

Department of Microbiology, Molecular Biology and Biochemistry
Departmental Profile
September 2002

Introduction

The Department of Microbiology, Molecular Biology and Biochemistry MMBB is unique compared with academic units at many institutions since it encompasses traditional areas of both Microbiology and Biochemistry and integrates them with Molecular Biology. When at full strength, there are 17 faculty positions. Areas which need to be stressed in filling future positions are (in random order): 1) food safety/microbial pathogenesis, 2) plant, animal, or fungal cell biology, and 3) molecular environmental microbiology. In addition to the 14 faculty positions, there are 6 support staff, 14 Scientific Aides/Research Associates, 6 post-doctoral fellows, 1 visiting scientists and about 34 graduate students. Current faculty represent diverse areas with respect to training, background, and research interests; thus, they are able to work with a broad range of scientists in departments within the College of Agricultural & Life Sciences and with faculty in other departments across the campus. Our goal is to offer degrees that meet or surpass guidelines sanctioned by national scientific societies. For example, our B.S. degree requirements in microbiology should meet guidelines established by the American Society for Microbiology.

Teaching

The Department offers undergraduate majors in i) Microbiology and in ii) Molecular Biology and Biochemistry (MBB) which appeal to students who have a broad range of interests and backgrounds. We currently have approximately 132 undergraduate majors in these two programs. Our primary teaching mission is to support our undergraduate majors with a balanced and up-to-date curriculum competitive with Research I institutions. We also provide a significant amount of service teaching with introductory courses in microbiology and biochemistry required by over twenty majors at the University of Idaho. In addition, we participate in providing part of the University Core Curriculum with MMBB 154/155, a microbiology lecture and laboratory course for non-science majors. Enrollment in introductory courses ranges from 100 to 150/semester in each course with multiple laboratory sections where students receive personal attention from faculty and teaching assistants. Even though we have support from the College of Agricultural & Life Sciences for five teaching assistants each year, we need 8-9 each fall semester and 14-16 each spring semester. The funding needed for increased numbers of teaching assistants and operating funds to support our teaching program is one of the biggest challenges facing the Department at this time. At the graduate level, the department offers degrees leading to the M.S. and Ph.D. degrees in MMBB. Our graduate students are well prepared for research-oriented careers in a variety of academic, industrial or governmental settings. Graduate students have opportunities to conduct thesis research in one of seven programs funded predominantly by grants from federal agencies. Supplemental support is obtained from commodities, private agencies and the Idaho Agriculture Experiment Station (see below).

Research

MMBB has developed state of the art research programs which are nationally competitive while meeting the needs of agriculture and the citizens of Idaho. Although we are considered a department which is strong in basic science research, patent applications originating from research in MMBB have far outnumbered those in any other UI department since prior to 1980. This fact demonstrates that good basic research is not only our best means of attracting motivated students to our college, but also our most sure way to serve the needs of the University's constituents. When all of our positions are filled, our major areas of research strength include, in random order:

1. Applied and environmental microbiology.
2. Microbial pathogenesis, food safety and disease prevention
3. Molecular and general genetics
4. Molecular basis of development and cell biology
5. Mammalian, plant and microbial physiology
6. Biochemistry
7. Agricultural biotechnology

All faculty have active research programs with nearly all being funded by external grant support. In a typical year, faculty publish 50-60 peer-reviewed publications and receive about \$3,000,000 in external grants funds. In addition to individual programs, many faculty are involved in one or more collaborative research projects with individuals in other departments, universities or UI institutes. During the past few years, our faculty has extended its research interests internationally by memoranda of understanding established, or in progress, with institutions in Asia and Central/South America. Examples of collaborative projects include: 1) studies on the ecology of O157:H7 *Escherichia coli* which causes bloody diarrhea and complications after ingestion of contaminated bovine meat products, 2) studies on the bacterial virulence factors leading to bovine mastitis, 3) determining the genetic controls over leaf development and the time to reproduction, 4) molecular approaches to pre-harvest management and 5) biological control of fungal agents which cause plant diseases, 6) development of bioremediation processes for the clean-up of contaminated soils, waters, and aquifers.