chemistry) and four additional courses selected in consultation with the Supervising Professor. These courses cover topics in bio-organic chemistry, mechanistic enzymology, structural biology, and synthetic organic chemistry and are offered by Division faculty and by Chemistry and Molecular Biosciences faculty. Students must complete all courses with a grade of B- or above (but maintain a 3.0 GPA).

b) Students are strongly encouraged to carry out 2-3 research rotations in their first semester. The rotations are discussed with and scheduled by the Academic Advisor. This requirement may be waived under unusual circumstances. At the end of the rotations, students select a Supervising Professor.

c) Students must attend the Division seminar series every long semester and present a divisional seminar in their third long semester. The Academic Advisor will notify the student in order to schedule to the seminar.

d) Students must serve as teaching assistants for two long semesters in the College of Pharmacy, the Department of Chemistry, Molecular Biosciences, or related departments.

e) Students must successfully pass a two-part written and oral qualifying examination. The first part covers the proposed dissertation research project and the second part covers an original research proposal. For each part, students prepare a 10-15 page proposal and defend the proposal after a 20-30 min presentation (of the proposal).

f) Under the direction of the Supervising Professor, students complete the dissertation research project, write a dissertation, and defend the dissertation. Students must make satisfactory progress on their research project each semester, as determined by the Supervising Professor, in order to complete the Ph.D.

In general, students complete all requirements (except for the research project described in f) by the end of their second full year. Students take the two-part qualifying examination at this time so that they can be admitted to candidacy by the start of the third year. The research project is then completed over the next 3-5 years.

B. STUDENT RESPONSIBILITY

The student is held responsible for knowing deadlines, degree requirements and enrolling for courses that fit into the degree program. The student is likewise held responsible for knowing the University regulations with regard to the standard of work required for continuance in the Graduate School. If the student needs additional information, the Student Office of the Graduate School, the Graduate Advisor, or the Academic Advisor should be consulted. All students are encouraged to check with the appropriate degree clerk in the Student Office of the Graduate School early in their graduate careers.

C. CURRICULUM

1. Listed below are the course requirements that must be satisfied before a student may apply for doctoral candidacy. It should be noted that courses are not offered every semester and are subject to change.
Core Course Requirements (Required of all students unless waived by the Academic Advisor, as described below):

- CH 386J Advanced Organic Chemistry
- CH 395G Biochemistry (This can be replaced with other courses by permission)
- CH 395J Molecular Biology (This can be replaced with other courses by permission)
- PGS 396M Medicinal Chemistry: General Principles, Pharmacological Classification, and Mechanism of Action

Electives (Choose 4 courses): These are some examples – if you find a course that interests you, ask Dr. Whitman!

- PGS 388C Introductory Bioorganic Chemistry
- BCH 339J Chemical and Synthetic Biology
- BCH 394P Bioinformatics
- CH 386K Advanced Organic Chemistry
- BCH 387D Physical Methods in Biochemistry and Molecular Biology
- BCH 394 Structure and Function of Proteins & Nucleic Acids

Students may enroll in other electives with the approval of the Academic Advisor and the Supervising Professor. Fill out the Advising form (Appendix 1) each semester.

2. Division Seminar: All students are required to attend the Division seminars (PGS 196S) unless a schedule conflict precludes their attendance. The conflict must be discussed with the Academic Advisor and the absence approved. In the fall semester, seminars are held at 2 pm in PHR 4.114. In the spring semesters, seminars are held at 12:30 in PHR 4.114. The room is subject to change. Seminars are generally 1 hour (with questions).

All students must present a divisional seminar in their third long semester. The Academic Advisor will contact the student in order to schedule the seminar. See Appendix 2 for helpful hints to guide you in the presentation of your seminar.

3. Course Waivers: Students who have been accepted into the Ph.D. program with previous graduate level course credit or relevant experience may have some of the required courses waived based upon agreement with the Supervising Professor and the Academic Advisor. Both must agree upon this waiver for it to be approved; the default is that the student must take the required course. When appropriate, a professor teaching a comparable course may be consulted for guidance or comparison of syllabus.

