



# 2017 – 2018

# Graduate Handbook

Department Home Page  
*<http://biochemistry.tamu.edu>*

Graduate Program Committee  
Department of Biochemistry and Biophysics  
Texas A&M University

*Please submit any suggestions or corrections to, Mr. Rafael R. Almanzar, Senior Academic Advisor,  
Room 103C Biochemistry/Biophysics Building, (979) 845-1779*

# Welcome

Welcome to the Biochemistry Graduate Program at Texas A&M University. This *Ph.D. Handbook* describes Departmental and University policies of importance to Ph.D. students in biochemistry. This handbook is the official source of departmental policies for the graduate program. For University policies, while every attempt has been made to ensure that the policies described in this *handbook* are accurate, be advised that the TAMU Graduate Catalog for 2017-2018 is the authoritative source for University rules and regulations. Use this *handbook* as a source of guidelines and specific information, but not as a substitute for the advising and counseling functions of your individual research supervisor, the Graduate Program Committee (GPC) and the Office of Graduate and Professional Studies (OGAPS). <http://ogaps.tamu.edu/>

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## FALL SEMESTER 2017

August 18-25 Friday-Friday	Orientation for first year incoming students
August 25 Friday	Last day to register for fall classes and pay fees
August 28 Monday	First day of fall semester classes
August 28 Monday	First Lab Rotation Preference Sheet due at 10:00AM to Rafael
August 30 Wednesday	BGA Tea Time @ 3:30 PM in Bio/Bio lobby Departmental Seminar @ 4:00 PM in Bio/Bio room 108
September 1 Friday	First Lab Rotation Assignments announced Last day for adding/dropping courses for the fall semester
September 4 Monday	First Lab Rotation begins
October 2 Monday	Second Lab Rotation Preference Sheet due at 10:00 AM to Rafael
October 6 Friday	Second Lab Rotation Assignments announced
October 9 Monday	Second Lab Rotation begins
November 6 Monday	Third Lab Rotation Preference Sheet due at 10:00 AM to Rafael
November 10 Friday	Third Lab Rotation Assignments announced
November 13 Monday	Third Lab Rotation begins
November 9 Thursday	Pre-Registration for 2017 Spring Semester begins
November 17 Friday	Last day for students to drop courses with no penalty (Q drop) Last day to officially withdraw from the university
November 22 Wednesday	Reading Day No Classes
November 23 & 24 Thursday-Friday	THANKSGIVING HOLIDAY
December 4 Monday	Redefined day, students attend their <b>Friday</b> classes
December 5 Tuesday	Redefined day, students attend their <b>Thursday</b> classes
December 6 Wednesday	Last day of fall semester classes
December 7 Thursday	Reading day, no classes
December 8, 11-13 Friday, Monday-Wednesday	Fall semester final examinations
December 15 Friday	Commencement and Commissioning
December 18 Monday	Permanent Lab Preference Sheet due at 10:00 AM to Rafael
December 20 Wednesday	Permanent Lab Assignments announced
December 23 - January 1	Faculty and Staff holiday

## SPRING SEMESTER 2018

January 2 Tuesday	First-year students report to permanent lab or arrange 4 <sup>th</sup> rotation
January 12 Friday	Last day to register for spring semester classes
January 15 Monday	Martin Luther King Jr. Day, Faculty and staff holiday
January 16 Tuesday	First day of spring semester classes
January 22 Monday	Last day for adding/dropping courses for the spring semester (5 pm)
February 6-10	4th rotations end; Permanent lab assignments made
February 9 & 10 Friday-Saturday	Biochemistry Symposium/ Recruiting Weekend * TENTATIVE*
March 15-16 Thursday-Friday	SPRING BREAK Holiday, Faculty and Staff
April 2 Monday	First-year students submit proposed thesis advisory committee to Graduate Program Committee
April 5-20	Pre-registration for the first term, second term, 10-week summer semester, and fall semester
April 13 Friday	First-year students begin to schedule Pre-Proposal Committee Meeting that will be held in summer; Meeting must be scheduled by Monday, May 14th
April 17 Tuesday	Last day for all students to drop courses with no penalty (Q-drop) Last day to officially withdraw from the University (5 pm)
May 1 Tuesday	Last day of Spring semester classes Redefined day, students attend their Friday classes. Classes meet, but no major exams
May 2 Wednesday	Reading day, no classes
May 3-4, 7-8 Thursday-Friday Monday-Tuesday	Spring semester final examinations for all students
May 11-12 Friday-Saturday	Commencement and Commissioning
May 14 Monday	Last day to schedule Pre-Proposal Committee Meeting

## SUMMER SEMESTER 2018

May 25 Friday	Last Day to register for first term and 10-week summer classes
May 28 Monday	MEMORIAL DAY, Faculty and Staff Holiday
May 29 Tuesday	First day of first term and 10-week semester classes
June 2 Friday	Last day for dropping courses with no record for the first term and 10-week semester 5:00 PM Last day for adding courses for the first term and 10-week semester
June 18 Monday	Last day for all students to drop courses with no penalty for the first term (Q-drop). Last day to officially withdraw from the University for first term
June 29 Friday	Last day of first term classes
July 2 Monday	Summer I Term Final Exams
July 4 Tuesday	INDEPENDENCE DAY – Faculty & Staff Holiday
July 18 Wednesday	Last day for dropping courses with no record for the 10-week semester (Q-drop) Last day to officially withdraw from the University for 10-week semester
August 1 Wednesday	Last day for first-year students PreP meeting to avoid registration block
August 6 Monday	Last day of second term and 10-week semester classes
August 7-8 Tuesday-Wednesday	Second term and 10-week semester final examinations
August 10 Friday	Commencement and Commissioning

***Dates and times are subject to change***

## DEPARTMENT RESOURCES

### Graduate Program Committee

#### Members of the Graduate Program Committee

<b>Mary Bryk, Associate Professor &amp; Chair</b> Room 334A Biochemistry Building 979 862-2294 office 979 845-6982 lab <a href="mailto:bryk@tamu.edu">bryk@tamu.edu</a>	<b>Jennifer Herman, Associate Professor</b> Room 305A Biochemistry Building 979 862-3165 office 979 862-3166 lab <a href="mailto:jkherman@tamu.edu">jkherman@tamu.edu</a>
<b>Jim Hu, Professor</b> Room 443A Biochemistry Building 979 862-4054 office 979 862-4055 lab <a href="mailto:jimhu@tamu.edu">jimhu@tamu.edu</a>	<b>Tatyana Igumenova, Associate Professor</b> Room N118A NMR Building 979 845-6312 office 979 845-6313 lab <a href="mailto:tigumenova@tamu.edu">tigumenova@tamu.edu</a>
<b>Craig Kaplan, Associate Professor</b> Room 322A Biochemistry Building 979-845-0429 office 979 845-0452 lab <a href="mailto:cdkaplan@tamu.edu">cdkaplan@tamu.edu</a>	<b>James Sacchetti, Professor</b> Room 2138A ILSB Building 979 862-7636 office 979 862-7639 lab <a href="mailto:sacchett@tamu.edu">sacchett@tamu.edu</a>
<b>Junjie Zhang, Assistant Professor</b> Room 2157A ILSB Building 979 458-9882 lab <a href="mailto:junjiez@tamu.edu">junjiez@tamu.edu</a>	<b>Rafael R. Almanzar, Senior Academic Advisor</b> Room 103C Biochemistry Building 979 845-1779 office 979 845-9274 fax <a href="mailto:r.almanzar1@tamu.edu">r.almanzar1@tamu.edu</a>
<b>Deborah Gau, Administrative Associate II</b> Room 103A Biochemistry Building 979 845-1013 office 979 845-9274 fax <a href="mailto:dgau@tamu.edu">dgau@tamu.edu</a>	<b>Jason Allen, BGA Representative</b> Room 436 Biochemistry Building (Pellois Lab) 979 845-0101 lab <a href="mailto:musicandmelody777@tamu.edu">musicandmelody777@tamu.edu</a>

The Biochemistry Graduate Program Committee (GPC) is responsible for administering the biochemistry graduate program. Every member of the GPC has a strong interest in the success of graduate students. Students are encouraged to contact any member of the GPC with concerns or questions regarding the graduate program.



## Biochemistry Graduate Association

Graduate students formed the Biochemistry Graduate Association (BGA) in 1992 to promote the welfare and improve the educational experience of graduate students in biochemistry and to enhance communication between graduate students and the faculty. The BGA is currently funded by Graduate Enhancement Program funds from student tuition and private donations. The BGA promotes direct involvement in departmental decisions to help improve the Biochemistry graduate experience. Problems encountered by a majority of students are often brought to the attention of the Department Head. A faculty member (chosen by the BGA) sits in on meetings in an advisory role only. In addition, the BGA appoints student representatives to the Graduate Student Council and to faculty committees, including the GPC and GRAC.

BGA meetings provide an opportunity to interact with graduate students from various labs and at different stages in the degree program. The meetings are to discuss problems and air grievances. Minutes and information pertaining to the organization or important to students are available from the BGA executive.

The BGA sponsors the following activities and services:

- Student Mentors: New first year students are assigned graduate student mentors.
- Dissertation Expenses: The BGA can pay some costs of producing the dissertation.
- Job Files: Postings are located in Room 203 near the student mailboxes.
- Programs: Presentations of specific interest to biochemistry graduate students, such as “How to look for a post-doctoral position” and “Career diversity” seminars.
- Research Competition: Selected students present their research results to a panel of judges to compete for monetary prizes.
- Student-Sponsored Seminars: Students invite off-campus speakers to present departmental seminars.
- Travel Grants: Students may be awarded up to \$600 per year to travel to scientific meetings.

