Committee on Microbiology

Chair

• Michaela Gack, Microbiology

Professors

• Joy Bergelson, Ecology & Evolution
• Eugene B. Chang, Medicine
• Alexander Chervonsky, Pathology
• Michaela Gack, Microbiology
• Tatyana Golovkina, Microbiology
• Jean Greenberg, Molecular Genetics & Cell Biology
• Joseph Kanabrocki, Microbiology
• Dominique Missiakas, Microbiology
• Eric Pamer, Medicine
• Tao Pan, Biochemistry & Molecular Biology
• Glenn Randall, Microbiology
• Phoebe Rice, Biochemistry & Molecular Biology
• Raymond Roos, Neurology
• Lucia Rothman-Denes, Molecular Genetics & Cell Biology
• Howard Shuman, Microbiology
• Wei Jen Tang, Ben May Department for Cancer Research
• Aaron Turkewitz, Molecular Genetics & Cell Biology

Associate Professors

• Sarah Cobey, Ecology & Evolution
• Michael Rust, Molecular Genetics & Cell Biology

Assistant Professors

• Jueqi, Chen, Microbiology
• Maureen Coleman, Geophysical Sciences
• A. Murat Eren, Medicine
• Daria Esterhazy, Pathology
• Sam Light, Microbiology
• Mark Mimee, Microbiology
• Jacob Waldbauer, Geophysical Sciences

Emeritus Faculty

• Robert Haselkorn, Molecular Genetics & Cell Biology
• Bernard Roizman, Microbiology

The primary purpose of the Committee on Microbiology is to produce research scientists and teachers in microbeiology by offering formal instructions; by fostering informal dissemination of information among the faculty, fellows and students engaged in research in microbiology; and by administering a program of study leading to the degree of Doctor of Philosophy. Through its faculty, activities and educational program, the Committee on Microbiology integrates studies in various clinical and non-clinical departments of the Biological Sciences Division. The Committee on Microbiology maintains maximum flexibility in its program to cater to students' developing interests. Students with backgrounds in any appropriate field (physics, chemistry, biology, biochemistry, and medicine) may commence work in microbiology upon entering the graduate program of the Biological Sciences Division. The Committee on Microbiology sponsors a seminar series, which brings to campus prominent microbiologists from all over the world to discuss their research and meet with microbiology faculty and students. Another regular activity sponsored by the committee is the Microbiology Research Forum. Research Forums feature a current graduate student, postdoctoral fellow or other training fellow in microbiology presenting his/her research data. Microbiology Research Forums are open to the university community, offering an informal forum for the discussion of microbiology within the Chicago scientific community.

The Committee on Microbiology is a member of the Biomedical Sciences Cluster, which also houses graduate programs of the Committee on Cancer Biology, the Committee on Immunology, and the Committee on Molecular Metabolism and Nutrition. The four academic units share a joint admissions committee, several
courses, a seminar series and other events for students and faculty within the cluster. The goal of the cluster system is to encourage interdisciplinary interactions among both trainees and faculty, and to allow students flexibility in designing their particular course of study. The Ph.D. degree is administered by the Committee on Microbiology and is recommended when the student has fulfilled the requirements stipulated in his or her individual program; has met the divisional requirements for the degree; and, in the opinion of the committee, has attained competence in research in his or her field of specialization.

**MICROBIOLOGY COURSES**

**MICR 30600. Fundamentals of Bacterial Physiology. 100 Units.**
This course meets one of the requirements of the microbiology specialization. This course introduces bacterial diversity, physiology, ultra-structure, envelope assembly, metabolism, and genetics. In the discussion section, students review recent original experimental work in the field of bacterial physiology.

Instructor(s): D. Missiakas Terms Offered: Autumn
Prerequisite(s): Three quarters of a Biological Sciences Fundamentals sequence, or consent of instructor
Equivalent Course(s): BIOS 25206

**MICR 31200. Host Pathogen Interactions. 100 Units.**
This course explores the basic principles of host defense against pathogens, including evolutionary aspects of innate and adaptive immunity and immune evasion strategies. Specific examples of viral and bacterial interactions with their hosts are studied in depth. A review of immunological mechanisms involved in specific cases is incorporated in the course.

