

MICROBIOLOGY & IMMUNOLOGY

COLLEGE OF LETTERS & SCIENCE | MONTANA STATE UNIVERSITY

MICROBIOLOGY AT MONTANA STATE UNIVERSITY

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 and Immunology 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.

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 and Immunology cooperates with the College of Agriculture in an interdisciplinary degree program in biotechnology where students can focus on Biotechnology Microbial Systems.

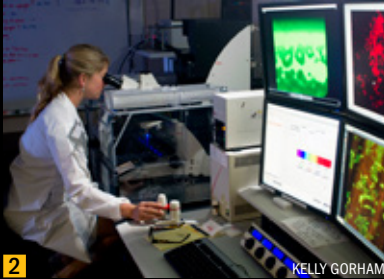
MICROBIOLOGY FACILITIES AT MSU

The microbiology classrooms and laboratories in Lewis Hall are complemented by research laboratories in the adjacent Cooley Laboratories building. The Cooley Laboratories building recently underwent a \$15 million renovation to create a state-of-the-art biomedical research facility.

The department has modern equipment for instruction and research, including state-of-the-art instruments for recombinant DNA technology, microscopy, genomics and bioinformatics.



1 KELLY GORHAM



2 KELLY GORHAM



3 KELLY GORHAM



4 KELLY GORHAM



5 KELLY GORHAM

1 Student Elliott Barnhart conducts research on coalbed methane 2 Student Kristen Brileya works with a state-of-the-art confocal microscope 3 Microbiology researchers collect samples from Heart Lake in Yellowstone National Park 4 Students prepare soil samples in Matthew Fields' laboratory for transport to a research site 5 Corrie Villegas was the first Native American accepted to the Montana Medical Laboratory Science Training Program

For additional information, contact:

Department of Microbiology & Immunology
Montana State University
109 Lewis Hall
P.O. Box 173520
Bozeman, MT 59717-3520

Tel: 406-994-2902
Fax: 406-994-4926

www.montana.edu/wwwmb
microbiology@montana.edu



Options within Major

- Microbiology Option
 - Microbiology Track
 - Environmental Microbiology Track
 - Premed Track
- Medical Laboratory Science Option
- Environmental Health Option
- Biotechnology Microbial Systems Option

Specialized Areas of Study/Minors

- Microbiology

What can I do with a degree in Microbiology?

- Analytical chemist
- Bacteriologist
- Biochemist
- Biophysicist
- Biostatistician
- Biotechnologist
- Blood bank technologist
- Chemist
- Clinical chemistry technologist
- Clinical pathologist
- Crime lab analyst
- Cytotechnologist
- Dentist
- Ecologist
- Embryologist
- Environmental health educator
- Environmental impact analyst
- Food and drug inspector
- Geneticist
- Hemotherapist
- Histologist
- Horticulturist
- Hospital administrator
- Immunologist
- Industrial hygienist
- Laboratory technician
- Medical doctor
- Medical illustrator
- Medical laboratory manager
- Medical record technician
- Medical technician
- Microbiologist
- Mycologist
- Natural resources manager
- Naturalist
- Parasitologist
- Patent specialist
- Pathologist
- Pharmaceutical sales representative
- Pharmacologist
- Physical therapist
- Physician assistant
- Public health specialist
- Quality control specialist
- Research assistant
- Research scientist
- Technical writer
- Toxicologist
- Veterinarian
- Virologist

6 Barry Pyle explains to student Chelsea Crandell the procedure for filling tubes with bacteria, fixative and medium

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CURRICULUM TRACKS IN MICROBIOLOGY

Microbiology

This track covers all areas of microbiology and prepares students to be professional microbiologists.

Environmental Microbiology

This track prepares students for careers as environmental microbiologists, 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.

Premed

This track prepares students for medical, dental, veterinary or graduate schools.

Medical Laboratory Science

This track is for students interested in careers in clinical laboratory testing. These tests provide data that are used in the diagnosis and treatment of diseases.

Environmental Health

Environmental health specialists are concerned with general environmental sanitation, food and waterborne disease control, air and water quality, water and wastewater treatment, solid and hazardous waste disposal, rodent and insect control, consumer product safety, recreational and occupational safety, radiological hygiene, epidemiology and health education.

Biotechnology Microbial Systems

This track enables graduates to work in the thriving biotechnology industry.

Biotechnology uses organisms to produce commercial products, either through natural processes or through genetic manipulation.

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.