## Around the Department

Department Home Page <http://biochemistry.tamu.edu>

**Graduate student mailboxes, Room 203**

**Department Fax** 979 845-9274

### Office Staff

#### **Rafael R. Almanzar, M.A.**

Senior Academic Advisor

Room 103C Biochemistry and Biophysics Building

979 845-1779

[r.almanzar1@tamu.edu](mailto:r.almanzar1@tamu.edu)

Graduate Advising & Counseling

#### **Debbie Gau**

Administrative Associate II

Room 103A Biochemistry and Biophysics Building

979 845-1013

[dgau@tamu.edu](mailto:dgau@tamu.edu)

Recruiting, Admissions, Advising, media/room reservations,

#### **Betty Cotton**

Administrative Assistant to Dr. Reinhart

Room 103D Biochemistry and Biophysics Building

979 845-5032

[blcotton@tamu.edu](mailto:blcotton@tamu.edu)

Help desk and notary public services

#### **Cathy Wolff**

Administrative Assistant

Room 103 Biochemistry and Biophysics Building

979 845-5032

[cathyw@tamu.edu](mailto:cathyw@tamu.edu)

Photocopy cards; key issuance, media/room reservations, and help desk

#### **Sherry Coronado**

Business Coordinator

Room 103G Biochemistry and Biophysics Building

979 845-1435

[s-coronado@tamu.edu](mailto:s-coronado@tamu.edu)

Payroll, key issuance

## **Office of Graduate and Professional Studies**

The TAMU Office of Graduate and Professional Studies (OGAPS), located in suite 112 in the Jack K. Williams Administration Building, is responsible for overseeing all graduate students at Texas A&M University. Over the course of your graduate career there are several steps where OGAPS approvals are needed: when you submit your degree plan, when you turn in your checklist and signature sheet for your prelims, when you submit your proposal, when you schedule your final defense, and when you are getting ready to graduate. The relevant functions of the OGAPS are described in this handbook and in the Graduate Catalog available on the OGAPS web page. This website also has downloadable forms and relevant instructions required at various times during your graduate career. <http://ogaps.tamu.edu/>

## **International Student Services**

International Student Services is located on the 1<sup>st</sup> Floor, The Pavilion, Room 110, and offers assistance to international students. For further information, call 845-1824 or visit: <http://iss.tamu.edu/>

## **Student Loans**

The Student Loan Administration office is located in the GSC, Suite 2801. Office hours are Monday - Friday, 8:00 A.M. - 5:00 P.M. and offers both emergency loans for tuition and fees and short-term loans for expenses other than tuition and fees. Emergency loan applications must be completed online via a valid Texas A&M "neo" email account. For further information on student loans and financial aid, call 979-845-3236 or 979-845-3987 or visit: <https://financialaid.tamu.edu>

## **Student Health Insurance**

Teaching and research assistants are considered TAMU employees and receive medical insurance through TAMU. Students should sign-up for insurance during orientation.

Students with fellowships or who are supported on training grants are not considered TAMU employees and need to obtain their own health insurance. These students have the option to purchase health insurance through the Texas A&M University System. Before purchasing health insurance, speak with Dr. Bryk ([bryk@tamu.edu](mailto:bryk@tamu.edu)) or Dr. Reinhart for guidance. In many cases, the department or the College of Agriculture and Life Sciences will help students obtain health insurance. Contact the department accounting office (979-845-6848) to obtain additional information on health insurance plans and reimbursement.

International students require additional health insurance for evacuation and repatriation.

Information about health insurance is available through the Human Resources at <http://employees.tamu.edu/benefits/grad-students/> and the Texas A&M System at: <https://tamu-gradempl.myahpcare.com/>

## **Emergency Funds for Unexpected Medical Expenses**

The Office of the Vice President for Student Affairs (VPSA) has the ability to provide emergency funds for students who have unexpected medical expenses. They will assess the student's funding from other sources to ensure they can provide the additional funding. The student has to complete a short application form that explains the need. Cari Tawney ([c-tawney@tamu.edu](mailto:c-tawney@tamu.edu)) is the director of business operations for the VPSA and will provide answers to questions about emergency funds.

If a student/spouse has questions about the student health insurance plan, the Patient Services manager, Courtney Waggoner, ([cwaggoner@shs.tamu.edu](mailto:cwaggoner@shs.tamu.edu)) is knowledgeable of the plan and she will assist with questions and direct you to the appropriate plan administrators.

Student Assistance Services (SAS) in the Offices of the Dean of Student Life (ODSL) is available for students if they need other resources, both community and university. If you are having legal issues, Student Legal Services, also in the Offices of the Dean of Student Life, will assist with questions. These services are available at no charge to students. The phone numbers for ODSL is 979-845-3111 and for SAS is 979-845-3113.

## **UNIVERSITY AND DEPARTMENTAL POLICIES**

The Texas A&M University System and the Department of Biochemistry and Biophysics have a strong commitment to equal employment opportunity, without regard to race, color, sex, religion, or age.

## **THE DOCTORAL PROGRAM**

The primary objective of the graduate program in Biochemistry and Biophysics is to prepare graduates for success in future careers through Ph.D. level, independent mastery of biochemistry and its application to molecular, cellular, and biophysical questions. Such mastery is only part of becoming a well-rounded and competitively prepared member of the workforce. To make sure our students are as competitive as possible, we have designed our program curriculum and mentoring framework to allow students to achieve the following objectives within a five year timeframe.

We envision our graduates to:

- Gain and demonstrate broad understanding of biochemical and molecular biology principles.
- Achieve extensive expertise in a specific research area exemplified by Ph.D.-level research.
- Through coursework, designed curriculum-related activities, and individual research programs obtain communication, teaching, and critical-thinking skills.
- Experience how scientific research programs are developed, organized, and funded.
- Develop written and oral communication skills, each of which will be enhanced by opportunities within the program for scientific writing, scientific communication, manuscript and thesis preparation, and presentations at local and national scientific meetings.
- Participate in activities that develop and reinforce professional skills, such as attending and presenting at scientific conferences and participating in teaching certificate programs and other workshops offered by the Office of Graduate and Professional Studies, the Center for Teaching Excellence, the University Writing Center and the Career Center.
- Obtain a network of faculty and graduate student contacts with knowledge of academic careers, industry science, and other PhD career paths.

A fundamental goal of the program is that each student achieves balanced competency in the broad field of biochemistry. In addition to substantial course offerings and a wide variety of research opportunities, the Ph.D. program offers informal, intensive instruction with close contact between students and faculty advisors. The Ph.D. degree is primarily based on your original research. Coursework, the Pre-proposal committee meeting, and the preliminary examinations are designed to prepare students for work in the laboratory and to help the GPC and faculty evaluate student progress toward a degree.

Below is a brief version of a typical graduate career in our department. The handbook provides explanations of the listed items.

## **First Year**

- Core coursework
- Three laboratory rotations
- Join a laboratory
- Select members of thesis advisory committee
- Pre-proposal committee meeting (summer, end of 1<sup>st</sup> year)
- Prepare and submit online degree plan

## **Second Year**

- Elective coursework
- Journal club participation
- Teaching

## **Third Year**

- Dissertation proposal and preliminary examinations (fall semester)
- Admission to candidacy
- Graduate Student Seminar presentation
- Journal club participation

## **After the Third Year**

- Annual advisory committee meetings
- Journal club participation
- Ph.D. dissertation
- Dissertation defense
- Graduation

A Ph.D. degree for a student without a master's degree in biochemistry from a U.S. college or university requires at least 96 hours of credit. This total is accumulated through traditional coursework, journal clubs, seminars, and research. A Ph.D. degree for a student with a master's degree in biochemistry from an U.S. college or university requires at least 64 hours of credit. No courses counted for credit toward the master's degree can be included in the 64 hours. Transfer courses are acceptable on the degree plan with the approval of the student's advisory committee, the Graduate Program Committee, and the Office of Graduate and Professional Studies.

## **FIRST YEAR**

### **Prerequisites**

Incoming students should have undergraduate training in biological, chemical, mathematical and physical sciences. Specifically, most of our first-year students will have taken and passed the following courses:

- A two-semester course in Biochemistry (equivalent to BICH 410/411 at TAMU)
- A one-semester course in Physical Chemistry (equivalent to CHEM 328 at TAMU)
- A one-semester course in Molecular Genetics (equivalent to BICH/GENE 431 at TAMU)
- Two semesters of Organic Chemistry
- One semester of Physics
- One semester of Calculus

These background courses are essential for students in the doctoral program. Students lacking any of these prerequisites will likely be required to enroll in the necessary course during the first year or during the summer prior to the first year and earn a grade of “C” or above. Students who need to fulfill Physical Chemistry requirement have the option of taking the class in the Fall of the first semester. Students are expected to attend all of the classes, take all of the exams, and receive a grade of “C” or better.

## **Orientation**

Seven days before the start of the fall semester is designated for Orientation. During this period the department schedules activities to familiarize new graduate students with University policies, procedures, and regulations radiological and laboratory safety, and to complete paperwork for payroll and employee benefits. Attendance at orientation meetings is required of all students.

## **English Language Requirement for International Students**

Proficiency in English must be certified before international graduate students are eligible to serve as teaching assistants. Certification can be obtained in several ways:

1. Score of 26-30 on the speaking section of the TOEFL exam
2. Scoring 8 or higher on the speaking section of the IELTS exam
3. Scoring 85 or higher on the speaking section of the PTL exam
4. Earning a baccalaureate degree following four years of study at an accredited institution or institutions located in the U.S.
5. Being a citizen of one of the approved countries listed by the [Office of Admissions](#)

If a student does not meet one of these criteria, then he or she can take the English Language Proficiency Exam offered at Texas A&M University. Scores of 80 or higher on the oral section of the English Language Proficiency Examination (ELPE) will suffice for certification of English Language Proficiency.

