

Microbiology

College of Letters and Science



Photo by Evelyn Boswell, MSU News.

Microbiology is the branch of science dealing with microorganisms. It is one of the most relevant, dynamic and exciting disciplines in the biological sciences. Microbiology has become an umbrella term that encompasses many subdisciplines or fields of study, including: bacteriology (the study of bacteria); mycology (the study of fungi); protozoology (the study of protozoa); phycology (the study of algae); parasitology (the study of parasites); and virology (the study of viruses).

An understanding of these various life forms in the environment has created the other subdisciplines of microbial ecology, microbial physiology, microbial genetics and molecular biology. Our need to control infectious diseases has brought about the fields of pathology and immunology. Genome sequencing and other high throughput molecular studies of microorganisms has led to the field of bioinformatics, computational approaches to understand the complexity of life.

The discipline of microbiology is diverse, and the opportunities for microbiologists are enormous. The Department of Microbiology at MSU is a modern department that has kept pace with recent advances in the various subdisciplines of microbiology. We offer courses in each of the fields indicated above.

Undergraduate Degrees:

Undergraduate students obtain a Bachelor of Science degree in Microbiology under one of these options:

- Microbiology
- Environmental Microbiology
- Medical Laboratory Science
- Biotechnology, Microbial Systems (interdisciplinary with College of Agriculture)

Graduate Degrees:

The department also offers both a Master of Science and a Doctor of Philosophy degree in Microbiology.

Faculty:

For a list of current faculty please see: www.montana.edu/wwwmb/index.php?page=faculty

For additional information, contact:

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Microbiology at Montana State University

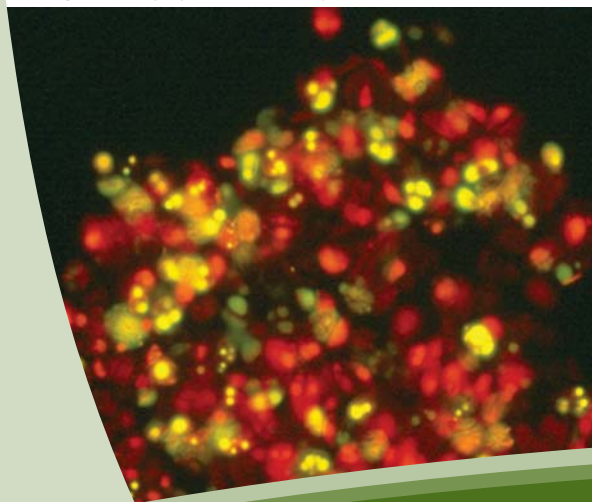
During the first year of study, each student is assigned an advisor from the department who works closely with the student to plan the curriculum best suited to his or her interests. Currently the department has about 120 undergraduates and 25 graduate students. The Department of Microbiology cooperates with the College of Agriculture in an interdisciplinary degree program in biotechnology where students can focus on Biotechnology Microbial Systems.

Undergraduate Research

To further enhance career opportunities, the department encourages participation in undergraduate research with a faculty mentor. In addition, participation in the Honors Program is encouraged. This requires that students carry out directed and independent research leading to the submission and defense of a senior thesis.

Image courtesy of Keith Cooksey.

Photo by Kelly Gorham, MSU News.



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Career Opportunities:

Our graduates are employed by the mining, health, petroleum, textile, biotechnology, food, agriculture and pharmaceutical industries, and by university, institutional and governmental entities. Some examples of job opportunities include:

- Bacteriologist
- Biochemist
- Biomedical Lab Manager
- Chemistry Lab Technologist
- Clinical Lab Scientist
- Dairy Technologist
- Educator
- Environmental Scientist
- Food Technologist
- Forensic Specialist
- Geneticist
- Immunologist
- Mycologist
- Pathologist
- Parasitologist
- Medical Technologist
- Research Specialist
- Quality Assurance Technologist
- Technical Sales
- Technical Writer
- Virologist

The undergraduate program at MSU is also designed to prepare students for graduate study. Students who complete a graduate degree are generally employed in industry, colleges, university or medical institutions. Some pursue postgraduate medical or research studies.

The Department of Microbiology has four curriculum options from which to choose:

Microbiology/Pre-Med

This option covers all areas of microbiology and prepares students to be professional microbiologists. The curriculum is also excellent preparation for those who wish to attend medical, dental, veterinary or graduate schools.

Environmental Microbiology

Microorganisms play an important role in maintaining healthy ecosystems. They are also used for beneficial processes such as bioremediation of hazardous waste and generation of useful products, including biofuels. Environmental Microbiologists are concerned with environmental sanitation, food and waterborne disease control, water quality and wastewater treatment, consumer product safety, epidemiology, ecological processes, industrial microbiology and health education.

Medical Laboratory Science

This option is for students interested in careers in clinical laboratory testing. These tests provide data that are used in the diagnosis and treatment of diseases. MSU has developed a Medical Laboratory Science training program in conjunction with nine hospitals in Montana for the education of the next generation of Medical Laboratory Scientists.

Biotechnology, Microbial Systems

This option enables graduates to work in the thriving biotechnology industry. Biotechnology uses organisms to produce commercial products, either through natural processes or through genetic manipulation. This is an interdisciplinary program with the College of Agriculture.



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Microbiology Facilities at MSU

The microbiology classrooms and laboratories in Lewis Hall are complemented by research laboratories in the adjacent Cooley Laboratories building. The department has modern equipment for instruction and research, including state-of-the-art instruments for recombinant DNA technology, microscopy, genomics and bioinformatics.



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