D. RESEARCH ROTATIONS AND CHOOSING A SUPERVISING PROFESSOR

1. Research Rotations: Students are strongly encouraged to review the individual faculty web pages, read the listed articles (review articles can be particularly useful), and talk to other graduate students in order to find compatible research interests. Ideally, the literature work should be completed before applying to a program, but it can be done during the registration period and the first few weeks of the first semester. Students will discuss their 2-3 top choices with the Academic Advisor who will arrange for 2-3 research rotations (6 to 9 weeks in duration). Students must meet with the faculty member before starting the rotation (at least one week before the start of the rotation) and may be required to write a short report at the end of the rotation (to be turned in to the Supervising Professor) and/or make an oral presentation. It is very important that students impress the faculty member with their attitude, initiative, work ethic, and academic preparation during this rotation. If a student fails to make a favorable impression, he/she may NOT find a willing Supervising Professor and is subject to dismissal from the program.
2. Choosing a Supervising Professor: Students must select a Supervising Professor at the beginning of their second long semester. After completing the research rotations, students discuss their preferences for a supervising professor with the Academic Advisor. The Academic Advisor will discuss these preferences with the faculty members involved and inform the student of the decision. A faculty member is NOT required to take a student in his laboratory. Choosing a supervisor requires the consent of the faculty member involved. The selection of the Supervising Professor is a very important decision and a milestone in your graduate and professional career.

3. Change of Supervising Professors: In consultation with the Supervising Professor, Academic Advisor, and Division Head, students are permitted to change Supervising Professors during the course of their program, should this enhance their progress towards a degree. Thus, the initial choice, while important, may be changed with a compelling reason before the student enters candidacy. Changes after candidacy are possible, but are likely to substantially slow a student's progress towards a degree.

E. THE QUALIFYING EXAMINATION AND CANDIDACY

Please meet with Dr. Whitman when you’re ready to do this!

1. General Procedure: At the beginning of the semester in which the qualifying examination will be taken, the student should notify the Graduate Coordinator that candidacy is approaching. Students should also update their progression worksheet and notify the Academic Advisor to ensure that there are no deficiencies.

2. Proposal and Presentation Guidelines: Students will prepare two written proposals. The first proposal (Part 1) involves his/her research project and the second proposal (Part 2) involves an original project conceived and developed by the student. Both proposals must include five general sections (specific aims, background & significance, preliminary studies, if applicable, research design & methods, literature cited). More details can be found in Appendix 3. Generally, both proposals are 10-15 pages in length (including Figures and Schemes, but not references - single spaced). Students will also prepare two Powerpoint presentations (both about 20-30 min in length) summarizing the highlights of the written proposals. The written proposals should be submitted to the committee a minimum of one week prior to the scheduled exam (unless other arrangements have been made with committee members). Otherwise, the exam is subject to cancellation and rescheduling.

3. Qualifying Exam Committee: An examining committee will be formed, consisting of the student’s Supervising Professor and at least three other faculty members, one of whom must be from outside the College (selected by student in consultation with his/her Supervisor). At least three members of the committee must be College of Pharmacy faculty, and at least two members must be faculty in the Division of Chemical Biology and Medicinal Chemistry. The Supervising Professor serves as the committee chair, but does not participate in the questioning. Once the composition of the committee has been determined, it is the student’s responsibility to schedule the exam (time and place) and have the appropriate equipment in place.

4. Qualifying Exam Procedures: At the exam, the student will be asked to give one of the Powerpoint presentations. The student will be asked questions during the presentation and/or at the end of the presentation. Once there are no more questions, the student will be asked to give the other presentation. Questions will be related to the presentation as well as the fundamentals of Medicinal Chemistry, Biochemistry, Chemistry, or related topics. Generally students trip up on fundamentals so it is important to review your coursework.
The examining committee will evaluate the candidate for his/her general knowledge of Medicinal Chemistry, Biochemistry, Chemistry, and related topics. The committee will evaluate the proposals for creative thought, understanding of the chosen scientific problem, clarity and organization of presentation, and thoroughness and accuracy of experimental design. Although no specific amount of time is required for the exam, it is typically 2-3 hours in length.