The Department of Biochemistry and Biophysics has resources available for graduate students preparing for the ELPE. Any student who would like assistance should speak with Rafael Almanzar or Dr. Bryk during orientation week. In addition, the Center for Teaching Excellence offers English Language Proficiency (CTE-ELP) instruction to help international students achieve a certifying score on the oral section of the ELPE.

## **Additional Information on the Oral Skills section of the ELPE**

The English Language Proficiency Examination is administered by Data and Research Services of Texas A&M University. For the English Language Proficiency Examination schedule and registration, please visit: <http://dars.tamu.edu/Testing/ELPE>

## Information on the Oral Skills Assessment from the Data and Research Services website

The Oral Skills Assessment has the following features:

- 1) The Assessment is conducted by a panel of three trained people.
- 2) The interview takes about ten minutes.
- 3) The interviewers have pre-session training to ensure common standards.

There are three segments to the Oral Skills Assessment

- 1) A short reading passage from a text from the student's major.
- 2) A brief (ten minute or less) lecture on a subject derived from an introductory textbook in the student's major. Students are given an extract from the text and given twenty minutes to prepare.
- 3) A short question and answer period on a topic chosen by the student from a list of possible topics (such as favorite film, a location near home they enjoy, etc.).

The criterion for this Assessment is whether the panel can understand what the person is saying. Because the raters are not subject-matter experts, the accuracy of what the person says does not matter, just whether they can be understood without difficulty. The purpose of each section is to elicit samples of the student's speaking. To an extent, the more the student talks, the easier it is for the raters to make an evaluation.

Some reference materials for the ELPE are located at the Sterling Evans Library at Texas A&M University. Books are on reserve at the Reserve Desk and audiotapes can be checked out from the Learning Resource Center.

Here is a link to resources provided by International Student Services

<http://iss.tamu.edu/Current-Students/Resources/English-Language-Proficiency-Exam-%28ELPE%29#0-HowtoPreparefortheELPE>

Prior to the Fall and Spring semesters, there is an ELPE Practice Session offered by ISS. The link below will bring you to a webpage with more information.

<http://iss.tamu.edu/Events/ELPE-Practice-Session>

## Courses

During orientation, a GPC member will determine the courses each student will take during the first year. If you need to take a pre-requisite course, you will be notified. Incoming students will be able to register for fall semester classes after all blocks have been removed. If your GPC advisor recommends changes in your course enrollment, see the graduate academic advisor in Room 103C of the Biochemistry Building or call the office at 979-845-1779.

Students who have completed all of the prerequisites will have the schedule shown on the next page. You must register for at least 9 credit hours in both the fall and spring semesters. You are required to maintain an average GPA of 3.0 or better, **with no more than one "C"** in the required biochemistry courses.



### Typical First-Year FALL Course Schedule

Course #	Title	Description	Credit Hours	
*BICH 603	Principles of Biochemistry & Biophysics Dr. Hays Rye	Thermodynamics, molecular structure & dynamics, ligand binding, kinetics, catalysis	3	Required
BICH 689	Principles of Molecular Genetics Dr. Craig Kaplan	Genetic and molecular basis underlying biochemical systems	3	Required
BICH 608	Critical Analysis of Biochemical Literature Drs. Ping He, Tatyana Igumenova, John Mullet and Ry Young	Practice analyzing papers, interpreting experimental data critically, drawing conclusions	2	Required
BICH 689	Application of Scientific Values Dr. Jennifer Herman	Explore core values of science & learn how mindful practice will make you a better scientist	1	Required
	Rotations Various faculty members	Learn about research by becoming a temporary member of a research group	0	Required

\*Students who need to take Physical Chemistry will enroll in CHEM 328 during the fall semester and will audit BICH 603; their BICH 603 grade will be reported to the GPC at the end of the fall semester. The student's BICH 603 grade will be reported to the University in the fall semester of the 2<sup>nd</sup> year.

### Typical First-Year SPRING Course Schedule

Course #	Title	Description	Credit Hours	
BICH 689	Advanced Modules Instructors to be determined	Six 1-cr modules: Metabolism, Quantitative Analysis in Biochemistry and Biophysics, Quantitative Analysis in Genomics/Molecular Biology, Advanced Ligand Interactions, NMR Spectroscopy, Biochemical Kinetics	6	Required
BICH 681	Presentation/Seminar Drs. Mary Bryk, Craig Kaplan, Greg Reinhart, and Jim Sacchettini	Learn about facets of an effective talk by focusing student presentations on the different types of information that are common to scientific presentations	1	Required
BICH 689	Graduate Student Seminar Drs. Mary Bryk and Jennifer Herman	Weekly graduate student seminar during which two Biochemistry graduate students (3 <sup>rd</sup> year or higher) each give 20-25 minute oral presentations on their doctoral research	1	Required
BICH 685	Directed Studies In your permanent lab	Register under Dr. Bryk's section	1	Required

## Evaluation of First-year Students

Students are evaluated by the GPC in the middle and at the end of the first and second semester. Grades in courses (midterm and final) as well as rotation reports are used to evaluate student progress in the first semester. Grades in second-semester courses and input from the research advisor are used to evaluate student progress in the second semester.

## Lab Rotations (for additional guidance, see 'Advice for Selecting Rotation Labs and a Permanent Lab' below the next section)

As part of the process of selecting a research advisor, you will participate in three lab rotations during your first semester. The rotations begin early in the fall semester and end in December. The exact dates are indicated on the Graduate Student Calendar. Rotations offer exposure to different fields of Biochemistry. They also allow you to experience the research environment of a specific lab before making a commitment to do doctoral research there. It is also the time for the laboratory to determine the motivation level and abilities of the student. ***The decision to accept a student into the lab is largely based on performance in the rotation.***

Your first consideration in choosing a lab should be the scientific activities and environment in the particular laboratory, but it is also important to inquire about the future availability of laboratory space and stipend support. To get an idea of the research activities in each lab, students are required to attend the departmental "Poster Session" and "Faculty Research Talks" held during orientation.

Faculty will submit a written report of your rotation to the GPC. The report is based on several elements, including time commitment, enthusiasm, perseverance, and interactions with laboratory personnel (a copy of the rotation evaluation form is in the Appendix). The rotation reports are considered in the first-semester evaluations (see below). Because the Ph.D. is primarily a research degree, productive and interactive lab rotations are important to set a positive course for your career as a research scientist.

One week before each rotation, each student is expected to submit a written preference list of three faculty names, in ranked order, to the graduate academic advisor. Preference forms will be delivered to your mailbox in room 203 in the Biochemistry building. You are required to communicate with the faculty members listed on your preference form before submitting the form. If you have already rotated in a lab, do not include that lab on your preference list for a subsequent rotation. You are not allowed to rotate in the same lab twice. The GPC will assign rotations according to the preference lists, subject to the approval of the faculty involved and the rule of assigning no more than two students in one laboratory per rotation.

Even if you arrive for your first semester of graduate school knowing the lab group you want to join for your thesis research, it is important to use the rotation process to find your best possible back-

up choices. Keep in mind that individual faculty members usually take only one or two new students per year.

A student who enters the program with a Master of Science degree from a United States university or equivalent, and has arranged to pursue the doctoral degree under a specific faculty member before accepting our offer of admission may be excused from rotations with the permission of the GPC. These arrangements must be approved by the GPC.

### **Selection of Research Advisor** (for additional guidance, see ‘**Advice for Selecting Rotation Labs and a Permanent Lab**’ directly below this section)

Before the end of the fall semester, each student should meet with prospective research advisors to determine if there is room in the lab for a new student and to discuss possible research projects. A ranked list of three choices for a research advisor is to be turned in by the date indicated on the calendar to the Graduate Program Office. Generally, no more than two first year biochemistry Ph.D. students may join the same laboratory. To ensure that all students have equal access to faculty mentors, students do not make arrangements to join a lab directly with individual faculty. After a student joins a lab, stipend support for that student becomes the responsibility of the research advisor on June 1<sup>st</sup>. All advisors pay students the amount set by the department. It is the responsibility of all faculty, and particularly tenured faculty to provide support for students accepted into their laboratories. Therefore, it is the policy of the Department of Biochemistry and Biophysics that tenured faculty who accept a biochemistry graduate student as a Ph.D. mentee are responsible for financial support of that student for the subsequent 12 months.

### **Advice for Selecting Rotation Labs and a Permanent Lab**

#### **Start by deciding what research you find interesting**

- Visit faculty webpages to get a sense of the breadth of research areas in the department. Don't be afraid to step out of your comfort zone into less familiar areas. Learning about research areas that you are not familiar with is an important aspect of graduate education.
- Read papers being published by the labs you find interesting. This will help you learn about the research area and the techniques used in each lab. Reading papers may help you find review articles and perspectives articles to deepen your knowledge of the field.
- Speak to the faculty members in whose labs you might want to rotate.
- Speak to graduate students, postdoctoral associates, research assistants and other members in the labs to learn more about the research, the lab environment, and the advisor's style.