Instructor(s): A. Chervonsky Terms Offered: Autumn
Prerequisite(s): BIOS 25206 and BIOS 25256
Equivalent Course(s): IMMU 31200, BIOS 25260

**MICR 31600. Molecular Basis of Bacterial Disease. 100 Units.**
This course meets one of the requirements of the microbiology specialization. This lecture/discussion course involves a comprehensive analysis of bacterial pathogens, the diseases that they cause, and the molecular mechanisms involved during pathogenesis. Students discuss recent original experimental work in the field of bacterial pathogenesis.

Instructor(s): D. Missiakas, J. Chen Terms Offered: Winter
Prerequisite(s): Three quarters of a Biological Sciences Fundamentals sequence.
Equivalent Course(s): BIOS 25216

**MICR 34600. Introduction to Virology. 100 Units.**
This class on animal viruses considers the major families of the viral kingdom with an emphasis on the molecular aspects of genome expression and virus-host interactions. Our goal is to provide students with solid appreciation of basic knowledge, as well as instruction on the frontiers of virus research.

Instructor(s): T. Golovkina Terms Offered: Spring
Prerequisite(s): Three quarters of a Biological Sciences Fundamentals sequence and third- or fourth-year standing
Equivalent Course(s): BIOS 25287

**MICR 35900. Medical Microbiology. 100 Units.**
Provides an overview of the clinically important microorganisms and their role in the causation of human infectious disease. The objectives of the course are to discuss mechanisms of microbial pathogenesis and host manifestations of disease, provide knowledge of the common organisms associated with specific infectious disease presentations as foundation for a system (organ)-based approach to diagnosis, and to describe the role of the clinical diagnostic laboratory in identification of pathogens and disease management. Lectures are held three days a week in 50-minute periods. Additionally, students attend weekly laboratory sessions during the quarter and participate in student-led case-based discussion groups with a faculty preceptor on a weekly basis. Two multiple-choice exams are administered, as well as a final laboratory practical exam and several laboratory quizzes.

Instructor(s): J. Benoit, G. Randall Terms Offered: Spring
Prerequisite(s): Second year medical students only or consent of instructor

**MICR 38000. Fundamentals and Applications of the Human Microbiota. 100 Units.**
Thousands of microbes colonize the human body to collectively establish the human microbiota. Research findings over the past two decades have led to a growing appreciation of the importance of the microbiota in various facets of human health. This course will explore the human microbiota through a critical review of the primary scientific literature. The first portion of the course will cover distinct ways by which the human microbiota impacts mammalian health. The second part of the course will focus on established and developing microbiota-targeting biotechnologies. Students will leave the course with a general understanding of the current state of human microbiota research and its therapeutic and diagnostic applications.

Instructor(s): S. Light, M. Mimee Terms Offered: Winter
Prerequisite(s): Three quarters of a Biological Sciences Fundamentals sequence
Equivalent Course(s): BIOS 25207

**MICR 39200. Tutorial: Microbiology. 100 Units.**
Additional readings in an area of Microbiology. Must be prearranged with a faculty member and preapproved by the chair of the Curriculum Committee.
Instructor(s): M. Gack  Terms Offered: Autumn Spring Summer Winter

**MICR 39900. Readings: Microbiology. 100 Units.**
Reading course in an area of Microbiology of special interest to the student. Must be prearranged with a faculty member and preapproved by the chair of the Curriculum Committee.

Instructor(s): M. Gack  Terms Offered: Autumn Spring Summer Winter

**MICR 40000. Microbiology Research Forum. 100 Units.**
All graduate students and honors undergraduate students of the Committee on Microbiology will present their research in a central forum, the data club, once each year. Students and postdoctoral fellows present their recent research data for critical evaluation by the faculty of the Committee on Microbiology. This course provides a forum to ensure continued progress of graduate students in their thesis projects. First year graduate students are required to register for the course.

Instructor(s): M. Gack  Terms Offered: Autumn Spring Winter

**MICR 47000. Thesis Research: Microbiology. 300.00 Units.**
Laboratory research for senior graduate students.

Instructor(s): M. Gack  Terms Offered: Autumn Spring Summer Winter

**MICR 47100. Non-Thesis Rsch: Microbiology. 300.00 Units.**
Non-Thesis Research refers to laboratory rotations. The purpose of laboratory rotations is to expose the student to different research environments, to broaden his or her acquaintance with useful laboratory techniques, and to introduce him or her to the conceptual framework of experimental design. Students undertake short, ten-week research projects in at least two different laboratories before beginning their dissertation research.

Instructor(s): M. Gack