5. Outcomes: A student may be allowed to repeat part 1 or part 2 of the exam (written or oral), at the discretion of a majority of committee members. However, a student is only allowed one re-examination. The decision for transfer to a terminal master’s program may also be made at this time or at a subsequent meeting. If the qualifying examination is not passed, the examining committee may:
   1. Recommend that the student be terminated from the PhD graduate program.
   2. Recommend that the student be allowed to retake the examination(s).
   3. Require that other action be taken (e.g., prior to retaking the examination, the student may be required to take additional coursework for better preparation).

After you pass the exam, have your committee sign the forms (available from the Graduate Coordinator). In addition, follow the procedure in the College Guide to advance to candidacy.

F. THE DISSERTATION AND DISSERTATION DEFENSE

1. Dissertation Supervisory Committee: The application for candidacy includes specification of the members of the Dissertation Supervisory Committee. The student consults with the Supervising Professor and the Academic Advisor concerning the composition of this committee, and the College Graduate Advisor nominates these members to the Graduate Dean. The committee ordinarily consists of 4 members (minimum) drawn chiefly from the candidate's major area, and chaired by the student’s Supervising Professor. At least one member of the committee must be from outside the College of Pharmacy. The committee requires three faculty members from the Division of Chemical Biology and Medicinal Chemistry. Based upon the Graduate Advisor's nomination, the Graduate Dean appoints the committee, which then serves to guide the student in the pursuit of the research problem and in the writing of the dissertation itself. While there is every expectation that the dissertation research project evaluated in the qualifying exam will serve as the blueprint for the student's dissertation research, it is recognized that new findings may require substantial changes. These should be done in consultation with the student's Dissertation Supervisory Committee.

   The Dissertation Supervisory Committee should meet annually to evaluate the student’s progress. It is the student’s responsibility to initiate and arrange these meetings. The student will also prepare a summary of research results and a short Powerpoint presentation for these committee meetings. Although annual meetings are strongly encouraged, the student must convene at least one meeting 8-12 months prior to the proposed graduation date. Documentation of these meetings should be provided to the Academic Advisor (via the Progression worksheet).

2. Dissertation Defense: For the Defense, the student prepares a dissertation seminar, which is 40-45 minutes in length. It will be presented immediately prior to the dissertation defense and will be open to the University community. It should adequately summarize the doctoral research work, and could also be designed to serve as a job interview seminar. An abstract is not required for this seminar. However, it must be scheduled and announced at least two weeks in advance of the date.
V. MASTER OF SCIENCE DEGREE

A. OVERVIEW AND PROCEDURE

The Division of Chemical Biology and Medicinal Chemistry does not admit students to a master’s degree-granting program. However, students in the Ph.D. program may be transferred to a terminal master’s program under some circumstances.

1. Supervising Professor: The program of each master's candidate will be developed under the guidance of a Supervising Professor and a Supervising Committee. The committee consists of 2-3 members of the Graduate Faculty. One member shall be the Supervising Professor and one may be from a division outside Chemical Biology and Medicinal Chemistry or outside of the College of Pharmacy. One member must be a member of the Division of Chemical Biology and Medicinal Chemistry. This committee is responsible for the quality, depth, and balance of the student's educational experience.

2. Research Proposal for Thesis Work: The student, with the assistance of the supervising professor, may prepare and submit to the supervising committee for their comments and guidance, a Research Proposal for the Master's level research project. A non-thesis master's degree is not available in the College of Pharmacy.

3. Seminar Requirements: Students are expected to have completed the seminar requirements.

4. Coursework Requirements: These are identical to those in the Ph.D. program unless waived by the Medicinal Chemistry Academic Advisor.