### **During the rotation and when deciding on a thesis lab**

- Determine if the research area engages you. You will be working on a project in this research area for the next 4-5 years. Does the research make you want to get to the lab early and stay late? This is often a good measure of your interest.
- Do you like the style and availability of the faculty member/advisor? Do you want a faculty advisor who is available on a daily basis or one who has a more 'hands-off' mentoring approach?
- Do you feel comfortable talking with the faculty advisor? When you ask questions, are you given answers and explanations that you understand? Are you able to discuss alternative ideas and make dissenting arguments with the faculty advisor?
- You may want to take courses or workshops related to teaching, grant-proposal writing, business, etc., as a graduate student. Will the faculty advisor allow you to pursue your professional development needs beyond research?
- Does the lab environment suit you? Can you see yourself as a member of the research group? Are lab members helpful? Are you comfortable communicating with lab members and are those conversations productive?
- Talk with others in the lab to determine how students, postdocs and research assistants like working in the lab. How long does it take to earn a Ph.D.? Do lab members receive the attention needed to help projects advance?
- Ask lab members if they are allowed to try new things and design their own experiments.
- Do lab members have their own projects or work in teams on the same project? If teams, do they work collaboratively? How is authorship determined?

### **Select a permanent thesis lab**

- Speak with the faculty advisor to find out if there is space in the lab, if there is funding for you, and what projects are available.
- Ask the faculty advisor if she/he will consider taking you in their lab. The "fit" of a student in a lab is a two-way street. Both student and advisor need to agree that the advisor's lab is the right place for the student. You should not assume that if you choose a lab, that lab will choose you. Communication is paramount when selecting your thesis lab.
- Ask about their style and speak to others in and outside the lab to learn more.

### **How student-lab matches are made**

- After the third rotation, students submit a ranked list of labs they would like to join to the Graduate Programs Office.
- Faculty members submit a ranked list of rotation students.
- The graduate academic advisor makes 1-to-1 matches. Student choices are given priority.

- The graduate academic advisor calls each faculty member with the name of student(s) who have indicated interest in the lab. Faculty member decides which students they will accept in their lab.

### **Fourth rotation**

- For students in good standing, a fourth rotation will be granted. For students with one or more Cs in first-semester coursework, or who are otherwise compromised in their good standing, the option of a fourth rotation will be voted upon by the GPC.
- Students who need to do a fourth rotation should contact faculty members to schedule meetings to discuss the possibility of a fourth rotation. Once a student and faculty member confirm a fourth rotation, the Graduate Program Office should be notified by the faculty member. Fourth rotations should start no later than one week in January after returning from the holiday break.

### **Seminars**

All biochemistry graduate students are expected to attend the regular departmental seminars, which are held in room 108 at 4:00 PM each Wednesday during the fall and spring semesters. These seminars provide graduate students with an excellent opportunity to learn about research being done around the country. After each seminar, graduate students meet with the seminar speaker in an informal atmosphere.

### **Scientific Meetings**

Attending scientific meetings is an integral part of being a professional scientist. Researchers learn about the latest results before they are published, exchange ideas and make professional contacts. Departmental funding is available for first-year students to attend a regional meeting in the first year. In addition, the BGA awards travel grants that allow senior Ph.D. students to attend national scientific meetings. Students need to apply to the BGA for these competitive travel grants when the call for applications is announced.

### **Advisory Committee**

Upon entering a laboratory, the student forms a thesis advisory committee. The composition of the thesis advisory committee must be proposed to the GPC. Students should submit a list of the proposed committee members to the Graduate Programs Office by April 2, 2018 (see form in appendix). The thesis advisory committee must consist of four members of the graduate faculty in the student's field of study and research. The thesis committee members should represent expertise in molecular and biochemical/biophysical areas. Three members, including the chair or co-chair, must be from the Department of Biochemistry and Biophysics, and one member must have a primary appointment in a department other than the Department of Biochemistry and Biophysics. If the chair of the advisory committee is an Associate member of the Department of

Biochemistry and Biophysics, one of the three full members must be named as co-chair. Advisory committees will be approved by the GPC by mid-April.

Once formed, the thesis advisory committee must meet during the summer of the first year (Pre proposal meeting, see below) and then once each academic year. Students are encouraged to use Doodle, an online scheduling tool that can be used to find a date and time that is compatible with each committee member's schedule (<https://beta.doodle.com/>). The graduate academic advisor must be notified of the date and time of the annual advisory committee meeting so required forms (Ph.D. Advisory Committee Evaluation form and the Graduate Student Self-Evaluation form) can be distributed to the student and faculty advisor. **Graduate students must bring copies of the Ph.D. Advisory Committee Annual Report, a completed Annual Graduate Student Self-Evaluation form, and an updated *Curriculum Vitae* to every annual committee meeting.** The Ph.D. Advisory Committee Annual Report must be completed by each committee member at this meeting and filed with the Graduate Programs Office. The graduate academic advisor will block registration for any student whose records do not contain annual report forms from the past 12 months.

### **Pre Proposal (PreP, pronounced Prep-E)**

The PreP meeting is a special committee meeting that is held during the summer of the first year in the Biochemistry Ph.D. program. The goal for the Pre Proposal is to engage students in their doctoral research project and other research-related activities early in their graduate career. The Pre Proposal encourages students to develop an understanding of their research objectives, methodology, data analysis, and appreciation for how their work will fit into the larger field of study early in their graduate career.

#### **To prepare for the Pre Proposal students are expected to:**

- Read literature relevant to their research focus in depth
- Discuss their research with experts in their field (advisor, students in the lab, other scientists on and off campus)
- Work purposefully in the lab with guidance from the advisor and lab members in a manner that promotes understanding of methodology, controls, analysis, limitations, etc.
- Participate in opportunities to develop skills and confidence in preparing and making presentations at lab meetings, journal club, seminar class, etc.
- Learn how their work fits into 'the big picture'

By focusing on dissertation research during the spring semester of the first year, Biochemistry first-year students will be in a position to prepare a proposal that will be useful immediately and in the future.

### **Advisory Committee:**

1. 1<sup>st</sup> year student submits a list of proposed committee members to the GPC by **April 2, 2018**. GPC will approve or suggest modifications. This process is expected to be completed by mid-April.
2. PreP meeting requires a GPC member be in attendance as Chair. The GPC member will be appointed by the GPC. A thesis advisory committee member who is also a GPC member can fulfill this role. The advisor, regardless of membership on GPC, cannot fulfill this role.
3. The PreP meeting chair will guide the meeting with the input of the committee and act as a scribe for the generation of feedback to the student (full committee input expected).
4. Members of the PreP committee (advisor, thesis advisory committee members and GPC member) are not to answer questions posed to student. If needed, clarifying questions/remarks may be addressed by the chair or committee members
5. After the PreP meeting, the oral preliminary exam meeting and subsequent annual committee meetings do not require a GPC member.

### **Scheduling:**

1. The PreP meeting should be scheduled by May 14<sup>th</sup>, 2018. The PreP meeting will be held during the summer and should be completed by the end of July. If scheduling the summer PreP meeting with your normal thesis advisory committee is not possible, a Bio/Bio faculty member may be used as a substitute committee member for the PreP meeting. A GPC member will be assigned to act as Chair for each PreP meeting.
2. Student has the option of having a committee meeting (with their approved thesis advisory committee) prior to the PreP meeting.
3. Registration will be blocked if the PreP meeting is not completed by the end of July.

### **Required materials for the PreP meeting:**

Items 1-5 should be submitted in electronic format to the Biochemistry Graduate Programs Office, the thesis advisor, committee members and the GPC member (PreP meeting Chair) **two weeks before** the scheduled PreP meeting.

1. Cover page/Honor statement - Title of Pre Proposal, student's name, lab, date, honor statement verifying with signature that the written Pre Proposal is the student's own work.
2. Written Pre Proposal - format similar to the NIH F31 graduate fellowship research plan; up to 6 pages, single-spaced (the page limit does not include references). The written proposal must be the student's own work (no pasting of your advisor's proposals)
  - i. 1 page Abstract/Aims
  - ii. 1 page Background and Significance
  - iii. 2-3 pages Approach (Discussion of rationale, methods, proposed experiments, and preliminary data)
  - iv. 1 page Student's contribution to the research plan and a discussion of the student's long-term goals/career goals. The GPC encourages all graduate students to prepare

an Individual Development Plan to define their career goals. To get started, visit the myIDP site: <http://myidp.sciencecareers.org/>

3. Curriculum Vitae – the GPC requires that each student establishes a [myNCBI](#) account and uses the [SciENCv](#) builder
4. Annual Graduate Student Self-Evaluation form (see copy in Appendix)
5. Draft Degree Plan with grades (the advisory committee should have access to rotation grades and evaluation forms, as well; (see draft degree plan form in Appendix)
6. Lab notebooks – the student's lab notebooks (physical or electronic) should be brought to the meeting as a resource for the student to use during the question period.
7. Slideshow – Student will give a 20-minute presentation. The student should expect to be interrupted with questions during the slide presentation but practice talks without interruptions should be no longer than 20 minutes. Guideline: One slide/minute.

### **The PreP meeting and assessment:**

1. At the PreP meeting, the student will make an oral presentation with slides. Questions will be posed by PreP committee members. It is expected that the oral presentation with slides and questions on completed research, proposal, methodology, and student's contributions should last ~ 50 minutes.
2. Additional questions to student about ~10 minutes, may include discussion of:
  - a. career goals
  - b. plan for professional development
  - c. clarification of research plan
3. Each committee member will be given a PreP evaluation form to complete during the meeting.
4. The GPC member acts as the scribe to summarize the comments of committee members in order to provide written feedback to the student.
5. The thesis advisor, committee members, and GPC member are not to answer questions posed to the student (unless scientific clarification is required). *Generally, the meeting chair or a committee member will request clarification. The purpose of this rule is to encourage student responsibility for scientific content, to evaluate the student's knowledge and understanding, and to determine what areas will require improvement.*
6. After the presentation and question period, the student leaves the room; the GPC member and committee members prepare a formative assessment of the student's progress in the program.
7. Student returns to room for verbal summary of committee's assessment.

