

# Program-Level Assessment Plan

Program: Biochemistry & Molecular Biology	Degree Level (e.g., UG or GR certificate, UG major, master's program, doctoral program): Ph.D.
Department: Biochemistry & Molecular Biology	College/School: School of Medicine
Date (Month/Year): 08/21	Primary Assessment Contact: Tomasz Heyduk

Note: Each cell in the table below will expand as needed to accommodate your responses.

#	Student Learning Outcomes What do the program faculty expect all students to know or be able to do as a result of completing this program?  Note: These should be measurable and manageable in number (typically 4-6 are sufficient).	Curriculum Mapping In which courses will faculty intentionally work to foster some level of student development toward achievement of the outcome? Please clarify the level at which student development is expected in each course (e.g., introduced, developed, reinforced, achieved, etc.).	Assessment Methods	
			Artifacts of Student Learning (What) 1. What artifacts of student learning will be used to determine if students have achieved this outcome? 2. In which courses will these artifacts be collected?	Evaluation Process (How) 1. What process will be used to evaluate the artifacts, and by whom? 2. What tools(s) (e.g., a rubric) will be used in the process?  Note: Please include any rubrics as part of the submitted plan documents.
1	Possess an appropriate level of knowledge on current biomedical science as related to biochemistry and molecular biology and the ability to evaluate and critique publications; possess the ability	The outcome is learned throughout the students' learning period. Upon entering the program, students take advanced courses in biochemistry and molecular biology and begin research on their dissertation project under the guidance of their faculty advisor. Required coursework beyond the first year Core curriculum include:  Macromolecules: Structure, Function and Interactions (BCHM-6230)	The following artifacts are used to monitor the achievement of this learning outcome:  1. A passing grade on the preliminary written exam. 2. A passing grade on the preliminary oral exam. 3. Yearly evaluation of the progress in the dissertation research by student's dissertation committee. 4. Preparation and defense of the	The intent of the preliminary exam is to verify that the student is capable of Ph.D.-level research. The student must pass both the written Preliminary Examination and Oral Comprehensive Examination in order to advance to dissertation status. The written proposal focuses on topics related to the thesis project. A high quality written proposal is a necessary prerequisite for advancing to the Oral Comprehensive Examination. The following evaluation criteria are used for evaluating the written proposal: Idea and