5. Oral Examination, Master’s Degree: Although not required, the supervising professor may request an M.S. oral examination. The examination committee consists of the members of the supervising committee.

VI. GENERAL INFORMATION:

A. ACCESS TO BUILDING AND LABORATORIES:

Upon arrival at UT, the student will be issued a UT ID card to use to enter the Pharmacy building(s). If necessary, they will be given a key to student offices and/or research laboratories when necessary. Doors should be closed and locked at all times other than when the lab or office is occupied.

When the buildings are closed, you must use your UT ID and have approved access in order to get into the building. Access is dependent upon your affiliation with a supervisor and/or lab. Do not prop any exterior doors open because this causes the alarm to activate and makes the building vulnerable to theft.

You should not let anyone into the building or bring friends in with you. Unauthorized people who are in the building after building hours should be reported immediately to the UT Police at 471-4441.
B. LIBRARY

The student should adhere strictly to the library regulations on campus. Books and reference materials should be returned promptly by their due dates. Books and bound journals must not be used on a laboratory bench where they may become damaged by solvents. Materials must always be checked out before they are removed from the library.

Libraries of interest to Chemical Biology and Medicinal Chemistry graduate students are Life Sciences (in the Main building) and Chemistry (in the Welch Chemistry building). Most items of interest are now available free of charge electronically (via PubMed).

C. OFFICE SUPPLIES

Office supplies are limited to use for Division or research-related activities only. Graduate students are expected to supply their own materials for production of their dissertation. Therefore, copying of drafts of the dissertation is not allowed on Division copy machines. However, the student’s supervising professor may choose to help the student defray some of the costs of printing, copying, and binding of the dissertation.

D. RESEARCH LABORATORIES AND RELATED FACILITIES

The pharmacy graduate student has access to the laboratory where the research work is to be done. With the approval of the supervising professor (and approval of other laboratory supervisors as applicable), the student may be able to use equipment in other research and teaching laboratories. It is necessary to check with the faculty member in charge and read the instruction booklet before working with most instruments in the College. Check with your supervising professor in advance of using any apparatus, if at all in doubt.

Being allowed to work in a lab other than your own is a special privilege, which can be revoked if you leave the lab in disarray or damage the equipment.

E. PURCHASING

When materials required by a student for research are not available from University facilities, the student should fill out a purchase requisition and take it to the supervising professor for signature and further processing. (This is generally done electronically.) The requisition form must include all information: account name and number to be used for the purchase, name of item, supplier, address, vendor identification number, catalog number, quantity, price, and person contacted at the vendor. The form should be signed by the supervising professor. In general, each laboratory has a set of purchasing procedures, which should be followed. Failure to follow prescribed procedures may delay the acquisition of research supplies.

F. PHOTOCOPYING

Photocopying on College machines is charged to the Division’s operating expenses. A graduate student’s course notes and other personal material should not be copied on College machines, nor paid for with any university account. The machines are available for use by all graduate students, postdoctoral students, and technicians during the day. If the machine is inoperative, please tell Cathy.
G. PREPARING REPORTS AND MANUSCRIPTS

Research progress reports, thesis/dissertation, and manuscripts can be prepared following the suggested format. These are only suggestions and students should consult with lab members for the preferred laboratory format.

- Introduction (Background literature, previous work, aims/purpose of your work)
- Experimental procedures (Materials and Methods)
- Results (present results – do not discuss or analyze them!)
- Discussion (discuss and analyze results – put into literature context)
- Conclusions
- References

The Introduction is long and more in-depth in the thesis/dissertation and much more concise in a manuscript being submitted for publication. In research reports, it may be longer at first and then shortened as your graduate career progresses. Regular research reports make writing the thesis/dissertation and manuscripts much easier. For the Introduction, the reader really wants to know why this is an important question, what has been done, and what you are doing. You should provide enough background about the general area so that the reader doesn’t have to go elsewhere.

