GUIDELINES FOR THE Ph.D. DEGREE PROGRAM
IN THE DEPARTMENT OF BIOCHEMISTRY
UNIVERSITY OF LOUISVILLE SCHOOL OF MEDICINE

A. CRITERIA AND MECHANISM FOR SELECTION

In addition to the Graduate School requirements the following criteria will be used as the basis for formal acceptance of students to the Ph.D. program in Biochemistry. Acceptance of each student requires approval unanimously by the Graduate Executive Committee or by a majority of the Graduate Committee.

1. Transcript of course work. A two-semester course in organic chemistry is required (see D1).
2. Grade point average: The Department requires an overall 3.0 grade point average (4.0 system) with an average of 3.0 in science courses.
3. The Graduate Record Examination general test.
4. At least two letters of recommendation, preferably from faculty in biology and/or chemistry.
5. A personal interview with members of the Biochemistry Department is encouraged for all applicants.

B. STUDENT SUPPORT[1]

Every applicant will be considered for IPIBS Fellowship support. Support after IPIBS support (currently 23 months) is the responsibility of the students Dissertation Advisor. Students are also encouraged to seek extramural support.

C. GUIDANCE FOR THE STUDENT[2]

The Director of the Biochemistry Graduate Program will serve as the first year advisor to all incoming graduate students until a Dissertation Advisor is selected. During the first year all students will meet with all available faculty to discuss research projects. After completion of lab rotations and before beginning the second year, the student will select a preceptor, subject to the approval of the Graduate Executive Committee and the Chairman.

After a preceptor is approved, they and the Graduate Program Director must approve the student's registration each semester.

Drop/add of courses must be approved by the student's preceptor and the Director of the Biochemistry Graduate Program in consultation with the instructor.

At the end of the first year, a Dissertation Committee will be formed which will serve as the Reading Committee and Examining Committee. This Committee will consist of the preceptor, three other faculty of the Biochemistry Department (at least three of the Committee members must be primary faculty in the Biochemistry Department), and one member outside of the Department, and must be approved by the Graduate Executive Committee.

[1] See "Graduate Student Funding Policies"

[2] See "General Policies for Rotations and Preceptor Selection"

Each student must meet regularly with his/her Dissertation Committee. There must be at least one formal meeting per year. Students should provide a written progress report to their committees at least 1 week prior to the meeting. This meeting may occur immediately after the student presents his or her annual research conference. After each meeting, the advisor will complete the "Student Meeting Form" and provide copies to the Committee members, the student, the Director of the Biochemistry Graduate Program and the Department Chair. If deficiencies are identified at the annual meeting, a second meeting of the student and committee will be held that year to determine whether the student has remediated the deficiencies. The first formal meeting of a Ph.D. student with the committee will probably be to present the Preliminary Proposal.

Students who do not have at least one committee meeting per year (every 12 months) will be given an incomplete in Research. This will become an F if the deficiency is not made up within one semester. Students in candidacy will not be allowed to register for the next semester unless they have had a committee meeting.

D. COURSE REQUIREMENTS FOR THE Ph.D. DEGREE IN BIOCHEMISTRY

1. Students entering the Ph.D. program should have taken two semesters of organic chemistry and earned satisfactory grades. Students with unsatisfactory grades in organic chemistry have the option of taking and passing the ACS examination with a minimum score of the 40th percentile in the area of deficiency or taking a remedial undergraduate course(s) or appropriate graduate course(s) in the area of deficiency and earning a B or better.

2. The courses required for the Ph.D. in Biochemistry, are the core IPIBS requirement (shown in bold below), and a minimum of 24 credit hours of classroom instruction (not including research, rotations or seminars), of which 17 credit hours must be in BIOC courses. The Biochemistry courses that can be used to satisfy these requirements are listed below.

Fall Semester:	Course No.	Credit Hours	
Biochemistry	**545/645**	(**3**/4)	**Biochemistry I**
	611	(3)	Advanced Techniques in Biochemical & Mol Biol I Methods I
	668	(4)	Molecular Biology
	641	(4)	Advanced Eukaryotic Genetics
	660	(2)	Molecular Endocrinology
	603	(1-3)	Special Topics in Biochemistry
Math	591	(3)	Math Models in Computational Biology
Spring Semester:			
Microbiology	**667**	**(3)**	**Cell Biology**
Biochemistry	**547/647**	**(3/4)**	**Biochemistry II**

612	(2)	Advanced Techniques in Biochemical & Mol Biol II
603-04	(2)	Molecular Interactions
603-02	(1)	Ethics
661	(3)	Molecular Toxicology
675	(4)	Cancer Biology

The selection of courses to complete the credit requirements should be made in consultation with the students dissertation committee and require approval of the Graduate Executive Committee. Course descriptions may be found in the current edition of the Graduate Bulletin.