	<p>to identify and select meaningful problems to be addressed in bioscience research, to frame testable/falsifiable hypotheses concerning an important research question; be able to create and implement experimental protocols with suitable controls to test a scientific hypothesis, and to interpret the results of experiments in light of the hypothesis driving them.</p>	<p>Advanced Topics: Molecular Basis of Human Disease (BCHM-6240)</p> <p>Preparation and Evaluation of Scientific Research Proposals (Preliminary Exam, BCHM-6250)</p> <p>Dissertation Research (BCHM-6990)</p> <p>Mentorship discussions with senior scientists are also important components.</p>	<p>dissertation</p> <p>Artifacts 1&amp;2 are collected in Macromolecules: Structure, Function and Interactions (BCHM-6230).</p>	<p>Critical Thinking, Presentation, NIH Style Critique (Overall Impact, Significance, Approach During). During the oral exam, a five-member committee assesses the student's ability to master the research subject of his/her Ph.D. thesis, including the ability to think critically and creatively about this area, and to communicate their ideas in writing. Preparation of a research proposal provides a vehicle to develop and test these abilities. To earn the Ph.D. degree, students must demonstrate a firm grasp of biochemistry and related areas of molecular biology, especially as it relates to lecture and seminar courses taken, and independent studies and rotations completed.</p> <p>After successful completion of preliminary written and oral exams, the progress towards this learning objective is monitored by a Thesis Committee. This committee is formed with the student's mentor as a chair and have a minimum of three faculty members. All students are required to submit a progress report and meet with their committee for progress evaluation every year between Sept.1 and Nov. 1. Students entering their 5<sup>th</sup> year in the Department will meet with their committee at least twice a year. For each of the yearly progress meetings, each committee member is expected to rate the student's performance ("outstanding," "satisfactory" or "unsatisfactory") in each of the following 10 areas, and provide the student with constructive suggestions for improvement: the quality of the written report, quality of the presentation, suitability of timetable for the next year, knowledge of the literature, ability to</p>
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2	<p>Demonstrate the ability to effectively communicate biomedical research with respect to the content, organization, logical flow, presentation, and appropriate use of language incorporating the use of visual aids.</p>	<p>Students are required to present at a minimum of three journal clubs/colloquia. Students also have opportunities to present at the annual departmental retreat and at regional and national scientific meetings. Students must make an oral presentation and defense of a dissertation project before a 5-member committee.</p> <p>The courses relevant to this student learning outcome:</p> <p>Colloquium (BCHM-6920)</p> <p>Biochemistry and Molecular Biology Journal Club (BCHM-6910)</p> <p>Preparation and Evaluation of Scientific Research Proposals (Preliminary Exam, BCHM-6250)</p>	<p>Student performance in journal club/colloquium is graded. The oral preliminary defense is graded by the 5 members of the committee</p> <p>The artifacts of student learning are collected in:</p> <p>Colloquium (BCHM-6920)</p> <p>Biochemistry and Molecular Biology Journal Club (BCHM-6910)</p> <p>Preparation and Evaluation of Scientific Research Proposals (Preliminary Exam, BCHM-6250)</p>	<p>The coursemasters of Colloquium and Biochemistry and Molecular Biology Journal Club courses collect evaluation of student presentations from all faculty present at these presentations. They use these evaluations to assign the grade. The presentation during oral preliminary examination is evaluated by a 5-member student examination committee.</p>
3	<p>Understand the expectations for responsible</p>	<p>Saint Louis University provides a series of 2-hour workshops throughout the year on conflict of interest, intellectual property, authorship and peer review, scientific</p>	<p>Online training sessions typically include questions and answers modules that</p>	<p>Online training and attendance at four workshops is a university requirement, and graduate students can't graduate</p>

	conduct of research.	misconduct, IRB, animals in research and data confidentiality. Each interactive workshop consists of instruction in the topic, engaged discussion, and applied cases. Additionally, graduate students supported by research funds from NIH and/or NSF are required to complete RCR online modules through the Collaborative Institutional Training Initiative (CITI).	have to be passed in order to complete the training.	without attending the required # of sessions. Attendance is taken and tracked carefully for federal compliance.
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### Use of Assessment Data

1. How and when will analyzed data be used by program faculty to make changes in pedagogy, curriculum design, and/or assessment practices?

A new position of Vice-Chair was created in our Department in 2021. One of the responsibilities of the Vice-Chair (Dr. Yuna Ayala) is supervision of all training activities within the Department. Dr. Ayala chairs the BMB Training Committee (Yuna Ayala, Edwin Antony, Susana Gonzalo, Marie Reynolds and Tomasz Heyduk). This committee meets regularly (monthly) to discuss all the current issues related to our Ph.D. program. Dr. Ayala provides a report from committee meetings to the entire faculty during the regular monthly faculty meetings.

2. How and when will the program faculty evaluate the impact of assessment-informed changes made in previous years?

Once a year (at the end of Spring semester), the regular monthly meeting of BMB Training Committee will be devoted to the evaluation of the impact of assessment-informed changes made in previous years. Dr. Ayala will provide a report from this meeting to entire faculty during a faculty meeting.

### Additional Questions

1. On what schedule/cycle will program faculty assess each of the program's student learning outcomes? (Please note: It is not recommended to try to assess every outcome every year.)

Student learning outcome 1 is a core mission of our program and it will be evaluated yearly by BMB Training Committee. Student learning outcomes 2 & 3 will be evaluated every 3 years.

2. Describe how, and the extent to which, program faculty contributed to the development of this plan.

Members of BMB Training Committee participated in development of this plan through discussion during regularly scheduled monthly committee meetings.

**IMPORTANT: Please remember to submit any rubrics or other assessment tools along with this plan.**