### **Post-PreP Feedback:**

Two weeks after PreP committee meeting, a written summary of performance (prepared by GPC member, and reviewed by thesis advisor and thesis advisory committee members) will be available to the student in the Biochemistry Graduate Program Office.



## **BEYOND THE FIRST YEAR**

### **Continuing Registration**

After joining a lab, students enroll in BICH 690 “Theory of Biochemical Research” (weekly lab meetings), a journal club every fall and spring semester, elective courses, and enough credits of BICH 691 “Research” every semester to total 9 credit hours during fall and spring semester and 6 credit hours during the summer. Check with the Graduate Programs Office to determine the appropriate sections.

### **Degree Plan**

The degree plan serves to establish the official advisory committee and states the coursework for the doctoral degree. The University requires the degree plan to be submitted electronically to the Office of Graduate and Professional Studies (OGAPS) [http://ogaps.tamu.edu/Buttons/Resources-for-Degree-Completion - 0-SubmitDegreePlan](http://ogaps.tamu.edu/Buttons/Resources-for-Degree-Completion-0-SubmitDegreePlan) upon formation of the advisory committee and before the end of the spring semester of the 2<sup>nd</sup> year. To be eligible to schedule the preliminary exam, a student must have completed all but six hours of formal coursework on his or her degree plan, not counting *Research* BICH 691 coursework. This rule affects how you design your degree plan. The degree plan should be formulated at the PreP meeting of the student’s advisory committee, which should be scheduled before the end of July of the first year. If the advisory committee later determines there is sufficient reason to alter the plan of coursework, petitions to change your degree plan should be submitted through the Graduate Program Office to OGAPS. A form you can use to make a draft degree plan for your PreP meeting is included in the Appendix.

### **Full Course Waiver**

When students have only their defense to complete and will not be on Texas A&M payroll the entire spring or summer semester, he/she may register for one credit hour of BICH 691 and be reclassified as a Research Assistant on wages. This is a one-time appointment for three and a half months. International students should meet with staff at ISS about registering for 1 hour. ISS also requires international students to complete a reduced course load form.

### **Elective Courses**

In addition to the required courses, students are required to complete 6 credit hours of elective coursework at the graduate level or in an approved 400 level course. More information about approved electives can be found in the appendix. Pre-requisites for core courses, such as BICH 411, CHEM 328 and BICH 431, cannot be counted as electives.

### **Journal Club**

To assure continued practice in oral presentation skills and to encourage broad exposure to current literature, all students are required to register for a one credit Journal Club every fall and

spring semester until graduation. Several journal clubs (see Appendix) covering various areas of biochemistry and related topics meet regularly during the academic year.

### **Annual Leave**

The department policy is that graduate students are entitled to two weeks of paid vacation per year, in addition to normal state employee holidays.

### Typical 2nd-Year Course Schedule

<b>Fall Semester</b>		<b>Title</b>	<b>Credit Hours</b>
REQUIRED	BICH 6**	Journal Club*	1
REQUIRED	BICH 690	Theory of Biochemical Research	2
REQUIRED	BICH 691	Research	1-5
REQUIRED	BICH 697	Teaching	1
		Electives*	1-3
		<b>Total</b>	<b>9</b>
<b>Spring Semester</b>		<b>Title</b>	<b>Credit Hours</b>
REQUIRED	BICH 690	Theory of Biochemical Research	2
REQUIRED	BICH 691	Research	1-6
REQUIRED	BICH 6**	Journal Club*	1
REQUIRED	BICH 697	Teaching	1
		Electives*	1-3
		<b>Total</b>	<b>9</b>
<b>Summer Semester</b>		<b>Title</b>	<b>Credit Hours</b>
REQUIRED	BICH 691	Research	6
		<b>Total</b>	<b>6</b>

### Typical 3rd-Year and beyond Course Schedule

<b>Fall Semester</b>		<b>Title</b>	<b>Credit Hours</b>
REQUIRED	BICH 690	Theory of Biochemical Research	2
REQUIRED	BICH 691	Research	1-6
REQUIRED	BICH 6**	Journal Club*	1
		<b>Total</b>	<b>9</b>
<b>Spring Semester</b>		<b>Title</b>	<b>Credit Hours</b>
REQUIRED	BICH 689**	Graduate Student Seminar	1
REQUIRED	BICH 690	Theory of Biochemical Research	2
REQUIRED	BICH 691	Research	1-6
REQUIRED	BICH 6**	Journal Club*	1
		<b>Total</b>	<b>9</b>
<b>Summer Semester</b>		<b>Title</b>	<b>Credit Hours</b>
REQUIRED	BICH 691	Research	6
		<b>Total</b>	<b>6</b>

\*See the Appendix for Electives and Journal Clubs

\*\* Registration required in 3<sup>rd</sup> year and not in subsequent years

## Teaching

Students are required to serve as Teaching Assistants (TAs) during their graduate career. All students are expected to teach two semesters. If a student is supported fully by a fellowship or training grant, then the GPC will consider a request for the student to teach only one semester. Students will successfully complete the Teaching Assistant Institute program offered by the Center for Teaching Excellence (CTE) before teaching in their 2<sup>nd</sup> year. During the semesters when serving as a TA, the student registers for BICH 697 "Teaching Biochemistry Laboratory".

For more information about the Teaching Assistant Institute program:

<http://cte.tamu.edu/Graduate-Student-Support/Teaching-Assistant-Institute>

The instructor, for whom the student is serving as an assistant, will assign the specific TA duties. Typically, biochemistry graduate students will be assigned TA duties in either an undergraduate lab course or in a recitation section for a lecture course.

International students serving as TAs must have certification in English proficiency. (See "English Language Requirement.")

## Candidacy

A student must meet the following requirements to be admitted to candidacy.

- Has completed all formal course work on the degree plan with the exception of any remaining BICH 691.
- Has a 3.0 Graduate GPR and a Degree Plan GPR of at least 3.0 with no grade lower than C in any course on the degree plan.
- Has passed the written and oral portions of the preliminary examination.
- Has submitted an approved dissertation proposal.
- Has met the residence requirements.

## Residence Requirements

Students who enter the doctoral degree programs with baccalaureate degrees must spend two academic years in resident study. Students who hold master's degrees when they enter doctoral degree programs must spend one academic year in resident study. Having met these requirements, the student is admitted into candidacy for the Ph.D. degree at the beginning of the next academic semester.

## **Unaccounted absences**

Please note that students who choose to leave Texas A&M University for personal reasons for longer than one full workday should inform their faculty mentor. This is a good practice that will help to maintain open channels for communication within the lab.

## **Dissertation Proposal and Preliminary Examinations**

All students must complete preliminary examinations and have an approved dissertation proposal as part of the Ph.D. requirements. The department requires that students complete their preliminary examinations by the end of the fall semester of their third year. In the Biochemistry Ph.D. Program, discussion and approval of the dissertation proposal is part of the oral preliminary exam.

To be eligible to schedule the preliminary examinations, you must have an official grade point average of at least 3.0 and be within 6 credit hours of completion of the formal coursework listed on the degree plan, excluding Research BICH 691 hours. A student first schedules the times of the written and oral exams. The schedule must be finalized at least three weeks before the date of the first written examination. When scheduling preliminary examinations, keep in mind that getting all the members of the advisory committee together at the same time and place requires planning in advance. Once the schedule is set, the student **MUST** fill out the "[Preliminary Examination Checklist](#)" form. The student will then need to obtain the committee chair's signature on the "Preliminary Examination Checklist" form. The student will give the signed checklist to the graduate academic advisor to obtain the department head's signature. The student **MUST** take the "[Report of the Preliminary Examination](#)" form to the preliminary examination for the advisory committee to sign. When completed, the signed forms should be submitted immediately to the graduate academic advisor for further processing. The graduate academic advisor will submit the "Report of the Preliminary Examination" and the "Preliminary Examination Checklist" forms to the Office of Graduate and Professional Studies. The Office of Graduate and Professional Studies will then do a post-review of the examination and the eligibility requirements. To be admitted for candidacy, the student is encouraged to include a copy of their research proposal with their Preliminary Examination forms to the graduate academic advisor.

## **Dissertation Proposal**

A dissertation proposal documenting the research project must be prepared and submitted to the advisory committee at least two weeks prior to the preliminary examinations. The dissertation proposal defines the scientific problem you will study for your dissertation research. The dissertation proposal is a description of proposed research, so that it can be prepared as soon as the overall research plan is developed. There is no requirement or expectation that a proposal will contain significant preliminary data.

The proposal should explain the rationale, approaches and the methodology you will use in your dissertation research. The format of your dissertation proposal document is likely to be similar to the format of the pre-proposal document you prepared for your PreP meeting. Although the research plan for an NIH fellowship application is typically 6 pages in length and single spaced, give your committee members a double-spaced copy so there is space to write comments and suggestions. A well-written proposal is organized according to National Institutes of Health (NIH) Grant Guidelines and should include three major sections: **Specific Aims** (1 page), **Research Strategy** (5-6 pages) containing **A. Background and Significance**, **B. Innovation**, **C. Approach** (for each Aim or sub-aim, include a section on i. Experimental Design, ii. Anticipated Results & Interpretation, and iii. Potential Pitfalls, Alternative Approaches & Future Directions, and **Literature Cited** (no page limit, for multi-author references, provide a list of up to 6 authors).