The Experimental Procedures section is often times the most important part of a report/thesis/dissertation/manuscript. You must provide sufficient detail so that someone trained in the field can reproduce your findings. Being able to reproduce your findings is fundamental to the scientific enterprise and your reputation as a scientist. The Experimental Procedures section is frequently the easiest place to start when writing a report.

Results are just that – results. Present your actual findings and try not to analyze or discuss them. Sometimes, it is easier to get things down and then decide if they belong in the experimental, results, or discussion sections.

The Discussion section is where you analyze and discuss your results and put them into a scientific context. A well-written discussion takes time and should be interesting! Near the end you can speculate and suggest future directions.

The Conclusions section summarizes the major findings and is succinct (3-4 sentences and no more than a paragraph).

For more help in writing a scientific article and proper formatting, examine articles in the Journal of the American Chemical Society, Journal of Organic Chemistry, Journal of Medicinal Chemistry, and Biochemistry (to name a few) for the appropriate styles. The first issue of the year in these journals and the corresponding websites lay out the editorial policy and format. Ethics and obligations of authors and reviewers are also discussed (see also the College Guide). These journals are easily accessed online. Students should also consult with their supervising professor for proper use of abbreviations, spellings, hyphens, decimal places, and statistical treatment of the data. The following link takes you to the Biochemistry website and provides information for authors.

http://pubs.acs.org/page/bichaw/submission/authors.html

H. COPYRIGHT REGULATIONS

In order to copy or otherwise use materials including software where (a) the materials are copyrighted, (b) use exceeds what is permitted by license, and (c) the four factor use test indicates that the use is likely not fair, permission should be obtained from the copyright owner. See more here: https://www.utsystem.edu/board-of-regents/policy-library/policies/uts107-use-copyrighted-materials
I. GRAPHICAL METHODS AND SOFTWARE

The student should become familiar with specific requirements made by the Graduate School, the editors of journals, and the supervising professor before preparation of Figures, Schemes, Graphs, Tables, Photographs, etc. A hastily or poorly drawn graph, although it may be supported by careful experimentation and valid data, will reflect poorly on the quality of work and on the author.

The Division has a site license for ChemDraw. See Dr. Whitman for details.

The thesis or dissertation can be reproduced to yield multiple copies by relatively inexpensive offset or photocopy methods, which give a professional appearance to the document. Bindings in a number of styles are available; the Graduate School Office can assist you with decisions about duplicating, binding and other matters regarding the thesis or dissertation. The finished work represents the results of your efforts; you will want it to have the appearance of the finest quality possible.

J. THE RESEARCH NOTEBOOK

The manner in which you keep records of research work in your notebook is of the greatest importance. Your Supervising Professor will provide specific instructions, but the following points are worth noting.

1. You can use a notebook providing carbon-page duplicates, which may be removed and kept by you or the supervising professor in a safe place. This prevents loss from fire or other causes which could require that you re-do much of your work. When finally completed, the research notebook remains the property of the supervising professor. The student retains the tear out sheets. Alternately, the student may photocopy the notebook.

2. The notebook is for recording all data as collected. Do not use scraps of paper to record weights, spectrophotometer readings, etc. for transfer to the notebook. Instead, enter all data directly into the notebook.

3. Computer print-outs, hand-prepared graphs, photographs, or chromatograms must be pasted into the notebook at the appropriate point. Sometimes a more satisfactory practice is to keep a separate loose-leaf folder for large or bulky recordings such as NMR spectra. The pertinent data from such sheets should be recorded in the notebook when received and a reference made to the loose leaf folder and page number where the original document is located.

4. The researcher must never rely on memory for data keeping. Data should be recorded in the notebook immediately when gathered. All information - dial settings, temperatures, formulas of reagents, company sources of equipment and supplies and reference standard values must be recorded. All calculations should be shown clearly, so there would be no problem in repeating the operation at a later time by another investigator. Scratch work should be done in the notebook, then followed by the neater and more orderly steps of calculation.

