SAINT LOUIS UNIVERSITY

Saint Louis University
Program Assessment Plan

Program (Major, Minor, Core): Biochemistry & Molecular Biology
Department: Biochemistry & Molecular Biology (BMB)
College/School: School of Medicine
Person(s) Responsible for Implementing the Plan: Alessandro Vindigni, Ph.D.
Date Submitted: 04/27/16

Program Learning Outcomes	Curriculum Mapping	Assessment Methods	Use of Assessment Data
What do you expect all students who complete the program to know, or be able to do?	*Where is the outcome learned/assessed (courses, internships, student teaching, clinical, etc.)?*	*How do students demonstrate their performance of the program learning outcomes? How does the program measure student performance? Distinguish your direct measures from indirect measures.*	*How does the program use assessment results to recognize success and "close the loop" to inform additional program improvement? How/when is this data shared, and with whom?*
Successful students will: possess appropriate level of knowledge current biomedical science as related to biochemistry and molecular biology and the ability to evaluate and critique publications; possess the ability 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.	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 includes: Macromolecules: Structure, Function and Interactions (BCHM-6230) Advanced Topics: Molecular Basis of Human Disease (BCHM-6240) Preparation and Evaluation of Scientific Research Proposals (Preliminary Exam, BCHM-6250) Dissertation Research (BCHM-6990) Mentorship discussions with senior scientists are also important components.	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. During the oral exam, a 5-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. Students must complete and defend a dissertation before a 3-member committee. Annual progress reports before the committee are required of each student.	This information is used to determine whether the student is ready to advance in the program, to identify weaknesses in their knowledge base that need to be remediated, to help design the remediation, and in periodic reviews of the curriculum to determine if we are meeting our goals and whether the goals themselves are still optimal. These data are shared with the Program Director (Dr. Vindigni), the oversight committee (Drs. Baldan, Eissenberg, and Vindigni), and the BMB Chair (Dr. Di Cera). They are shared with the BMB faculty as needed for programmatic assessment.

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.	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.	Student performance in journal club/colloquium is graded. The oral preliminary defense is graded by the 5 members of the committee	This information is used to determine whether the student is ready to advance in the program, to identify weaknesses in their knowledge base that need to be remediated, to help design the remediation, and in periodic reviews of the curriculum to determine if we are meeting our goals and whether the goals themselves are still optimal. These data are shared with the Program Director (Dr. Vindigni), the oversight committee (Drs. Baldan, Eissenberg, and Vindigni), and the BMB Chair (Dr. Di Cera). They are shared with the BMB faculty as needed for programmatic assessment.
Summarize the expectations for responsible conduct of research.	Saint Louis University provides a series of 2-hour workshops throughout the year on conflict of interest, intellectual property, authorship and peer review, scientific 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).	Online training and attendance at four workshops is a university requirement, and graduate students can't graduate without attending the required # of sessions. Attendance is taken, and tracked carefully for federal compliance.	The Saint Louis University Office for Research Integrity maintains a spreadsheet of attendance records. Primary responsibility for meeting the contract requirements for RCR training is in the hands of the PI. The Office of Research Integrity instructs attendees that they should contact them with any questions regarding how many hours they have and when they are finished if they would like a certificate/transcript.

1. **It is <u>not recommended</u> to try and assess (in depth) all of the program learning outcomes every semester. It is best practice to plan out when each outcome will be assessed and focus on 1 or 2 each semester/academic year. Describe the responsibilities, timeline, and the process for implementing this assessment plan.**

   The BMB Graduate Oversight Committee will conduct an annual internal review of these assessment procedures. Each summer semester, we will review one of the program learning outcomes, alternating between the foundational knowledge outcome and the hypotheses testing outcome.

2. **Please explain how these assessment efforts are coordinated with Madrid (courses and/or program)? N/A**

   Not applicable. We have no interactions with the Madrid Campus.

3. **The program assessment plan should be developed and approved by all faculty in the department. In addition, the program assessment plan should be developed to include student input and external sources (e.g., national standards, advisory boards, employers, alumni, etc.). Describe the process through which your academic unit created this assessment plan. Include the following:**

   a. Timeline regarding when or how often this plan will be reviewed and revised. (This could be aligned with program review.)

      We maintain a formal Graduate Policies Handbook, which is assessed annually by the BMB Graduate Oversight Committee (Drs. Alessandro Vindigni, Joel Eissenberg, and Angel Baldan) in conjunction with the all faculty in the department. The Handbook is updated as needed and all changes are voted on by the full faculty before implementation.

   b. How students were included in the process and/or how student input was gathered and incorporated into the assessment plan.

      The students are continually in very close contact with their mentors (usually multiple times daily) and communication occurs primarily from the student to the mentor. A committee of three faculty members (including the Ph.D. Mentor) advises the student and reviews their progress toward the Ph.D. at least once a year until the completion of the degree. Our students feel very empowered to directly discuss these issues with us. This information is assessed and integrated among the faculty as a whole whenever instructional issues arise, with the assessment being led by the BMB Graduate Oversight Committee (Vindigni, Chairperson). Proposed alterations to the program are discussed with senior students to receive feedback from the student's perspective. Students often participate in the revisions to the BMB graduate policies handbook.

   c. What external sources were consulted in the development of this assessment plan?

      Very little external validation for this process is needed because this is how almost all apprenticeship-style graduate programs in the world operate. It is a standard, well-validated paradigm. We track our students after they leave the program, and their successes in achieving high-quality post-doctoral or technical positions (often leading to faculty or senior scientist positions)

indicate that our assessment procedures are doing their job.

d. Assessment of the manageability of the plan in relation to departmental resources and personnel

Management of the program and assessment plan is part of the routine duties of the full faculty in the program, particularly members of the BMB Graduate Oversight Committee. It is not an onerous task because our program is small and well-defined.