In addition, Biochemistry 606 (Seminar) is required each year of residence. In the first year, students will receive credit for attendance and participation. After the first year, students will present seminars, with a total of three seminars presentations required. The first two seminars will be graded. *Only one seminar may be on a topic related to the student's research.* Attendance is required at all Biochemistry Seminars and Research Conferences.

3. All classes should be taken before the end of the students second year and must be taken before the student enters candidacy. For students with previous graduate training, documented graduate level courses may be accepted to fulfill credit requirements. This requires approval by the Graduate Executive Committee when the student is admitted.

4. All Ph.D. students are required to assist in teaching 8-10 hours per week for one semester during their 2nd or 3rd years. The 2nd year is preferable. This requirement is normally met by serving as a teaching assistant in Biochemistry I or II.

5. Students are expected to maintain B (3.0) averages in their course work. A student who fails to maintain a B average will be placed on academic probation and will be subject to dismissal from the program.

E. EXAMINATIONS AND PROPOSAL

(If a mentor ascertains that the following schedule is not in the best interest of a student, the mentor may petition, in writing, the Graduate Executive Committee for a change in the schedule.)

Ph.D. qualifying exam (Exam I). The purpose of this exam is to evaluate the student's ability to interpret literature, independently develop a research plan, integrate material from the graduate curriculum, write clearly, organize a proposal, and orally defend their ideas. It will help the student to develop the tools necessary for preparation and defense of their doctoral dissertations. Successful completion of Exam I will be a strong indicator for successful completion of the Ph.D. Details about the format for exam I can be found in appendix A.

Exam I will usually be taken in May - June of the second year in the Ph.D. program. Students must have completed their core graduate courses, have a cummulative GPA of 3.0 or greater, and selected a mentor approved by the Graduate Executive Committee to be eligible for Exam I. Successful completion of this exam will allow the student to enter Ph.D. candidacy

Preliminary Dissertation Proposal. The purpose of this preliminary proposal is to allow the Dissertation Committee to assess whether the proposed project is appropriate for Ph.D. research and whether the student is prepared to develop a Written Proposal for Oral Examination. The student will meet with his/her Ph.D. Committee to discuss the student's academic progress, get advice on electives and discuss the research project *during the third quarter of the second year*. The student will provide the Committee with a 1 to 2-page summary of research proposed for the Ph.D. dissertation one week prior to this meeting. The write-up may be in outline format and must include a hypothesis, a list of the specific aims, the general methodology that will be used, and the experiments that will be performed for the next few months in preparation of the formal research proposal. The candidate will give a 15-30 minute oral presentation to the Committee emphasizing the hypothesis, specific aims and feasibility of the proposed project and demonstrating knowledge of the literature. The completed "Student Meeting Form" will indicate whether or not an additional meeting is required.

Written Dissertation Proposal and Oral Examination (Exam II) - The purpose of this written proposal is for the Dissertation Committee to examine the student's ability to develop and defend a research project. A formal written proposal of the student's dissertation work and oral defense should be completed *before December of the student's third year*. The proposal, typed single-spaced, will not exceed one page for hypothesis and specific aims, two pages for background (significance), three pages of preliminary results, and three pages for proposed experimental plans. The proposal will also include a listing of major equipment required, a proposed time frame for the conduct of experiments, and literature citations. See instructions for NIH proposal Guidelines at the NIH web site. The student is responsible for the literature search, specific experimental design and preparation of the proposal. Students may format the dissertation proposal in the form of a thesis, and submit it to the graduate school for an M.S. degree. In this case the oral presentation and examination will serve as the M.S. thesis defense. Committee members must receive the proposal two weeks prior to the date of the oral examination. During the oral examination, the student will present a formal research conference open to the Department. This will be followed by an oral defense with the student's Committee. The dissertation advisor should coordinate the proposal process and officiate at this examination, but should not dominate the questioning. A written report stating the outcome of the examination and signed by each examiner will become a part of the student's record. Failure to perform at an adequate level will result in the student being paced in Masters degree candidacy and may result in their being dismissed from the graduate program.

F. DISSERTATION AND DEFENSE

A dissertation consists of a complete and coherent body of work resulting in a significant,

substantial and novel contribution to the field of biochemistry and molecular biology. It is expected that the work will result in first author, peer-reviewed publications. At a minimum, one peer reviewed, first author publication should result from a student's dissertation. The absence of such a publication will require a specific review by the Dissertation committee addressing why a publication has not resulted from the work and confirming that the dissertation indeed represents a significant advance of the field. This review must be approved by the Chair of the Department in consultation with the Graduate Executive Committee.

The Dissertation Committee and Chair of the Department must receive a completed copy of the dissertation at least two weeks prior to the expected date for the defense. The Chair of the Department must approve the dissertation and scheduling of the final defense. For the format of the dissertation, consult the current "Standards for the Preparation of Theses and Dissertations," published by the Graduate School. A copy is available on line at the Graduate School's web site.

G. CHANGE IN GUIDELINES

When requirements change, a student has the option of satisfying either the requirements in effect when he/she entered the program or the current requirements.

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