5. Sketches for apparatus, ideas for new approaches, and references to pertinent literature should be included -- clearly marked as such -- in the notebook.
6. It is of great importance to include the reason for conducting each experiment and a discussion on the meaning of the results obtained. Any reasons for repeating the experiment or conducting a new or modified experiment would be included at this point.

7. It is better to be verbose than too brief in recording procedures, results, and impressions in the notebook. If one notebook is filled, the recordings are continued in a second, third, etc. book, each properly identified: I, II, III, etc. with the title of the project and the experimenter's name.

8. At the beginning of each day, the experimenter dates the page. At the end of each day's recording, the experimenter should place the date and full signature at the bottom of the last written page. If significant results are being collected which could become the subject of a patent, or otherwise needed for legal proof at a later time, a second person close to the work should co-sign each page. No erasures should be made and no space left unused on a page if the document is liable to be needed in a courtroom at some later time.

9. All data belongs to the supervising professor, not the student. This means that all original laboratory notebooks remain with the supervising professor after the student completes their program of study.
Appendix 1. Required Forms

Requirements for Lab Rotation in CBMC – BME or PHR Building (p. 1 of 2)

Complete and submit to Dr. Whitman when training is completed to get access to the building and rooms.

Student name: _____________________________ EID

Today’s date:

Type of Appointment (GRA, TA, Fellowship, etc):

Faculty and Building

PI name:

Rotation I start date:
Rotation I end date:
Rotation II start date:
Rotation II end date:
Rotation III start date:
Rotation III end date:

Proximity access to building needed (yes/no)?
Number on back of Proximity card (if yes):
Which building (BME, PHR)?
Specific room numbers for key access?

Division Head Signature & Date (after completion of all required training):

Student Signature & Date (print confirmation of training record):

Date proximity card access is approved:
Date key approval is given:
Date keys are returned (including desk key):

Laboratory Safety Training (must be completed by end of first week and prior to being alone in the lab)

https://ehs.utexas.edu/training/lab-training-requirements.php

Required Training for all Laboratory Personnel

a) OH101, Hazard communication
b) OH201, Laboratory Safety
c) OH202, Hazardous Waste Management
d) OH207, Biological Safety
e) There might be some additional courses – just do them!!!

In-lab training (Site-Specific Hazard Communication) is provided by the Supervising Professor.

Required in-person courses: (sign up for first available; training does not need to be completed in first week)
a) FF205 - Fire Extinguisher Use (1 hour)

Lab specific training (check with PI)
OH301, Radiation Safety (for example)

Conflict of Interest Training Completed:
https://research.utexas.edu/ors/conflict-of-interest/
Advising for ________________________________
year and semester

Student ________________________________

EID ________________________________

Courses: ________________________________

________________________________________

________________________________________

Advisor’s signature: ________________________________

After you have obtained your Advisor's signature on this form, please take it to Char Burke so that she can clear you for registration. You may scan it in and email it to her at char.burke@austin.utexas.edu
# Progressions Form

**Name:**

**Today's date:**

**Date entered program (mo/yr):**

<table>
<thead>
<tr>
<th>Coursework</th>
<th>Course #</th>
<th>Course name</th>
<th>Semester</th>
<th>Grade</th>
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<td>Biochemistry</td>
<td>CH 395G</td>
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<td>CH 395J</td>
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<td>Elective #4</td>
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<tr>
<td>Division Seminar</td>
<td>PGS 196S</td>
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<tr>
<td>Division seminar (if applicable)</td>
<td>PGS 196S</td>
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<td></td>
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<tr>
<td>(Indicate Title/Date/Pass/No Pass)</td>
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<td>Other training (specify)</td>
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<td>Rotation 2</td>
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<tr>
<td>Rotation 3 (if applicable)</td>
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<tr>
<td>Final Supervising Professor choice</td>
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<th>Committee members</th>
<th>Outcome</th>
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<td>Date entered candidacy</td>
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<td>Committee Meeting 3</td>
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<tr>
<td>Graduated (Congratulations!)</td>
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</table>