Submit one copy of your proposal with the signed Proposal Approval Form For Thesis, Dissertation, Or Record Of Study to OGAPS

[http://ogaps.tamu.edu/OGAPS/media/media-library/documents/Forms\\_and\\_Information/Proposal-Approval-Page-RK-Revision-3-Aug.pdf](http://ogaps.tamu.edu/OGAPS/media/media-library/documents/Forms_and_Information/Proposal-Approval-Page-RK-Revision-3-Aug.pdf)

#### • **Specific Aims**

Answer the question "What do you intend to do?" State the broad, long-term objectives and list concisely and realistically what the specific research described in this application is intended to accomplish and hypotheses to be tested. **One page is recommended.**

#### • **Background and Significance**

This section should answer the questions "What has already been done?" and "Why is the work important?" Briefly sketch the background to the present proposal, critically evaluate existing knowledge, and specifically identify the gaps that the proposed research is intended to fill. State concisely the importance of the research by relating the specific aims to the broad, long-term objectives. **One to two pages are recommended.**

#### • **Approach**

Explain how you will do the work. Feel free to use figures and diagrams to explain the background material or how certain kinds of experiments will be done. Outline the experimental design and the procedures to be used to accomplish the specific aims of the project. The experimental section of a proposal should not be detailed description of protocols that you would expect to find in the *Materials and Methods* section of a paper. Rather, it should focus on how the data will be collected, analyzed, and interpreted. Describe any new methodology and its advantage over existing methodologies. Discuss the potential difficulties and limitations of the

proposed procedures and alternative approaches to achieve the aims. Provide a tentative sequence or timeline for the investigation. Inclusion of an additional section describing preliminary results you have obtained may be appropriate. It is recommended that this section be placed at the beginning of the Approach section and be named 'Preliminary Results'.

**The total for the Background, Significance and Approach sections of your proposal should not exceed 6 pages single-spaced in an 11-point font.**

#### • Literature Cited

Use references to support statements or concepts. List your references at the end of your proposal rather than throughout the text. Each citation must include the names of all authors (or at least up to six), the title of the article or book, the name and volume number of the journal, page numbers, and year of publication. The list should be relevant and current; it need not be exhaustive.

You are expected to have read and understood all, or the pertinent parts, of each reference listed. References may be organized in any consistent fashion; for example, list in order of appearance and number consecutively in the text, or cite the authors in the text and list the references alphabetically by author.

#### • Preliminary Examinations

The preliminary exams have two parts: written and oral. The written exams are usually scheduled 1-2 weeks before the oral exam, with each member of the committee allotted one day. Each member of the advisory committee gives the student a written examination. The student should discuss the format of each written exam beforehand with each committee member. All written exams and the oral exam must be completed in a time period of no more than three weeks.

Because the oral portion of the preliminary exam deals primarily with scientific principles, techniques, and issues raised in the proposal, you must submit a draft of the proposal to each member of your advisory committee at least two weeks prior to the oral portion of the exam. Although the proposal is the focus of both the written and oral exams, the student is expected to be able to discuss related fields and different experimental approaches to related problems.

Upon successful completion of all written exams, the oral examination may be taken. The oral examination usually focuses on a defense of the dissertation proposal. The oral exam also gives committee members the opportunity to follow up on questions that arose during the written exams. A typical oral exam begins with a discussion of the written exams with the student out of the room. The student then gives a presentation of the proposal that will be interrupted by questions from the

committee. At some point, the student will be asked to leave again and the committee will discuss the student's performance. A positive vote by members of the graduate committee with no more than one dissension is required to pass the preliminary exams.

Upon completion of the oral exam, the student or the chair (your thesis research advisor) will submit the signed Report of the Preliminary Examination immediately to the graduate academic advisor for further processing. The graduate academic advisor will submit the Report of the Preliminary Examination and the Preliminary Examination Checklist to the Office of Graduate and Professional Studies. To be admitted for candidacy, the student must include their research proposal with their Preliminary Examination to the graduate academic advisor. The Office of Graduate and Professional Studies will do a post-review of the examination of the dissertation and the eligibility requirements. The examination results should be reported whether or not final changes on the proposal have been approved. If necessary, the revised approved proposal and proposal approval page form, signed by all members of your advisory committee and the Department Head, will then be sent to the Office of Graduate and Professional Studies.

In the event that the student fails to pass either portion of the preliminary examinations, the advisory committee may elect to reschedule that portion of the preliminary examinations after at least six months of additional preparation. Alternatively, the student may be assigned to, or elect to change to, the Master of Science degree.

All written exams and the oral exam must be completed in a time period of no more than three weeks. A sample of the Preliminary Examination Checklist, the Report of the Preliminary Examination, and Title Page can be found at:

<http://ogaps.tamu.edu/OGAPS/media/media-library/documents/Forms%20and%20Information/Preliminary-Examination-checklist-and-report.pdf>



## **Ph.D. Dissertation**

### **Requirements for dissertation/thesis preparation**

Texas A&M University has extensive requirements for the writing and preparation of a dissertation or a thesis. These requirements can be quite rigid, even for what may appear to be minor items, such as font size, page margins, etc. Therefore, reading and following the university requirements is a necessity. Students can access the official manual electronically at: <http://ogaps.tamu.edu/New-Current-Students/Thesis-and-Dissertation-Services>

In scientific publications, we want to emphasize that due to the collaborative nature of research, proper citation of work done by others is required. Every table or figure that contain results not obtained by the author of the dissertation should cite the source in the legend. Alternatively, the student can have an acknowledgement section where all results from others are duly acknowledged.

### **Defense of the Dissertation**

The final steps in obtaining a Ph.D. is writing and defense of the dissertation. The student should discuss the status of the research with the advisory committee before beginning to write the dissertation. When the student, advisor and advisory committee agree on a time for submission and defense of the doctoral dissertation, the Office of Graduate and Professional Studies and graduate academic advisor must approve the scheduling of the defense. The Office of Graduate and Professional Studies publishes a calendar for each academic term listing strict University deadlines for these events. A copy of the OGAPS calendar is available at: <http://ogaps.tamu.edu/Buttons/Calendars>.

The dissertation must be given to members of the advisory committee at least 14 days before the scheduled defense. A defense of dissertation includes a public seminar held in a main lecture hall on campus. Convenient locations to have the public seminar include the Biochemistry Building, the ILSB, the Borlaug Center, and the Heep Building. The graduate academic advisor must be notified of the date, time, place, and title of the dissertation seminar at least two weeks beforehand to allow sufficient time to distribute and post notices of the defense. Specific forms are required at the defense so it is imperative that you consult closely with the graduate academic advisor before the dissertation seminar and exam. If a student has only their defense to complete and will not be on Texas A&M payroll for the entire semester, he/she may register for one credit hour of BICH 691 and be reclassified as a temporary research assistant. It is important to understand that change of classification will affect the student's benefits and insurance. Please contact the graduate program advisor with any questions.

## MASTER OF SCIENCE DEGREE

Students may elect to pursue a thesis or non-thesis Master of Science in Biochemistry. Master's students are required to take all core coursework required of Ph.D. students.

Students, who leave the Ph.D. degree program, may be allowed to pursue a Master of Science degree. This change requires the approval of the research advisor and PhD thesis advisory committee. It is also necessary to fulfill all the University requirements.

Pursuit of a Master of Science thesis-option degree requires that the Principal Investigator (PI) extend full stipend support or arrange for equivalent support during the period of the master's research. Students in the Master of Science program are strongly advised to familiarize themselves with the University requirements for Master of Science degrees, which are extensive, and to consult with the GPC and the graduate academic advisor. For example, for a thesis-option Master of Science degree, these requirements include (but are not necessarily limited to):

**Domestic Students:** Degree level changes must be made no later than the 20<sup>th</sup> class day in the fall/spring and the 4<sup>th</sup> class day in the summer.

**International Students:** Degree level changes must be made no later than the 12<sup>th</sup> class day in the fall/spring and 4<sup>th</sup> class day in the summer. International students must have all immigration documents corrected with the International Student Services (ISS) no later than the 15<sup>th</sup> class day.

### Thesis Option

- A minimum of 32-semester credit hours of approved courses, including all required biochemistry courses, and research hours.
- A degree plan approved by a thesis advisory committee and the Office of Graduate and Professional Studies. Note that the deadline for submitting a degree plan to OGAPS is usually in the middle of the semester *before* you are planning to graduate; for December graduation, the deadline may be before the start of the Summer term.
- Submission of a thesis *proposal* approved by the advisory committee and the Department Head (this does not require a committee meeting, but a meeting may be useful to discuss the proposal)
- An oral defense of a Masters thesis, which must be approved by the advisory committee and the head of the department.
- Submission of two copies of the completed thesis with the appropriate approvals to the Office of Graduate and Professional Studies' Thesis Office.
- Approval of the thesis by the Thesis Office.

At the start of the semester when you plan to defend your thesis, you must apply to OGAPS for your graduate degree and pay a diploma fee. Important deadlines can be found for each semester on the OGAPS calendar at: <http://ogaps.tamu.edu/Buttons/Calendars>

## **Non-Thesis Option**

Requirements include:

- A committee chosen by the department.
- Completing a minimum of 36 semester hours approved by the student's advisory committee and department head.
- A final comprehensive exam.
- The requirements as to level of courses and examinations are the same as for the thesis option of Master of Science degree.
- No examination may be held prior to the mid-point of the semester or summer term in which a student will complete all remaining courses on the degree plan.
- A thesis is not required.
- Students pursuing the non-thesis option are not allowed to enroll in 691 (Research) for any reason and 691 may not be used for credit toward a non-thesis option Master of Science degree.
- Two credit hours of 690 (Theory of Research) may be used toward the non-thesis option Master of Science degree.
- Any combination of 684, 685, 690, and 695 may not exceed 25 percent of the total credit hour requirement shown on the individual degree plan.
- All requirements for the non-thesis option Master of Science degree other than those specified above are the same as for the thesis option degree.

