



COLLEGE OF NATURAL SCIENCES, FORESTRY, AND AGRICULTURE

# Microbiology

## UMaine's ADVANTAGE

- Hands-on experience early in your program
- Close interaction with faculty
- Extensive research opportunities
- High placement rates in competitive graduate and professional schools

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## WHY STUDY MICROBIOLOGY AT UMAINE?

Microbiology is the study of microscopic forms of life such as bacteria and viruses and the immune response to these microorganisms. It is a broad, multi-disciplinary field using techniques of genetics, chemistry, biochemistry, physiology, ecology, and pathology to study the biology of microorganisms from gene expression at the molecular level to the composition of populations of microorganisms.

Exciting discoveries involving microorganisms have important and far reaching implications for biotechnology, molecular biology, medicine, public health and the environment. AIDS and other important diseases present new and exciting challenges for microbiologists in the public health field; and advances in recombinant DNA technology, immunology, and the ability to manipulate the biology of microbial cells have revolutionized science and thrust microbiology into the center of the rapidly expanding arena of biotechnology.

## WHAT CAN I DO WITH A DEGREE IN MICROBIOLOGY?

A career in microbiology offers an opportunity to explore new phenomena, participate at the frontiers of actively expanding areas of science and to make significant contributions to the human condition and global community. Our graduates have taken positions in university research laboratories; biotechnology industries; medical, dental and veterinary research laboratories; public health laboratories; pharmaceutical, food and chemical industries; and environmental research and monitoring laboratories.

Our majors also find that they are highly competitive in getting into graduate programs at colleges and universities around the country, where they earn Ph.D., M.S. or M.D. degrees. Our students are very competitive for

admission to medical schools and other health-related fields as a result of our rigorous biochemistry and microbiology courses.

## OUR UNDERGRADUATE PROGRAM

The department offers three related undergraduate programs leading to a bachelor of science degree in biochemistry, microbiology or molecular and cellular biology. All three programs are designed to give students a broad background in the biological and physical sciences and an opportunity for in-depth concentration in one or more of these disciplines.

**HANDS-ON EXPERIENCE:** A key aspect of all three undergraduate programs is the opportunity to gain hands-on experience in the laboratory. Laboratory courses are offered in fundamental aspects of biochemistry and microbiology as well as specialized topics such as recombinant DNA techniques, virology, cell culture, immunology, pathogenic microbiology and microbial genetics and diversity. Laboratory courses in these topics are not generally available at smaller institutions that lack graduate and research programs or at many larger research universities where student numbers are too large to accommodate numerous laboratory courses in such specialized areas. In their senior year, all majors are required to engage in independent research with a faculty member. This direct link to active national and international-level research activities is an important aspect of our undergraduate programs. Students become part of a research team in the faculty's laboratory and are actively engaged in ongoing research projects that are both publicly and privately funded.

## OUR GRADUATE PROGRAM

Our graduate students plug into faculty research in such areas as: the molecular biology of gene expression and the regulation of development; toxicology and

## ABOUT UMAINE

The University of Maine, founded in Orono in 1865, is the state's premier public university. It is among the most comprehensive higher education institutions in the Northeast and attracts students from across the U.S. and more than 73 countries. It currently enrolls 11,286 total undergraduate and graduate students who can directly participate in groundbreaking research working with world-class scholars. The University of Maine offers doctoral degrees in 35 fields, representing the humanities, sciences, engineering and education; master's degrees in roughly 70 disciplines; 90 undergraduate majors and academic programs; and one of the oldest and most prestigious honors programs in the U.S. The university promotes environmental stewardship on its campus, with substantial efforts aimed at conserving energy, recycling and adhering to green building standards in new construction. For more information about UMaine, visit [umaine.edu](http://umaine.edu).

## explore

*Bachelor of Science in  
Microbiology*

*Minor in  
Microbiology*

*Master of Science in  
Microbiology*

*Master of Professional Studies in  
Microbiology*

*Ph.D. in  
Microbiology*



carcinogenesis; membrane function and structure; molecular biology of the development of cell surface antigens; structures and interactions of DNA; evolution of DNA sequences; molecular mechanisms of virulence of pathogens; host-pathogen interaction, cell-cell communication mechanisms and mechanisms of symbiosis. In addition, the department participates in the statewide Graduate School of Biomedical Sciences and Engineering (GSBSE) Ph.D. program, with cooperating faculty at The Jackson Laboratory, the Maine Medical Center Research Institute, the Foundation for Blood Research, the University of Southern Maine, Mount Desert Island Biological Laboratory and others to offer graduate students expanded research and educational opportunities.

### OUR FACULTY

Our faculty are active in a variety of research fields. Many have working relationships with top research institutes in Maine, such as The Jackson Laboratory and Maine Institute for

Human Genetics and Health. Funding for faculty research comes from the National Science Foundation, National Institutes of Health and other national organizations.

### OPPORTUNITIES TO EXCEL

Faculty in our department generally have an open lab policy, accepting motivated and qualified majors to work in their labs very early in their education. Most students will continue this lab work throughout their UMaine career. Generous funding by alumni underwrites this undergraduate research experience. Our majors have been very successful in selection for early acceptance to Tufts University School of Medicine through the Tufts Maine Track Early Assurance program. UMaine consistently has high placements in the program.

### HOW DO I APPLY?

Visit [umaine.edu](http://umaine.edu) for an application, as well as information about academics and life at UMaine.



**My easy transition from student to research associate was due to BMMB's research requirement. Being given all the tools for research from my classes was important, but being able to choose a laboratory to work in, and being urged to get results was the best preparation for the real world possible. That year of research makes one self-sufficient and independent in the laboratory, which is what my employer says is the most important attribute for a laboratory researcher."**

— Justin Gaudet, Class of 2000, B.S. in Microbiology  
Employed in the Department of Molecular Pathology,  
Harvard University, Massachusetts General Hospital

