

## **Graduate Program in Microbial Biology Ph.D. Degree Learning Goals and Assessment**

The goal of the Microbial Biology Ph.D. Program is to give students a fundamental understanding of the biology of microorganisms including the genetic, metabolic, and systematic diversity of microbial life and the diverse roles microorganism play in the environment, including the multitude of applications of microbes in biotechnology, the food industry, agriculture, and medicine.

### **Learning Goal 1: Attain marked ability, scholarship, research and leadership skills in the field of microbial biology.**

Assessment of student achievement of Goal 1:

- Grades in graduate courses
- Comprehensive examination assessing depth and breadth of knowledge
- Review by faculty of student progress with close advising and mentoring
- Placement in positions and careers that require ability and scholarship in microbiology

Role of the graduate program in helping students to achieve Goal 1:

- Close advising to assure that students are being prepared in a coherent and academically rigorous fashion
- Effective monitoring of student progress, including annual reports on research progress from both the student and the student's committee chair
- Evaluations of teaching effectiveness of instructors in graduate courses
  - If effectiveness is below expectations, work with instructors to improve effectiveness
- Periodic review of curricular offerings and assessment tools by the program faculty

### **Learning Goal 2 for Students: Engage in and conduct original research**

Assessment of student achievement of Goal 2:

- Preparation of research proposal (Qualifying Exam)
- Oral defense of research proposal (Qualifying Exam)
- Assessment of quality of Ph.D. dissertation
  - Public defense of dissertation
  - Critical reading of dissertation by committee of graduate faculty members and a committee member from outside of the microbial biology graduate program.
  - Submission and acceptance of peer-reviewed articles and conference papers based on the dissertation
- Achievement of students as evidenced by professional placements, selection for conference presentations, peer-reviewed publications, and obtaining individual grants

Role of the graduate program in helping students achieve Goal 2:

- Provide comprehensive advising and assist in the identification of mentors
- Provide early introduction to research methods and hands-on laboratory research
- Provide opportunities to present research and receive feedback
- Maintain adequate funding levels through the research phase

### **Learning Goal 3 for Students: Prepare to be professionals in careers that require training at the highest levels in microbial biology**

Assessment of student achievement of Goal 3:

- Review papers presented at conferences
- Review journal publications
- Evaluate teaching effectiveness of graduate student instructors
- Collect data on positions obtained after graduation
- Review by external advisory committees, both inside of and external to the university
- Survey alumni/ae

Role of the program in helping students achieve Goal 3:

- Encourage participation in professional development programs in such areas as human subjects research, library use, writing skills, course management software, interview skills, presentation skills, development of CVs, use of research tools, training in the responsible conduct of research, and proposal writing
- Host discipline-specific training when appropriate
- Develop or enhance programs related to job and networking skills, including activity in professional societies
- Develop discipline-specific programs in concert with the Teaching Assistant Project and/or Carnegie Academy for Scholarship on Teaching and Learning programs
- Provide flexible options for students with interdisciplinary interests
- Acquaint students with non-academic career opportunities

**The leadership of the Microbial Biology graduate program** will regularly review the structure and content of the program and the feedback received from assessments and surveys. These reviews will be used to provide the best possible education to students in order to meet the needs for highly trained individuals in microbiology.