## **UNIVERSITY INFORMATION**

### **Petitions**

In the course of your graduate career, you may find it necessary to request changes in the approved degree plan on file in the Office of Graduate and Professional Studies. A petition can be used to change a committee member or change coursework on the approved degree plan. An online petition is available on the Document Processing Submission System (DPSS) web site. Petitions must be approved electronically by all members of your official advisory committee and by the department head.

### **Academic Status**

The University mandates that all full-time graduate students supported by an assistantship register for 9 credit hours each fall and spring semester, 6 credit hours in summer, and maintain a grade point average of 3.0 or above.

A graduate student is considered full-time if registered for a minimum of:

- 9 semester credit hours during the fall and spring semesters; and
- 6 semester credit hours during a 10-week summer session

If you fail to register for the required minimum number of credit hours, or **if for any reason your credit hours fall below the minimum during the semester, your graduate assistantship position will be terminated and, if you have an out-of-state tuition waiver, it will be dropped.**

If you are out of compliance with the continuous registration requirements, your registration will be blocked. To have the block lifted, you must get both 1) a favorable recommendation from the department head, and 2) approval from the Office of Graduate and Professional Studies.

International students may have additional requirements depending on their visa status. To obtain current information on visa requirements, international students should consult an International Student Advisor, Office of International Student Services, at 979 845-1824, 1<sup>st</sup> Floor, The Pavilion, Room 110, College Station, TX, 77845-1226. In most cases, the only form required is a waiver for full-time hours that can be obtained at the International Students Services Immigration Office, 1<sup>st</sup> Floor, The Pavilion, Room 110. Email: [iss@tamu.edu](mailto:iss@tamu.edu)

## **Tuition**

Teaching assistants, research assistants, and non-teaching graduate students who are employed at least one-half time at a Texas institution of higher education, and whose job duties are related to teaching or research in an academic program associated with their field of study, are entitled to resident tuition and fees for themselves, their spouse and their children. Graduate students in Biochemistry are limited to 7 years of resident tuition at the doctoral level.

## **Paychecks**

Paychecks are paid for the preceding month on the first weekday of the subsequent month. Consequently, you will not receive your first paycheck until the first weekday in **OCTOBER (10/2/2017)**.

## **Right to Review Records**

Students, once enrolled, have the right to review their educational records, except for those excluded by law, such as parents' financial statement or records maintained by a physician or psychiatrist. Educational records are maintained in departmental offices, the Admissions & Records Office and Student Financial Aid, the offices of various College Deans and in the Career Center.

## **Academic Honesty**

Academic dishonesty in any form is a serious offense and is not be tolerated in an academic community. Dishonesty, in any form, including cheating, plagiarism, deception of effort, or unauthorized assistance, may result in a failing grade in a course and/or suspension or dismissal from the Graduate Program. Falsification of data is grounds for immediate dismissal.

## **Ownership of Data**

When a student enters a laboratory to work on a project, it is understood that any data obtained remain the property of the University through the individual faculty member. NIH guidelines require

that data and notebooks remain with the Principal Investigator and with the University. Final decisions on publication and on co-authorship of papers rests with the Principal Investigator (Faculty Advisor).

**OGAPS WEBSITE:** <http://ogaps.tamu.edu/>

Refer to the OGAPS web page for forms, tutorials, and links

- **Dates & Deadlines:** <http://ogaps.tamu.edu/Buttons/Calendars>
  
- **Degree Plans:** <http://ogaps.tamu.edu/OGAPS/media/media-library/documents/Forms%20and%20Information/Degree-Plan-Fact-Sheet.pdf>
  
- **Forms:** <http://ogaps.tamu.edu/Buttons/Forms-Information - 0-AcademicProcessForms>
  - **Preliminary Examination Checklist and Report**
  - **Request for Final Examination**
  - **Proposal Approval Page for Thesis or Dissertation**
  - **Letter of Intent**
  - **Request for Letter of Completion**
  - **Special Request Letter**
  - **Graduation Cancellation Form**
  
- **Petitions** for the following are made through the Document Processing Submission System (DPSS) <https://ogsdpss.tamu.edu/>
  - **Petition for Change of Committee Members**
  - **Petition for Change of Major, Degree or Department**
  - **Petition for Course Changes**
  - **Petition for Waivers or Exceptions to University Requirements**

## APPENDIX

### Approved Electives

The list below includes several elective courses taken by biochemistry graduate students recently. To ensure that an elective course provides the content you are interested in, you should contact the instructor to obtain a syllabus to confirm the content, time, and location of the class. At least 3 of the 6 elective credit hours must be at the 600 level. Please note that a **489** or **689** course number indicates the course is a “Special Topic”, the course may be assigned a different, permanent number in subsequent semesters.

The following list of elective courses is not exhaustive. If there is a course you are interested in taking that is not on the list, the GPC will consider adding other courses to the list of approved electives. For a course to be considered by the GPC, you must provide the chair of the Graduate Program Committee with the syllabus for the course that describes course content, number of credits, grading scheme and information on how students are evaluated.

<b>BIOCHEMISTRY</b>	
<b>400 Level</b>	
BICH 489	Practical Genomics
<b>600 Level</b>	
BICH 628	Computational Biology – 3 credit hours
BICH 650	Genomics – 3 credit hours
BICH 654	Structural Biochemistry – 3 credit hours
BICH 655	Crystallography Methods – 3 credit hours
BICH 661	Advanced Genome Annotation with Ontologies – 1 credit hour
BICH 662	Eukaryotic Transcription – 1 credit hour
BICH 664	Fluorescence- 1 credit hour
BICH 665	Biochemical Kinetics – 1 credit hour
BICH 689	Special Topics
<b>BIOLOGY</b>	
<b>400 Level</b>	
<b>600 Level</b>	
BIOL 601	Biological Clocks – 3 credit hours
BIOL 602	Transmission Electron Microscopy – 5 credit hours
BIOL 603	Advanced TEM Methodologies in Life & Material Sc. – 3 credit hours
BIOL 604	Fund. Of Scanning Electron Microscopy – 2 credit hours
BIOL 605	Prin. & Methods of Systematic Biology – 4 credit hours
BIOL 606	Microbial Genetics – 3 credit hours
BIOL 607	Terrestrial Ecosystems – 4 credit hours
BIOL 608	Light Microscopy – 3 credit hours
BIOL 611	Molecular Biol. of Differentiation & Development – 3 credit hours
BIOL 613	Cell Biology – 3 credit hours

BIOL 614	Cell Biology Cell Signaling – 3 credit hours
BIOL 620	Transcription Initiation – 3 credit hours
BIOL 624	Fungal Genetics - 3 credit hours
BIOL 635	Plant Molecular Biology – 3 credit hours
BIOL 636	Plant Cell Biology – 3 credit hours
BIOL 644	Neural Development
BIOL 647	Digital Biology
BIOL 650	Genomics (register for BICH 650) - 3 credit hours
BIOL 651	Bioinformatics – 3 credit hours
BIOL 670	The Cell Cycle – 1 credit hour
BIOL 672	Molecular Biology of Photosynthesis – 3 credit hours
BIOL 674	Cellular and Molecular Aspects of Development – 3 credit hours
BIOL 689	Special Topics
<b>CHEMISTRY</b>	
<b>400 Level</b>	
CHEM 446	Organic Chemistry III
<b>600 Level</b>	
CHEM 603	Modern Chromo Separation Methods – 3 credit hours
CHEM 604	Modern Electrophorescence Sep Methods – 3 credit hours
CHEM 610	Organic Reactions – 3 credit hours
CHEM 615	Organic Synthesis – 3 credit hours
CHEM 618	NMR Spectroscopy – 3 credit hours
CHEM 619	Analytical Spectroscopy – 3 credit hours
CHEM 621	Chemical Kinetics - 3 credit hours
CHEM 622	Absorption Phenomena & Heterogeneous Catalysis 3 credit hrs.
CHEM 626	Thermodynamics – 3 credit hours
CHEM 627	Principles of Biological Chemistry – 3 credit hours
CHEM 628	Coordination and Bioinorganic Chemistry – 3 credit hours
CHEM 633	Principles of Inorganic Chemistry – 3 credit hours
CHEM 635	Introduction to X-ray Diffraction Methods – 3 credit hours
CHEM 641	Structural Inorganic Chemistry – 3 credit hours
CHEM 646	Organic Chemistry – 3 credit hours
CHEM 658	Molecular Modeling – 3 credit hours
CHEM 672	Bioorganic Reaction Mechanisms – 3 credit hours
CHEM 689	Special Topics
<b>GENETICS</b>	
<b>600 Level</b>	
GENE 603	Genetics – 4 credit hours
GENE 626	Analysis of Gene Expression – 2 credit hours
GENE 631	Biochemical Genetics – 3 credit hours
GENE 654	Analysis of Complex Genomes – 3 credit hours
GENE 689	Special Topics
<b>PHYSICS</b>	
<b>400 Level</b>	

