The Ohio State University Department of Microbiology provides an interface between academic molecular biology and real world applications in human health care and environment. The teaching and research interests of microbiology faculty span all aspects of interactions of microorganisms with animals and the environment.

AT A GLANCE
Research projects, financed by federal, state, industrial, and private sources, with more than $5 million in revenue annually, result in more than 50 research articles, reviews, and books each year.

DEGREE PROGRAMS
UNDERGRADUATE
• BS, Microbiology
• BA, Microbiology
• Minor, Microbiology

GRADUATE
• PhD, Microbiology

The Department of Microbiology has a rich history and long tradition of training world-class scientists.

MICROBIOLOGY PROFESSOR SHEDS LIGHT ON THE 22ND AMINO ACID

Joseph Krzycki, professor of microbiology, is senior author of a new study demonstrating that the amino acid, pyrrolysine, is produced by a series of just three chemical reactions with a single precursor—the amino acid lysine. Until now, pyrrolysine remained the only natural amino acid for which there was no established biosynthetic pathway. But Krzycki and colleagues at Ohio State revealed that pyrrolysine is made by combining two molecules of the canonical amino acid lysine—a surprising finding, given that some portions of its structure suggested to researchers that it might have more complex origins.

Studying of all aspects of the biology and activities of microorganisms.
THE ACADEMIC EXPERIENCE

STUDENTS LEARN ABOUT:

- Molecular architecture of microbial cells
- Microbial diversity
- Fundamental mechanisms of gene regulation and protein synthesis
- Metabolic processes
- Growth of microbial cells and populations
- Applications of microbial processes: vaccine production, water treatment, alternative fuels, production of antibiotics
- Mechanisms of microbial diseases: host pathogen interaction and the host immune responses
- Mechanisms of microbial resistance to antibiotics
- AIDS: the virus, and the molecules that are important in the disease

STUDENTS GAIN VALUABLE LABORATORY EXPERIENCE IN:

- Gene cloning
- Antigen-antibody interactions
- Western blotting, enzyme-linked immunoassay, immunofluorescence
- The use of microorganisms for chemical analysis
- DNA-agarose gel electrophoresis
- Determining environmental factors that influence microorganisms
- Transposon mutagenesis
- The analysis of microbial diversity
- The isolation and analysis of plasmic DNA
- Culture of T-lymphocytes

THE GRADUATE STUDENT EXPERIENCE

The department's PhD program offers an individualized approach to graduate study in one of the nation’s largest teaching and research institutions. Students will actively participate in planning their graduate program while working with colleagues from around the world. In this new era of genomics and molecular life sciences, research students on the PhD track are training to become the next generation of researchers.

RESEARCH

Faculty members in the Department of Microbiology have research interests that cover all aspects of the biology of microorganisms and their interactions with humans, animals, and the environment. Research topics range from the molecular basis of diseases and antibiotic resistance to production of commercial enzymes, from immunobiology and cancer to pollutant biodegradation and environmental remediation, from life at 100°C at the bottom of the ocean to photosynthesis, from basic molecular mechanisms to food protection and bioenergy.