

Microbiology and Immunology

Chair

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Undergraduate major: microbiology (BS)

Undergraduate minor: microbiology

Graduate degrees: MS in microbiology; PhD in microbiology

Faculty: <https://microbiology.medicine.uiowa.edu/profile/leadership>

Website: <https://microbiology.medicine.uiowa.edu/>

Study in the Department of Microbiology and Immunology is dedicated to the branch of biological sciences that investigates the smallest living things: microbes that include bacteria, archaea, fungi, algae, protozoa, and viruses. It is coupled with immunology that includes the study of the protective responses of higher organisms to disease-causing microbes and cancers, and mistakes in immune function. Microbiology and immunology often interact in humans through the microbiome, those microbes that live with humans on their skin and mucosal surfaces, and yet must be restricted from causing diseases by the immune system.

Microbiology and immunology are at the forefront of the modern biological revolution. Microbes are experimental subjects of choice for examining genetic and biological phenomena because of their small size, rapid growth rate, relative simplicity, and variety of characteristics that allow them to cause many kinds of infections and alter normal body functions. Immunology often makes use of microbes and cancer cells to study the critical and complex human responses to eliminate microbes and cancers. A significant portion of contemporary biochemical research employs microbiological and immunological methods.

Current research is making theoretical and practical advances concerning microbes that infect animals, including humans, and the immune response to those microbes; the use of comparative genomics, gene expression profiling, and recombinant DNA methods to analyze biological processes and generate valuable products, such as antibiotics and antibodies; genetics and regulation of metabolic processes; and the genetics and regulation of the immune response, including characterization of mechanisms used by microbes to signal one another and characterization of interactions between different types of immune cells and their targets.

The Department of Microbiology and Immunology offers an undergraduate major and a minor, and graduate majors leading to an MS and a PhD, and determines the curricula for those programs. Undergraduates majoring in microbiology receive their degrees (Bachelor of Science) from the College of Liberal Arts and Sciences and are governed by that college's undergraduate academic policies. The graduate degrees are awarded by the Graduate College.