PHYS 408	Thermo & State Mechanics
PHYS 412	Quantum Mechanics I
<b>600 Level</b>	
PHYS 689	Special Topics
<b>STATISTICS</b>	
STAT 489	Principles of Statistics and Data Science – 3 credit hours
STAT 645	Applied Biostatistics and Data Analysis – 3 credit hours
STAT 651	Statistics in Research I – 3 credit hours
STAT 652	Statistics in Research II – 3 credit hours
STAT 661	Statistical Genetics – 3 credit hours
<b>VETERINARY INTERGRATIVE BIOSCIENCES</b>	
VIBS 613	Evolutionary Bioinformatics – 3 credit hours
<b>VETERINARY MICROBIOLOGY</b>	
VTMI 601	Pathobiology – 5 credit hours
VTMI 663	Molecular Biology of Viruses – 3 credit hours
<b>VETERINARY PHYSIOLOGY AND PHARMACOLOGY</b>	
VTPP 653	Endocrinology – 4 credit hours
VTPP 676	Genetic and Molecular Toxicology – 3 credit hours
VTPP 677	Fluor Detection – 3 credit hours
<b>APPROVED JOURNAL CLUBS – 1 credit hour each</b>	
BICH 625	Nucleic Acid -Protein Interactions                      Graded
BICH 671	Macromolecular Folding and Design                      Graded
BICH 672	Biological Membranes    Graded
BICH 673	Gene Expression    Graded
BICH 674	Protein Folding and Stability                                      Graded
BICH 675	Plant Biochemistry and Genomics                              Graded
BICH 676	Bacteriophage Biology    Graded
BICH 677	CHEM GENE & Drug Discovery                                      Graded
BICH 678	Metal Ions    Graded
BIOL 681	RNA Biology and Computational Genomics...Pending approval
MSCI 681	Host-Pathogen Interface...Pending approval
CHEM 681	Enzyme Structure and Function...Pending approval



**PhD Advisory Committee Annual Report**  
 Department of Biochemistry and Biophysics, Texas A&M University

Student Name \_\_\_\_\_ Date entered PhD Program \_\_\_\_\_

Meeting Date \_\_\_\_\_ Previous Meeting Date \_\_\_\_\_

Chair \_\_\_\_\_ Co-Chair \_\_\_\_\_

**\*\*Committee Chair should collect and submit evaluation forms completed by each PhD Advisory Committee member to the Graduate Studies Office, Bio/Bio 103C \*\***

**Name of Reporting Committee Member** (please print legibly) \_\_\_\_\_

**How well does the student meet your expectations in the following areas?**

Note: Expectations should represent a common level of proficiency demanded of all students in this program

	Above Expectations	Meets Expectations	Needs Improvement	Not Acceptable	Not enough information
1. Progress toward degree?					
2. Exhibits understanding of discipline-specific knowledge?					
3. Applies knowledge to justify decisions?					
4. Considers a variety of sources and alternative views when critically evaluating ideas and information?					
5. Develops clear, data-supported research plans?					
6. Uses appropriate technologies to solve problems?					
7. Performs experiments with appropriate controls?					
8. Quality/reproducibility of experimental work?					
9. Proficiency in analysis of data?					
10. Communicates effectively?					

10.1 Has the student published any of her/his PhD research? Yes \_\_\_ No \_\_\_

If yes, how many publications from her/his PhD research? \_\_\_\_\_

10.2 Has the student presented at a scientific conference? Yes \_\_\_ No \_\_\_ If yes, how many presentations? \_\_\_\_\_

If yes, indicate the type of presentation(s)? Circle: Poster Platform

Has the student participated in other professional development activities? Yes \_\_\_ No \_\_\_ If yes, what activities?

**Summarize your specific recommendations to student**

**Additional comments**

**\*\*Committee chair should collect completed forms at the time of the meeting and turn all forms into the Graduate Programs Office, Department of Biochemistry and Biophysics, Room 103C.\*\***

**Failure to file Annual Reports with the Graduate Program Office will result in a registration block.**

Revised: December 2015

# Annual Graduate Student Self Evaluation

Department of Biochemistry and Biophysics, Texas A&M University

**The following information and a current CV is to be provided to each committee member and to the Graduate Programs Office in Bio/Bio 103C before the Annual PhD Advisory Committee meeting.**

Student \_\_\_\_\_ Date entered PhD program \_\_\_\_\_

Report date \_\_\_\_\_

Committee Chair \_\_\_\_\_ Co-Chair (if Applicable) \_\_\_\_\_

Number of publications or other major writing achievements while in current degree program.	In prep	Submitted	Accepted/ Published
Refereed publications			
Non-refereed publications			
Other (specify)			

Number of oral or poster presentations at scientific meetings while in current degree program	National Internationa l	Region al Meeting	Dept/Univ	Research Competition
Oral presentations				
Poster presentations				

Grant proposals that you have submitted or have been awarded (excluding scholarships & financial aid), while in current degree program. Specify funding source and award amount.		
Departmental or other TAMU (e.g. travel grants)	Funding source	Award amount
External		

Teaching experiences while in current degree program	Total # different courses	Total # semesters
As Bio/Bio TA		
Other		

**Research experiences unrelated to dissertation research** while in current degree program, e.g. internships or Study Abroad:

\_\_\_\_\_

\_\_\_\_\_

Awards (specify)	Departmental	College-level	University level	National/International

Rate your proficiency in the following areas	Proficient	Acceptable	Developing
Literature or publication searches			
Statistical analysis			
Collaborative writing and or presentation tools			
Software & technology within your discipline			
(Specify which software/technology)			



## Doctoral Degree Plan

Course	Course Title	Credit Hours
BICH 603	Principles of Biochemistry & Biophysics	3
BICH 608	Critical Analysis of Biochemical Literature	2
BICH 689	Principles of Molecular Genetics	1
BICH 689	Application of Scientific Values	1
BICH 681	Presentation Seminar	1
BICH 685	Directed Studies	2
BICH 689	Advanced Molecules	6
BICH 689	Graduate Student Seminar	1
BICH 690	Theory of Biochemical Research	12
BICH 691	Research	55
BICH 697	Practice of Teaching	2
BICH 6XX	Journal Club	1
BICH 6XX	Journal Club	1
BICH 6XX	Journal Club	1
BICH 6XX	Journal Club	1
Elective		3
Elective		3
	<b>Total Hours</b>	<b>96</b>

**Note:** The hour requirements reflected in the degree plan represent the **minimum** departmental requirements. Students may elect to take more courses and/or the student's committee or chair may require more hours than what is listed on these degree plans. Students must take a Journal Club every semester until they graduate.

# Advisory Committee List

Graduate Student's Name \_\_\_\_\_

1. Chair - \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. Out of Department \_\_\_\_\_ Dept. \_\_\_\_\_

## Advisory Committee

A list of the proposed members of the advisory committee must be submitted to the GPC by 12 noon on April 2, 2018. The advisory committee must consist of four members of the graduate faculty representative of the student's field of study and research. Three members, including the chair or co-chair, must be from the Department of Biochemistry and Biophysics, and one member must have a primary appointment in a department other than the Department of Biochemistry and Biophysics. If the chair of the advisory committee is NOT an associate member of the Department of Biochemistry and Biophysics, one of the three full members must be named as co-chair. The committee members should reflect a broad biochemical perspective with faculty from molecular and biophysical endeavors. All advisory committees must be approved by the GPC.

Once formed, the advisory committee must meet for the PreP meeting in the summer of the first year and then beginning the following year, annually each academic year. *A Ph.D. Advisory Committee Annual Report* form must be completed by each committee member during each committee meeting and filed with the Graduate Programs Office. The graduate academic advisor will block registration for any student whose records do not contain completed *Ph.D. Advisory Committee Annual Report* forms from within the past 12 months. The graduate academic advisor should be notified of the scheduling of the annual advisory committee meeting so the forms required for the meeting can be distributed to the student and the student's advisor.

**Please turn into the Graduate Programs Office, Biochemistry Building Room  
103 by 12 noon on April 2, 2018**

# Rotation Evaluation 2017/2018

Student Name: \_\_\_\_\_, PI Name: \_\_\_\_\_,

Rotation Period: \_\_\_\_Rotation 1, \_\_\_\_Rotation 2, \_\_\_\_Rotation 3, \_\_\_\_Rotation 4 (if needed)

Please evaluate the rotation student in the following categories and write comments below.

Categories	Exceeds expectations	Acceptable	Needs Improvement	Unobserved
Attendance	Spends over expected time	Spends expected time in lab	Not enough time spent in lab	
Work ethic	in lab	(~20 hours per week)	Work ethic needs	
Punctuality	Excellent work ethic	Good work ethic	improvement	
	Punctual	Punctual	Misses meetings	
Organization	Superior organization	Good balance between	Unfocused	
	skills improve efficiency	planning, executing, and	Disorganized	
	in lab	analyzing experiments	Forgetful	
Understanding of project	Reading and thinking go beyond specifics of project	Understands big picture and specifics of project	Effort and/or background insufficient for good understanding	
Independence (by the end of the rotation)	Confident Rapidly became independent but kept mentor informed	Good balance between seeking instruction and working independently	Timid Unable to execute or analyze experiments independently	
Productivity	Went beyond rotation goals and/or results advanced project in the lab	Completed rotation goals	Problems in one or more of the above areas impeded progress	
Discussion of project with PI	Clear, organized, thought-provoking, and engaging discussions	Clear and well articulated explanation of all aspects of project	Unclear explanations and/or insufficient preparation	
Oral communication	Thought-provoking, engaging	Clear, logical, concise	Confusing, disorganized	
Written communication	Superior writing ability, able to tie specific goal of the project to big picture	Clear, logical, concise, and complete	Substantial problems with grammar, sentence structure, flow, and/or logic	
Attitude and interaction with others	Makes special efforts to interact with lab members and discuss science. Considerate of others	Good interaction with lab members and good lab citizen	Insufficient interaction with and/or inconsiderate of lab members; difficult interaction with mentor and/or professor	
Interest in science	Enthusiastic, excited, highly-motivated	Interested and involved in the process	Indifferent or disengaged	
<b>Comments:</b>				