**Grant Proposal Submitted**

**Date**
Appendix 2. Preparing a Seminar

**General Guidelines:** Scientists must be able to convey their findings to an audience. As part of your graduate training, you will attend seminars and present a departmental seminar. In addition to learning new material and being exposed to different areas of research, you should watch experienced students and guest speakers and make decisions on how and how not to prepare and present seminars. If the Division faculty deems a student’s seminar as inadequate, the student will be required to do another seminar in the subsequent semester. Moreover, you are likely to be embarrassed in front of your friends and faculty.

**Guidelines for a Worthwhile Talk:** The objective of the seminar speaker should not be to "get it over with". There should be an attempt to present some basic information in a chosen scientific area that will be worthwhile to most of the audience. **Try to teach your audience something!** This requires knowledge of the audience's background, skill in presentation, and ingenuity of thought.

Many speakers try to impress the audience with their skill in using the jargon or sophisticated language of their discipline. They often expect that it is the audience's responsibility to understand, to follow the intricate details, to fend off boredom, and to stay awake. Actually, it is the speaker's responsibility to keep it simple, intellectually fascinating, and exciting. A good rule of thumb is to aim at a diverse audience that generally has only slightly more knowledge of the topic than the man (or woman) on the street.

Scientific speaking should present precise and accurate thinking in the most intelligible form. To accomplish this, the speaker must observe several basic principles:

A. **Remember the listener.** This is the single most important principle. If the listener does not understand or is confused, the speaker must clarify the information.

B. **Know your material.** If you do not understand your material, the audience cannot possibly understand it. Regardless of how much you hope you will be successful, you will almost always be embarrassed when your ignorance is revealed.

C. **Be as organized as possible.** Clarity is your guiding principle. If the speaker presents the material in a disorganized fashion, everyone's time is wasted.

D. **Use suitable visual aids.** Find out how to make impressive slides or transparencies. Slides of tables or graphs from books, poor quality photography, or unreadable slides frustrate everyone. **At the least, the visuals should be LARGE (this is usually a big problem – the audience cannot see the print on the slides!).** They can also be colorful and fun, but be careful with colors – they may look pretty on your screen but they may not be legible in the lecture hall.

E. **Choose an interesting topic.** It is important to get an audience there in the first place. Choose an attractive title such as "How Do Erythromycin Molecules Cross the Membrane?" Isn't this more enticing than "The Absorption Kinetics of Erythromycin in Solution"? Use your ingenuity, but don’t get too cute or be offensive. Bounce the title off your lab mates and your Supervising Professor.

F. **Use the rules of public speaking.** If you feel uncomfortable or unsure in front of an audience, practice your talk many times. The slides are your cues and you should know what you are going to say about every slide!!!! Brush up on general rules on how to get an audience "with you". Develop a "feel" for the audience. If the audience appears disinterested or someone dozes off, it's a good clue that you're wasting everyone’s time.
G. **Keep your talk simple.** "De-jargonize" your talk by using simple terms and defining all words that the audience may not be familiar with. No one is interested in how well you can impress them with big words.

H. **Be brief.** A speaker should not run overtime. It is a fact that the average adult can concentrate on even the most interesting speaker for only about 20 minutes. Keep your talk 35-40 minutes, as a general rule, and leave time for questions. Near the end of your talk, audience members will tend to be distracted very easily. ("When is this person going to finish?")

I. **Be enthusiastic!** The audience will usually be with you if you're confident and enthusiastic. Get them involved by asking frequent rhetorical questions for them to ponder. Make the information as personal as you can to them. ("Did you ever wonder whether Italian food affects the absorption of erythromycin?")

Remember - will you be happy with giving "just another boring scientific talk"? NO!
Appendix 3. Qualifying Examination Research Proposals

Please meet with Dr. Whitman when you’re ready to do this!!

Overview:
As part of your Qualifying Examination, you will design, write, and orally defend your proposed dissertation research project and an original research project. The subject of the first proposal will be the research that you plan to perform during the next two or three years. Although graduate research often presents unexpected twists and turns, the goal is that this proposal will form the core of your thesis project. The subject of the second proposal will be a topic not related to your research.

Steps to take in preparation for writing your proposed dissertation research project
1. Discuss your research project with your mentor. Formulate specific hypotheses and think about how you could test them. These can become the Specific Aims of your proposal.
2. Begin reading the literature that will serve as the foundation for your project. The best place to start is usually the earlier papers from your lab, and next are the papers from the two are three other groups (typically) that are working in the same area. You should strive to develop a deep knowledge of the research that has led up to the starting point for your work. It is better to identify the handful of papers that directly precede your work – and then to read them over and over until you thoroughly understand them – than it is to skim a large number of papers that are only tangentially related.
3. You may want to manage your references using a software system like Endnote or Reference Manager. This will make it MUCH easier to properly insert citations in your proposal, and you will continue to use the database of references for as long as you continue to work in the same area of research.
4. Do some experiments! One section of your proposal will be Preliminary Results, and you may include any relevant results that you have obtained. It is not necessary to have a lot of preliminary results for this, and we realize that some of you have only recently joined a lab, but you should strive to include what you can.

Writing the proposal – (Get a copy of a grant from your supervising professor)
1. Organization. The sections of the proposal are:
   A. Specific Aims
   B. Background and Significance (think about intellectual and medical significance)
   C. Preliminary Results
   D. Research Design and Methods
   E. Literature cited
In addition to these sections, you need a title and abstract.
The total length of sections A through D must not exceed 10-15 pages (single spaced). This includes figures and schemes, but not references. Also, this is a maximum, not an absolute requirement. It is fine for your proposal to be shorter! You should strive for brevity. There is no minimum length, but it is hard to imagine an effective and complete proposal that is shorter than six or seven pages.
2. Rules for writing. You should get help in the design of your project and in the writing. First, the Specific Aims should be designed in close consultation with your mentor. Your mentor may also assist in the organization of your proposal, but you should write it yourself. You should then solicit feedback on the proposal from your mentor, other members of your lab, and anyone else that you think will be helpful.

**Defending your proposal orally**

Prepare a Powerpoint presentation and talk that summarizes the background and describes what questions you plan to address (i.e. your Specific Aims) and how you plan to address them. The total length of your talk should be roughly 20 minutes (but not more than 30 minutes). The committee will ask you questions that are centered on your project and the background, and the questions may branch out to other relevant areas.

**Steps to take in preparation for your original research project**

1. Choosing a topic is the most important part! To find topics, read review articles that interest you or look at the Table of Contents for the last two years of journals in your field. The topic should not be related to your research but you can stay in the same field (or not). If you are in doubt about how related the topic is to your research you may discuss it with the Academic Advisor or your Supervising Professor.

2. Once you have a topic in hand, think about key experiments that will give you answers (and new information) no matter what the outcome. You generally need only 3-4 specific aims and some well-designed experiments.

3. Repeat the steps described above for the preparation of the proposal, but do not have in-depth discussions about your original research topic with your Supervising Professor. Your Supervising Professor can, however, read your proposal and give you some general guidelines and suggestions. You may also consult with your lab mates and other students. Also, you will (generally) not have preliminary results so your Background and Significance and Research Design and Methods sections can be longer. In some cases, you may have done some computer modeling or sequence alignments - you may include these results in your Preliminary Results section. However, do not focus on Preliminary Results – we are more interested in how well you develop and defend the idea (with specific hypotheses!). (It is also not good practice to make up results just to have results.)

**After your (successful) defense**

Get in the lab and get going! You should use your proposal as a starting point and a guide to help you get immersed in your thesis project.
Certification page

“I certify that I have read, understand, and agree to, the entire contents of this Graduate student handbook.”

Signature: ____________________________________________________

Date: ______________________________________________________